

A TECHNOLOGICAL HISTORY OF THE DEBATE OVER THE US-INDIA NUCLEAR
COOPERATION AGREEMENT IN INDIA (2005-2007)

by

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A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Environmental Science & Public Policy

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Date: _____ Summer Semester 2014
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DEDICATION

I dedicate this dissertation to my parents. My mother, Jayashree Ravi for her unquestioning belief and constant encouragement that helped me get to the end of this project. My father, P. R. Ravi for inculcating discipline and impulse control during my formative years, traits that have stood me in good stead while writing this document. And my younger brother Prashanth. Ravi, a PhD student as well, for patiently hearing out my self-doubts and urging me to not give up during tough times even as he dealt with his own challenges in dignified silence.

ACKNOWLEDGEMENTS

Umuntu ngumuntu ngabantu "a person is a person through other persons" - Zulu maxim

Gratitude is a quality similar to electricity: it must be produced and discharged and used up in order to exist at all- William Faulkner

Several people have played direct and indirect roles in the completion of my dissertation. I am profoundly grateful to Dr. Allison Macfarlane, my first Committee Chair for helping me select the right courses, commenting extensively on my thesis proposal drafts and critiquing my chapter drafts. Her prompt communication, professionalism and patience in dealing with an international student still coming to grips with the US academic system were key factors that enabled me to finish this dissertation.

I am also very indebted to Dr. Hugh Gusterson, my current Committee Chair who took over from Allison in a smooth transition and shaped the bulk of my dissertation. His extensive theoretical insights and contextualizing facts, all delivered in an atmosphere of fastidious politeness have made this dissertation much better.

I heartily thank Dr. M. V. Ramana for agreeing to be on my committee, for his honest comments on my chapter, for his deep insights about the Indian nuclear program and for making the trip from New Jersey for my proposal and dissertation defense. I also highly appreciate Dr. David Hart's expert guidance, prompt communication and almost immediate review of my chapters. In particular, the theoretical framework in Chapter 3 has benefited substantially from his comments. Dr. Chris Kennedy agreed to become a part of my committee despite my project being at an advanced stage and has since provided valuable feedback on my chapters. I am especially grateful for your flexibility in 'beaming' yourself from Australia for my defense so that it could occur as planned. I also thank Sonja Schmid for her detailed comments on my thesis proposal and Dinshaw Mistry as well as Govind Gopakumar for commenting on drafts of my chapters. Fellow Ph.D student Arnaud Kurze was also helpful with comments on my thesis proposal.

This dissertation would not have materialized without consistent funding from the Provost's Office in the form a three-year Presidential Scholarship and steady subsequent teaching assistantships arranged by the Environmental Science and Policy Department and Biology Department at George Mason University. I appreciate the efforts made by Dr. Robert Jonas and Dr. Albert Torzilli to ensure that I had the requisite funds to complete my doctoral research. Sharon Bloomquist was of immense help in enabling me to navigate and complete the procedures required to stay in student status.

The generous stipend provided by the Institute for Peace and Conflict Studies (IPCS) and the crucial support provided by its leadership including P.R. Chari, Dipankar Banerjee, Mallika Joseph and Suba Chandran gave me access to the Indian strategic community. Fellow researchers Siddharth Ramana, Jasbir Singh, Pia Arora and Kriti Singh were warm, hospitable and encouraging.

My parents and brother provided encouragement, financial support and logistical assistance at crucial periods in my doctoral research. My friends Abhijeet, Arundhati and Aditya hosted me during weekends, picked up the tab at restaurants and made me a part of their expeditions to the Shenandoah Valley. They never made me feel like a student among professionals. Their support is an important factor in the completion of this project.

Finally, my landlord Hasan Morshed, his wife Sharmin Bably and young daughter Sameen maintained an atmosphere of utter tranquility so that the sleepy graduate student in their basement could focus more on his dissertation. They also showed generosity in liberally interpreting the rent deadline during tough times. I appreciate your support.

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LIST OF ABBREVIATIONS

Atomic Energy Commission (India)	AEC
Atomic Energy Regulatory Board	AERB
Bhabha Atomic Research Center	BARC
Boiling Water Reactor	BWR
Department of Atomic Energy	DAE
Fast Breeder Reactor	FBR
Fast Breeder Test Reactor	FBTR
International Atomic Energy Agency	IAEA
Indira Gandhi Center for Atomic Research	IGCAR
Iran-Pakistan-India pipeline	IPI
Ministry of External Affairs	MEA
Myanmar-Bangladesh-India pipeline	MBI
Nuclear Power Corporation of India Limited	NPCIL
Non-Proliferation Treaty	NPT
Nuclear Non-Proliferation Act (1978)	NNPT
Nuclear Regulatory Commission	NRC
Nuclear Supplier's Group	NSG
Prime Minister's Office	PMO
Prototype Fast Breeder Reactor	PFBR

Pressurized Heavy Water Reactor	PHWR
Turkmenistan-Afghanistan-Pakistan-India pipeline	TAPI
United Kingdom Atomic Energy Commission	UKAEA
United States Atomic Energy Commission	USAEC

ABSTRACT

A TECHNOLOGICAL HISTORY OF THE DEBATE OVER THE US-INDIA NUCLEAR COOPERATION AGREEMENT IN INDIA (2005-2007)

Chaitanya. Ravi, Ph.D.

George Mason University, 2014

Dissertation Director: Dr. Hugh Gusterson

On July 18, 2005, US President George W. Bush reversed three decades of non-proliferation policies and offered to allow Non-proliferation Treaty (NPT) holdout India to buy nuclear reactors, uranium and dual use technologies on the international market. In return, Prime Minister Manmohan Singh undertook to separate India's civilian nuclear facilities from its military ones and to place the civilian ones under International Atomic Energy Agency (IAEA) safeguards. The US-India nuclear deal was heralded as the centerpiece of a transformed US-India relationship and the key initiative that would pave the way for a long-term strategic partnership with profound implications for the Asian and global balance of power.

The rather unexpected announcement of a grand nuclear bargain with significant implications for India's hitherto isolated nuclear program and its overall foreign policy posture led to a comprehensive three-year debate in India. The actors included India's political, scientific, strategic and media communities. Independent researchers, anti-nuclear activists and civil society also played an important albeit underreported role.

Given the techno-politico-strategic implications of the nuclear deal, the debate in India focused on a variety of issues including the contours of the separation plan to partition India's nuclear infrastructure, the civilian or military status of the fast-breeder reactors in the plan, the impact of the nuclear deal and the US-India rapprochement for the Iran-Pakistan-India (IPI) pipeline and Iran-India relations, the implications of the initiative for India's energy security and the constraints imposed by US domestic legislation on India's ability to obtain nuclear fuel, reprocess foreign fuel and test nuclear weapons.

A wider discussion also ensued on the impact of the nuclear deal and the US-India strategic partnership for India's foreign policy. The intensity of the opposition to the nuclear deal from both the political Right and the Left nearly toppled the government of Prime Minister Singh and threatened to end his political career.

The dissertation is a qualitative study that aims to understand the multifaceted debate over the nuclear deal in India. I rely on newspaper articles, foundational references, leaked American diplomatic cables, government documents and critiques by independent researchers and anti-nuclear activists. The theoretical framework consists of concepts from Science and Technology Studies (STS) and Political Science.

Chapter 1 provides a brief history of US-India relations since India's independence in 1947 and consolidates the various 'birth stories' attempting to explain the origins of the nuclear deal. Chapter 2 reconstructs the 8 month long debate in India (July 2005 to March 2006) over the contours of its nuclear separation plan and the safeguarded civilian or unsafeguarded military status of the fast breeder reactors. The

theoretical framework consists of Bijker's concept of *relevant social groups*, the modified concept of *relevant social individuals* and the notion of *boundary objects* by Star and Griesemer.

Chapter 3 also concentrates on the same period as Chapter 2 and chronicles the intersection of the debate over the Iran-Pakistan-India (IPI) pipeline and the nuclear deal using the modified concepts of *relevant social individuals* and a *technopolitical frame*. The idea of a technopolitical frame is obtained by combining Bijker's notion of a *technological frame* with literature from political science and international relations. Chapter 4 analyzes the important role played by Indian nuclear scientists in the debate over the nuclear deal from March 2006-August 2007. I deploy Bijker's concept of relevant social groups and relevant social individuals, Hecht's idea of a *technopolitical regime*, the notion of *experimenter's regress* by Collins and Pinch and the abstraction of *hyperconstruction* by Gusterson. Finally, Chapter 5 summarizes the key insights gained from the aforementioned chapters and contrasts the claims made in 2005 by the nuclear deal's proponents with the current state of US-India relations as of July 2014.

CHAPTER 1: INTRODUCTION

Chapter 1 provides a brief history of US-India relations and focuses on the widespread perception among Indian elites shared later by their American counterparts that India's nuclear weapons status in the world order was a primary impediment to a wide-ranging strategic partnership. I also describe the different 'birth stories' of the historic July 18 2005 joint statement, a bold American foreign policy outreach to India by a small coterie in the Bush administration that abruptly jettisoned three decades of US non-proliferation policies and recognized India's nuclear weapons. I conclude with brief summary of major viewpoints on nuclear issues in India, a dissertation outline that provides a broad overview of its structure, a short discussion of the contribution of my research to the study of US-India nuclear relations and its theoretical relevance for Science and Technology Studies (STS).

The US and India: estranged democracies

US-India relations were lukewarm throughout the Cold War¹ except for brief periods of fleeting warmth. The broader strategic reason was the US support for Pakistan in its bid to contain the spread of communism in South Asia² and India's tilt towards the Soviet Union despite its professed non-aligned foreign policy and emphasis on 'strategic autonomy.'³ India's quasi-socialist economy with its slow "Hindu rate of growth" also

¹ Jutta Weldes, Mark Laffey, Hugh Gusterson and Raymond Duvall, ed. *Cultures of Insecurity-States, Communities, and the Production of Danger*. Minneapolis: University of Minnesota Press, 1999. p 121

² Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 58

³ Pant, Harsh V. *The U.S-India Nuclear Pact- Policy, Process and Great Power Politics*: Oxford University Press, 2011. P 21

restricted the ability of American capital to enter the large Indian market in a major way and the resulting narrow base of the US-India economic relationship failed to create constituencies on both sides that could lean on their respective governments to improve relations. In fact, US-India relations were so “astonishingly insecure”⁴ that the world’s most powerful democracy and the world’s largest democracy were characterized as “estranged democracies” by US diplomat Dennis Kux in a famous book by the same name.⁵

The nuclear irritant

An important reason for the lack of warmth in US-India relations was the intense disagreement between the two countries over the status of India’s nuclear weapons in the global nuclear order. India’s first Prime Minister Jawaharlal Nehru and its first Chairman of the Atomic Energy Commission Homi Bhabha had solicited and received extensive Western assistance for the fledgling Indian civilian nuclear program in the 1950’s and 60’s. The precondition for British, Canadian and American collaboration was that India would not divert civilian assistance to the military side of its nuclear program.

Western powers were convinced to keep extending cooperation by Nehru’s rhetorical assurances that India would not build atomic weapons although he also periodically indicated his willingness to not altogether close the military option.⁶ In particular, the US was eager to keep India out of the Soviet orbit and sought to build

⁴ Jutta Weldes, Mark Laffey, Hugh Gusterson and Raymond Duvall, ed. *Cultures of Insecurity-States, Communities, and the Production of Danger*. Minneapolis: University of Minnesota Press, 1999. p 121

⁵ Kux, Dennis. *India and the United States: Estranged Democracies 1941-1991*. Washington D.C. : National Defense University Press, 1992. p xiv

⁶ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 19, 34-37.

leverage with an India that refused to sign the Non-proliferation Treaty of 1970 through nuclear cooperation under its Atoms for Peace Initiative.⁷

Thus, India's "peaceful nuclear explosion" on May 18 1974 without alerting US intelligence agencies⁸ angered its Western partners and resulted in the immediate termination of Canadian assistance. The US refused to recognize India as a formal nuclear weapons state and led international efforts to form a strong export control mechanism, the Nuclear Supplier's Group (NSG) in order to strictly regulate the transfer of nuclear assistance from the advanced countries to the developing ones. The US Congress passed the Nuclear Non-proliferation Act of 1978 that terminated fuel-supply and technology assistance to the two US-constructed reactors at Tarapur in Maharashtra and imposed technology sanctions quarantining large parts of the Indian nuclear program from the international market.

Although the US agreed to allow France to step in as a substitute fuel-supplier for the Tarapur reactors, the American refusal to legitimize India's nuclear test, its punitive sanctions on the Indian nuclear program and the subsequent difficulties faced by the isolated nuclear program caused deep resentment among India's nuclear elites. Differences over the nuclear issue combined with the weak economic relationship and larger Cold War-era strategic differences, particularly US support for Pakistan during the 1971 Bangladesh War and India's refusal to explicitly criticize the Soviet invasion of Afghanistan to sour US-India relations.

⁷ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 21

⁸ Laxman, Srinivas. "'Smiling Buddha' Had Caught Us Off-Guard in 1974

" *Times of India*, December 7 2011.

Halting strategic reconciliation but persisting nuclear tension

The strategic factor responsible for the acrimony in US-India relations disappeared in 1991 with the collapse of the Soviet Union and the emergence of a unipolar American-dominated world order. The economic impediment to closer relations also began to erode with the rightward shift in the political orientation of the Indian polity in 1991. The shift allowed then Prime Minister Narasimha Rao and finance minister Manmohan Singh to exploit a transient balance of payment crisis in order to dismantle the “license-raj,” liberalize the Indian economy and throw open entire sectors to foreign investment.

The rapid influx of American capital into the Indian market and the brisk economic growth rate that resulted combined with strategic factors including the emergence of China as a strategic competitor and radical Islamic terrorism as a grave threat to place democratic India as a potential ally on the American strategic horizon. Another increasingly influential factor was the economic rise of an Indian American community in the US that began to occupy leadership positions in the information technology, medical and higher education sectors. A strong desire among the first generation immigrants in this community for better relations between their country of birth and country of adoption combined with their business interests, resulting in the emergence of the community as a significant pressure group on Capitol Hill. The community’s influence was magnified manifold by the increasing support from American businesses eager to make further inroads into the long sought after Indian market.

Despite the elimination of the larger strategic constraint to improving US-India relations and the significant erosion of the economic impediment, other strategic and

nuclear concerns continued to retard the relationship. The American policy of equating India and Pakistan and exhorting India to make concessions on Kashmir infuriated India's strategic elites.⁹ Although the tottering civilian component of the Indian nuclear program had managed to stabilize by the early 1990's and was beginning to add capacity, its pace of expansion remained hobbled both by American sanctions and internal mismanagement. Moreover, the US policy of "cap, roll back and eliminate" pursued vigorously in the early 1990's in order to reverse the Indian nuclear weapons program and American efforts to get India to sign the Comprehensive Test Ban Treaty (CTBT) elicited strong opposition from Indian elites.

Nuclear differences worsened following the Hindu nationalist Bharatiya Janata Party (BJP)-led NDA coalition government's decision to conduct five nuclear tests on May 11 and May 13 of 1998 including a controversial thermonuclear bomb that resulted in a fresh round of international criticism, strong American condemnation and refusal to recognize India's nuclear weapons. The US also imposed a second round of sanctions on the Indian nuclear and space establishments and denied visas to certain scientists. Despite strong international pressure, Pakistan conducted its own series of nuclear tests on May 28 and May 30 and announced itself a nuclear power, completing the overt nuclearization of the subcontinent to the detriment of US strategic interests.

⁹ Talbott, Strobe. *Engaging India: Diplomacy, Democracy, and the Bomb*. Washington D.C: Brookings Institution Press, 2004. p 7

The Strobe-Talbott talks

In a carefully calculated move, India announced a “unilateral moratorium” on nuclear testing following the 1998 series of tests and began an intense diplomatic effort to reach a nuclear rapprochement with the US. Then Deputy Secretary of State Strobe Talbott and his Indian counterpart Minister for External Affairs Jaswant Singh held 14 rounds of closed-door negotiations for 2 years at 10 locations in 7 countries.¹⁰ The US agreed to lift sanctions provided India acceded to ‘four and half’ benchmarks;’ 1) India should sign the CTBT, 2) commit itself to entering negotiations on the Fissile Material Cut-off Treaty (FMCT), 3) enact domestic legislation imposing strict export controls as safeguards against proliferation, 4)a) define further its nuclear doctrine of credible minimum deterrence (CMD)-especially the upper ceiling and sophistication of its nuclear weapons and b) improve its relations with Pakistan.¹¹

The talks were inconclusive as India refused to sign the CTBT and further clarify the size and quality of its nuclear arsenal. Despite the apparent failure of the talks, the sheer number of meetings had already given the Clinton administration a better understanding of India’s nuclear ambitions. Further, the 1998 tests also gave rise to a sentiment of resigned acceptance in the Clinton administration after the initial period of angry punitive measures. The traditional non-proliferation imperative to constrain India’s nuclear weapons program began to be tempered by a growing desire to co-opt a rising

¹⁰Chellaney, Brahma. "Jas and Strobe Show." *India Today*, October 4, 2004.

<http://indiatoday.intoday.in/story/engaging-india-diplomacy-democracy-and-the-bomb-by-strobe-talbott/1/195139.html>

¹¹ Sreenivasan, T P. *Words Words Words- Adventures in Diplomacy*: Dorling Kindersley (India Pvt Limited), 2008. P 140-141

India and its nuclear weapons to advance US strategic interests in the face of an ascendant China.

The unexpected US reaction to Kargil

The first example of this changed mindset was a significant weakening of the American tendency to equate India and Pakistan during the 1999 Kargil border war. The Clinton administration came out in support of the Indian position and President Clinton pressured Pakistani Prime Minister Nawaz Sharif to withdraw the Pakistani infiltrators from the Kargil sector in Kashmir. The Clinton administration's public support for the Indian position set the stage for further deepening of the incipient, nuclear constrained, US-India strategic relationship.

The Pakistanis and Indians were both surprised by the U.S. position: Pakistan because Islamabad assumed the U.S. would always back them against India and India because they could not believe the U.S. would judge the crisis on its merits, rather than side automatically with its long time Pakistani ally. Both protagonists were rooted in the history of their half-century conflict and astounded that the U.S. was not bound by the past. For the previous fifty years, with a few exceptions, the United States had been tied to Pakistan, while India had been aligned with the Soviet Union in the Cold War. Pakistan had been the take off point for U2s flying over Russia and for Henry Kissinger's trip to China. During the Soviet occupation of Afghanistan in the 1980s Pakistan had been the U.S.' critical ally in aiding the mujahedin freedom fighters against communism, along with Saudi Arabia. In 1971 the Nixon Administration

had “tilted” toward Pakistan and against India during the war that led to Bangladesh’s freedom. Although U.S.-Pakistani relations had cooled significantly after 1990 when the U.S. determined Islamabad was building a nuclear arsenal (leading to an aid suspension), the popular and elite perception in both countries was that the U.S. was more pro-Pakistani than pro-Indian.¹²

In March 2000, Bill Clinton became the first American president to visit India in over 22 years in the final days of his second term as part of broader strategic engagement with both India and Pakistan. For his part, Prime Minister Atal Behari Vajpayee reiterated his belief that the US and India were “natural allies.”¹³ The symbolism of Clinton’s five-day stay in India as compared to his five-hour junket to Pakistan was not lost on veteran India watchers who predicted a strengthening of the economic relationship despite a lack of progress on other issues of concern to American foreign policy including non-proliferation.

At the core of his five-day stay was a brilliant speech to the Indian parliament that acknowledged India’s civilizational greatness, noted its economic and scientific progress, and praised India’s adherence to democratic norms. However, the speech tactfully set forth areas of American concern: Kashmir, India’s relations with Pakistan, and nuclear proliferation.¹⁴

¹²Riedel, Bruce. "American Diplomacy and the 1999 Kargil Summit at Blair House." *Center for Advanced Study of India-University of Pennsylvania* (2002). p 5

¹³Address by Shri Atal Bihari Vajpayee-Prime Minister of India

". (September 7, 2000). Accessed on March 31 2014 <http://asiasociety.org/address-shri-atal-bihari-vajpayee>

¹⁴ Cohen, Dr. Stephen P. "India and America: An Emerging Relationship

Despite the strategic shift in the American approach towards India in the waning days of the Clinton administration, the nuclear impediment to the strategic relationship caused by India's unresolved nuclear status and refusal to accede to the aforementioned benchmarks persisted. The Clinton administration was still unwilling to break core non-proliferation norms by accommodating India into the existing nuclear order through either a direct or tacit recognition of its nuclear weapons.

Bush's India fixation

As chapter 3 explains in greater detail, President George W. Bush had expressed an interest in improving the relationship with India during the Presidential campaign of 2000. His eventual National Security Adviser Condoleezza Rice had also indicated in an important article in *Foreign Affairs*¹⁵ that the US should dissociate India from Pakistan and pursue relations with both countries on separate tracks.

When George W. Bush took office in January 2001, he soon revealed his interest in continuing, and indeed intensifying, the rapprochement, and the Indians eagerly reciprocated. In April 2001, Bush "dropped by" (External Affairs Minister Jaswant) Singh's meeting with National Security Adviser Condoleezza Rice, leading to a cordial 40-minute talk in the Oval Office. When Bush unveiled his controversial nuclear missile defense proposals the next month, the Vajpayee government responded far more positively than did most U.S. allies. What explains the

" (December 8-10, 2000). Accessed on March 31 2014.

<http://www.brookings.edu/~media/research/files/articles/2001/12/08india%20cohen/kyoto> p.1

¹⁵ Rice, Condoleezza. "Promoting the National Interest." *Foreign Affairs*, January - February 2000.

newfound warmth between these formerly estranged democracies? On the Indian side, Vajpayee's Bharatiya Janata Party (BJP), which dominates the ruling coalition, is strongly nationalistic but does not share the visceral anti-U.S. feelings that flourished in India during the Cold War. Vajpayee and his advisers see better relations with the United States as being in India's national interest. Although the prime minister's portrait of the two countries as "natural allies" is perhaps overdrawn, a growing consensus in New Delhi believes that improved ties with the United States will help India attract foreign investment, assume a greater global role, and ensure that U.S. policies do not jeopardize Indian interests, especially with regard to Pakistan. On the U.S. side, Bush has been impressed that India, despite its vast population, high level of poverty; and enormous social diversity; genuinely shares democratic values with the United States. His advisers regard India as an emerging great power and hence a strategic partner for the United States in Asia. Indeed, a closer U.S. -India relationship would be useful should things go wrong with China.¹⁶

India's vocal support for the US in the aftermath of the 9/11 attacks and its offer of logistical assistance (making available Indian airbases for US operations in Afghanistan) was immediately appreciated by the Bush administration. Meanwhile, a serious Track II dialogue (US-India Strategic Dialogue) with India headed by Philip Zelikow, an academic and close ally of Rice under the aegis of The Aspen Institute began

¹⁶Kux, Dennis. "India's Fine Balance". Accessed on March 31 2014. http://asr2.myweb.uga.edu/Readings/kux_fine_balance.pdf .p2.

in 2002. The dialogue focused primarily on US “diplomatic, military and economic relations” with India and the regular consultations between American and Indian elites gave the former cohort a better sense of the strategic and nuclear ambitions of the latter.¹⁷

However, the desire of American elites for a rapid acceleration of US-India relations including the eagerness of the Pentagon to build a robust ‘mil-to-mil’ relationship was frustrated due to two reasons. First, experts like Zelikow began realizing that the technology denial regime erected by the US to constrain the Indian nuclear (and space) programs was not only preventing any nuclear commerce with India but also impeding any American transfer of defense technology given the prohibition on dual-use technology transfer. Thus, the American sanctions were effectively shutting out the US military-industrial complex from entering the lucrative multi-billion dollar Indian defense market dominated by Russia and were having adverse effects on the ability of American forces to ensure “inter-operability” with their Indian counterparts for a future mission due to the mismatch between US and Russian weapons systems. Moreover, the American exclusion from the Indian defense market would also have strategic costs due to the lack of leverage over the foreign policy of an emerging power through the supply of advanced weapons platforms and long-term servicing and maintenance contracts.

Second, the State Department led by Colin Powell shared the perceptions of strategists like Zelikow that the US must ease sanctions on India in order to take forward the strategic partnership but did not want such a relaxation to either be so comprehensive

¹⁷ "Aspen Strategy Group-About the U.S.-India Strategic Dialogue." Accessed on March 31 2014. <http://www.aspeninstitute.org/policy-work/aspen-strategy-group/about-USID>

as to weaken the international norm against testing by non-nuclear weapon states violated twice by India or at such a pace as to not result in concrete reciprocal commitments from India.

The glide path

Thus, the conservative approach adopted by the State Department resulted in an incremental “glide path” that eventually led to the Next Steps in Strategic Partnership (NSSP) initiative, a successor of the modest High Technology Cooperation Group (HTCG) set up by the US and India in November 2002 to discuss high-technology sanctions-related trade issues.¹⁸

The NSSP’s aim was to improve US-India relations through incremental cooperation in civilian nuclear activities, civilian space programs and high technology trade, a trinity of issues of immediate interest to India without fundamentally changing the bulk of the sanctions regime constraining India’s nuclear program.¹⁹ The initiative would involve multiple rounds and each American concession would be based on a reciprocal non-proliferation improvement from the Indian side. The First Round (Phase I)

¹⁸ Parthasarathy, Malini. "Bush, Vajpayee Talk over Phone " *The Hindu*, September 10 2000. Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005). Accessed on March 31 2014. <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> .p 5,6,7.

¹⁹ Tellis, Ashley J. "India as a New Global Power: An Action Agenda for the United States." (2006). Accessed on March 31 2014. http://carnegieendowment.org/files/CEIP_India_strategy_2006.FINAL.pdf. p 13

'Next Steps in Strategic Partnership with USA' -'India and the United States of America Agree to Expand Cooperation in Three Specific Areas: Civilian Nuclear Activities, Civilian Space Programmes, and High Technology Trade". *Outlook*. January 13 2004.

Juster, Kenneth I. " A New Strategic Partnership for the U.S. And India " *The Wall Street Journal*. October 1, 2004.

Ereli, Adam. "United States - India Joint Statement on Next Steps in Strategic Partnership." (September 17, 2004). Accessed on March 31 2014. <http://2001-2009.state.gov/r/pa/prs/ps/2004/36290.htm>

of the NSSP concluded on September 21 2004.²⁰ However, the NSSP was perceived as a failure by the end of 2004 as an Indian nuclear establishment increasingly frustrated by the initiative's cumbersome procedural complexities and perceived low returns began teaming up with the space bureaucracies to torpedo it.

Meanwhile, a Bush administration trapped in a quagmire created by the raging insurgency in Iraq and facing severe criticism from Congress and the public began to look for a foreign policy success early on in its second term. A recent security development that further impelled an already eager US to deal head-on with the issue of sanctions in order to pave the way for a strategic relationship with India was India's impressive mobilization of its naval assets in the wake of the 2004 Asian tsunami. Tsunami-battered India was able to provide disaster relief to countries in the Indian Ocean before the arrival of American vessels. India's rapid naval mobilization capability further convinced American defense elites that the rationale for a strategic partnership and future joint operations by the two navies was indeed sound. On the economic front,

²⁰ Tellis, Ashley J. "India as a New Global Power: An Action Agenda for the United States." (2006). Accessed on March 31 2014. http://carnegieendowment.org/files/CEIP_India_strategy_2006.FINAL.pdf. p 13

"Next Steps in Strategic Partnership with USA' -'India and the United States of America Agree to Expand Cooperation in Three Specific Areas: Civilian Nuclear Activities, Civilian Space Programmes, and High Technology Trade". *Outlook* January 13 2004.

Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005). Accessed on March 31 2014. <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> p 6, 7

Juster, Kenneth I. " A New Strategic Partnership for the U.S. And India " *The Wall Street Journal* October 1, 2004.

"Announcement on U.S.-India Next Steps in Strategic Partnership

". (September 2004), <http://www.bis.doc.gov/news/2004/us-indianextstep.htm>

Ereli, Adam. "United States - India Joint Statement on Next Steps in Strategic Partnership." (September 17, 2004). Accessed on March 31 2014. <http://2001-2009.state.gov/r/pa/prs/ps/2004/36290.htm>

the Indian economy's near double-digit growth rate significantly strengthened the already robust support of American businesses for a transformed US-India relationship.

The idea of a nuclear deal

It is in this strategic-politico-economic context that Rice was confirmed as the Secretary of State in early 2005. She and a close coterie of advisers around her immediately set about designing an initiative much more ambitious than the NSSP that would permanently resolve the thorny issue of India's nuclear status still impeding a strategic partnership. Zelikow proposed that the US blithely walk away from three decades of non-proliferation policies, accord defacto recognition to the Indian nuclear weapons program and simply dismantle the entire sanctions regime. Rice took the idea to President Bush and he agreed to support a bold nuclear outreach to India as the centerpiece of a transformed relationship. Rice discussed the ideas with a stunned Indian political leadership during her visit to India in March 2005 and the latter immediately evinced interest in her nuclear outreach. Support from President Bush and the Pentagon enabled Rice to win against opponents in the inter-agency process including non-proliferation-minded bureaucrats who favored a more conservative approach.

The July 18 2005 joint statement

Thus, after some tense negotiations that nearly resulted in the Indian delegation pulling out of the summit-level meeting organized to consummate the nuclear deal, the two sides agreed on a final draft of a joint statement on July 18 2005. The statement was released with great fanfare by President George. W. Bush and Prime Minister Manmohan Singh. The historic document began by declaring the resolve of the two heads of state to

“transform the relationship between their countries and establish a strategic partnership.”²¹ Entire new organizations and initiatives were announced to take forward the relationship including a CEO Forum “to harness private sector energy and ideas to deepen the bilateral economic relationship,” a US-India Energy Dialogue to meet India’s growing energy needs, a US-India Global Democracy Initiative to strengthen democracy in other countries, a US-India Disaster Relief Initiative to conduct joint disaster relief operations and a Science and Technology Framework Agreement to improve high-technology cooperation.²²

However, the core of the joint statement was Bush’s recognition of India as a “state with advanced nuclear technology,” a de facto recognition of its long-ostracized nuclear weapons program and an accommodation into the existing global nuclear order that outlier India had sought since 1974. The recognition paved the way for Bush’s offer to jettison three-decades of US non-proliferation policies and resume “full” civil nuclear energy cooperation with India by persuading Congress to “adjust US laws and policies” and cajole international partners to carve out an exemption for India in key export-control institutions thereby facilitating the resumption of nuclear cooperation.²³

In return, Prime Minister Manmohan Singh committed to identify and separate India’s civilian nuclear facilities from its military ones, place the civilian facilities under permanent International Atomic Energy Agency (IAEA) safeguards, sign an Additional

²¹ "Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 18 2005). Accessed on March 31 2014. <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

²² Ibid.

²³ Ibid.

Protocol to enhance the confidence of the international community regarding India's commitment to non-proliferation, reiterate India's post-1998 unilateral moratorium on nuclear testing, help the US clinch multilateral non-proliferation initiatives such as the Fissile Material Cut-off Treaty (FMCT) and harmonize India's regulatory frameworks with those of non-proliferation export control groups to prevent horizontal proliferation.²⁴

The nuclear deal-birth stories

I briefly examine the various 'birth stories' of the nuclear deal and the motivations that led to the consummation of the initiative advanced by American and Indian experts. George Perkovich, the Vice President for Studies at the Carnegie Endowment for International Peace supported the dominant narrative for the origin of the nuclear deal by claiming that the Bush administration's eagerness to clinch a strategic partnership led it to grant the relentless Indian demand since the 1974 test for relief from sanctions in return for across-the-board cooperation.

They have been coming to us for many, many years, saying, "You want better relations, the No. 1 issue has been to open up for nuclear cooperation, end the different kinds of sanctions." So they've been hammering on this for decades. Yes, they came to us saying we want fully open nuclear cooperation. Modestly, they would have settled for fuel right now, but they wanted everything. And then this administration,

²⁴ "Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 18 2005). Accessed on March 31 2014. <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

unlike others, for a variety of reasons said, "Let's give them everything."²⁵

Perkovich also reckoned that the nuclear deal was made possible by a constellation of actors on the American side including President Bush, Secretary Rice and a close circle of advisers (Philip Zelikow, Robert Zoellick, Ashley Tellis and Robert Blackwill).²⁶

The advisers reckoned that previous US non-proliferation policies that aimed to cap, roll back and eliminate India's nuclear weapons had failed. India was a 'responsible state' that had not proliferated sensitive technologies and was emerging as a key factor in the Asian balance of power. It would be in the US interest to not further retard and even help indirectly augment India's nuclear weapons capabilities to a certain extent in order to balance Chinese power and prevent a Sino-centric Asia. A US nuclear accommodation of India would also cement and accelerate the crucial defense leg of the already growing strategic partnership and function as a goodwill generator eliciting across the board cooperation on issues ranging from counterterrorism to Iran.²⁷ Further, the deal would provide India with another option to enhance its energy security, reduce pressure on global energy markets and wean it away from pan-Asian energy projects like the Iran-Pakistan-India (IPI) natural gas pipeline that threatened to undermine the US navy's ability to control energy flows.

²⁵ Gwertzman, Bernard. "U.S.-India Nuclear Deal: Perkovich Q&A with CFR." Accessed on March 30 2014. <http://carnegieendowment.org/publications/index.cfm?fa=view&id=18077>

²⁶ Perkovich, George. "Faulty Promises: The U.S.-India Nuclear Deal." (September 2005). Accessed on March 28 2014. <http://www.carnegieendowment.org/files/po21.perkovich.pdf> .p 1

²⁷ Ibid.p 2.

Ashley Tellis, a Senior Associate at the Carnegie Endowment for International Peace and a key co-progenitor of the nuclear deal agreed with Perkovich but added that the nuclear deal was forged because of Prime Minister Manmohan Singh's willingness to offer more concessions than his predecessor (Atal Bihari Vajpayee).

Interviewer: There is no such thing as a free lunch. So, what are the US motivations behind this nuclear deal?

Tellis: It is not we who wanted to snatch the deal. It was India that had been asking for such a deal for the last five years. Even the (Atal Bihari) Vajpayee government wanted to have a nuclear agreement.

Interviewer: Why was no deal struck then with the Vajpayee government?

Tellis: The deal could not be reached because the Vajpayee government did not offer much to the US in exchange for the agreement. We got more from the government of (Prime Minister) Dr Manmohan Singh.

Interviewer: What is it that you wanted from the Vajpayee government but could not get?

Tellis: I am afraid I cannot answer this question.²⁸

A review of the documentary record on the Indian side provides broad clues regarding the information that Tellis refused to divulge. The evidence indicates that the nuclear deal of 2005 was a more ambitious version of a proposal made by Brajesh Mishra, former national security adviser in the previous Vajpayee government to Colin

²⁸"Why Vajpayee Didn't Sign the Nuclear Deal." (July 19, 2006). Accessed on March 31 2014. <http://www.rediff.com/news/2006/jul/19inter1.htm>

Powell, then US Secretary of State during the incremental Next Steps in Strategic Partnership (NSSP) talks in 2002. Raj Chengappa of *India Today* magazine reckoned that Mishra offered to place 2 reactors under safeguards but got no response from Powell, presumably because the latter was dissatisfied with the former's offer.²⁹

An anonymous column in the *Indian Express* posited that Mishra offered 14 power reactors, the same number that would eventually be offered by India for permanent IAEA safeguards under the nuclear deal of 2005.³⁰ He also seems to have made a similar offer (1 or 2 out of 21 reactors under safeguards and a commitment to place future reactors in return for lifting of sanctions on fuel supply) to the French. The French were receptive to the proposal. Maurice Gourdault-Montagne, diplomatic adviser to the French President presented a "US-France-UK non-paper outlining a menu of possibilities, including the separation of the civil and military programme."³¹

Stephen Cohen, a senior fellow at Brookings and veteran India watcher reckoned that the idea of a nuclear "half-way house" was mooted around two decades ago.³² However, successive American administrations refused to restore civil nuclear co-operation after India's 1974 test fearing that the decision would undermine the NPT, a cornerstone of US foreign policy. Cohen argued that the situation changed dramatically during the first and second terms of the Bush administration as President George W. Bush viewed India as a regional counterweight to China, an emerging technological

²⁹ Chengappa, Raj. "How the Deal Was Clinched." *India Today* September 7, 2007.

³⁰ "In Each Other We Trust." *Indian Express*, March 03, 2006.

³¹ Varadarajan, Siddharth. "The American Dilemma at the NSG." *The Hindu*, Aug 28, 2008.

³² Cohen, Stephen Philip. "A Deal Too Far?" (February 28, 2006). Accessed on March 31 2014.
<http://www.brookings.edu/views/papers/cohens/20060228.pdf> .p 1-3

power and a thriving democracy in an unstable region. The nuclear deal of 2005 was born out of this presidential support and the confidence gained by both the American and Indian sides after the successful consummation of a crucial defense agreement of unprecedented scope in early 2005. Cohen explained that the idea of a nuclear deal was raised by either the American or Indian side as the next logical problem to tackle after defense cooperation in order to advance the strategic partnership.

Indian Foreign Secretary Shyam Saran played a key role in the negotiation of the July 2005 joint statement and the subsequent consultations over the March 2006 separation plan and the August 2007 123 agreement. He took a broader view and cited six main factors that led to the nuclear accommodation agreement.

There were six key developments that merged to create the basis for July 18. First and foremost, an India growing at the rate of 8% per annum has led to a very different attitude on the part of the US towards India. Let me turn to a second significant element of the new calculus — India as a nuclear weapon power.....This has made a compelling case for greater engagement with India.....A third development is the larger strategic canvas that argues in favour of raising the quality of Indo-US ties. As a pluralistic and secular democracy in a world where fundamentalist violence is on the rise, India's emergence as a model of stability, modernization and predictability, has begun to impact on international consciousness.....A fourth element in the US approach to India has been its awareness of the potential that our partnership holds in respect of the knowledge economy.....A fifth point to be noted is that these

developments are part and parcel of India opening up to the world. The impact of India integrating with the global economy cannot be underestimated, least of all on its leading player, the United States....And sixth, as an open society and an open economy, the growth in India's capabilities has been welcomed by the world. Our record and our worldview give no cause for apprehension in any quarter.³³

Former National Security Adviser Brajesh Mishra played a pivotal role in moving India away from its longstanding non-aligned foreign policy during the previous NDA government's tenure under directions from former Prime Minister Atal Behari Vajpayee. He was also a vocal proponent of a US-India-Israel axis and a strong supporter of a US-India strategic partnership through high-technology (especially nuclear and defense) cooperation. Mishra was more pointed than Saran in a personal interview with me regarding the origins of the nuclear deal. He specifically identified Condoleezza Rice as the principal actor who persuaded a hitherto reluctant State Department to consummate the nuclear deal out of broader strategic considerations.

Chaitanya. Ravi: What is your stance on the Indo-U.S nuclear deal and do you believe this deal to be a culmination of the phased Next Steps in Strategic Partnership (NSSP) or this deal a radical departure, a top down American driven idea?

³³ ""The India-US Joint Statement of July 18, 2005 - a Year Later": Address by Foreign Secretary Mr. Shyam Saran at India Habitat Centre, New Delhi." (July 14, 2006). Accessed on March 31 2014. https://www.indianembassy.org/archives_details.php?nid=677

Brajesh Mishra: Well even the NSSP was top driven, it was not something which the bureaucrats in the State Department were happy with. So the idea of top down was there from the very beginning. When I met the people from the Bush administration, I said to them (that) I needed, apart from lifting of sanctions against India , I needed high technology exchange, about which there was already an agreement between Mr (Ronald) Reagan and Mr. (Rajiv) Gandhi. So I needed permission for export of dual use items, and I needed co-operation in the civilian use of nuclear energy. So this is what I conveyed to them.....After the Next Steps in Strategic Partnership which was a phased approach, three phases have gone, and it would have taken some years to fructify. But in 2005, July 2005, after....Dr. Rice became Secretary of State, she seemed to have moved the State Department which was opposing and therefore it was possible, in my view for President Bush and Prime Minister Manmohan Singh to agree on such a radical move.....So it was a....leap forward, if I may put it that way from the earlier NSSP and it is driven more by strategic considerations than by the need for energy. Energy was part of it of course but in my view during the Bush administration, it is clear that they wanted India to progress fast in order to balance China in Asia....If you remember, one month before that in June 2005, Mr. Pranab Muskerjee who was

Defense Minister, he had gone to the US and signed a defense co-operation agreement. So you must look at this from that point of view.³⁴

Siddharth Varadarajan, Strategic Affairs Editor for *The Hindu* pointed out that the nuclear deal originated from the Bush's administration's conclusion that efforts to develop a strategic partnership with India by focusing on strengthening military-to-military ties were not succeeding due to the larger restrictive implications of nuclear sanctions for the transfer of defense technology (through a ban on the transfer of dual-use items).

A small coterie of Bush administration top officials became convinced that something dramatic had to be done to change entrenched anti-American mindsets and the initiative would have to be sufficiently large to erase in one stroke the legacy of US-India relations during the Cold War and Indian antipathies over the American support for Pakistan. The necessity of coming up with a 'big idea' that would fundamentally recalibrate the US-India relationship became more urgent following India's refusal to send active or peacekeeping troops to Iraq in the summer of 2003 despite vigorous American lobbying.

A U.S. envoy made a final push with a top Indian official in early July that year. "Future generations of Americans will be grateful for India's help," he said. "But what can you do for us now? Are you prepared to lift the restrictions on our civil nuclear programme?" the official asked. The envoy had no answer. He returned empty handed, but the record of that

³⁴ Interview with Brajesh Mishra, Former National Security Adviser, April 21 2010.

conversation left its mark in the Beltway. And the effect was felt almost immediately. First up, the High Technology Cooperation Group, which had been set up in 2002, got a boost. Later that year, the Next Steps in Strategic Partnership took shape.³⁵

Finally, a more narrow history of the key day-to-day events that led to the joint statement was provided by Glenn Kessler, staff writer for the *Washington Post* “based on interviews with more than 20 US and Indian officials, many of whom spoke on the condition of anonymity.”

(U.S. Undersecretary of State) Burns, (Indian Foreign Secretary) Saran and other officials conferred for nearly three days. From the start, negotiators said the conversations were tense as it became clear that the U.S. goals were not what India was hoping to hear. One by one, Indian negotiators balked at requests, indicating they would walk away before accepting conditions for inspections and other safeguards. (Secretary of State Condoleezza) Rice went to Saran's suite in the Willard Hotel on Sunday, July 17, to provide a final push. At 6 p.m., she and Burns thought they had an agreement, but then Saran called Burns at 10:30 p.m., saying the deal was off -- it was too much politically for the Indian government to swallow all at once. On Monday, July 18, the morning that (Prime Minister Manmohan) Singh was to meet with Bush, Rice called Burns at 5:30 a.m. and said, "We're not going to give up." She met with Singh at 8 a.m. and persuaded him to let the negotiators try again.

³⁵ Varadarajan, Siddharth. "The American Dilemma at the NSG." *The Hindu*, Aug 28, 2008.

Thus, as Bush and Singh met one-on-one in the Oval Office, senior U.S. and Indian aides closeted in the Roosevelt Room were furiously scribbling out the text of a deal that would overturn three decades of U.S. policy on stemming the spread of nuclear weapons. There were several highly technical issues holding up the announcement. But, in essence, India wanted the coveted status of an official nuclear state, a recognition that would get it into the most exclusive club in the world. Under the Nuclear Non-Proliferation Treaty, only the United States, Russia, China, France and Britain are weapons states. All other countries, except for Pakistan, India and Israel, signed on to the agreement, promising to forgo nuclear weapons in exchange for civilian nuclear technology. Now India wanted the technology, wanted to remain outside the treaty and wanted membership in the club. The final agreement fudged the issue.³⁶

The Indian nuclear landscape

A brief discussion of India's national identity, the role of nuclear weapons in it and the various positions in India on the nuclear weapons issue provides the context to situate the US-India nuclear deal and sets the stage for the subsequent chapters.

George Perkovich has argued in *India's Nuclear Bomb* that India's national identity as defined by the long dominant, center left Congress Party consists of two contradictory, uneasily coexisting norms: a desire to be a great power in an international system dominated by the nuclear weapons states through the possession of nuclear

³⁶Kessler, Glenn. "India Nuclear Deal May Face Hard Sell." *Washington Post* April 3, 2006.

weapons and an opposing impulse to simultaneously demonstrate moral superiority through a limited nuclear arsenal and calls for disarmament. He also briefly described the two other major positions on the Indian nuclear landscape on the issue of nuclear weapons: 1) The main opposition center right Bharatiya Janata Party's (BJP) support during its intermittent tenure in power for a greater emphasis on the great power norm at the expense (though not exclusion) of the moral superiority through nuclear restraint norm and 2) The support of a small band of conservative strategists for the total abandonment of the moral norm and a full scale adoption of the great power norm.

India's national identity is constructed around the determination to be an independent, great state that transcends its colonial past and is morally superior to its colonizers and the dominant states of the international system.....Two vital norms coexist uneasily within this national identity: one, India should achieve major power status in the international system and, two, India should demonstrate moral superiority over the world's dominant states, which have been perceived as exploitative, overly militarized, and insensitive to the needs and aspirations of the world's majority of poor people. These two norms have clashed in the nuclear policy arena.Acquisition and demonstration of nuclear weapon capabilities could plausibly fulfill the norm of achieving great power status in an international system led by nuclear weapon states, but possession of nuclear weapons also could undermine the moral norm.....Only the Bharatiya Janata Party (BJP) has favored the "great power" norm to the exclusion (almost) of the moral-superiority-

through-nuclear-self-restraint-norm.....Even after the May 1998 tests, Prime Minister Vajpayee reinvoked India's normative calls for nuclear disarmament and equivocated on the question of going forward to deploy nuclear weapons. A small covey of India's most bellicose strategists has bristled at this moralistic approach and urged an unmitigated pursuit of amoral Realpolitik, but even after May 1998 this position has represented only a small minority within the polity.³⁷

I categorize the Congress party's stance on nuclear weapons as the *Nehruvian socialist position*, articulated and institutionalized by India's first Prime Minister Jawaharlal Nehru, a leading proponent of global nuclear disarmament since the Second World War and a deliberately ambiguous supporter of an Indian nuclear weapons capability by acquiring the necessary nuclear infrastructure under the US Atoms for Peace Program. The Nehruvian socialists supported India's non-aligned foreign policy since independence and its equidistant approach towards the two great power blocs led by the US and the Soviet Union during the Cold War (although India depended on the Soviet Union for key weapons systems and for political support at the UN Security Council). India's refusal to sign the Non-Proliferation Treaty (NPT) of 1968, its acquisition of a nuclear weapons capability through the 1974 test and subsequent refusal to conduct further tests to perfect its nuclear arsenal for the next 24 years (until the BJP's rise to

³⁷ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 449

power in 1998) can be understood as strategies pursued by the Nehruvian socialists to both pursue the great power norm while adhering to the moral superiority norm.³⁸

The opposition BJP's approval of India's five nuclear tests in 1998 including a controversial lone thermonuclear test can be abbreviated as the *Hindu nationalist position* conceived and articulated by Prime Minister Atal Behari Vajpayee. The Hindu nationalists placed more emphasis on the pursuit of the great power norm as part of an assertive foreign policy that emphasized the development, demonstration and possession of the full spectrum of nuclear weapons capabilities (including thermonuclear weapons) and a movement away from the previous non-aligned position in favor of greater strategic engagement with the United States, the preponderant power. It is this policy that led to Prime Minister Vajpayee's historic statement in 2000 that referred to the US and India as "natural allies." Yet, even the more assertive BJP was not prepared to completely abandon the moral superiority norm as witnessed through its formulation of a no-first use policy and doctrine of credible minimum deterrence.³⁹

³⁸ Although a rival explanation can be advanced that India's nuclear self-restraint post-1974 was a result of Indian leaders being apprehensive of further nuclear tests due to the adverse international repercussions in the form of severe economic sanctions, I believe that such a postulation albeit useful is insufficient. India had previously demonstrated a capacity to undertake actions such as invading East Pakistan during the 1971 Bangladesh War in the teeth of international opposition ignoring the threat of sanctions and isolation. There is no reason to believe that Indian leaders did not have the ability to approve additional tests following the 1974 test (similar to a weak China which conducted multiple tests until it acquired thermonuclear and ICBM capabilities ignoring the economic repercussions) had they wanted to do so. Their desire to adhere to the moral norm provides a key part of the explanation for the 24 year interregnum following the 1974 test.

³⁹ Again, an argument can be made that BJP leaders desisted from further testing due to the threat of adverse economic repercussions caused by international sanctions. However, other actions can be cited as examples that BJP leaders were quite capable of ignoring international opinion when they were determined to carry out a particular action. For example, India's full-scale military mobilization following the 2001 attack on the Indian Parliament by terrorists it claimed were supported by Pakistan resulted in a year long border standoff with Pakistan and significant losses to the Indian economy due to the flight of billions of dollars of foreign capital. And yet, BJP leaders did not order a de-escalation until late 2002, only after several diplomatic interventions by top US diplomats who were worried about the threat of nuclear war in the subcontinent and the adverse implications of the Indian mobilization for the American War on Terror in

The third position identified by Perkovich of a small group of conservative strategists who were in favor of the total abandonment of the moral superiority norm and the unabashed pursuit of the great power norm through the acquisition of full spectrum nuclear weapons capability (including megaton yield thermonuclear weapons and intercontinental range delivery systems) can be understood as the *nuclear maximalist position*. The nuclear maximalists view the acquisition of thermonuclear-ICBM capabilities as the key enabling factor in India's emergence as a great power in the same league as the US and China and decisively above regional rival Pakistan. Consider this "primer" addressed to the Prime Minister and his advisers by conservative strategist Bharat Karnad, a Professor at the New Delhi-based Center for Policy Research and virulent critic of the US-India nuclear deal right from its inception in 2005. Notice the importance that Karnad attaches to India's acquisition of hard power: megaton yield thermonuclear capability acquired through open-ended testing and intercontinental range ballistic missiles. Karnad also advised that India not be deterred by Western economic sanctions.

1. International relations is jungle-raj and, like in the badlands of Uttar Pradesh, might is right
2. In this tussle, hard (thermonuclear military) power with reach matters the most, offering the country absolute security and immunity against pressure. It is decisive in the rank-ordering of countries; soft-power only embroiders and augments this hard power of the state.

Afghanistan due to the diversion of much needed Pakistani troops to intercept the Al Qaeda and Taliban leadership fleeing into Pakistan.

3. Powerful countries may humour weaker states but do not help them become strong, thereby adding to the competition.
4. States generating cutting-edge technology do not sell or transfer it to any other country for any reason.
5. India's economic card has historically been trumped by the foreigner's military card, meaning the decisive military technology and capability of the day. India lacked a meaningful navy in the 17th century. It did not help that the country was an economic superpower at the time. The military card that cannot be beaten today is the triad (triad) of frightening megaton thermonuclear weapons, intercontinental ballistic missiles and nuclear-powered submarines, which has to be secured on a war footing. It will provide the security overhang beneath which the Indian economy can grow rapidly, unmolested
6. Resumption of open-ended testing is a technical imperative, necessary to obtain boosted-fission and fusion weapons that are safe, proven and reliable-qualities, incidentally, missing in the existing Indian deterrent. Ties with the West disrupted by the Indian tests will quickly return to normal, because the advanced economies are hooked profitably into the comparatively advantaged techno-economic sphere in India, because of the lure of huge profits....⁴⁰

⁴⁰ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 180-181

An additional fourth position on nuclear weapons can be identified on the Indian nuclear landscape. This position has two similar, yet different variants. The more establishmentarian variant is supported by the Left Front (an alliance of four communist parties) while the more systemic critique is backed up a broad cross-section of civil society. The Left parties, key coalition allies of Prime Minister Manmohan Singh's Congress Party-led United Progressive Alliance (UPA) coalition government from 2005-2008 when the US-India nuclear deal was negotiated opposed India's 1998 nuclear tests and urged the government to reemphasize the moral superiority norm by calling for global nuclear disarmament.⁴¹ However, they have historically supported the civilian nuclear program and have reluctantly acquiesced to India's possession of nuclear weapons along with its nuclear doctrine of credible minimum deterrence. This position can be abbreviated as the *nuclear minimalist position*.

The other, more critical variant of the fourth position has been advanced by predominantly left-leaning independent researchers and social movements. The critical variant is more systemic in that it not only questions the security premise and the great power norm underlying India's pursuit of nuclear weapons but also attacks the energy premise of the civilian nuclear program. Leading proponents of the fourth position include journalist Praful Bidwai, academic Achin Vanaik, researcher M. V. Ramana and the National Alliance of People's Movements to name a few. The anti-nuclear energy, anti-nuclear weapons position advanced by the aforementioned luminaries can be

⁴¹ Ramana, Zia Mian and M. V. "Wrong Ends, Means, and Needs: Behind the U.S. Nuclear Deal with India." *Arms Control Today* January/February 2006.

categorized as the *nuclear abolitionist position*. The proponents of this position demand a complete abandonment of the civilian and military components of the nuclear program, a greater focus on alternative energy sources and a foreign policy that completely eschews great power ambitions and the nuclear weapons buildup that such a policy entails.

Standing outside the political parties is a broad network of social movements in India that have become an increasingly important element in its political life. The most prominent of these, the National Alliance of Peoples Movements, an umbrella group of several hundred organizations and campaigns that support the rights of the poor, women, minorities, farmers, and workers, has come out against the deal because they see it as having been concluded without any public debate; as strengthening an unaccountable, dangerous, and costly Indian nuclear energy and nuclear weapons program; and as undermining important nuclear nonproliferation and disarmament goals.^{42 43}

A striking feature of the debate over nuclear weapons in India is the broad agreement among Nehruvian socialists, Hindu nationalists, nuclear maximalists and even the nuclear minimalists that India was right in not signing the NPT in 1968 and must continue to remain outside it and resist all major non-proliferation initiatives. Only the nuclear abolitionists have time and again demanded that India join the global nuclear mainstream by acceding to the NPT and the broader non-proliferation regime but their

⁴² Ramana, Zia Mian and M. V. "Wrong Ends, Means, and Needs: Behind the U.S. Nuclear Deal with India." *Arms Control Today* January/February 2006.

⁴³ As an example, see Sandeep Pandey, "Condemnation of India-U.S. Nuclear Deal," Statement by the National Alliance of People's Movements, October 26, 2005.

demands are considered as radical and completely ignored by the mainstream establishmentarian groups. George Perkovich has explained the reasons behind the widespread opposition to the NPT (and other non-proliferation initiatives) among Indian nuclear policy-makers and defense intellectuals.

.....Indians equate the nonproliferation regime with colonialism and racism. Thus, many Indians tar opponents of more restrained nuclear policies with invidious and intimidating language. In urging India to block the nuclear test ban treaty in Geneva, the former foreign secretary, A. P. Venkateswaran, brutally attacked proponents of a less confrontational approach in racially laden terms: "Alas, some of our own analysts are guilefully Uncle-Tomming such a course of action on the servile argument that we should not displease the great powers." Another prominent nuclear hawk added a sexual dimension to this debate. Noting that American "nonproliferation missionaries" pressed India to sign the Comprehensive Test Ban Treaty and support a treaty to ban unsafeguarded production of fissile materials, Brahma Chellaney argued that accession to these "self-castration measures" would leave India as a "nuclear eunuch." In a subsequent attack on India's self-restrained nuclear policy, Chellaney likened India's "nuclear option" to "chronic impotence," and decried national leaders for leaving the nation "naked." The character of this debate-prevalent since the mid-1960s-makes it increasingly difficult for Indian political leaders to advocate nuclear restraint, let alone a roll-back of the Indian nuclear program. As long as

resistance to unproliferation is identified with defying colonialism, racism, and emasculation, it will be difficult to overcome.⁴⁴

Dissertation Outline

I provide a brief dissertation outline that describes the key thrust of the remaining three chapters and the conclusion section. As stated earlier, the July 2005 joint statement and the nuclear deal embedded at its core led to a three-year acrimonious debate in India that nearly toppled the government of Prime Minister Singh and forced the US Congress to ratify the deal just in the nick of time at the height of the Great Recession of 2008.

Chapter 2 provides a detailed description of the terms of the July 18 2005 joint statement and the comprehensive albeit narrow 9 month debate in India (July 2005 to March 2006) between key actors and institutions over the contours of India's nuclear separation plan using concepts from Science and Technology Studies (STS). I focus in particular on the differences between two powerful bureaucracies within the Indian state over the placement of the fast breeder reactors on the (safeguarded) civilian or (unsafeguarded) military side of the plan.

Chapter 3 also focuses on the period from July 2005 to March 2006 but adopts a broader focus and looks at the intersection of the debate over the Iran-Pakistan-India (IPI) pipeline and the US-India nuclear deal in India. The chapter begins by focusing on the origins, evolution and emergence of the IPI pipeline as a key initiative on the Indian energy policy/foreign policy landscape due to the efforts made by one particularly enterprising individual and the resulting deep concerns over the project harbored by

⁴⁴ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 457-458

American diplomats in India. I then trace the abrupt but rapid emergence of the US-India nuclear deal, the competition between the pipeline and the nuclear deal and the eventual victory of the deal over the pipeline. The theoretical framework of the chapter is an amalgam of concepts from the STS field and political science.

Chapter 4 examines the important role played by Indian nuclear scientists in the debate over the nuclear deal from March 2006-August 2007 using STS concepts. I trace the reactions of the scientists to the Hyde Act, a key domestic enabling legislation that would allow President Bush to negotiate a bilateral 123 agreement with India and chronicle their demands regarding American concessions on a trinity of issues in the 123 agreement. I then focus on the underlying historical reasons for the demands of the scientists regarding two out of three issues in the trinity; 1) fuel-supply assurances and 2) the right to reprocess. A particularly important part of the chapter is the debate on the reliability of India's 1998 thermonuclear test and the implications of that debate for negotiations over the issue of nuclear testing and the language pertaining to it in the 123 agreement. The chapter ends with a concise description of the accommodative negotiating posture of the Bush administration and the resulting American concessions on the trinity of issues.

The final conclusion section consolidates the insights gained from each of the preceding chapters and contrasts the current state of US-India strategic and nuclear relations against some of the promises made by the proponents of the nuclear deal from 2005-2008. My hope is that the dissertation will contribute to a better understanding of

the internal debate in India over the nuclear deal and the initiative's future given its vulnerability to the vagaries of US-India relations.

The overarching objective of this dissertation in addition to providing a technological history of the domestic debate over the nuclear deal in India between 2005-2007 is to explore the complex relationships between various relevant social groups, the dynamics of alliance formation (and disintegration) between them and the impact of such shifting dynamics on the theoretical concept of *technopolitical frames* (and *technopolitical regimes*) used to organize the debate.

The theoretical contribution of my dissertation to the STS field is minimal. Rather, it is the existing STS concepts deployed in the chapters of this thesis that provided an alternative vantage point to understand a complex techno-politico-strategic nuclear agreement heretofore studied through the lens of Security Studies, International Relations and Political Science. I conclude this introductory chapter by briefly discussing the current literature on the US-India nuclear deal and the contribution that my dissertation makes to it.

The contemporary literature on the US-India nuclear deal attempts and succeeds in providing revealing insights about the origins of the initiative on the American side (in terms of the identifying the actors involved in conceiving the pact), the initial reception to it by the Indian political leadership and the subsequent debate among key constituencies in India.

Harsh V. Pant, an Adjunct Fellow, Wadhvani Chair in US-India Policy Studies at the Center for Strategic and International Studies (CSIS) provides a concise but

illuminating history of the origins of the US-India nuclear deal in *The US-India Nuclear Pact: Policy, Process and Great Power Politics* and the process through which the two democracies clinched the initiative. Pant draws from the political science literature and uses the Levels of Analysis (LoA) approach as an analytical framework to examine the salient factors that were instrumental in influencing the course and the contours of the nuclear deal. Part I of the book identifies a range of factors at multiple levels that were important in setting the trajectory of the US-India relationship that ultimately resulted in the historic July 18 2005 joint statement announcing the nuclear deal. Pant deploys the LoA approach to analyze this plurality of causative factors at the international system level, the state level and the individual level.⁴⁵ The key conclusion from Part I is that the US-India nuclear deal was the product of a constellation of factors at the structural, domestic, political and individual levels.

Part II focuses on the complex three year negotiating process from 2005 to 2008 between American and Indian diplomats that resulted in the nuclear deal, a process complicated by the domestic debate within both countries (especially the acrimonious debate in India that nearly toppled the coalition government of Prime Minister Manmohan Singh). Part III of the book situates the nuclear deal in the broader debate in the international relations literature on the role of international institutions in global politics and concludes that the nuclear pact

is primarily a response to great power realignment in contemporary international system. Non-proliferation concerns have been largely

⁴⁵ Pant, Harsh V. *The U.S-India Nuclear Pact- Policy, Process and Great Power Politics*: Oxford University Press, 2011. p 12

peripheral to the whole process of negotiating this pact, underlining once more that great power politics will continue to trump institutional imperatives.⁴⁶

Dinshaw Mistry, an Associate Professor of Political Science and Asian Studies at the University of Cincinnati uses the theoretical framework of “two-level games” to explain the complex interactions between interstate diplomacy and domestic politics during the negotiation and implementation of the nuclear agreement.⁴⁷ The paper became the basis of a book (*The US-India Nuclear Agreement-Diplomacy and Domestic Politics*) that was scheduled for publication in July 2014. Mistry’s main conclusion in the paper is that

.....the current Indian government’s political weakness prevented it from making nonproliferation concessions to Washington in its nuclear separation plan and in the “123 Agreement” even though it was structurally in a better position to implement the nuclear agreement because it did not legally require parliamentary approval for implementation. This delayed U.S. congressional approval for the nuclear agreement—approval that the Bush administration institutionally required. Yet, because the Bush administration was a strong government, it could better bargain with its domestic opponents, and it successfully

⁴⁶ Pant, Harsh V. *The U.S-India Nuclear Pact- Policy, Process and Great Power Politics*: Oxford University Press, 2011. p 130

⁴⁷ Mistry, Dinshaw. "Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement." *Asian Survey* 46, no. 5 (September/October 2006). p 676

secured congressional endorsement for the first steps toward nuclear cooperation with India by mid-2006.⁴⁸

Books and research papers by other authors have eschewed the explicit application of theoretical concepts and instead adopt a ‘tell the story’ approach that focuses on the origins, processes and events that led to the consummation of the nuclear deal. However, the authors implicitly deploy concepts from political science and international relations (such as Graham Allison’s three models for decisionmaking) in explaining some of the key turning points in the passage of the nuclear deal.

Indo-U.S Nuclear Deal-Seeking Synergy in Bilateralism edited by P.R. Chari, former civil servant and a Visiting Professor at the New Delhi-based Institute for Peace and Conflict Studies focuses in depth on the domestic debate over the nuclear deal in India. The main contribution of the book is its successful organization and description of the disparate actors that participated in the debate. Another important contribution is the chapter (“Prime Time Deal”) on the role of the electronic and print media by Indian journalist Vidya Shankar Iyer.⁴⁹ Iyer tracks the change in the role of the media (and its capacity to influence opinion) from ignorance and initial lack of interest in the deal to its active role in politicizing the initiative to enable easier reporting and “race to the finish line”⁵⁰ style coverage at the very end.⁵¹

⁴⁸ Ibid. p 676-677

⁴⁹ Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. p 32

⁵⁰Ibid, p 32-33.

⁵¹ Ibid

Strategic Sell-Out, Indian-US Nuclear Deal is a comprehensive compendium of newspaper articles published by nuclear strategist Bharat Karnad and three prominent retired nuclear scientists (Dr. A. N. Prasad, former Chairman of the Bhabha Atomic Research Center- BARC, Dr. P. K. Iyengar, former Chairman of the Atomic Energy Commission and Dr. A. Gopalakrishnan, former Chairman of the Atomic Energy Regulatory Board). The quartet question the energy and national security premise of the nuclear deal and their main criticism is that the initiative will cap the Indian nuclear arsenal at a technologically primitive state and saddle the country with expensive imported reactors that are a deviation away from the principle of self-reliance underlying the indigenous three-stage nuclear program.⁵²

Conservative nuclear strategist Bharat Karnad devotes the final part of *India's Nuclear Policy* to analyzing the strategic motivations that led the US to offer a nuclear deal to India and the energy security imperatives that motivated Prime Minister Manmohan Singh to accept it. He reckons that the primary American motivation behind offering India a grand nuclear bargain was to construct a strategic partnership and recruit India as the third prong of the US-Japan alliance to contain rising Chinese power in Asia.⁵³ Karnad also suggests that Prime Minister Manmohan Singh was motivated to accept the deal due to an acute shortage of uranium faced by the Indian nuclear program in early 2005 and the conviction that importing uranium (and reactors) from foreign vendors would not only allow the growth of the civilian nuclear program to meet India's

⁵² P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009.p xiv-xv

⁵³ Karnad, Bharat. *India's Nuclear Policy*: Praeger Security International 2008.p 150

burgeoning energy needs but also free up indigenous uranium for weapons production.

Karnad levels five key criticisms at the nuclear deal.

1) India's will be permanently saddled with a nuclear arsenal consisting of Hiroshima yield fission weapons and unproven thermonuclear weapons due to clauses in US domestic legislation threatening complete cessation of nuclear cooperation in case India conducted a nuclear test.

2) The separation of India's hitherto intermeshed nuclear program into civilian and military nuclear components, India's core commitment under the nuclear deal will "at a stroke destroy the unitariness and cohesion of the broad-based dual-use nuclear energy program that has allowed, in terms of both cost and effort, for economical use of the human and material resources, which are in short supply."

3) India's decision to place numerous civilian facilities including costly imported reactors under permanent IAEA safeguards will permanently saddle India with financial boondoggles in case the nuclear deal collapses as a result of an Indian nuclear test that is punished by foreign suppliers through a fuel-embargo

4) The Indian commitment to agree to assist the US in the expeditious negotiation of a multilateral Fissile Material Cut-off Treaty (FMCT) undermines its national interests by preventing India from building up the appropriate amount of fissile material to match China, effectively capping the number of its nuclear weapons.

5) The Indian commitment to adhere to the stipulations of the Missile Technology Control Regime (MTCR) also undermines the national interest by preventing it from

using counter-proliferation strategies (such as the transfer of missile systems to Vietnam) to strategically discomfit China and mute the China-Pakistan axis.⁵⁴

On the American side, *Gauging U.S-Indian Strategic Co-operation* edited by Henry Sokolski is a collection of essays by proponents and opponents of the deal. One of the contributing authors is Ashley Tellis, a senior associate at the Carnegie Endowment for International Peace and considered to be a key architect of the deal. Tellis identifies the main purpose of the nuclear deal as an initiative “intended to convey in one fell swoop the abiding American interest in crafting a full and productive partnership with India to advance our common goals in this new century.”⁵⁵

As stated earlier, the aforementioned literature succeeds in providing revealing insights about the origins of the nuclear deal and the dynamics of the domestic debate over it in India. However, the literature is narrow in that all the previously cited authors rely on concepts from political science and international relations either explicitly or implicitly for their analysis. My dissertation provides a constructivist perspective that serves as an alternative vantage point to analyze and understand the debate over the nuclear deal in India. I also focus more comprehensively on the domestic debate in India and attempt to reconstruct the exact sequence of events, actors and strategies that led to important inflection points such as the final shape of the separation plan, the status of the fast breeder reactors, the Prime Minister’s shift away from the Iran-Pakistan-India

⁵⁴ Karnad, Bharat. *India's Nuclear Policy*: Praeger Security International 2008.p 153-154

⁵⁵ Sokolski, H., ed. *Gauging U.S-Indian Strategic Co-operation* March 2007, Strategic Studies Institute. p 254.

<http://www.strategicstudiesinstitute.army.mil/Pubs/display.cfm?pubid=755>

pipeline to the nuclear deal and the dynamics of alliance formation between the retired nuclear scientists. Finally, my dissertation is also an attempt to craft a rich narrative of the debate over the nuclear deal in India by consolidating a variety of sources including short-lived electronic articles, newspaper items, semi-structured interviews, leaked American diplomatic cables, foundational references, government statements and think-tank reports. In particular, the heavy reliance on and deployment of excerpts from the leaked American diplomatic cables provides a ring-side view of the debate in India and the role of the US Embassy in it that be useful to scholars and policymakers.

CHAPTER 2: THE SOCIAL CONSTRUCTION OF INDIA'S FAST BREEDER REACTORS.

Introduction

On July 18 2005, US President George W. Bush reversed three decades of US non-proliferation policies and offered to help Non-proliferation Treaty (NPT) holdout India to obtain a special exemption to nuclear export control rules that would allow it to buy nuclear reactors, uranium, and dual use technologies on the international market. In return, Prime Minister Manmohan Singh undertook to separate India's civilian nuclear facilities from its military ones and to place the civilian ones under International Atomic Energy Agency (IAEA) safeguards.

The chapter aims to understand the complex techno-politico-strategic debate in India over the idea of separation and the safeguarded (civilian) or unsafeguarded (military) status of the fast breeder reactor program in the separation plan from July 2005 to March 2006. I use the concept of *relevant social groups* from the Social Construction of Technology (SCOT) approach and divide actors into social groups based on their shared common meaning of the idea of separation.

The concept of relevant social groups helps to understand the separation debate as a triangular struggle between a powerful first coalition that supported it, a second coalition that opposed it, and an emerging third coalition that opposed separation while manifesting intermittently in the mainstream media. I tabulate the relevant social groups that comprised the three coalitions and juxtapose the arguments of contending groups from the first, second and third coalitions. The three coalitions were by no means

homogenous and there were significant differences within each of them over the contours of the final Indian separation plan. The debate over the safeguarded (civilian) or unsafeguarded (military) status of the Prototype Fast Breeder Reactor-PFBR (and to a lesser extent the Fast Breeder Test Reactor- FBTR) between two powerful first coalition relevant social groups (Department of Atomic Energy-DAE and the Ministry of External Affairs- MEA) serves as a good example. I provide a brief analysis of the motivations of the DAE and the MEA behind their respective versions of the separation plan and demonstrate its interpretative flexibility.

Although details of the internal debate within the Indian state are shrouded in secrecy, press articles suggest that the DAE's plan was adopted over the MEA's version as the official Indian negotiating position by the Prime Minister's Office (PMO) in the days leading up to the second round of Indo-US negotiations on the separation plan. I try to ascertain the reasons behind the DAE's victory.

I then focus on the MEA's indirect facilitation of a coordinated attack on the DAE in the mainstream press through its allies following the failure of the third round of Indo-US negotiations over the separation plan and indications by the American side that India should place the breeders under safeguards. Chairman of the Atomic Energy Commission and DAE Secretary Anil Kakodkar responded to the attacks through an interview in a major newspaper in which he publicly called for the breeders to be placed on the unsafeguarded military side for energy security and national security reasons. The interview raised the political cost of any decision by the Prime Minister's Office (PMO) to adopt the MEA's safeguarded breeder plan as the official Indian separation plan. The

Prime Minister caved in to Kakodkar's demands and announced in the Indian Parliament that the breeders would not be placed under safeguards but would be retained on the military side of the separation plan. Thus, India's final separation plan was either the DAE's unsafeguarded breeder plan or a variant of it.

I conclude by using theoretical insights developed by Susan Leigh Star and James R. Griesemer to analyze interesting facets of the debate over the separation plan and the status of the breeder.

Background

A brief history of the Indian nuclear program and its pre-2005 structure provides the context for understanding the debate. India was the first country in Asia to establish an Atomic Energy Commission (AEC) in 1948⁵⁶, a year after its independence.

Jawaharlal Nehru, the country's first Prime Minister and Homi Bhabha, the first Chairman of the Atomic Energy Commission were the architects of nuclear policy. Their vision arose from a certain diagnosis of the causes for India's decline and colonization. Bhabha and Nehru shared the perception that India was colonized because of its inability to develop modern science and technology. The duo also wanted the country to emerge as a great power and believed that the goal was possible only if it developed an economy based on modern science and technology.

The Nehru-Bhabha combine determined that India should be in the forefront of the atomic revolution that was considered to be the cutting edge of science and technology in the aftermath of World War II. George Perkovich pointed out in his magisterial *India's Nuclear Bomb* that the "capacity to master the atom represented modernity, potential prosperity, transcendence of the colonial past, individual and national prowess, and international leverage."⁵⁷ He also argued that Nehru was aware of the military potential of atomic technology all along and sought to develop the

⁵⁶Gadekar, Surendra. "India's Nuclear Fuel Shortage." *Bulletin of Atomic Scientists*, August 6 2008.

⁵⁷Perkovich, George. *India's Nuclear Bomb: The Impact of Global Proliferation*. London: University of California Press, 1999.p 13

technological capability to manufacture nuclear weapons right from the outset despite public positions that suggested otherwise.⁵⁸

Bhabha was aware of the poor quality and modest quantity of uranium reserves in India that he claimed could support only 10,000 MW of nuclear power for 40 years at high extraction cost.⁵⁹ However, the country possessed 25% of the world's thorium deposits.⁶⁰ Bhabha proposed a sequential, inter-linked three-stage nuclear program that would optimally utilize the country's meager uranium reserves and transition to thorium producing large amounts of electricity.⁶¹ Self-reliance was declared as the underlying principle of recently independent India's nuclear program that was based on a "closed fuel cycle" wherein the "spent fuel of one stage is reprocessed to produce fuel for the next stage and multiplies manifold the energy potential of the fuel."⁶² Although the Indian nuclear program relied extensively on foreign help, Bhabha continued to emphasize that imports were a temporary measure in order to provide a quick take-off and indigenous technology would eventually play the dominant role in meeting the country's energy needs.⁶³

The first stage involves the use of natural uranium as fuel in small to medium Pressurized Heavy Water Reactors (PHWRs).⁶⁴ The irradiated spent fuel is reprocessed in

⁵⁸ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p-14

⁵⁹ Ashwin Kumar, M. V. Ramana "The Safety Inadequacies of India's Fast Breeder Reactor." *Bulletin of Atomic Scientists* July 21 2009.

⁶⁰ Gadekar, Surendra. "India's Nuclear Fuel Shortage." *Bulletin of Atomic Scientists*, August 6 2008.

⁶¹ S.K.Jain, Dr. "Nuclear Power –an Alternative." <http://www.npcil.nic.in/pdf/nuclear%20power-%20an%20alternative.pdf> p 3

⁶² Ibid

⁶³ Abraham, Itty. *The Making of the Indian Atomic Bomb: Science, Secrecy and the Postcolonial State*: Orient Longman, 1998. p 77-78

⁶⁴ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 54.

reprocessing plants that extract plutonium.⁶⁵ The plutonium is then used to “provide startup cores of fast breeder reactors (FBRs)”⁶⁶ that are expected to be the mainstay of the nuclear program and provide a quarter of all electricity by 2050.⁶⁷ These cores would be surrounded by “blankets” of either depleted or natural uranium, to produce more plutonium to fuel more breeders.⁶⁸ Eventually, thorium would be substituted for uranium in the blankets to produce fissile uranium-233, the startup fuel for the third stage⁶⁹ consisting of breeder reactors using uranium-233 in their cores and thorium in their blankets.⁷⁰

⁶⁵ Ibid.,p. 54

Ashwin Kumar, M. V. Ramana "The Safety Inadequacies of India's Fast Breeder Reactor." *Bulletin of Atomic Scientists* July 21 2009.

⁶⁶ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55.

⁶⁷Chandra, R. B. Grover and Subash. "Scenario for Growth of Electricity in India." *Energy Policy* 34, no. 17 (2006): p. 2845.

⁶⁸ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55

⁶⁹ Ibid

⁷⁰ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55.

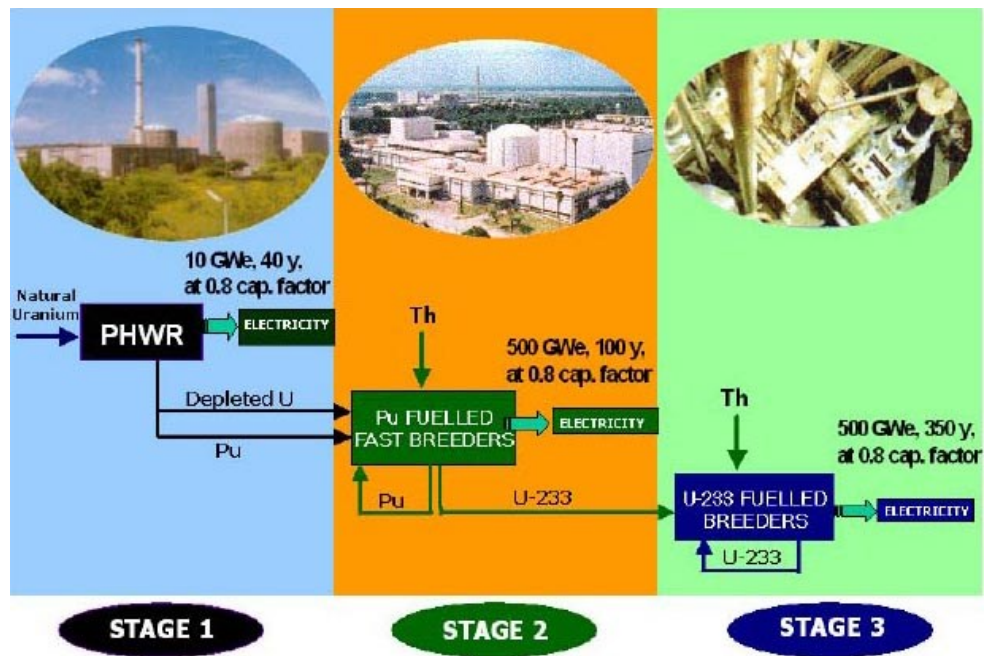


Figure 1: India's three-stage nuclear program (Bhabha plan)

Source: S.K.Jain "Nuclear Power –an Alternative."

<http://www.npcil.nic.in/pdf/nuclear%20power-%20an%20alternative.pdf> (p.4)

Nuclear weapons program

The Nehru-Bhabha duo followed a sophisticated strategy towards the acquisition of a nuclear weapons capability. Nehru used his image as a leader committed to high idealism to publicly announce that India would not acquire nuclear weapons while always qualifying such statements at key junctures to leave open the possibility of a nuclear weapons capability. He also created the necessary institutional conditions by supporting framework legislation (Atomic Energy Act of 1948 and 1962) with provisions to shroud the nascent Indian nuclear program in unprecedented secrecy that concentrated power in the hands of the nuclear scientists and allowed very little public oversight.

While Nehru's numerous statements could be taken as unequivocal commitments not to develop atomic weapon capability, he and Bhabha were following a more sophisticated strategy. Bhabha and Nehru understood and rhetorically welcomed the military potential of the nuclear program, particularly the plutonium separation plant, before 1962. The nuclear program created multiple options regardless of the label put on it. Indeed, from late 1955 through 1960, and then later, Bhabha and Nehru directly and indirectly invoked the capability and possible intention to make nuclear explosives. Their statements betrayed genuine ambivalence and vacillation but also a clear awareness of the value of a nuclear weapon option.⁷¹

⁷¹ Perkovich, George. *India's Nuclear Bomb: The Impact of Global Proliferation*. London: University of California Press, 1999. P 34-35

India's "peaceful nuclear explosion" in 1974 resulted in an international embargo on fuel supply and technology transfer. The adverse effects of the embargo further slowed an already tottering nuclear program that was on track to miss its 1980 expansion target even before the imposition of sanctions.⁷² Although the embargo cut-off Western assistance to substantial portions of the Indian nuclear program, sporadic co-operation with international partners such as the Soviet Union and later Russia continued. India's power reactors struggled with low capacity factors (65%) through the mid-1990's that rose to 85% in 2001-2002 indicating the country's growing mastery of the nuclear fuel cycle.⁷³ However, the DAE's inability to open new mines due to local opposition, its compulsion to build more reactors to justify its funding and internal mismanagement served to further aggravate the pre-existing natural uranium deficit.⁷⁴ To summarize,

⁷² Conversations with Dr. M. V. Ramana, Associate Research Scholar, Program on Science and Global Security, Princeton University. February 2012.

⁷³ "Nuclear Power in India." (September 2011). Accessed on December 5 2011.
<http://www.world-nuclear.org/info/inf53.html>.

⁷⁴ India's 15 existing Pressurized Heavy Water Reactors (PHWR's) consumed 480 tons of uranium per year and the 7 new reactors under construction would require another 120 tons when commissioned. M. V. Ramana and Zia Mian estimated that India's dedicated weapons grade plutonium production reactors (CIRUS and DHRUVA) required an additional 30-35 tons of uranium annually. The DAE was able to produce just 220-300 tons per year resulting in a significant shortfall. The supply gap was bridged by resorting to the use of previously stockpiled uranium. However, that stockpile was depleting rapidly and was likely to be exhausted by 2007. The DAE also operated existing reactors below their full capacity in order to conserve uranium. The capacity factor of Indian reactors dropped precipitously from 90% in 2002-03 to 76% in 2004-05. The Mid-Term Appraisal of the 10th Five Year Plan (2002-2007) of the Indian Planning Commission blamed the shortage on the "non-availability of nuclear fuel because the development of domestic mines has not kept pace with addition of generating capacity." An unnamed Indian official admitted to the BBC that India had nuclear fuel to last only till the end of 2006. Ramana M V and Zia Mian. "Feeding the Nuclear Fire." *Foreign Policy in Focus*. (September 20, 2005), http://www.fpi.org/reports/feeding_the_nuclear_fire
See Ramachandran, R. "Nuclear Deadlock." *Frontline*, no. 04 (2006). Accessed on November 10 2011.
<http://www.hinduonnet.com/fline/fl2304/stories/20060310007301000.htm>
Mistry, Dinshaw. "Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement." *Asian Survey* 46, no. 5 (September/October 2006). P 677-678
Gopalakrishnan, A. "Civilian and Strategic Nuclear Facilities of India." (January 5, 2006). Accessed on January 1 2012.

multiple external and internal constraints led to the DAE missing its extravagant expansion targets and being forced to remain content with a modest nuclear program (despite enormous government investments and implicit subsidies).⁷⁵

India initially produced weapons grade plutonium for nuclear weapons from the 40MWt CIRUS reactor supplied by Canada for research purposes in 1960 and the 100 MWt Dhruva reactor built indigenously in 1985.⁷⁶ CIRUS became critical in 1960 and

http://www.idsa.in/idsastrategiccomments/CivilianandStrategicNuclearFacilitiesofIndia_AGopalakrishnan_050106

Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. p 12

Subramaniam, T. S. "Uranium Crisis." *Frontline* 22, no. 27 (Dec. 31 - Jan 13, 2006).

Planning Commission. "Tenth Five Year Plan: Energy." Accessed on September 10 2011.

<http://planningcommission.nic.in/plans/mta/midterm/english-pdf/chapter-10.pdf>. p 329-330

⁷⁵ India had 15 operating Pressurized Heavy Water Reactors (PHWR's) when the separation plan was being debated in 2005-2006. 4 of them were under IAEA safeguards while the remaining 11 were unsafeguarded. The 15 reactors produced 3,310 MWe or 3% of India's electricity. Another 7 reactors under construction (including 2 1000 MWe Russian VVER's committed to IAEA safeguards, 5 unsafeguarded PHWR's, a small 13 MWe second stage Fast Breeder Test Reactor (FTBR) and a much larger 500 MWe Prototype Fast Breeder Reactor (PFBR) that was due to begin operating from 2011) would generate 3420 MWe. The DAE planned to construct 20,000 MWe by 2020. The target would be met by a combination of indigenous natural uranium fuelled PHWR's (10,540 MWe), 6 larger imported enriched uranium fuelled 1000 MWe LWR's and 4 500 MWe FBR's. The imported LWR component depended on the nuclear deal going through.

See Ramachandran, R. "Nuclear Deadlock." *Frontline*, no. 04 (2006),

<http://www.hinduonnet.com/fline/fl2304/stories/20060310007301000.htm>

Mistry, Dinshaw. "Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement." *Asian Survey* 46,

no. 5 (September/October 2006). P 677-678

Gopalakrishnan, A. "Civilian and Strategic Nuclear Facilities of India." (January 5, 2006). Accessed on

January 1 2012.
http://www.idsa.in/idsastrategiccomments/CivilianandStrategicNuclearFacilitiesofIndia_AGopalakrishnan_050106

Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. p 12

Subramaniam, T. S. "Uranium Crisis." *Frontline* 22, no. 27 (Dec. 31 - Jan 13, 2006).

Ramana, Zia Mian and M.V. "Feeding the Nuclear Fire." *Foreign Policy in Focus*. (September 20, 2005),

http://www.fpiif.org/reports/feeding_the_nuclear_fire

Commission, Planning. "Tenth Five Year Plan: Energy."

<http://planningcommission.nic.in/plans/mta/midterm/english-pdf/chapter-10.pdf>. p 329-330

Srivastava, Sanjeev. "Indian Pm Feels Political Heat " BBC News. Accessed on September 1 2011.

http://news.bbc.co.uk/2/hi/south_asia/4715797.stm

⁷⁶ "Nuclear Power in India." (September 2011). Accessed on December 5 2011.

<http://www.world-nuclear.org/info/inf53.html>

fully operational in 1963. An extended refurbishment of CIRUS started in October 1997, and it resumed operation in October 2003.⁷⁷ Dhruva was commissioned in 1985 but began normal operation in 1988.⁷⁸

Data for the operating capacity factors of the two reactors is sparse. However, a team of nuclear scientists relied on Indian press articles that claimed that the availability factors⁷⁹ of CIRUS and Dhruva were over 70% and 68% respectively. The scientists assumed that the reactors operated at full power when available and arrived at an “upperbound estimate of plutonium production. At full power and an availability factor of 70 percent, each year CIRUS would produce about 10.2 tons of spent fuel, containing about 9.2 kg of weapons grade plutonium, and Dhruva would produce about 25.6 tons of spent fuel containing 23 kg of weapons grade plutonium.”⁸⁰ They also estimated India’s cumulative weapons grade plutonium production as of 2006. I reproduce their estimates.

Zia Mian, A. H. Nayyar, R. Rajaraman, and M. V. Ramana. "Fissile Materials in South Asia and the Implications of the U.S.-India Nuclear Deal." *Science and Global Security* 14 (2006): 121.

⁷⁷ Ibid

⁷⁸ Ibid

⁷⁹ The availability factor of a power station is the percentage of time it is available to generate power.

See Khoshmashrab, Shahab. "Power Plant Reliability " (October 2009). Accessed on January 4 2012. http://www.energy.ca.gov/2008publications/CEC-700-2008-013/FSA/32_Ivanpah%20Reliability.pdf (p. 3).

⁸⁰ Zia Mian, A. H. Nayyar, R. Rajaraman, and M. V. Ramana. "Fissile Materials in South Asia and the Implications of the U.S.-India Nuclear Deal." *Science and Global Security* 14 (2006): 121

Table 1: Estimated cumulative weapons grade plutonium production (kg) up to 2006 in India

Reactor	CIRUS	DHRUVA
Cumulative Plutonium production (kg)	234	414

Source: Adapted from Zia Mian, A. H. Nayyar, R. Rajaraman, and M. V. Ramana. "Fissile Materials in South Asia and the Implications of the U.S.-India Nuclear Deal." *Science and Global Security* 14 (2006):

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India conducted its first nuclear weapon test, a plutonium implosion bomb in 1974 and a second round of tests in 1998 using weapons grade and reactor grade plutonium. The country may possess sufficient weapons grade plutonium for one hundred nuclear weapons.⁸¹ Figure 2 provides an overview of India's extensive nuclear infrastructure, a result of sustained government support since the nuclear program's inception.

⁸¹"Nuclear Power in India." (September 2011). Accessed on December 5 2011.

<http://www.world-nuclear.org/info/inf53.html>

"Nuclear Weapons: Who Has What at a Glance." Accessed on December 7 2011.

<http://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat>



Figure 2: Atomic Energy Establishments in India

Source: "Atomic Energy Establishments in India ". (Accessed on February 26 2014), <http://dae.nic.in/?q=node/260>

Figure 3 provides a concise visual representation of the institutional architecture for nuclear policymaking in India. I will rely on Figure 3 to explain the outsized influence of the nuclear establishment, especially the AEC Chief Anil Kakodkar with respect to the breeders later in the chapter.

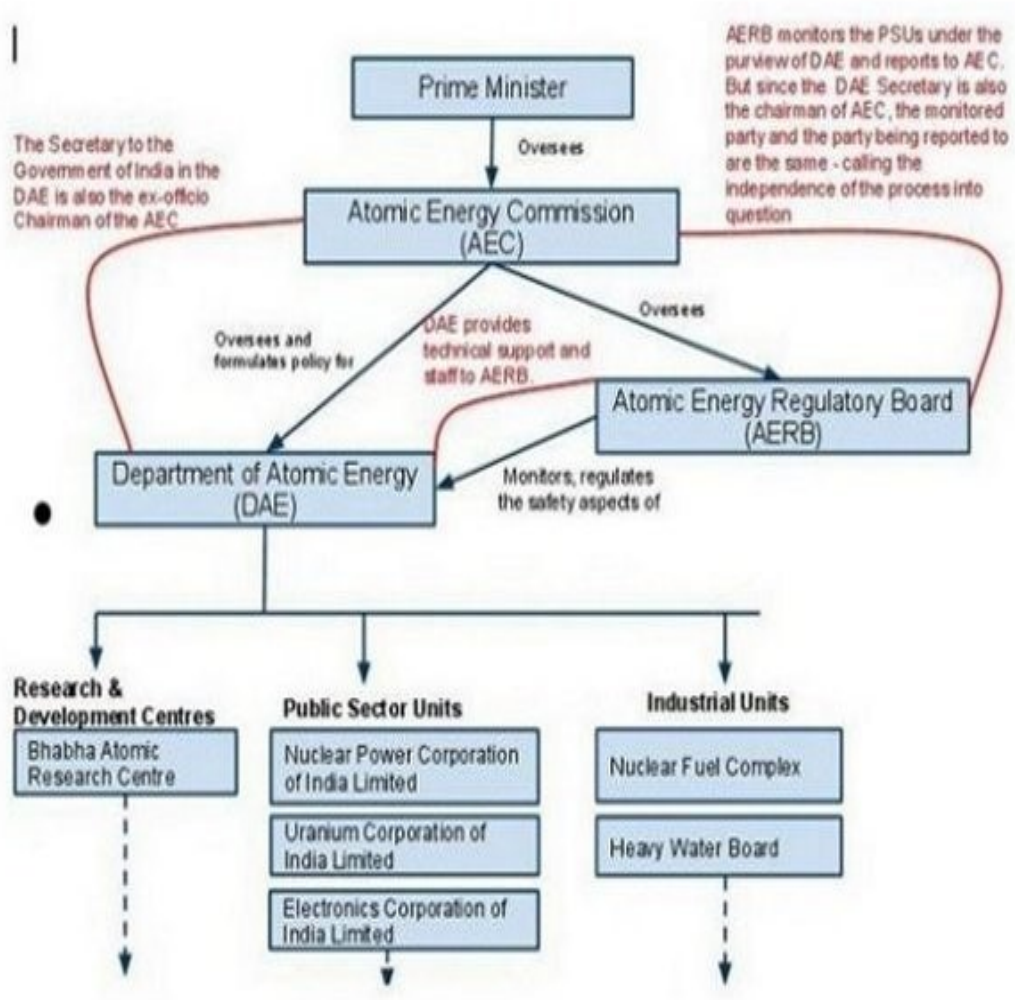


Figure 3: Organizational structure of the nuclear establishment

Source: "India's Nuclear Structure". (April 5, 2011). Accessed on February 26 2014. <http://www.greenpeace.org/india/en/What-We-Do/Nuclear-Unsafe/Nuclear-Power-in-India/Indian-Nuclear-Establishment/>

The July 18 2005 joint statement

On July 18, 2005, US President George W Bush and Indian Prime Minister Manmohan Singh issued a joint statement in which they resolved to “transform the relationship between their countries and establish a global partnership.”⁸² Bush recognized India as a “responsible state with advanced nuclear technology”⁸³ and resolved “to achieve full civil nuclear energy cooperation.”⁸⁴ He agreed to amend US domestic laws and help adjust Nuclear Supplier’s Group (NSG) export control regulations, to allow India, a country that tested nuclear weapons and never signed the Nonproliferation Treaty (NPT), to buy nuclear reactors, fuel and dual use technologies on the international market. The decision to end the US nuclear embargo was significant as it abruptly reversed three decades of non-proliferation policies.⁸⁵

In return, Singh conveyed that India would “reciprocally agree that it would be ready to assume the same responsibilities and practices and acquire the same benefits and advantages as other leading countries with advanced nuclear technology, such as the

⁸² *India - U.S. Joint Statement*. July 18 2005. Accessed on September 5 2011. Available from: http://www.indianembassy.org/press_release/2005/July/21.htm

⁸³ Ibid

⁸⁴ Ibid

⁸⁵ Thyagaraj, Manohar. "The U.S.-Indian Nuclear Agreement: Balancing Energy Needs and Nonproliferation Goals " *Orbis* 50, no. 2 (Spring 2006): 355.

United States. These responsibilities and practices consist of identifying and separating civilian and military nuclear facilities and programs in a phased manner and filing a declaration regarding its civilian facilities with the International Atomic Energy Agency (IAEA); taking a decision to place voluntarily its civilian nuclear facilities under IAEA safeguards; signing and adhering to an Additional Protocol with respect to civilian nuclear facilities.....”⁸⁶

T. P. Sreenivasan was a member of the Prime Minister’s National Security Advisory Board (NSAB)⁸⁷ and a veteran Foreign Service bureaucrat who served as the Deputy Chief of Mission in the Indian Embassy in Washington (1997-2000) during the tumultuous period in US-India relations following India’s 1998 tests. He would later play a key role in supporting the nuclear deal by publishing numerous articles supporting the initiative. Sreenivasan explained the significance of the deal.

At least in the eyes of the United States, India is now a nuclear weapons state. The gamble of 1998 has finally paid off. India had offered to subject some additional facilities to safeguards even earlier, but we had not considered it feasible to separate the civilian and military ("vegetarian and non-vegetarian" in DAE parlance) facilities because of the interlinkages between the two. The Department of Atomic Energy must have resisted this move till the end, in view of the massive effort involved in this separation. The significance of the nuclear deal goes beyond the concrete benefits that may accrue to India and the US. It

⁸⁶"India - USA Joint Statement". (2005). Accessed on September 5 2011.

<http://www.dae.gov.in/press/jtstmt.htm>

⁸⁷ Sreenivasan, T.P. "Mr. Obama's Passage to India." *Wall Street Journal*, September 28, 2010.

means not only a real transformation in bilateral relations; it is the legitimisation of India's nuclear assets and recognition of India as a nuclear weapons state.⁸⁸

Sreenivasan's claim that India's calculated "gamble" to test nuclear weapons in 1998 was a success in the light of the 2005 nuclear deal is interesting. He seemed to be suggesting that Indian leaders approved the 1998 tests to not only break out of the perceived constraints imposed by the supposedly looming Comprehensive Test Ban Treaty (CTBT) but also with the full knowledge that after an initial period of American anger and the resulting chill in US-India relations caused by a fresh round of technology sanctions, the US would have to pragmatically reckon with the strategic implications of India's overt nuclear weapons posture. The strategy of the leadership was that India would ride out any peripheral technology sanctions imposed by the US in the near and medium term on the back of its rapid economic growth since the systemic liberalization in 1991 while forcing the US to choose between two stark choices: 1) continue to isolate and sanction India in the context of a rising China with the associated strategic and economic costs or 2) strike some sort of a grand nuclear bargain with India involving a creative accommodation of its nuclear weapons into the existing nuclear order and pave the way for the US to tap India to advance its economic and strategic interests in Asia. The crucial calculation made by the Indian leadership was that the US would eventually opt for the second choice out of sheer pragmatism.

⁸⁸ Sreenivasan, T P. "The Nuclear Deal." (July 20 2005). Accessed on August 21 2011. <http://www.rediff.com/news/2005/jul/20tps.htm>

Further, Sreenivasan's claim that the nuclear deal not only legitimized India's nuclear weapons but also recognized it as a formal nuclear weapons state deserves closer scrutiny. Although the US did recognize India's nuclear weapons by categorizing the latter as a "responsible state with advanced nuclear technology" in the joint statement⁸⁹, the recognition was *de facto* and not *de jure*. In other words, Non-proliferation Treaty (NPT) holdout India's possession of nuclear weapons was acknowledged in retrospect and its right to continue possessing them (without any qualitative improvements that would result from a future nuclear test) was also accepted without inclusion in the current international nuclear order of five formal weapons states and NPT signatories.

A more nuanced interpretation of the significance of the joint statement would be that the US managed to carve out an exemption for India from the core rules of the non-proliferation regime without extensively damaging the existing nuclear order by fully inducting India into the formal nuclear weapons states club.

Finally, it is also useful to briefly ponder the possible reason behind the DAE leadership's initial resistance to the separation of India's nuclear infrastructure during the negotiations over the joint statement and eventual reluctant acceptance. The reason was not only due to the interlinkages among the civilian and the military facilities in the "janus-faced" Indian nuclear program as Sreenivasan claimed. After all, the DAE was facing an acute fuel shortage as of 2005 and had every incentive to go along with the American demand for separation given that the economic costs of separating India's

⁸⁹ "India - USA Joint Statement". (2005). Accessed on September 5 2011. <http://www.dae.gov.in/press/jtstmt.htm>

nuclear infrastructure would be far outweighed by the benefits of restoration of fuel supplies. M. V. Ramana, Associate Scholar, Program on Science and Global Security, Princeton University explained the real historical reason behind the DAE's opposition to the separation of India's intermeshed nuclear program.

The lack of separation is not an accident, but a choice made by the nuclear establishment. As early as the 1970s, Ashok Parthasarathi, a senior bureaucrat and science adviser to the prime minister, had suggested that the inspection of all nuclear installations from the point of view of health and environmental safety should be administered by a body with a suitable name and located in department of science and technology, as that department had been assigned the national responsibility for ensuring the preservation of environmental quality (Parthasarathi 2007: 131-32). But even the idea of having an external agency monitor its environmental record was not acceptable to the AEC (Atomic Energy Commission), let alone having someone monitor safety in its facilities.⁹⁰

The joint statement and debate over the contours of the separation plan was covered extensively by the Indian press. Politicians, scientists, strategists, journalists and editors participated in a vigorous debate conducted in the opinion columns and editorials of the country's agenda setting English language newspapers, online news websites, television shows and think-tank seminars. A Joint Working Group on Civil Nuclear

⁹⁰Ramana, M. V. "India: Flunking Atomic Audits - Cag Reports and Nuclear Power" *The Economic and Political Weekly*, , September 29, 2012. Also available at <http://www.sacw.net/article2872.html>

Energy Cooperation consisting of American and Indian interlocutors was formed to implement the joint statement. On the Indian side, Prime Minister Singh constituted two groups consisting of the Prime Minister's Office, the Department of Atomic Energy (DAE), the Ministry of External Affairs (MEA) and the Armed Forces to design a separation plan. The groups were instructed to ensure the integrity of the strategic nuclear program while maximizing areas for co-operation with the international civil nuclear energy community.⁹¹

The joint working group met 4 times and the Indian side handed over 3 drafts of the separation plan. The drafts seem to have been circulated among a few powerful American senators and representatives.⁹² The details of the drafts are shrouded in secrecy. However, some aspects were publicly debated as a result of leaks to the media by “highly placed” unnamed sources, statements by the Chairman of the AEC and US diplomats.

I briefly digress from my description of the debate over the separation plan in order to discuss the theoretical framework that will help organize the subsequent sections.

Theory

I use literature from the interdisciplinary field of Science and Technology Studies (STS) that aims to acquire “an integrative understanding of the origins, dynamics and consequences of science and technology.”⁹³ In STS, I draw from the social constructivist

⁹¹"Text of Suo-Motu Statement Made by Prime Minister Manmohan Singh on Civil Nuclear Energy Cooperation with the United States in Parliament ". (2006). Accessed on February 26 2014.

<http://www.hindu.com/thehindu/nic/suomotuu.htm>

⁹² Varadarajan, Siddharth. "Make the Indo-U.S. Nuclear Deal More Transparent" *The Hindu*, 19 January 2005.

⁹³ Edward J. Hackett, Olga Amsterdamska, Michael Lynch, Judy Wajcman, ed. *The Handbook of Science and Technology Studies*. Third ed. Cambridge Massachusetts: MIT Press, 2008. p 1

research program that uses “historical and sociological perspectives.”⁹⁴ Practitioners of the Social Construction of Technology (SCOT) approach reject technological determinism and argue that “a technology’s definition is a result of its interpretation by relevant social groups: artifacts may be interpreted flexibly, because what they do and how well they perform are results of competing goals or competing senses of what they should do.”⁹⁵

Artifacts are analyzed by constantly referencing the statements of various individual and collective actors and no properties of the artifact are assumed to exist independently of those statements.⁹⁶ SCOT practitioners aim to develop a “multidirectional model” of technological development (instead of linear models that do not describe rival explanations, actors, strategies and artifacts) in order to show that “the successful stages in the development are not the only possible ones.”⁹⁷ They generally focus on technological controversies⁹⁸ as sites of research because it is easier to deduce the socially constructed nature of facts and artifacts.⁹⁹

⁹⁴Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachusetts: MIT Press, 1997. p 6

Hukkinen, Henrik Bruun and Janne. "Crossing Boundaries: An Integrative Framework for Studying Technological Change." *Social Studies of Science* 33, no. 1 (February 2003): p 100.

⁹⁵Edward J. Hackett, Olga Amsterdamska, Michael Lynch, Judy Wajcman, ed. *The Handbook of Science and Technology Studies*. Third ed. Cambridge Massachusetts: MIT Press, 2008. p 16

⁹⁶ Bijker, Wiebe E. "

How Is Technology Made?—That Is the Question." *Cambridge Journal of Economics* 34 (November 11 2009): p 4.

⁹⁷ Wiebe E. Bijker, Thomas P. Hughes, Trevor J. Pinch, ed. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge Massachusetts: MIT Press 1989. p 28

⁹⁸ Ibid, p. 14.

⁹⁹ Ibid, p. 29.

I use concepts from the SCOT approach to expose the “contingencies in the history and the meanings of technologies, contingencies on actions and interpretations by different social groups.”¹⁰⁰ I rely on both the narrow and broad definitions of the phrase ‘social construction of technology’ at appropriate stages in my study. I begin with the narrow definition that refers to the approach (Social Construction of Technology denoted by the acronym SCOT)¹⁰¹ developed by Pinch and Bijker who adapted conceptual and methodological tools from the Sociology of Science (especially the Sociology of Scientific Knowledge- SSK) to study technology.¹⁰² The two argue that the development of modern low wheelers (e.g. safety bicycle) from the high wheeler machines of the 19th century (e.g. Ordinary), was not an inevitable consequence of an ever improving, autonomous technological logic, but the result of social processes that shaped the technical contents of the bicycle over a nineteen year time span.¹⁰³ According to the authors, only this kind of explanation can account for the numerous variations that emerged during the nineteen year period.

¹⁰⁰ Edward J. Hackett, Olga Amsterdamska, Michael Lynch, Judy Wajcman, ed. *The Handbook of Science and Technology Studies*. Third ed. Cambridge Massachusetts: MIT Press, 2008. p 16

¹⁰¹ Bijker, Wiebe E. "How Is Technology Made?—That Is the Question." *Cambridge Journal of Economics* 34 (November 11 2009): p 4.

¹⁰² Hukkinen, Henrik Bruun and Janne. "Crossing Boundaries: An Integrative Framework for Studying Technological Change." *Social Studies of Science* 33, no. 1 (February 2003): p 100.

Bijker, Wiebe E. "How Is Technology Made?—That Is the Question." *Cambridge Journal of Economics* 34 (November 11 2009): p 3-4.

Wiebe E. Bijker, Thomas P. Hughes, Trevor J. Pinch, ed. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge Massachusetts: MIT Press 1989. p 4-5, 12.

Winner, Langdon. "Social Constructivism and the Philosophy of Technology: Upon Opening the Black Box and Finding It Empty." *Science Technology Human Values* 18 (1993): p 365-66.

¹⁰³ Hukkinen, Henrik Bruun and Janne. "Crossing Boundaries: An Integrative Framework for Studying Technological Change." *Social Studies of Science* 33, no. 1 (February 2003): p 101

In the bicycle case study, Pinch and Bijker designated Ordinary non-users (consisting of elderly men and women) who considered the high wheeled Ordinary to be an *Unsafe Bicycle* (a meaning given by them because of the difficulties involved in mounting, riding and dismounting the bicycle) as a *relevant social group* based on their shared common meaning of the artifact. On the other hand, the group of Ordinary users (young upper class men) was designated as a *relevant social group* based on their shared meaning of the bicycle as a *Macho Bicycle*, a machine that they could use to show off before their lady friends.¹⁰⁴

An important step was the description of the artifact through the eyes of other relevant social groups that are usually ignored in conventional accounts (bicycle producers, women cyclists and anti-cyclists).¹⁰⁵ Bijker then carried out a sociological deconstruction of the high wheeled Ordinary into the *Unsafe Bicycle* and the *Macho Bicycle* to demonstrate the *interpretative flexibility* of the Ordinary.¹⁰⁶

¹⁰⁴ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 74-75

Wiebe E. Bijker, Thomas P. Hughes, Trevor J. Pinch, ed. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge Massachussets: MIT Press 1989. p 42

Bijker, Wiebe E. "

How Is Technology Made?—That Is the Question." *Cambridge Journal of Economics* 34 (November 11 2009): p 6

¹⁰⁵ Ibid.

¹⁰⁶ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 74-75

Wiebe E. Bijker, Thomas P. Hughes, Trevor J. Pinch, ed. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge Massachussets: MIT Press 1989. p 42

Bijker defines relevant social groups as “institutions and organizations such as the military or some specific industrial company, as well as organized or unorganized group of individuals” whose members “share a common set of meanings attached to a specific artifact.”¹⁰⁷ I narrow Bijker’s notion of relevant social groups, propose the modified concept of a *relevant social individual* and define it as “the meaning/meanings imparted by an individual to an artifact” in order to better capture the role of key individuals in the debate over the contours of the separation plan and the safeguarded (civilian) or unsafeguarded (military) status of the fast breeder reactors.

I use the concept of relevant social groups and relevant social individuals in order to juxtapose the meanings assigned to the idea of separation by collective and individual actors loosely organized into two broad contending coalitions consisting of politicians, scientists, strategists and editors. I also use the twin concepts to examine the radically different meanings advanced by an emerging third coalition of anti-nuclear activists, independent researchers and social movements that manifested intermittently. Thus, the debate over the idea of separation can be understood as a triangular contest between a powerful first coalition that supported it, a second coalition that opposed it, and an emerging third coalition that manifested intermittently.

¹⁰⁷ Wiebe E. Bijker, Thomas P. Hughes, Trevor J. Pinch, ed. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge Massachusetts: MIT Press 1989. p. 30.

Finally, I also draw on research on boundary objects by Susan “Leigh” Star, the recently deceased Professor in the School of Information Sciences at the University of Pittsburgh and James R. Griesemer, a Professor of Philosophy at the University of California (Davis). The authors examine the development of a natural history research museum, the Museum of Vertebrate Zoology at the University of California, Berkeley during its early years of development¹⁰⁸ and advance an analytical framework for interpreting historical material that can be applied to studies focusing on scientific work in complex institutional settings with inherent tensions between heterogeneity and generalizability.¹⁰⁹

More specifically, they focus on how the actors associated with the museum including amateurs, professionals and administrators managed the inherent tension in heterogeneous scientific work between the viewpoints of different actors from various social worlds and the necessity for generalizable findings.¹¹⁰ Theoretically, the work of the authors is an extension of the (Bruno) Latour- (Michel) Callon model of *interessement*. Star and Griesemer identify two major strategies (methods standardization and the development of boundary objects) as central for the top museum scientist and his/her chief financial patron to ‘translate’ between different viewpoints from diverse social worlds into a common scientific lingua franca.¹¹¹

¹⁰⁸ Star L. Susan and James R Griesemer. "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39." *Social Studies of Science* 19, no. 387 (1989).p 387-388

¹⁰⁹ Ibid. p 387

¹¹⁰ Ibid. p 387

¹¹¹ Ibid. p 387

The authors begin by describing a basic challenge that confronts complex scientific work: the inherent heterogeneity caused by the interaction of diverse actors from different ‘social worlds’ and the necessity for cooperation among various actors to arrive at generalizable findings.¹¹² They focus on the Museum of Vertebrate Zoology at the University of California, Berkeley and describe in detail the conceptions/visions of the museum held by different participants from several distinct “social worlds” including professional scientists, amateur naturalists, patrons, trappers, farmers, hired hands and administrators.¹¹³ The authors adopt a “many-to-many” mapping approach “where several obligatory points of passage are negotiated with several kinds of allies, including manager-to-manager types.”¹¹⁴

Star and Griesemer described the founding of the Museum of Vertebrate Zoology in 1908 by Annie Montague Alexander (1867-1950), a wealthy philanthropist and committed amateur naturalist who was inspired to conserve California’s fauna by the paleontology courses she took at Berkeley and her safari experience in Africa.¹¹⁵ Alexander chose Joseph Grinnell, a biology instructor at the Throop Polytechnic Institute in Pasadena to head the museum.¹¹⁶ The work of the museum involved reconciling a range of very different visions arising from the intersection/collision of the social worlds of diverse participants including amateur naturalists, professional biologists, the general

¹¹² Ibid. p 388

¹¹³ Ibid. p 388

¹¹⁴ Ibid. p 390

¹¹⁵ Ibid. p 395

¹¹⁶ Ibid. p 395

public, philanthropists, conservationists, university administrators, preparators and taxidermists.¹¹⁷

The first reconciliation of visions occurred between Alexander and Grinnell. The former was not interested in conservation theories but was more concerned about the necessity to preserve California's fauna for posterity while the latter wanted to build an institution of authority with a different expertise than other museums. Thus, Grinnell restricted his focus to the state of California (instead of the worldwide focus adopted by many contemporary museums) and designed research questions in a manner that could only be answered by a careful consideration of geographically-based organic diversity on a finer scale.¹¹⁸ Consequently, the museum's target animals were Californian birds, mammals, reptiles and amphibians.¹¹⁹ Alexander and Grinnell also agreed on an effective separation of responsibilities with the former providing funds and managing the museum's day-to-day administrative affairs and the latter shaping research problems to effectively utilize the funds for collecting and preserving Californian fauna.¹²⁰

Grinnell's academic training and the regional focus of the nascent museum also influenced the theoretical approach that was adopted for collecting fauna. The ecological approach emphasized a large scale topographical focus with the primary units of analysis and selection being species and subspecies, habitats and niches. The main requirement for the proper execution of the approach was vast amounts of highly specific information

¹¹⁷ Ibid. p 396

¹¹⁸ Ibid. 398-400

¹¹⁹ Ibid. p 399

¹²⁰ Ibid. p 401

about fauna and the immediate aspects of its environment (such as where the animal/animals were trapped).¹²¹

Grinnell adeptly forged loose yet working alliances with various social groups such as amateur collectors and trappers in order to enlist their support for collecting the vast amounts of data required to implement his ecological approach.¹²² The amateur collectors were members of California's vibrant conservation organizations such as the Sierra Club, the Cooper Ornithological Club, the Society of Western Naturalists and the Save the Redwoods League.¹²³ Although they shared Grinnell and Alexander's vision that the fauna unique to California ought to be preserved for posterity and wanted to play a role in the scholarly pursuit of knowledge by professional biologists,¹²⁴ the amateur collectors were often irritated at the seemingly unpractical information gathering demands made by museum biologists far removed from the field.

In order to overcome the problem posed by the frustration of amateur collectors and trappers with the data intensive collection methods preferred by the more exacting museum biologists, Grinnell devised meticulous and standardized information gathering procedures that were easily deployable by the collectors yet useful to the biologists.¹²⁵

Grinnell's accommodation of the concerns of the collectors by designing methods that enabled them to both enjoy their specimen gathering expeditions yet collect precise information relevant to the museum scientists resulted in the collectors extending their

¹²¹ Ibid. p 397

¹²² Ibid. p 397

¹²³ Ibid. p 401

¹²⁴ Ibid. p 401

¹²⁵ Ibid. p 398, 406), 408

full cooperation. The collectors used their alliances with trappers, farmers and townspeople near the land where they looked for specimens to obtain rare and elusive animals in exchange for a price or a more edible specimen.¹²⁶ The trappers and the townsfolk were not interested in the Grinnell-Alexander vision of saving Californian fauna but were motivated to cooperate due to the lure of money or a more edible specimen in exchange for a scientifically interesting one.¹²⁷ Thus, money and barter trade can be understood as two important strategies that aligned the interests of the front line collectors and trappers (just as methods standardization aligned the disjointed social worlds of the collectors and the professional biologists).¹²⁸

At an institutional level, Grinnell's information gathering procedures that emphasized topographical information, careful preservation of animal specimens and detailed documentation of native habitats also shaped the museum's physical organization with more emphasis placed on the meticulous ordering of species and accuracy.¹²⁹ The layout of the exhibits was also designed in a way that sampling from restricted locations over extended periods of time would visibly capture evolution in progress as a response to changing environments.¹³⁰

The University of California's vision for the infant natural history museum was different from that of Grinnell, Alexander and the collectors. For the university, the

¹²⁶ Ibid. p 402

¹²⁷ Ibid. p 402

¹²⁸ Ibid. p 402

¹²⁹ Ibid. p 398

¹³⁰ Ibid. p 399

museum was a means to achieve its goal of becoming a national-class university.¹³¹

However, the administration also took note of Alexander's role as the largest financial patron of the museum. Accordingly, the museum was evaluated as any other academic institution in terms of its level of prestige and external funding secured while its largest supporter Alexander was accorded near total administrative power over the museum's functioning.¹³²

To summarize, the standardization of methods by Grinnell helped to "discipline" his allies and aligned their conflicting priorities but did not "over discipline" them to avoid alienation¹³³ and collapse of the elaborate network composed of collectors, trappers, farmers, townsfolk, professional scientists and administrators.¹³⁴

With respect to the collectors, Grinnell created a mesh through which their products must pass if they wanted money or scientific recognition, but not so narrow a mesh that the products of their labour cannot be easily used.¹³⁵

The methods avoided thorny and potentially combustible issues (e.g. such as the issue of evolution between deeply supportive museum scientists and still skeptical amateur collectors) by focusing on procedure ("how") rather than on their theoretical underpinnings ("what" or "why"). Thus, methods standardization served as an important lingua franca between amateur collectors and professionals and allowed both of them to

¹³¹ Ibid. p 403

¹³² Ibid. p 403

¹³³ Ibid. p 407.

¹³⁴ Ibid. p 406

¹³⁵ Ibid. p 407

coordinate effectively (just as money and barter trade helped to establish a working relationship between the conservation minded amateur collectors and the more transactional trappers).¹³⁶ From an academic standpoint, each information gathering protocol designed by Grinnell can also be understood as a record of the process of reconciliation between different social worlds.¹³⁷

Other action-channels (in addition to the aforementioned standardization of methods) that organically emerged out of the imperative to reconcile the conflicting priorities of intersecting social worlds were boundary objects that simultaneously inhabited different worlds while meeting the demands of each one.¹³⁸

Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds.¹³⁹

¹³⁶ Ibid. p 407

¹³⁷ Ibid. p 406-407

¹³⁸ Ibid. p 408

¹³⁹ Ibid. p 393

The authors improved on the aforementioned generic definition of boundary objects and detailed the specific conditions under which such objects developed to erect the Museum of Vertebrate Zoology.

In natural history work, boundary objects are produced when sponsors, theorists and amateurs collaborate to produce representations of nature. Among these objects are specimens, field notes, museums and maps of particular territories. Their boundary nature is reflected by the fact that they are simultaneously concrete and abstract, specific and general, conventionalized and customized. They are often internally heterogeneous.¹⁴⁰

Grinnell was brilliant in delineating the state of California itself as the ultimate boundary object, the outermost limit within which fauna would be collected. The boundary object was sufficiently generic to be acceptable to his allies (Alexander, the university president, nature-lovers, sponsors, local social elites, amateur collectors and professional biologists) while being specific enough to acquire a particular meaning in their respective social worlds (acquisition of greater external funding for the university president, allowing the amateur collectors to enjoy their natural expeditions while contributing to professional biology and allowing Grinnell to position the museum as a major institution of authority on Californian fauna).¹⁴¹

Thus, the boundary object of California was an analytic concept that was flexible enough to “both inhabit several intersecting social worlds and satisfy the informational

¹⁴⁰ Ibid. p 408

¹⁴¹ Ibid. p 409

requirements for each of them.”¹⁴² Other smaller boundary objects that emerged in the course of erecting the museum were lists of species, lists of environmental conditions in which they were found, locations, specimens, field notes and a series of increasingly abstract maps that linked the aforementioned objects together.¹⁴³ The authors classified the boundary objects into four loose categories: 1) repositories 2) ideal types 3) coincident boundaries and 4) standardized forms to analyze the translation tasks that occurred in the course of the museum’s buildup.¹⁴⁴

1. Repositories. These are ordered ‘piles’ of objects which are indexed in a standardized fashion. Repositories are built to deal with problems of heterogeneity caused by differences in unit of analysis. An example of a repository is a library or a museum. It has the advantage of modularity. People from different worlds can use or borrow from the ‘pile’ for their own purposes without having directly to negotiate differences in purpose
2. Ideal type. This is an object such as a diagram, atlas or other description which in fact does not accurately describe the details of any one locality or thing.....However, it is adaptable to a local site precisely because it is fairly vague; it serves as a means of communicating and cooperating symbolically-a ‘good enough’ road map for all parties. An example of an ideal type is the species. This is a concept which in fact described no specimen, which incorporated both concrete and theoretical data and which served as a means of communicating across both worlds.

¹⁴² Ibid. p 387, 393

¹⁴³ Ibid. p 405-406

¹⁴⁴ Ibid. p 387

3. Coincident boundaries: These are common objects which have the same boundaries but different internal contents. They arise in the presence of different means of aggregating data and when work is distributed over a large-scale geographic area.....An example of coincident boundaries is the creation of the state of California itself as a boundary object for workers at the museum. The maps of California created by the amateur collectors and the conservationists resembled traditional roadmaps familiar to us all, and emphasized campsites, trails and places to collect. The maps created by the professional biologists, however, shared the same outline of the state (with the same geo-political boundaries), but were filled in with a highly abstract, ecologically-based series of shaded areas representing 'life-zones,' an ecological concept.

4. Standardized forms- These are boundary objects devised as methods of common communication across dispersed work groups.....In the case of the amateur collectors, they were provided with a form to fill out when they obtained an animal, standardized in the information it collected.....The advantages of such objects are that local uncertainties (for instance, in the collecting of animal species) are deleted.¹⁴⁵

Star and Griesemer conclude by discussing the implications of boundary objects and the allied issue of methods standardization for their future research.¹⁴⁶

¹⁴⁵ Ibid. p 410-411

¹⁴⁶ Ibid. p 388

Relevant social groups

I begin by tabulating the relevant social groups and relevant social individuals that comprised the three coalitions.

Table 2: Various relevant social groups and relevant social individuals in the three coalitions

Relevant Social Groups & Relevant Social Individuals	First Coalition	Second Coalition	Third Coalition/Civil Society
Political	Prime Minister Manmohan Singh, his Congress Party led United Progressive Alliance (UPA) government, the Prime Minister's Office	The Left front, Bharatiya Janata Party (BJP) led National Democratic Alliance (NDA)	

Scientific	Dr R. Chidambaram (Scientific Adviser to the Prime Minister), Dr. Anil Kakodkar (Chairman of the Atomic Energy Commission)	Retired nuclear scientists including Dr. A. N. Prasad (former Director of the Bhabha Atomic Research Center) and Dr. P. K. Iyengar (former Chairman of the Atomic Energy Commission)	
Strategic	a majority of India's strategic thinkers led by K. Subrahmanyam, serving diplomats, National Security Advisor (M. K. Narayanan), Ministry of External Affairs (MEA) and	former national security advisor (Brajesh Mishra), strategists with hawkish views (Dr. Brahma Chellaney and Bharat Karnad) and retired diplomats	

	Foreign Secretary (Shyam Saran)		
English language newspapers	Indian Express Hindustan Times Times of India	Asian Age	
Anti-nuclear activists, independent researchers and grassroots organizations			Dr. M. V. Ramana, researcher at Princeton University, Dr. Sandeep Pandey, Convenor of the National Alliance for People's Movements (NAPM) and others.

I proceed to first juxtapose the arguments of contending social groups and individuals from the first, second and third coalitions over the idea of separating India's nuclear infrastructure. My intention is to not only familiarize the reader with the positions taken by various relevant social groups in India over the issue of separation, but also provide the political context for the 'debate within the debate' analyzed later in the chapter (the contestation over the safeguarded (civilian) or unsafeguarded (military) status of the fast breeder reactors in the separation plan). I then narrow the frame of reference for the debate over the breeders and focus on two powerful relevant social groups within the first coalition: the Ministry of External Affairs (MEA) and the Department of Atomic Energy (DAE).

First coalition-Prime Minister Manmohan Singh-Congress party

Dr. Manmohan Singh was Prime Minister at the time of the debate. His Congress Party had 145 seats¹⁴⁷ in the 543 member Lok Sabha, the lower house of Parliament.¹⁴⁸ The party along with its regional allies comprised the center-left United Progressive Alliance (UPA) that had 217 seats.¹⁴⁹ An economist by training, Singh was finance minister in 1991 and introduced reforms that liberalized the quasi-socialist Indian economy. He is regarded as the architect of the country's rapid economic growth. The Prime Minister was an ardent supporter of the joint statement and believed that it was

¹⁴⁷"India's Election and the Bjp: Saffron Hopes-the Bjp Enjoys an Optimistic Moment." *The Economist*, May 7th 2009

¹⁴⁸ "United Progressive Alliance: Partners in Governance." *The Times of India* Jul 8, 2006.

¹⁴⁹ Kronstadt, K. Alan. "India's 2004 National Elections." Congressional Research Service, July 12, 2004.

essential to enhance India's energy security.¹⁵⁰ Singh was also clear that the deal would fundamentally transform India's status by recognizing and legitimizing its nuclear weapons and accommodating it in the international nuclear order. Consider this excerpt from his statement to Parliament on February 27, 2006.

The essence of what was agreed in Washington last July was a shared understanding of our growing energy needs. But more importantly, in the Joint Statement, the United States implicitly acknowledged the existence of our nuclear weapons programme. There was also public recognition that as a responsible State with advanced nuclear technologies, India should acquire the same benefits and advantages as other States which have advanced nuclear technology, such as the United States. The Joint Statement offered the possibility of decades-old restrictions being set aside to create space for India's emergence as a full member of a new nuclear world order.¹⁵¹

¹⁵⁰ Infact, the Prime Minister fondly reminisced during a January 3 2014 press conference that his success in consummating the nuclear deal with the US was the best moment of his career. The statement is surprising given that Singh chose a foreign policy initiative as the defining moment of his tenure as Prime Minister rather than pointing to domestic achievements (e.g. the passage of the landmark Right to Information (RTI) Act)

"When asked what were the best and lowest moments in his career as Prime Minister, he said, "Well, I will need time to reflect on this. Certainly I think the best moment was when we were able to strike a nuclear deal with the US."

"Pm Manmohan to Bow out after Polls, Says Rahul Makes Good Pm, Modi a Disaster". *Deccan Chronicle*, Jan 3 2014.

¹⁵¹ "Text of Suo-Motu Statement Made by Prime Minister Manmohan Singh on Civil Nuclear Energy Cooperation with the United States in Parliament ". (February 27 2006). Accessed on September 10 2011. <http://www.hinduonnet.com/thehindu/nic/suomotuu.htm>.

The Prime Minister was also confident that the separation of India's extensive nuclear infrastructure was possible and could be carried out in a manner that would not prejudice the nuclear weapons program.

The separation of civilian nuclear facilities and military facilities, I have been told by our nuclear establishment, can be done. I have not studied the details, but competent observers have told me that the Father of India's Nuclear Programme, Dr. Raja Ramanna, himself had proposed, long ago, that such a division should be made.¹⁵²

¹⁵²"PM's Reply to the Rajya Sabha Debate on His Us Visit". (August 4 2005). Accessed on August 4 2011. <http://pmindia.nic.in/speech/content.asp?id=161>

Second coalition-Left Front

The Left front was an alliance of four communist parties (the Communist Party of India (Marxist), the Communist Party of India, the Revolutionary Socialist Party and the Forward Bloc)¹⁵³ with 62 seats in the Indian Parliament.¹⁵⁴ The Left provided crucial parliamentary support to Prime Minister Singh's government from the outside. Prakash Karat, appointed as the General Secretary of the Communist Party of India (Marxist), the largest faction in the Left in April 2005¹⁵⁵ had immediately reiterated his support for China's rise as a way of eroding the US dominated world order.

The tasks set out in the Party Congress have to be accomplished in an international situation wherein US imperialism is continuing its offensive. The re-election of Bush as President in November 2004 confirms that there will be no let-up in the aggressive posture of the US....China, the biggest socialist country has been steadily developing its economy and making all-round progress. For more than a decade China has registered above 9 per cent growth of GDP. The growing strength of China will have a determining effect on international relations in the coming days and strengthen the trends towards multipolarity.¹⁵⁶

¹⁵³"On Iaea Resolution on the Iran Nuclear Issue." (5 February 2006). Accessed on September 9 2011.

<http://cpim.org/content/iaea-resolution-iran-nuclear-issue>

¹⁵⁴ Kronstadt, K. Alan. "India's 2004 National Elections." Congressional Research Service, July 12, 2004.

"Nearly Half of Indians Back U.S Nuclear Deal-Survey." (August 24 2007). Accessed on August 10 2011.

<http://in.reuters.com/article/companyNews/idINDEL23878320070824>

¹⁵⁵ "Prakash Karat Is Cpi-M General Secretary." (April 11, 2005). Accessed on February 26 2014.

<http://ia.rediff.com/news/2005/apr/11cpm.htm>

¹⁵⁶Karat, Prakash. "18th Congress of the Cpi(M):Favourable Situation for Party Advance

" *The Marxist* XXI, no. 2 & 3 (April-September 2005). Accessed on February 26 2014.

http://www.cpim.org/marxist/200502_18%20Congress-prakash.pdf . p 1-3.

Given the aforementioned context, the Left argued that the nuclear deal should be seen as an element in a broader set of agreements between the US and India including a defense framework agreement of unprecedented scope signed just a few days before the joint statement. The agreements and the nuclear deal were intended to draw India into the US constructed system of alliances to balance China and prevent a Sinocentric Asian order.

The Communist Party of India (Marxist) still continues to be opposed to the India-US nuclear deal despite Prime Minister Manmohan Singh's suo motu statement in Parliament on July 29 (2005) wherein he had stated that the agreement would in no way harm the national security. Party general secretary Prakash Karat told reporters today after a Politburo meeting that his party had reservations over some contents of the agreement and the CPM would focus on what was harmful in the agreement in terms of Indian strategic and security interests. Mr. Karat said the trend of becoming a strategic US ally, started by the previous NDA (National Democratic Alliance) government, continued and announced that the party would raise the objections on the recent agreements with Washington in Parliament tomorrow.¹⁵⁷

¹⁵⁷Sharma, Rajeev. "Cpm Still Opposed to Indo-Us Deal " *The Tribune*, July 31 2005. Accessed on February 26 2014.

<http://www.tribuneindia.com/2005/20050801/nation.htm#5>

The Left was also concerned about the Prime Minister questioning the viability of the \$7.5 billion, 1,700-mile Iran-Pakistan-India (IPI) natural gas pipeline during his US visit and demanded that the government not shelve the pipeline under American pressure.¹⁵⁸ Further, the Left also opposed the nuclear deal fearing that it would put an end to India's longtime policy of calling for global nuclear disarmament by legitimizing its nuclear weapons and accommodating it into the current international nuclear order.¹⁵⁹

However, the Left's position on nuclear weapons was rather nuanced. Although the communists opposed India's nuclear tests and the intention among sections of the nuclear establishment, strategic thinkers and the political Right to conduct more, they were also against India signing away the 'right to test' by initialing any bilateral or multilateral initiative such as the nuclear deal with a test-ban clause or the Comprehensive Test Ban Treaty (CTBT). Veteran journalist Praful Bidwai explained the Left's position.

The two major left parties in India--the Communist Party of India (CPI) and the Communist Party of India Marxist (CPM)--are both opposed to the tests. 'That is good, and also very important,' says Praful. 'But there are also problems with what they say. Their positions are tainted in a number of ways. Firstly, they were supporters of the nuclear weapons of the USSR and Chinese regimes in the past.....They bought into the idea

¹⁵⁸Atal, Maha. "Ipi Vs. Tapi." *Forbes Magazine*, July 21, 2008.

Raghu, "Indo-US Nuclear Deal." *People's Democracy* XXIX no. 31 (July 31 2005). Accessed on February 26 2014.

http://pd.cpim.org/2005/0731/07312005_snd.htm

¹⁵⁹Bidwai, Praful. "Political Fallout of Indo-US Nuclear Deal Turns Severe" (August 21 2007). Accessed on February 24 2014.

<http://www.countercurrents.org/bidwai210807.htm>

that the Cold War arms race provided some kind of balance across the world in the interests of workers. Secondly, both parties supported the official state policy of Indian nuclear ambiguity between 1974 and 1998. This again lent credence to notions of nuclear nationalism. Because of this view, when it came to the debate about the Comprehensive Test Ban Treaty (CTBT) they refused to criticise the official Indian government position. When the signing of the new CTBT was imminent in 1996 the Indian government started opposing it.....'We pleaded with the two CPs (Communist parties) to at least oppose the blocking of the treaty (by the Indian government). That would at least distinguish them from those who opposed the treaty because they want the bomb.....To give the CPs credit, on Hiroshima Day in 1998 they organised a huge rally of 350,000 people in Calcutta.....We need those kinds of mobilisations to be sustained. But that means they must take a clearer position and stand against nuclear nationalism.'¹⁶⁰

¹⁶⁰ Bidwai, Praful. "Nuclear Weapons-Tested to the Limit." *Socialist Review*, September 2000
<http://pubs.socialistreviewindex.org.uk/sr244/ashman.htm>

Finally, the Polit Bureau of the CPI (M) also worried about the effects of the deal on indigenous research and asked the government to negotiate on the basis of strict reciprocity.¹⁶¹ The first major rift between the Left parties and the UPA government came out into the open after India voted for a US backed European Union motion to refer Iran to the Security Council in September of 2005 over its nuclear program.¹⁶² The Left was angered by what it viewed as the government's departure from India's non-aligned foreign policy in the face of American pressure to choose between the congressional approval for the separation plan and solidarity with Iran.¹⁶³

Second coalition-Bharatiya Janata Party (BJP)

The Hindu-nationalist BJP was the largest opposition party in Parliament with 138 seats.¹⁶⁴ The party and its regional allies comprised the center right National Democratic Alliance (NDA) that had 185 seats.¹⁶⁵ Key members of the party like former Prime Minister Atal Bihari Vajpayee and his National Security Advisor and close ally Brajesh Mishra ordered India's second round of nuclear tests at Pokharan in 1998.

As the extensive post-1998 nuclear reconciliation talks between India's then Minister of External Affairs Jaswant Singh and Deputy Secretary of State Strobe Talbott demonstrated, the BJP was more than willing to arrive at a nuclear understanding with

¹⁶¹"Indo-US Joint Statement." (July 21 2005). Accessed on September 8 2011.

<http://cpim.org/content/indo-us-joint-statement>

¹⁶² PTI. "India Votes to Refer Iran to Unsc." (September 25, 2005). Accessed on November 23 2011.

<http://www.rediff.com/news/2005/sep/25iran.htm>

¹⁶³"India's Surrender on Iran Nuclear Issue." (September 25 2005). Accessed on September 28 2011.

<http://cpim.org/content/indias-surrender-iran-nuclear-issue>

¹⁶⁴ "India's Election and the Bjp: Saffron Hopes-the Bjp Enjoys an Optimistic Moment." *The Economist*, May 7th 2009

¹⁶⁵Kronstadt, K. Alan. "India's 2004 National Elections." Congressional Research Service. July 12, 2004.

the US that would legitimize India's hitherto unrecognized nuclear weapons.¹⁶⁶ Infact, Mishra was a firm supporter of a US-India-Israel axis with the US-India partnership as its fulcrum as evidenced in a May 8 2003 speech before the American Jewish Committee (AJC).

India, the United States and Israel have some fundamental similarities. We are all democracies, sharing a common vision of pluralism, tolerance and equal opportunity. Stronger India-US relations and India-Israel relations have a natural logic.^{167 168}

However, the BJP's assiduous attempts to secure a strategic understanding with the US met with limited success. Despite President Bush's inclination to rapidly improve the US-India relationship in the aftermath of 9/11, only an incremental initiative was eventually pursued by a State Department headed by the more non-proliferation minded

¹⁶⁶ "Jaswant Singh - Strobe Talbott Meeting". (August 24, 1998). Accessed on November 28 2011. https://www.indianembassy.org/archives_details.php?nid=194

¹⁶⁷"Shri Brajesh Mishra, National Security Advisor of India." (May 8 2003). Accessed on February 26 2014. <http://www.ajc.org/site/apps/nlnet/content3.aspx?c=jjITI2PHKoG&b=851361&ct=1118743>

¹⁶⁸ Mishra also reiterated his support for robust US-India relations in a personal interview with me while speculating on the reasons as to why the nuclear deal polarized India's political, scientific, strategic and media communities.

"Chaitanya Ravi: As you know, the nuclear deal polarized the political, scientific and strategic communities in this country. Three year long acrimonious debate, near toppling of the government. Why was this deal so controversial in this country?

Brajesh Mishra: Well eh, in a way I think the UPA government committed a mistake in not immediately consulting the BJP. They were busy talking to their own partners, which is the leftists who they were trying to convince and they forgot all about BJP. So as you know, as a political party, you can't ignore the main opposition and you can't ignore the leader of opposition (L. K. Advani). So..., I think that was a big political mistake. It may not have totally smoothened, but the acrimony which came, I think could have been avoided.....because the BJP was not opposed to good relations with the U.S. After all, Mr. Vajpayee's government as I mentioned earlier also wanted civil nuclear co-operation."

Interview with Indian National Security Adviser Brajesh Mishra. April 21 2010.

Colin Powell who suggested a conservative “glide path”- the Next Steps in Strategic Partnership (NSSP) for resolving US-India nuclear tensions. The initiative was designed to slowly chip away at the US technology denial regime against the Indian nuclear (and space) bureaucracies through incremental cooperation in civilian nuclear activities, civilian space programs and high technology trade without fundamentally altering US non-proliferation laws constraining India’s nuclear program or the post-9/11 American strategic posture towards India of measured but not full-scale cooperation.

Yet, the BJP now opposed the nuclear deal on two counts. First, as the self-appointed custodian of the Indian nuclear weapons program since the 1998 tests, the BJP was opposed to any restrictions that would constrain India’s ability to produce the maximum number of nuclear weapons theoretically possible under the pre-nuclear deal intermeshed program. Vajpayee criticized the July 18 2005 joint statement’s requirement that India separate its nuclear infrastructure and worried that separating the civilian facilities from the military ones would be technically difficult, expensive and constrain India’s ability to determine the size of its nuclear deterrent as well as the pace at which it could be attained. Simply put, the BJP was very much in favor of a strategic partnership with the US but not at the cost of restrictions on the Indian nuclear arsenal.

Second, the BJP viewed Prime Minister Singh as a political appointee and academic economist obsessed with matters economic but devoid of the strategic acumen to clinch a groundbreaking initiative like the nuclear deal. It was disappointed and envious of Singh’s success in consummating the nuclear and strategic bargains that had managed to elude the BJP despite consistent efforts since 1998.

First coalition-Chairman of the Atomic Energy Commission (AEC)-Dr. Anil Kakodkar

Anil Kakodkar was the chairman of the AEC and secretary of the Department of Atomic Energy (DAE), an organization with 65,000 employees and a \$1.2 billion budget.¹⁶⁹ He was trained as a mechanical engineer and worked at the Bhabha Atomic Research Center (BARC), India's premier weapons lab in Mumbai from 1963.¹⁷⁰ Kakodkar agreed with the Prime Minister that separation was possible and that India should reserve the right to determine a reactor as civilian and conclude a voluntary offer safeguards agreement with the IAEA like other Nuclear Weapons States (NWS).¹⁷¹

Interviewer: What are the implications of the separation of civilian from military nuclear facilities?

Kakodkar: First of all, this is going to be a reciprocal arrangement.....it is a totally non-discriminatory arrangement. What we are saying now is that the determination of what is going to be identified as a civilian nuclear facility is going to be an Indian decision. It is going to be a decision taken at appropriate points of time. That determination will certainly take into account all our national needs in terms of security, development, and R&D. So there should be no impact on that part. Whatever we determine as civilian, we will put under the IAEA [International Atomic Energy Agency] safeguards. That will be done in a

¹⁶⁹Bagla, Pallava. "Breaking up (a Nuclear Program) Is Hard to Do." *Science* 311, no. 5762 (February 10 2006): 765-66

¹⁷⁰Ibid

¹⁷¹Subramanian, T.S. ""Identifying a Civilian Nuclear Facility Is India's Decision" " *The Hindu*, Aug 12, 2005

voluntary manner. Nuclear weapon states do place their civilian facilities under the voluntary safeguards arrangement of the IAEA. We will do the same.¹⁷²

Kakodkar also argued that separation of India's nuclear infrastructure would enable it to import large American Light Water Reactors (LWRs) and reactors from other countries as an 'additionality' to supplement the indigenous nuclear program in an August 2005 interview with *The Hindu's* T.S. Subramanian.

T.S. Subramanian: There is an assessment that putting the civilian nuclear facilities under safeguards will cap the nuclear weapons programme because the spent uranium from the nuclear power reactors can no longer be enriched in order to be used in the making of nuclear bombs.

Anil Kakodkar: I am telling you it is not there. The important point to recognise is that our energy requirements are very large. We have a three-stage nuclear power programme. In that, we have said that based on the natural uranium available in the country, we can support 10,000 MWe of Pressurised Heavy Water Reactors [PHWRs]. Beyond that, we will continue to grow on the basis of Fast Breeder Reactors. Beyond that, we will pick up thorium utilisation. This is our three-stage programme and it will continue as per plans. In the light of the fact that our national energy requirements are very large, we have been looking at external

¹⁷² Ibid

inputs as additionalities. If we can do that, the rate at which we can add nuclear power will be high. On that there was a constraint because of the nuclear technology control regime. If that constraint gets removed, and we are able to access both nuclear fuel and nuclear reactors from outside, I think we will gain a lot on the energy front. For example, if we get natural uranium in plenty from outside, then we can construct more PHWRs (Pressurized Heavy Water Reactors) within the country, for which we have the technology. You can visualise a PHWR capacity much larger than 10,000 MWe. There will be no problem in putting under safeguards this additional capacity, which we can sustain with imported uranium. You can, in fact, think tomorrow of large parks of imported [light water] reactors and of PHWRs built in the country but fuelled by imported uranium.¹⁷³

Second coalition-Retired nuclear scientists

However, Kakodkar's support for the separation of India's nuclear infrastructure and large scale reactor imports was opposed by prominent retired nuclear scientists including Dr. A. Gopalakrishnan, Dr. A. N. Prasad and Dr. P. K. Iyengar.

Prasad, former director of BARC and Iyengar, former Chairman of the AEC warned that separation was not feasible and economical due to the inter-linked nature of the program and the use of certain facilities for both civilian and military purposes.¹⁷⁴

¹⁷³ "Nuclear Issues-'It Is a Reciprocal Arrangement'-Interview with Anil Kakodkar, Chairman, Atomic Energy Commission." *Frontline*, Aug 27 - Sep 09, 2005.

<http://www.frontline.in/static/html/fl2218/stories/20050909002709400.htm>

¹⁷⁴ Varadarajan, Siddharth. "Nuclear Cooperation with U.S.: Experts Urge Caution " *The Hindu*, 18 July 2005.

Unlike the US, Indian nuclear military activities were aimed at deterrence that varied according to the threat perception and not stockpiling of nuclear weapons.¹⁷⁵ Separation would cap India's weapons program.

Gopalakrishnan, the former Chairman of the Atomic Energy Regulatory Board (AERB) questioned Kakodkar's rationale behind the decision to import a large number of reactors, especially from the US.

The glaring indictment against the advisability of importing nuclear reactors from the US is the predicament in which we find ourselves today in the case of Tarapur reactors (supplied by the US under a previous nuclear cooperation agreement signed in 1963 that was unilaterally terminated by the US in the aftermath of India's 1974 "peaceful nuclear explosion" leaving the reactors stranded and dependent on ad hoc fuel supplies from France, Russia and China). The US having reneged their contractual obligation to supply life-time fuel to these reactors, India finds itself going from country to country to get enriched uranium to keep these reactors running. Contrary to the past DAE (Department of Energy) expectations, there is also no chance of attracting any foreign investment in conjunction with reactor imports.¹⁷⁶

Prasad also opposed any deviation away from the Indian nuclear program's foundational principle of self-reliance in favor of large scale reactor imports.

¹⁷⁵Varadarajan, Siddharth. "Nuclear Bargain May Prove Costly in Long Run " *The Hindu* 20 July 2005.

¹⁷⁶ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 9

In recent weeks, US has been contemplating a change of attitude towards India as a part of a strategic shift in South Asia policy. Statements coming out from the Bush Administration regarding backing India for a permanent seat in the UN Security Council and helping India to become a major world power in the 21st century seems to have generated a flurry of activity in the Indian bureaucratic circles.....Whatever may be the outcome, self-reliance has been the hallmark of India....India being a mature and responsible global player in the nuclear field with the know-how and technological capability for building nuclear reactors on its own and also being a de-facto nuclear weapons power, is not really expecting any great high technology transfer from developed countries in the present context, but expects to obtain uranium and participation in the nuclear energy programme on commercial basis to meet the fast-growing energy demands of the country in the short-term and perhaps in the medium-term, though indigenous efforts will continue with full vigour.¹⁷⁷

Opposition from the retired scientists intensified after Bush administration officials testified before Congress that the Indian separation plan must be credible and defensible from a non-proliferation standpoint and that efforts to build support for India would depend on the number of facilities that it would place under safeguards and the speed at which it declared them.¹⁷⁸ The retired scientists viewed the testimonies as a

¹⁷⁷ Ibid. p 23-26

¹⁷⁸ House International Relations Committee. The U.S. And India: An Emerging Entente? R. Nicholas Burns, Under Secretary for Political Affairs, Robert G. Joseph, under Secretary for Arms Control and International Security. September 8, 2005. p-4.

departure from the principle of reciprocity enshrined in the joint statement that promised to treat India on par with the P5. They began complaining that the US was now telling India the number and type of facilities that it should place under safeguards. The opposition coincided with the Left's toughening stance over India's vote to censure Iran at the IAEA.

First coalition-Strategic thinker-K Subrahmanyam and a majority of Indian strategists

A majority in the New Delhi-based strategic community supported the idea of separation. K.Subramanyam, India's most influential defense analyst and former director of the Institute for Defense Studies and Analyses (IDSA), a premier strategic think tank argued in favor of separation.

Many ask why India, a recognised nuclear-weapon state, should declare which facilities are military and which civilian, and implement IAEA safeguards on the latter? But the fact that we're asked to do that is a recognition of India as a military nuclear power. It's surprising that there are objections to separating civil and military nuclear facilities. The original suggestion for this came from Raja Ramanna, the designer of the first Pokhran bomb. Ramanna's logic can't be challenged. If civilian and military facilities are not separated, it would mean all reactors in India support our military programme. If that were true, other nations would be justified in denying India even a screw for the atomic energy department as that would constitute nuclear proliferation. Those who say that civil and military components can't be separated are, therefore, supporting the

Ayatollahs of non-proliferation¹⁷⁹ who block any help to India's civilian nuclear programme. As a matter of fact, in India the two programmes have always been separate: even the scientists who deal with weapons and reactors are different.”¹⁸⁰

Second coalition-Nuclear hawks-Brahma Chellaney

Brahma Chellaney, a professor of strategic studies at the New Delhi-based Center for Policy Research and an influential strategic analyst was not convinced and attacked the principle of separation as burdensome and a potential financial boondoggle.

The deal, in fact, imposes obligations largely on India. Not only has India committed to carry out a burdensome civil-military segregation of its nuclear program and put all its civil facilities under IAEA inspections; it has also given its word to import commercial nuclear power reactors from the U.S. and thereby help revive the decrepit nuclear power

¹⁷⁹ The practice of referring to the non-proliferation lobby in Washington as “Ayatollahs” is obviously a clever rhetorical strategy by Subrahmanyam to dismiss his primary opponents as nothing but a bunch of ideological zealots akin to the supposedly dogmatic Iranian clergy. The term has been adopted wholesale by the Indian media and can be found in a wide variety of press commentary on the nuclear deal. Consider for example, this classic deployment of the term by journalist Seema Sirohi in a December 20 2005 article in the *India Today* magazine.

“The July nuclear agreement between India and the United States has hit some rocks. The rocks are courtesy the non-proliferation lobby in Washington, a small but vocal group of hard-liners wedded to its beloved orthodoxy to the exclusion of the big picture. Their picture is so small, it seems anachronistic in the rapidly globalising world. They are often called the “ayatollahs of non-proliferation,” a title they take seriously because they don’t brook the “third way” or the middle path or anything less than their maximalist demands. When they issue a *fatwa*, agreements are in danger. Their atavism is retarding and counterproductive.”

Sirohi, Seema. "The Ayatollahs of Non-Proliferation" *Outlook* December 20 2005. Accessed on February 18 2014.

<http://www.outlookindia.com/article.aspx?229608>

¹⁸⁰ Subrahmanyam, K. "Will Partisan Politics Nuke a Good Deal?" *Times of India* July 21, 2005.

industry there. The only U.S. obligation is to permit its industry to rake up billions of dollars worth of reactor and fuel exports to India.¹⁸¹

Evidence from a later period confirms that Chellaney's allegations regarding a strong economic incentive motivating the US to relax nuclear restrictions on India was not without basis. Even as the fully evolved nuclear deal was being considered by the Senate Foreign Relations Committee three years later on September 18 2008, then Under Secretary of State William J. Burns testified that

the Indian Government has provided the United States with a strong Letter of Intent, stating its intention to purchase reactors with at least 10,000 megawatts (MW) worth of new power generation capacity from U.S. firms. India has committed to devote at least two sites to U.S. firms. India also has committed to adhere to the Convention on Supplementary Compensation for Nuclear Damage. Adherence to this international liability regime by the Indian Government is an important step in ensuring U.S. nuclear firms are competing on a level playing field with other international competitors.¹⁸²

¹⁸¹ Chellaney, Brahma. "India-U.S. Nuclear Talks-Deal Harms Indian Interests." *The Japan Times* January 5 2006

¹⁸²" Agreement for Peaceful Nuclear Cooperation with India- Hearing before the Committee on Foreign Relations, United States Senate, One Hundred Tenth Congress, Second Session ". (September 18, 2008). Accessed on February 4 2014. <http://www.gpo.gov/fdsys/pkg/CHRG-110shrg46951/html/CHRG-110shrg46951.htm>

Third coalition/Civil Society- Independent Scientists and the National Alliance of People's Movements (NAPM)

Sandeep Pandey, National Convenor for the National Alliance of People's

Movements (NAPM) released a statement in which he implied that separation of civil and military nuclear facilities would enable India to buy nuclear fuel from the international market and conserve its scarce domestic uranium stocks for weapons production.

It is quite likely that the growth of nuclear power programme in India will result in an expansion of nuclear weapons capabilities in India. Under the deal, India can dedicate all its scarce supply of domestic uranium to nuclear weapons and not have to use most of it for fuel in its nuclear power reactors to make electricity. India would no longer be stopped from buying this fuel from the international uranium market.¹⁸³

Dr. M. V. Ramana and Dr. Zia Mian, research scientists in the Program on Science and Global Security at Princeton University advanced a broader critique and challenged the energy and security premises of the deal.

The nuclear agreement between the United States and India has many problems and raises two fundamental questions. The first is whether India needs nuclear energy for its development and the well-being of its people. A good case can be made that it does not. The second question is whether India needs nuclear weapons if it truly wants to live in peace

¹⁸³ Pandey, Sandeep. "Statement: Condemnation of the India-Us Nuclear Deal " (26 Oct 2005). Accessed on November 1 2011. http://www.mail-archive.com/saan_@yahoogroups.com/msg00143.html

with its neighbors and with the world. Many believe, with good reason, that it does not. The outcome of the proposed nuclear agreement, therefore, is a future in which a nuclear-powered and nuclear-armed India swaggers along in Washington's shadow. Such a choice could not be more stark."¹⁸⁴

The statements reviewed so far demonstrate a range of arguments in favor of and against the idea of separation between the three coalitions. However, there were differences of opinion within the coalitions as well. I suggest that differences within the first coalition merit greater attention as many of its relevant social groups were part of the government, privy to classified information and in a position to make the final decision. I focus on the differences between two powerful first coalition relevant social groups (DAE and MEA) over the civilian or military status of two fast breeder reactors (the Prototype Fast Breeder Reactor-PFBR and to a lesser extent the Fast Breeder Test Reactor-FBTR) in India's separation plan. I concentrate in particular on the non-proliferation and national security implications resulting from the safeguarded (civilian) or unsafeguarded (military) status of the larger PFBR.

Role of the breeders in the three-stage program

A brief overview of the first stage of the three-stage Indian nuclear program and the crucial role of the second-stage fast breeder reactors in enabling the transition from the first to the third stage provides the technical background for the DAE-MEA debate.

¹⁸⁴ Ramana, Zia Mian and M.V. "Feeding the Nuclear Fire." (September 20, 2005). *Foreign Policy in Focus*. Accessed on September 4 2011. http://www.fpiif.org/reports/feeding_the_nuclear_fire.

India's 22 Pressurized Heavy Water Reactors (PHWRs) use natural uranium as fuel. Natural uranium is a radioactive element that has an atomic number 92.¹⁸⁵ It has two principal isotopes: uranium-235 or U-235 (0.7 percent), with atomic weight of 235 and uranium-238 or U-238 (99.3 percent) with atomic weight of 238.¹⁸⁶ U-235 is fissile and can undergo fission after absorbing low-energy thermal (slow) neutrons to yield heat that can be used in electricity production.¹⁸⁷ U-238 is fertile (it becomes transmuted into the fissile plutonium-239 after absorbing one neutron and undergoing radioactive decay) and can undergo fission by absorbing high energy fast neutrons.¹⁸⁸ India's PHWRs burn natural uranium to produce electricity and yield highly radioactive spent fuel as byproduct.

The spent fuel contains plutonium: a radioactive, metallic element with atomic number 94 that results from the absorption of neutrons by uranium. All plutonium (Pu) is produced in nuclear reactors by the capture of extra neutrons by U-238 that results in U-239 which then undergoes a series of decays to yield Pu-239. Some of the Pu-239 gets consumed by fission before it can be removed from the reactor and a part of it gets transmuted to form heavier isotopes of plutonium (e.g. Pu-240) by capturing more

¹⁸⁵"Uranium ". U.S Nuclear Regulatory Commission. Accessed on February 1 2014.
<http://www.nrc.gov/reading-rm/basic-ref/glossary/uranium.html>.

¹⁸⁶ Uranium ". U.S Nuclear Regulatory Commission. Accessed on February 3 2014.
<http://www.nrc.gov/reading-rm/basic-ref/glossary/uranium.html>.

¹⁸⁷ "Fissile Material." U.S Nuclear Regulatory Commission. Accessed on February 3 2014.
<http://www.nrc.gov/reading-rm/basic-ref/glossary/fissile-material.html>

"Uranium Enrichment." U.S Nuclear Regulatory Commission. Accessed on February 3 2014.
<http://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html>

¹⁸⁸Uranium ". U.S Nuclear Regulatory Commission. Accessed on February 1 2014.
<http://www.nrc.gov/reading-rm/basic-ref/glossary/uranium.html>.

neutrons.¹⁸⁹ The plutonium mixture is separated from the rest of the spent fuel using a technique called reprocessing: a term that includes various processes that help separate spent fuel into material that can be used in new fuel and material that can be discarded as nuclear waste.¹⁹⁰

The mixture is referred to as "reactor-grade" plutonium.¹⁹¹ It typically contains 33.5% of Pu-240 and 66.4% Pu-239.¹⁹² The reactor grade plutonium is to be used in the start-up cores of fast breeder reactors (FBRs)¹⁹³ that use high energy fast neutrons to perpetuate the fission process and breed more fuel than is consumed.¹⁹⁴ Depleted or natural uranium would be used in the blankets of the breeder reactors in order to produce plutonium to fuel more breeders.¹⁹⁵ Eventually, thorium would replace the natural or depleted uranium in the blankets resulting in the production of uranium-233, the fissionable start-up fuel for the third stage Advanced Thorium Reactors (thermal and fast).¹⁹⁶

¹⁸⁹"Plutonium Manufacture and Fabrication." Accessed on January 20 2014.

<http://nuclearweaponarchive.org/Library/Plutonium/index.html>

¹⁹⁰"Reprocessing." U.S Nuclear Regulatory Commission, Accessed on January 1 2014.

<http://www.nrc.gov/materials/reprocessing.html>

¹⁹¹Ibid

"Plutonium Manufacture and Fabrication." Accessed on February 3 2014.

<http://nuclearweaponarchive.org/Library/Plutonium/index.html>

¹⁹² John Carlson, John Bardsley, Victor Bragin, John Hill. "Plutonium Isotopics - Non-Proliferation and Safeguards Issues". Accessed on February 5 2014.

http://www.fas.org/nuke/intro/nuke/O_9705.htm

¹⁹³ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55.

¹⁹⁴Subramanian, T.S. "A Mission at Kalpakkam." *Frontline*, Jan. 05, 2001.

¹⁹⁵ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55

¹⁹⁶ Glaser, Alexander. "Weapons Grade Plutonium Production Potential in the Indian Prototype Fast Breeder Reactor." (December 13 2006).Accessed on February 8 2014.

http://www.princeton.edu/~aglasertalk2006_princeton.pdf. p 2

To summarize, breeder reactors constituted the crucial second stage of India's three-stage nuclear program and were perceived as the enabling technology that could help the country transition from its limited uranium reserves to its vast thorium resources.¹⁹⁷

Fast Breeder Test Reactor (FBTR)

The DAE started the FBR program in the 1960's by setting up a Fast Reactor Section at the Bhabha Atomic Research Center (BARC) under S. R. Paranjpe and initiated preliminary design work on a 10 MWe experimental fast reactor that was later abandoned.¹⁹⁸ Dr. Vikram Sarabhai who became Chairman of the AEC in 1966 supported the development of fast reactor technology through international collaboration by drawing on the French experience with its experimental breeder reactor (Rapsodie-Fortissimo).

A bilateral agreement was signed between the DAE and the French Atomic Energy Commission (CEA) in 1969 for the "transfer of the design of the Rapsodie reactor, training of personnel in Rapsodie and transfer of manufacturing technology of

¹⁹⁷ G. Srinivasan, K.V. Suresh Kumar, B. Rajendran, P.V. Ramalingam. . "The Fast Breeder Test Reactor— Design and Operating Experiences. ." *Nuclear Engineering and Design* 236, no. 7-8 (April 2006): 796.

Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security* 17, no. 54–67 (2009): p 54

¹⁹⁸ "History and Evolution of Fast Breeder Reactor Design in India - a Saga of Challenges and Successes." (July 2006). Accessed on September 1 2011. <http://www.igcar.ernet.in/lis/nl69/igc69.pdf>. p 1
Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security* 17, no. 54–67 (2009): p 55.

critical components.”¹⁹⁹ A design team of 31 Indian engineers and scientists worked at the Cadarache Nuclear Center in France and came up with a preliminary design for an experimental fast breeder test reactor (FBTR) based on the design of the Rapsodie. France also transferred the steam generator design of its Phenix prototype fast breeder reactor.²⁰⁰

A team of 50 Indian engineers was shifted from the BARC complex in Mumbai to a newly constituted Reactor Research Center (RRC) in Kalpakkam in June of 1971 to work on the breeder project.²⁰¹ The RRC’s mission was to “develop the technology of sodium cooled fast reactors” and to “serve as a test bed for irradiation of fuels and materials and provide experience in large scale sodium handling and reactor operation.”²⁰²

Construction began in 1972 and civil works were completed in 1977.²⁰³ The FBTR was commissioned on October 18 1985 and then was plagued by accidents for

¹⁹⁹ G. Srinivasan, K.V. Suresh Kumar, B. Rajendran, P.V. Ramalingam. . "The Fast Breeder Test Reactor— Design and Operating Experiences. ." *Nuclear Engineering and Design* 236, no. 7-8 (April 2006): 796.

²⁰⁰Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security* 17, no. 54–67 (2009): p 55.

²⁰¹"History and Evolution of Fast Breeder Reactor Design in India - a Saga of Challenges and Successes." (July 2006). Accessed on September 1 2011. <http://www.igcar.ernet.in/lis/nl69/igc69.pdf>. p 1

²⁰² G. Srinivasan, K.V. Suresh Kumar, B. Rajendran, P.V. Ramalingam. . "The Fast Breeder Test Reactor— Design and Operating Experiences. ." *Nuclear Engineering and Design* 236, no. 7-8 (April 2006): p 796

²⁰³ History and Evolution of Fast Breeder Reactor Design in India - a Saga of Challenges and Successes.”(July 2006). Accessed on September 1 2011. <http://www.igcar.ernet.in/lis/nl69/igc69.pdf>. p 2

G. Srinivasan, K.V. Suresh Kumar, B. Rajendran, P.V. Ramalingam. . "The Fast Breeder Test Reactor— Design and Operating Experiences. ." *Nuclear Engineering and Design* 236, no. 7-8 (April 2006): p 803

fifteen years²⁰⁴ that reduced its availability factor to a mere 20 percent or less.²⁰⁵ The reactor was an experimental loop type sodium cooled 40MWt/13.2MWe reactor²⁰⁶ that used mixed carbide fuel of plutonium and uranium.²⁰⁷ The RRC was renamed as the Indira Gandhi Center for Atomic Research (IGCAR) in 1985²⁰⁸ with a mandate to “develop science and technology to design, build and operate FBRs to provide electricity.”²⁰⁹ The fuel discharged by the FBTR was reprocessed in a small scale reprocessing facility (CORAL) that was set up at IGCAR.²¹⁰

Prototype Fast Breeder Reactor (PFBR)

The DAE embarked on the design and development of a larger 500 MWe Prototype Fast Breeder Reactor (PFBR) based on the FBTR design and construction

²⁰⁴ Ibid.

Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security* 17, no. 54–67 (2009): p 55.

²⁰⁵ Ibid. p 57

²⁰⁶ Baldev Raj, S.C. Chetal and P. Chellapandi. "Fast Reactor Focus: India-Great Expectations " *Nuclear Engineering International*, January 08 2010

²⁰⁷Baldev Raj, S.C. Chetal and P. Chellapandi. "Fast Reactor Focus: India-Great Expectations " *Nuclear Engineering International*, January 08 2010
Subramanian, T.S. "A Mission at Kalpakkam." *Frontline*, Jan. 05, 2001.

²⁰⁸ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security* 17, no. 54–67 (2009): p 55

²⁰⁹Subramanian, T.S. "A Mission at Kalpakkam." *Frontline*, Jan. 05, 2001.

²¹⁰"Nuclear Power in India." (September 2011). Accessed on September 28 2011. <http://www.world-nuclear.org/info/inf53.html>

experience.²¹¹ Its main objective in building the PFBR was to demonstrate the “techno-economic viability of sodium-cooled fast reactors for commercial deployment” and “comprehensive closed fuel cycle technologies such as fuel fabrication, reprocessing, waste management and waste immobilisation.”²¹² The reactor was designed and developed by IGCAR and a state-owned DAE subsidiary (Bharatiya Nabhikiya Vidyut Nigam Limited-BHAVINI), was set up in 2003 to complete its construction. The December 26 2004 tsunami flooded the reactor building’s foundations and delayed the project by 4 months.²¹³ The delay caused by the tsunami compounded the already lagging rate of construction resulting in the DAE not being able to meet its September 2010 deadline for commissioning the reactor²¹⁴ that was extended to 2012-2013.²¹⁵

The PFBR is fuelled with uranium-plutonium oxide. The spent fuel discharged from the PFBR may initially be reprocessed at the Demonstration Fuel Reprocessing Plant (DFRP). A larger commercial scale reprocessing plant is planned as part of the Fast Reactor Fuel Cycle Facility (FRFCF) that would be located alongside the PFBR and

²¹¹Baldev Raj, S.C. Chetal and P. Chellapandi. "Fast Reactor Focus: India-Great Expectations " *Nuclear Engineering International*, January 08 2010

²¹² Ibid

²¹³ Bagla, Pallava. "Rethinking Nuclear Power. India's Homegrown Thorium Reactor." *Science* 309, no. 5738 (August 19 2005): 1174-75

²¹⁴ Ibid

²¹⁵Baldev Raj, S.C. Chetal and P. Chellapandi. "Fast Reactor Focus: India-Great Expectations " *Nuclear Engineering International*, January 08 2010

"History and Evolution of Fast Breeder Reactor Design in India - a Saga of Challenges and Successes." Accessed on September 1 2011. (July 2006), <http://www.igcar.ernet.in/lis/nl69/igc69.pdf> p 2-3

would consist of a fuel fabrication plant, a reprocessing unit, assembly plants and a facility for managing waste.²¹⁶

Table 3 -Main characteristics of the PFBR

Thermal power (MWt)	1250
Electric output (MWe)	500
Core diameter (mm)	1900
Fuel	PuO ₂ -UO ₂
Reactor containment	Rectangular
Plant life (years)	40
No. of shutdown systems	2
No. of decay heat removal systems	2

Reference: S.C. Chetal , V. Balasubramaniyan, P. Chellapandi, P. Mohanakrishnan, P. Puthiyavinayagam, C.P. Pillai, S. Raghupathy, T.K. Shanmugham, C. Sivathanu Pillai. "The Design of the Prototype Fast Breeder Reactor." *Nuclear Engineering International* 236 (2006): 853.

²¹⁶ Baldev Raj, S.C. Chetal and P. Chellapandi. "Fast Reactor Focus: India-Great Expectations " *Nuclear Engineering International*, January 08 2010

Breeders and energy security

Breeders played an important role in the DAE's expansion plans. The organization's short term expansion target was to build 20,000 MWe by 2020 (10,540 MWe of indigenous PHWRs, 6 1000 MWe imported LWRs and 4500 MWe of FBRs).²¹⁷ The first few FBRs would burn mixed oxide fuel and subsequent ones would switch to metallic fuel to enable shorter doubling time (the time required by an FBR to produce enough plutonium to fuel another FBR).²¹⁸ DAE scientists also planned to begin construction of a larger 1000 MWe fast reactor operating on metallic fuel in 2020.²¹⁹ Long-term targets combined the optimistic estimates of power production via the PHWR-FBR route (where FBR's utilize the plutonium recovered from the spent fuel of indigenous PHWRs to produce upto 275 GW by 2052) and the LWR-FBR route (where

²¹⁷ See Ramachandran, R. "Nuclear Deadlock." *Frontline*, no. 04 (2006), <http://www.hinduonnet.com/fline/fl2304/stories/20060310007301000.htm>
Mistry, Dinshaw. "Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement." *Asian Survey* 46, no. 5 (September/October 2006). P 677-678
Gopalakrishnan, A. "Civilian and Strategic Nuclear Facilities of India." (January 5, 2006), http://www.idsa.in/idsastrategiccomments/CivilianandStrategicNuclearFacilitiesofIndia_AGopalakrishnan_050106
Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22, 2006. P 12

²¹⁸ Subramanian, T.S. "A Mission at Kalpakkam." *Frontline*, Jan. 05, 2001.

Baldev Raj, S.C. Chetal and P. Chellapandi. "Fast Reactor Focus: India-Great Expectations " *Nuclear Engineering International*, January 08 2010

²¹⁹"Nuclear Power in India." (September 2011). Accessed on September 28 2011. <http://www.world-nuclear.org/info/inf53.html>

"History and Evolution of Fast Breeder Reactor Design in India - a Saga of Challenges and Successes." (July 2006), Accessed on September 1 2011. <http://www.igcar.ernet.in/lis/nl69/igc69.pdf>. p 7

FBR's use the plutonium recovered from the spent fuel of 40 GWe of imported LWR's to produce 400 GWe by 2050) for a mammoth total of 500-600 GWe by 2050.²²⁰

More recently, the DAE's projections were questioned by Dr. M. V. Ramana and J. Y. Suchitra. They argued that the projections were based on a "simplistic methodology that does not carefully account for the availability of plutonium that is required to fuel breeder reactors" and ignored "constraints coming from reprocessing capacity in the country." They put forth an alternative set of projections using a methodology that accounted for plutonium constraints and concluded that "the resulting breeder reactor capacity will be only 17% and 40% of the DAE's projections, and will likely never constitute a major source of electricity in India for several decades at the very least."²²¹

Implications of the breeders for non-proliferation

The breeders (especially the larger PFBR) can use the reactor grade plutonium separated from PHWR spent fuel in their cores to produce (breed) more reactor grade plutonium for more breeders. However, they can also simultaneously convert the depleted or natural uranium used in the radial and axial blankets to produce substantial

²²⁰ Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security* 17, no. 54-67 (2009): 63.

"Nuclear Power in India." (September 2011). Accessed on September 28 2011. <http://www.world-nuclear.org/info/inf53.html>
Subramanian, T.S. "'Fast-Breeder Reactors More Important for India'." *The Hindu*, Nov 24, 2004
"History and Evolution of Fast Breeder Reactor Design in India - a Saga of Challenges and Successes." (July 2006), Accessed on September 1 2011. <http://www.igcar.ernet.in/lis/nl69/igc69.pdf> . p 7

²²¹ M.V. Ramana, J.Y. Suchitra "Slow and Stunted: Plutonium Accounting and the Growth of Fast Breeder Reactors in India " *Energy Policy* 37 (2009): 5028

amounts of weapons grade plutonium²²² that contains approximately 93% Pu-239 and less than 7% of Pu-240. It is believed that India used weapons grade plutonium in the 1974 and 1998 nuclear tests.

To summarize, the PFBR would not only help India to produce more reactor grade plutonium for electricity production but also produce more weapons grade plutonium for making nuclear weapons.²²³ I deal with the PFBR's capacity to produce weapons grade plutonium and its implications for India's nuclear doctrine of credible minimum deterrence in the section that deals with the debate between the DAE and the MEA.

Uncertainty over type of safeguards

The debate in India occurred at a time when there was no clarity regarding the type of IAEA safeguards (voluntary offer/permanent) that would satisfy the US. The text of the joint statement specified that India's responsibilities consisted of

identifying and separating civilian and military nuclear facilities and programs in a phased manner and filing a declaration regarding its civilians facilities with the International Atomic Energy Agency (IAEA);

²²²To recover the weapons grade plutonium, the core and blanket fuel assemblies would have to be reprocessed separately.

Zia Mian, A. H. Nayyar, R. Rajaraman, and M. V. Ramana. "Fissile Materials in South Asia and the Implications of the U.S.-India Nuclear Deal." *Science and Global Security* 14 (2006): 133

²²³ Ibid

taking a decision to place voluntarily its civilian nuclear facilities under IAEA safeguards; signing and adhering to an Additional Protocol with respect to civilian nuclear facilities.....²²⁴

Indian analysts interpreted the language of the joint statement to mean the application of voluntary offer safeguards on civil nuclear facilities.²²⁵ However, the Bush administration did not confirm India's interpretation or specify the kind of safeguards it expected. The type of safeguards that would apply to civil nuclear facilities was important as it would influence the level of flexibility that India would be accorded in the usage of its civil facilities for military purposes.

Voluntary offer safeguards (similar to the ones adopted by the five formal nuclear weapons states) would enable India to transfer nuclear materials and facilities from the civilian to the military categories (and vice versa) citing national security considerations. Permanent safeguards (similar to the ones adopted by non-nuclear weapon states and in imported reactors in India), would deprive India of the ability to re-designate civilian facilities as military (although military facilities could still be re-designated as civilian) or move nuclear materials from the military to the civilian categories. In other words, if

²²⁴Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 18 2005). Accessed on August 9 2011. <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

India categorized a facility as civilian and placed it under permanent IAEA safeguards, it would lose the ability to use that facility for military purposes or retain the option to be able to do so in the future.

The Department of Atomic Energy (DAE)

The Indian Atomic Energy Commission was established in August 1948 in the newly constituted Department of Scientific Research. The Department of Atomic Energy (DAE) was set-up in 1954 under the direct charge of Prime Minister Jawaharlal Nehru.²²⁶ A March 1 1958 government resolution moved the AEC from the Department of Scientific Research into the DAE. The resolution stated that the Secretary to the Government of India in the DAE would also serve as the ex-officio Chairman of the AEC with the other members of the latter appointed on an annual basis after being recommended by the Chairman and approved by the Prime Minister.²²⁷ The DAE was tasked with executing the policies formulated by the AEC. The DAE's current mission includes five key focus areas.

1. Increasing share of nuclear power through deployment of indigenous and other proven technologies, along with development of fast breeder reactors and thorium reactors with associated fuel cycle facilities.
2. Building and operation of research reactors for production of radioisotopes and carrying out radiation technology applications in the field of medicine, agriculture and industry.

²²⁶ "About Us- the Organizational Structure of the Department." Accessed on February 26 2014. <http://dae.nic.in/?q=node/634>

²²⁷ "Government of India -Atomic Energy Commission." Accessed on February 26 2014. <http://dae.nic.in/?q=node/394>

3. Developing advanced technologies such as accelerators, lasers, supercomputers, advanced materials and instrumentation, and encouraging transfer of technology to industry.
4. Support to basic research in nuclear energy and related frontier areas of science, interaction with universities and academic institutions, support to research and development projects having a bearing in DAE's programmes and international co-operation in related advanced areas of research and
5. Contribution to national security.²²⁸

AEC Chairman and DAE secretary Dr. Anil Kakodkar was clear that his organization would not agree to the PFBR (and by extension the smaller FBTR) being declared as a civilian facility and placed under safeguards on the unsafeguarded civilian side of the separation plan. He articulated his position in an interview to *The Hindu* on August 12, 2005.

Subramanian: A.N. Prasad, former Director, Bhabha Atomic Research Centre (BARC) says the costs will be too prohibitive for India to have dedicated reactors for civilian and military purposes.

Kakodkar: Certainly, that also will be a factor in identifying what is civilian. If there is an implication on the strategic side, then we will not identify it as civilian. Only that which is clearly of no national security significance, only that part will be civilian. To that extent, there is no compromise.

²²⁸"Welcome to Department of Atomic Energy." (February 26 2014), <http://dae.nic.in/?q=node/159>

Subramanian: Will putting our civilian nuclear facilities under IAEA safeguards hamper our Fast Breeder Reactors programme?

Kakodkar: No. How will it hamper?

Subramanian: Dr. Prasad has said that. Several people whom I talked to said the plutonium reprocessed from our PHWRs will come under safeguards and that the IAEA may not allow that plutonium to be used in the breeders.

Kakodkar: We are not going to put any developmental programme under safeguards. Any research and development programme, we are not going to put under safeguards.

Subramanian: So the Prototype Fast Breeder Reactor (PFBR) under construction at Kalpakkam and the Fast Breeder Reactors will not come under safeguards?

Kakodkar: No. The PFBR will not come. The PFBR is a proto-type. Why should it go under safeguards? When technology becomes mature, it is a different story.²²⁹

Kakodkar also indicated that the civil-military separation process should occur in phases in the same interview. He advanced two rationales to justify his support for the PFBR's unsafeguarded status. The first rationale ("only that which is clearly of no national security significance, only that part will be civilian")²³⁰

²²⁹ Subramanian, T.S. "'Identifying a Civilian Nuclear Facility Is India's Decision" " (Aug 12, 2005). *The Hindu*. <http://www.hindu.com/2005/08/12/stories/2005081204521100.htm>

²³⁰ Ibid

seemed to indicate that he considered the breeders to be related to the strategic program (and having some national security significance). I term this rationale as the national security rationale. The second rationale (“we are not going to put any developmental programme under safeguards”)²³¹ indicated a desire to retain complete R&D autonomy to pursue the breeder program without any outside interference. I term this rationale as the research autonomy rationale.

Third coalition members like Dr. M.V. Ramana and Dr. Zia Mian took note of both rationales in Kakodkar’s statement but gave precedence to the one on national security. They warned that the real reason behind Kakodkar’s call for the PFBR to be placed outside safeguards indicated the DAE’s desire to either use it to produce fissile materials or at least retain it as an option to do so in the future.

The Department of Atomic Energy has always resisted placing the breeder program under international safeguards and is doing so again when asked to do so as part of the deal. Anil Kakodkar, chairman of the Atomic Energy Commission and secretary of the Department of Atomic Energy, has said that the Prototype Fast Breeder Reactor will not be under safeguards because it is a research and development program and “any research and development programme, we are not going to put under safeguards.”

He has also pointed out that “only that which is clearly of no national security significance, only that part will be civilian.” The department’s

²³¹ Ibid

resistance to safeguards on the breeder program begs the question as to whether this is or ever was intended only for civilian purposes.²³²

Members of the International Panel on Fissile Materials (IPFM) (Dr. Zia Mian, Dr. A. H. Nayyar, Dr. R. Rajaraman and Dr. M. V. Ramana) warned that if India used the PFBR to produce weapons grade plutonium, it would dramatically increase its nuclear arsenal.

The PFBR is designed to have a thermal power of 1250 MW and an initial inventory of 1910 kg of plutonium in its core. The current design is reported to have an overall, equilibrium cycle breeding ratio of almost 1.05. Applying the neutron balance in a generic breeder reactor with a homogeneous core permits a first order estimate of plutonium production in the PFBR core and its radial and axial blankets. With these uncertainties in mind, we find that at 80 percent capacity the PFBR could produce on the order of 135 kg of weapons grade plutonium every year in its blanket (about 1/3 in the axial blanket and 2/3 in the radial blanket). This would amount to about 25–30 weapons worth of plutonium a year, a four- to fivefold increase over India's current weapons plutonium production capacity.²³³

²³² Ramana M. V. and Zia Mian "Wrong Ends, Means, and Needs: Behind the U.S. Nuclear Deal with India." *Arms Control Today* January/February 2006.

²³³ Zia Mian, A. H. Nayyar, R. Rajaraman, and M. V. Ramana. "Fissile Materials in South Asia and the Implications of the U.S.-India Nuclear Deal." *Science and Global Security* 14 (2006): 133

Kakodkar did not elaborate on the role that he envisaged for the PFBR in India's nuclear weapons program and nuclear doctrine of credible minimum deterrence. Science correspondent R. Ramachandran speculated on a conceivable scenario in which the PFBR could be used for the weapons program in *The Hindu*. He assumed that the minimal strategic purpose of the breeder was to help India attain nuclear parity with Pakistan although such a projected purpose raises the question as to whether India did not already achieve the aforementioned nuclear parity in the years following the 1998 tests.

Now what does a fast breeder (where fast refers to the neutron velocity and not to breeding) do? The fuel that is used in a breeder is a mixture of depleted uranium (mostly non-fissile U-238) and RGPu (reactor grade plutonium) in the ratio of 7:3 or more. The core could be surrounded by a blanket of U-238 and/or thorium (Th-232). Neutrons from the plutonium fission (which produces energy) would be absorbed by U-238 (in the core and the blanket) to become Pu-239 and by Th-232 (in the blanket) to become U-233. That is, it breeds more Pu-239 than it consumes and the ratio is a little over 1. The time taken to breed enough Pu-239 to fuel another breeder is called the 'doubling time' and is quite long. It varies from 9 to 19 years depending upon whether the uranium-plutonium mixture is in metallic, nitride, carbide or oxide form. The PFBR under construction will use an oxide mix.But the more significant aspect of a breeder is that, even though you start with RGPu, the plutonium that comes out is weapons grade. In a breeder, besides Pu-239, the contaminants too fission with fast neutrons (which is not the case with

thermal neutrons in a PHWR). In effect, a breeder also functions as a "laundry" for dirty plutonium. However, since this bred plutonium is intended to fuel future breeders, it would be unwise to keep all of it for strategic use. But since the fissile material is growing, albeit by only 8 per cent or so a year, few tens of kg could always be withdrawn for weapon purposes to supplement the amount from CIRUS and Dhruva and achieve parity with Pakistan. In the case of the PFBR, which will become operational in 2011, you can, however, begin to withdraw only around 2014-15. This, of course, implies that MCD (minimum credible deterrent) with respect to Pakistan would be achievable only 8-9 years hence. But this would not be acceptable to the strategic establishment..... Till such time as breeder becomes the source of weapons material, MAPP (Madras Atomic Power Plant) could be operated on low burn-ups to keep pace with Pakistan (instead of running some PHWRs forever in this mode). Once the PFBR begins to discharge fuel, MAPP would be back on normal mode, and would from then on continue to provide RGPu for the PFBR. This may well have been the underlying rationale for attributing a strategic dimension to the PFBR, and it is unlikely that Dr. Kakodkar's remarks were made without the inputs of the strategic establishment.²³⁴

²³⁴ Ramachandran, R. "Is Breeder Needed for Strategic Purposes?" *The Hindu*, February 22, 2006.

Ramachandran's article suggested that Kakodkar advanced the national security rationale for the PFBR because he planned to use the weapons grade plutonium produced by it (once it became operational) to achieve and maintain nuclear parity with Pakistan. However, another op-ed by Ramachandran on February 09, 2006 in *The Hindu* also speculated on the centrality of the research autonomy rationale and the DAE's concerns over the ability of the IAEA to safeguard proprietary information in determining its position on the PFBR being placed on the unsafeguarded military side.

The U.S. wants the Indian fast breeder programme, even in its present R&D phase comprising one 40 MWth Fast Breeder Test Reactor (FBTR) and the upcoming 500 MWe Prototype Fast Breeder Reactor (PFBR) at Kalpakkam, to be brought under IAEA safeguards. Atomic Energy Commission (AEC) chairman Anil Kakodkar has expressed his inability to do so (see *The Hindu*, August 12, 2005). He had argued that safeguards can be considered when the indigenously developed breeder technology matures and becomes commercial, but not in its present R&D phase.....What DAE appears to be really apprehensive about — as Dr. Kakodkar has more recently articulated — are the intangibles that come with safeguards and international inspection, including protecting its proprietary breeder technology. The need to interrupt the R&D process and seek approval of the IAEA whenever there is a change in design or process or material could be a cause for concern, as it requires sending details of the proposals to Vienna. According to DAE insiders, the

experience with IAEA safeguards in India and elsewhere does not inspire confidence that sensitive information would be protected.²³⁵

Dr. A. Gopalakrishnan, former Chairman of the Atomic Energy Regulatory Board (AERB) and a member of the second coalition also expressed his deep suspicion of IAEA inspectors and their ability to safeguard proprietary information.

Gopalakrishnan, who was speaking at a seminar organised by the Institute of Defence Studies and Analyses (IDSA), accused IAEA inspectors of spying for the US. "I know for sure that most inspectors are spies for the (US) State Department. Whatever information they collect is first sent to Washington, then only to Vienna. I am sorry I do not share the faith in the Americans (like some other analysts)."^{236 237}

A report ("Separation of Civilian and Military N-Facilities") produced at the end of a March 24 2006 panel discussion held at the New Delhi-based Institute for Peace and Conflict Studies also concluded that the DAE was more worried about the IAEA's ability

²³⁵ Ramachandran, R. "The Complicated World of Nuclear Deals " *The Hindu*, February 09 2006
Ramachandran, R. "Is Breeder Needed for Strategic Purposes?" *The Hindu*, February 22, 2006.

²³⁶ "Former Dae Chairman Slams Indo-Us Nuclear Deal". (February 23 2006). Accessed on February 24 2014. <http://www.dnaindia.com/india/report-former-dae-chairman-slams-indo-us-nuclear-deal-1014462>

²³⁷ The DAE's concerns about the IAEA not being able to safeguard proprietary technology related to the breeders was rebuffed by G. Balachandran, a consulting fellow at the Institute for Defense Studies and Analyses (IDSA) during a panel discussion held by the Institute for Peace and Conflict Studies (IPCS) on March 24 2006.

"The DAE's paranoia about losing their industrial secrets vis-à-vis the FBR is unfounded. There are enough checks and balances in the IAEA to ensure total secrecy by the inspectors. Their complete reports are not available even to the IAEA Director-General."

Venkateshwaran, KS Manjunath & L. "A Separation of Civilian and Military N-Facilities- a Report " *IPCS (Institute for Peace and Conflict Studies) Special Report 15* (March 24 2006). Accessed on January 1 2014.
http://www.ipcs.org/pdf_file/issue/1207059260IPCS-Special-Report-15.pdf .p 7.

to protect industrial secrets and proprietary information related to the breeders than national security considerations.²³⁸

However, according salience to the research autonomy rationale raises three key questions. First, most countries around the world that had safeguarded breeders programs more advanced than the DAE have abandoned them. It is hence difficult to discern why the DAE and its allies in India would be worried about losing proprietary information to the IAEA given that the aforementioned countries including Japan and France never complained about the pilferage of proprietary technology.²³⁹ Second, the DAE's public emphasis on the research autonomy rationale could have also been motivated by its astute knowledge of the kind of rationale that would achieve the maximum traction in a post-colonial society to sway the public towards its position of the PFBR being retained on the unsafeguarded military side.²⁴⁰ Put another way, did the DAE use the research autonomy rationale as a public relations strategy to secure public support for the unsafeguarded military status of the PFBR even as it was internally clear that the reactor would be retained on the military side for national security reasons?

Third, Kakodkar's categorical call for the PFBR to be retained outside safeguards on the unsafeguarded military side of the separation plan out of concerns stemming from the need to protect proprietary technology is interesting as he had no problems placing all

²³⁸ Ibid. p 3-6

²³⁹ Conversations with Dr. M. V. Ramana, associate research scholar, Program on Science and Global Security, Princeton University. February 2012

²⁴⁰ Conversations with Dr. M. V. Ramana, associate research scholar, Program on Science and Global Security, Princeton University. February 2012.

future civilian second-stage breeders under safeguards on the civilian side to comply with US (and international) non-proliferation specifications. Assuming that the PFBR, a prototype, was not likely to be very different technically than the future civilian breeders succeeding it, a question arises as to how retaining the PFBR outside safeguards would protect the DAE's proprietary concerns while placing all future civilian breeders under safeguards would not jeopardize them (as they would now be thrown open to IAEA inspectors)?²⁴¹

I consider both the national security rationale and the research autonomy rationale symmetrically in keeping with my SCOT-based theoretical framework for the rest of the chapter and weigh the accumulated evidence in favor of each towards the end. Regardless of whether the national security rationale or the research autonomy rationale was salient, the DAE ultimately wanted the PFBR (and the smaller FBTR) to be placed on the unsafeguarded military side of the separation plan as evidenced in Kakodkar's statements from August 2005 to March 2006.

However, the PFBR's placement on the unsafeguarded military side of the separation plan would not just be an isolated event, sequestered from the rest of the decisions pertaining to the distribution of civilian and military facilities. The second stage PFBR was fuelled by reactor grade plutonium separated from the first stage PHWR spent fuel. Placing it on the unsafeguarded military side would also entail placing several

²⁴¹ Conversations with Dr. Hugh Gusterson, Professor of Anthropology and Sociology at George Mason University. January 2011

PHWR's required to fuel it on the military side. The net result would be a reduction in the number of facilities on the safeguarded civilian side and an increase in the number of facilities on the unsafeguarded military side (that already included the two dedicated weapons grade plutonium production reactors (CIRUS²⁴² and DHRUVA) that India used to produce nuclear weapons for the 1998 tests and some PHWR's earmarked for fissile material production and reprocessing facilities as shown in figure 4 below). The *Times of India* explained:

Keeping the FBR under military wraps will mean segueing several other related reactors and facilities under the same umbrella, making the "civilian" list woefully thin something the Bush administration will not accept on the excuse that it will not fly in Congress.²⁴³

The DAE's position on the unsafeguarded military status of the PFBR, the consequent alignment of several 'feeder' PHWR's on the military side and the additional positioning of dedicated weapons grade plutonium reactors and PHWR's earmarked exclusively for fissile material production can be represented by constructing a diagram based on Kakodkar's interviews. I term the resulting separation plan with a limited number of nuclear facilities on the safeguarded civilian side and a relatively substantial number of facilities on the unsafeguarded military side (due in major part to the linkages

²⁴² Although India agreed to shut down the CIRUS reactor and shift its core in order to prevent IAEA inspections in the sensitive Bhabha Atomic Research Center (BARC), India's premier nuclear weapons lab.

²⁴³ Rajghatta, Chidanand. "Indo-U.S N-Deal Stutters Again." *Times of India*, Feb 8 2006.

between the first stage PHWR's and the second stage PFBR) as the *unsafeguarded breeder plan*.

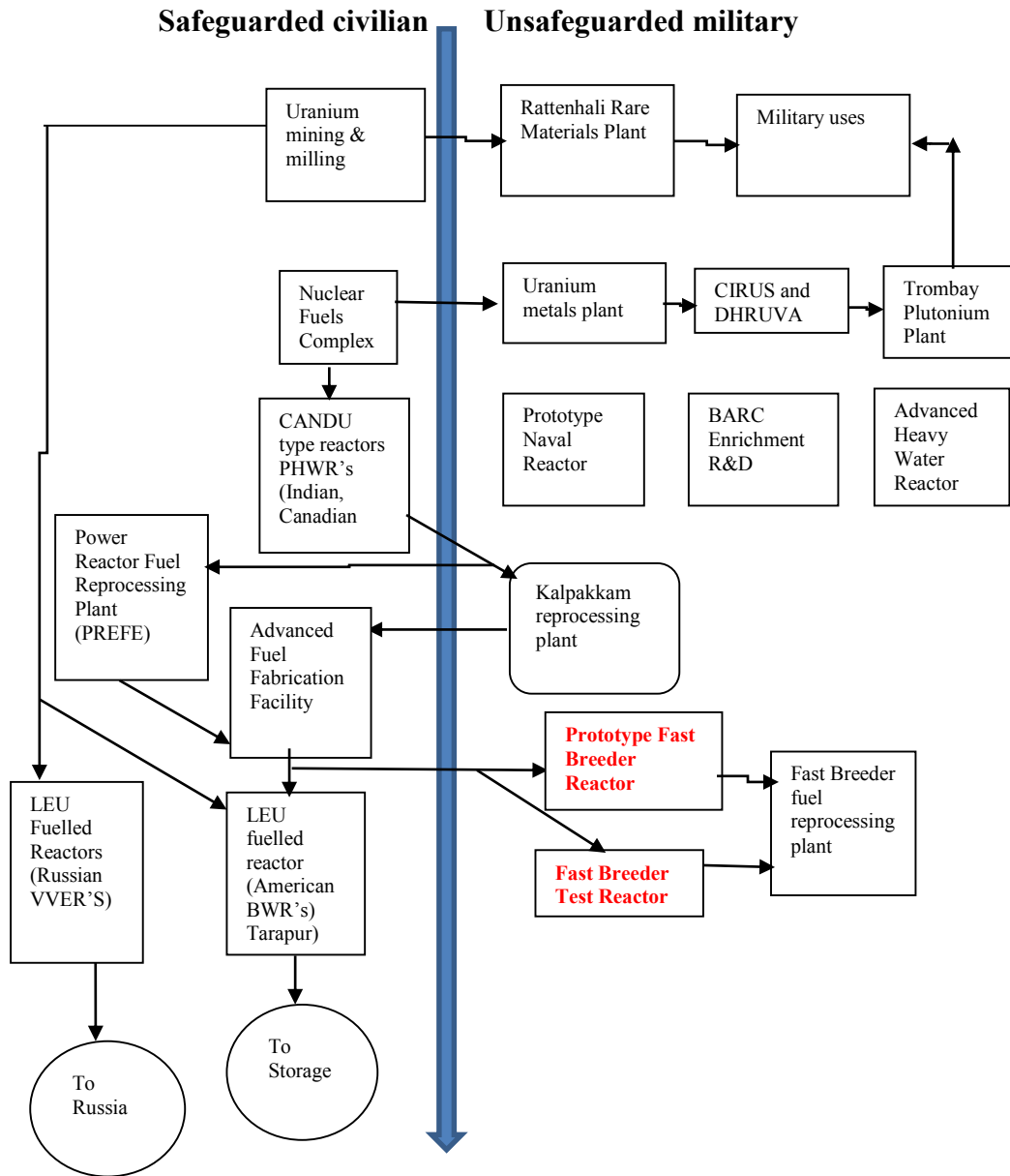


Figure 4: The DAE's unsafeguarded breeder plan

Sources: Adapted from Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views."

Congressional Research Service, December 22 2006. P 7

Dr. Frederick Mackie, Lawrence Livermore National Laboratory

In figure 4, the facilities to the left of the solid line were the ones that the DAE designated as civilian to be offered to safeguards while the facilities on the right were the ones that it supported retaining on the unsafeguarded military side. The PFBR (and the FBTR) were on the unsafeguarded military side under this plan. The unsafeguarded status of the PFBR would enable India to not only produce more fuel for more breeders but also fissile materials for more nuclear weapons. Isolated facilities of perceived national security importance like the Prototype Naval Reactor and the Bhabha Atomic Research Center (BARC) were also retained on the military side of the plan along with the civilian Advanced Heavy Water Reactor (AHWR).

Ministry of External Affairs (MEA)

The Ministry of External Affairs (MEA) was created at the time of India's independence in 1947 from the Foreign and Political department of the British India government.²⁴⁴ It conducts India's foreign relations.²⁴⁵ The MEA "is responsible for all aspects of external relations. Territorial divisions deal with bilateral political and economic work while functional divisions look after policy planning, multilateral

²⁴⁴"Particulars of Organizations Functions and Duties of the Mea." (October 3 2005). Accessed on September 1 2011. <http://meaindia.nic.in/mystart.php?id=8080>

²⁴⁵ "Joint Statement by S.M. Krishna and Hina Rabbani Khar." *The Hindu*, July 27, 2011.

organizations, regional groupings, legal matters, disarmament, protocol, consular, Indian Diaspora, press and publicity, administration and other aspects.”²⁴⁶ The Ministry “benefits from the advice of the elected representatives of the people through the Standing Committee and the Consultative Committee of the Parliament on External Affairs.”²⁴⁷ The day-to-day operations of the MEA are handled by bureaucratic personnel from the Indian Foreign Service headed by the Foreign Secretary.²⁴⁸

The MEA’s position on the principle underlying the separation of India’s nuclear infrastructure became clear on October 24 2005. Foreign Secretary Shyam Saran gave a major policy speech on non-proliferation at IDSA in order to placate the Left by situating India’s vote against Iran within a broader Indian worldview on non-proliferation.²⁴⁹ He commented briefly on civil-military separation.

The objective of the agreement is to advance India’s energy security through full civilian nuclear energy cooperation. It is legitimate for our partners to expect that such cooperation will not provide any advantage to our strategic programme and hence the need to separate it from our civilian nuclear sector. But it makes no sense for India to deliberately keep some of its civilian facilities out of its declaration for safeguards

²⁴⁶“Particulars of Organizations Functions and Duties of the Mea.” (October 3 2005). Accessed on September 1 2011. <http://meaindia.nic.in/mystart.php?id=8080>

²⁴⁷ “Arrangement for Consultation with or Representation by the Members of the Public in Relation to Formulation of Policies or Implementation Thereof.” (November 3 2005). Accessed on September 23 2011. <http://meaindia.nic.in/mystart.php?id=8086>

²⁴⁸ “Ranjan Mathai Takes Charge as Foreign Secretary.” (September 29, 2011). Accessed on November 2 2011. <http://www.ndtv.com/article/india/ranjan-mathai-takes-charge-as-foreign-secretary-123419>

²⁴⁹ Varadarajan, Siddharth. “India Submits to the Bush Doctrine?” *The Hindu*, October 28 2005.

purposes, if it is really interested in obtaining international cooperation on as wide a scale as possible. This would be quite illogical.²⁵⁰

Saran's statement indicated that he (and by extension the MEA) was more amenable to place a greater number of India's 22 civilian nuclear facilities including possibly the PFBR on the safeguarded civilian side than the DAE in its unsafeguarded breeder plan and open them to IAEA inspections in order to advance the nuclear deal.²⁵¹ A leaked American diplomatic cable sent the same day to Washington by US Ambassador to India David Mulford described the MEA's accommodative posture and noted with some satisfaction that Saran had reiterated his general predisposition to place a substantial number of Indian nuclear facilities under safeguards during the Q&A session that followed his speech.

In a landmark October 24 speech aimed at an elite group of strategic analysts, Foreign Secretary Sham (Shyam) Saran forcefully defended the India-US civil nuclear framework, offered helpful interventions on NSG (Nuclear Supplier's Group) and MTCR (Missile Technology Control Regime) harmonization, and highlighted India's vigorous support for the global non-proliferation effort. Saran also explicitly countered arguments that India has sold out to the US. Throughout the speech, Saran projected confidence that India and the US can sustain a cooperation based on shared interests, with India reaping visible benefits in terms of

²⁵⁰Saran, Shyam. "Nuclear Non-Proliferation and International Security." *Strategic Analysis* 29, no. 3 (July 2005).

²⁵¹Varadarajan, Siddharth. "India Submits to the Bush Doctrine?" *The Hindu*, October 28 2005.

technology transfers. Pressed during the Q and A on the separation of civilian and military nuclear facilities, Saran emphasized the value of India declaring the maximum number of civilian facilities in order to benefit fully from international nuclear cooperation.²⁵²

A cable from a later period (February 24 2006) that chronicled a conversation between then Under Secretary of State for Political Affairs Nicholas Burns and Minister of State for External Affairs Anand Sharma provides more specific albeit indirect evidence of the MEA's accommodative posture on the separation plan, especially the PFBR. Burns was clear that India would need to place the PFBR under safeguards for the Bush administration to approve its separation plan. Although Sharma countered with a long explanation about the mindset of Indian nuclear scientists, he did not reject outright the demand made by Burns indicating the MEA's agreement with the Bush administration's stance on the safeguarded status of the PFBR.

U/S (Undersecretary) Burns remarked that he and Foreign Secretary Saran had spent hundreds of hours to get just beyond 90% of the way to concluding the civil nuclear arrangement, but as with many things, the last little bit is the most difficult. The USG (United States Government) needs further clarity on India's separation plan, inter alia, how power and breeder reactors will be treated. Once we have an agreement, the isolation of India's scientists will be firmly in the past, and they will be

²⁵² Mulford, David. "India Emphasizes Support for Non-Proliferation in Landmark July 18 Defense." (October 24 2005). Accessed on February 15 2014.
<http://cablegatesearch.net/cable.php?id=05NEWDELHI8254&q=emphasizes%20india%20support>

welcomed into the international mainstream. U/S Burns reminded Sharma of India's potential role in the Global Nuclear Energy Partnership, and encouraged India to be part of that project at the ground floor. To be eligible, however, India's breeder reactors should be safeguarded. Otherwise it would be difficult for Delhi's nuclear establishment to collaborate with scientists from GNEP participants on advanced reactor technology. Sharma told U/S Burns the scientists are a proud group given the hurdles they overcame to build India's nuclear deterrent, and the Indian people are proud of them. Once they are integrated into the global scientific community, they will be in a position to share their knowledge and expertise in a larger partnership, which will help reduce the criticism some of their number voice about the proposed nuclear deal. "Both sides need to break down the old mindsets," Sharma offered.²⁵³

The US Embassy's interpretation of Saran's speech as a signal of a more accommodating MEA posture on the number of civilian facilities to be placed under safeguards including the PFBR was shared by prominent Indian science journalists. R Ramachandran, associate editor of *Frontline* magazine described the differences between the MEA and the DAE over the contours of the separation plan and the status of the

²⁵³Mulford, David. "Positive Burns-Sharma February 24 Meeting Focuses Potus Visit, Civil Nuclear, Democracy and Health" (February 24 2006). Accessed on February 17 2014. <http://cablegatesearch.net/cable.php?id=06NEWDELHI1396&q=breeder%20fast>

PFBR (and FBTR) in particular with the former preferring a more accommodating approach as opposed to the latter's maximalist one.

The condition that is critical for any progress on the deal is the separation of civilian and military nuclear facilities that India has committed to and the sequencing of the reciprocal steps envisaged in the agreement. This is very clear from the statements at the Congressional hearings on the Indo-US nuclear agreement. But the Ministry of External Affairs (MEA) and the DAE do not seem to be on the same wavelength on the civil-military separation issue. Anil Kakodkar, the Chairman of the Atomic Energy Commission (AEC), has made a public statement that the Prototype Fast Breeder Reactor (PFBR) and the Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam, an R&D Centre, will not be put under safeguards. He also said that the cost and any implication on our strategic programme would be factors in deciding what will be designated as civilian. "It makes no sense for India to deliberately keep some of its civilian facilities out of its declaration for safeguards purposes, if it is really interested in obtaining international cooperation on as wide a scale as possible," the Foreign Secretary Saran said in an address at a public forum with an obvious reference to Kakodkar's statement.²⁵⁴

Siddharth Varadarajan, former strategic affairs editor of *The Hindu* newspaper also noted the differences between the positions of the MEA and the DAE over the

²⁵⁴ Indo-US Nuclear Agreement and IAEA Safeguards. R Ramachandran Strategic Analysis, Vol. 29, No. 4, Oct-Dec 2005
http://idsa.in/system/files/strategicanalysis_ramachandran_1205.pdf

contours of the separation plan as well as the status of the PFBR following Saran's speech.

If Mr. Saran's words are followed through, all civilian nuclear facilities — including the prototype fast breeder reactor (PFBR) and other R&D facilities — will be offered for IAEA safeguards. This is something Anil Kakodkar, chairman of the Department of Atomic Energy, had ruled out in an interview to *The Hindu* and *Frontline* in August.²⁵⁵

Further, the sullen response of M. R. Srinivasan, member of the Atomic Energy Commission to Saran's statement and his allegation that Saran had not consulted Kakodkar before making the aforementioned policy speech also serves as evidence of the nuclear establishment's concerns about the MEA's accommodating posture regarding both the number of nuclear facilities to be placed under safeguards and the status of the PFBR.

Interviewer: Do you think the Department of Atomic Energy was not consulted properly before Mr. Saran made his observations?

Srinivasan: At least, it is my impression that Mr. Shyam Saran did not consult with the Chairman, AEC, Dr. Anil Kakodkar, before he made his speech at the IDSA (Institute for Defense Studies and Analyses). I am troubled that such an important issue has been dealt with in this manner by the Foreign Secretary. I will, therefore, once again stress the necessity

²⁵⁵Varadarajan, Siddharth. "India Submits to the Bush Doctrine?" (October 29, 2005). Accessed on August 14 2011. <http://www.globalresearch.ca/index.php?context=va&aid=1166>

for ensuring that senior technical experts available to the Government of India are fully involved before such policy decisions are taken.²⁵⁶

As evident from Saran's speech, a key reason for the MEA's willingness to place more nuclear facilities under safeguards as compared to the DAE was its interest in paving the way for India to access the widest possible level of international cooperation under the nuclear deal and the forthcoming waiver from the Nuclear Suppliers Group.

However, the most important reason for the MEA's more flexible approach to the separation plan was its eagerness to secure the broader strategic benefits that would accrue to India following the consummation of the nuclear deal. The July 2005 joint statement began the process of legitimizing India's nuclear arsenal and normalizing its nuclear status by creating an entirely new arbitrary category: a 'state with advanced nuclear technology' that fudged the stark difference between the Nuclear Weapon States (NWS) and Non-Nuclear Weapon States (NNWS) categories.²⁵⁷ Although India was not admitted into the formal nuclear weapon's 'club,' a country specific exception was carved in contravention of the core principles of the NPT.

The successful conclusion of negotiations over a separation plan would be the first crucial step in the process of realizing the aforementioned nuclear legitimization and accommodation. The steps (US domestic waiver legislation and the conclusion of a bilateral 123 agreement) that would follow the consummation of the separation plan had the potential to transform India's status from a target of the non-proliferation regime to a

²⁵⁶Subramanian, T.S. "Involve Nuclear Experts in Policy Decisions" " *The Hindu*, Nov 12, 2005.

²⁵⁷ Interview with Dr. Philip Zelikow, former counselor to then Secretary of State Condoleezza Rice in the State Department. November 24 2010.

partner by clearing the path for its membership in key institutions such as the Nuclear Supplier's Group (NSG), the Australia Group (AG) and the Missile Technology Control Regime (MTCR) maintaining the current nuclear order. Put another way, the nuclear deal would enable India to penetrate the very non-proliferation institutions that imposed strictures constraining its nuclear and missile programs for more than three decades. India's entry into the NSG would be particularly ironic as the institution was setup in the aftermath of India's first nuclear test in 1974 as a part of a global punitive response.

If the Clinton administration's 'cap, roll back and eliminate' policy kept the pressure on the Indian nuclear program by questioning India's very possession of nuclear weapons, the nuclear deal proposed by the Bush administration was a huge concession as it would make it harder to adopt such a fundamental stance in the future. Instead, the US would henceforth adopt a more pragmatic position that accepted the impossibility of denuclearizing India and recognized the necessity of accommodating it into the international nuclear order in order to harness India's growing weight to advance US strategic interests in Asia. Consequently, the terms of future official non-proliferation debates within the administration would shift from attacking India's possession of nuclear weapons to their numbers and technological sophistication.

The MEA also viewed the joint statement as evidence of American recognition of India's emerging "great power" status, a clean break from Cold War-era indifference, post-1991 ambivalence and post 9/11 restrained engagement. It seemed eager to clinch a broader strategic partnership with the US that would involve defense sales, interoperability and closer alignment of the respective military establishments. I have

explained elsewhere how the US and India could not have conducted any meaningful defense cooperation without the elimination of the technology denial regime's restrictions on dual use technology transfers that were originally targeted at the Indian nuclear program but were unintentionally constraining defense cooperation thus hampering the development of an important leg of the strategic partnership.²⁵⁸

To summarize, the MEA was more inclined to believe that coming up with a separation plan more sensitive to American expectations (that India place the maximum possible number of civilian facilities including the PFBR under safeguards) would be crucial to its successful acceptance by the US and serve as a key step forward in unlocking for India the multiple aforementioned strategic benefits. Designing a separation plan with more civilian facilities including the PBFR under safeguards and a smaller military component than the DAE's maximalist unsafeguarded breeder plan seemed a reasonable price to pay in exchange for the aforementioned nuclear and strategic benefits from the US.

Given the MEA's predilection towards placing the PFBR on the safeguarded civilian side, a reasonable inference would be that its strategy for fissile material production to produce nuclear weapons would either rely on the 2 research reactors (a replacement for the soon to be dismembered CIRUS and the DHRUVA) or retaining 1-2 or 2-4 PHWR's on the unsafeguarded weapons side and running them in low-burnup mode.²⁵⁹

²⁵⁸ See chapter 2

²⁵⁹Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on September 21 2011.
<https://www.fas.org/sgp/crs/nuke/RL33292.pdf>. p 15

The MEA's overall approach to the separation plan and its position on the PFBR can be represented by constructing a diagram based on Saran's policy speech. I term the resulting separation plan as the *safeguarded breeder plan*.

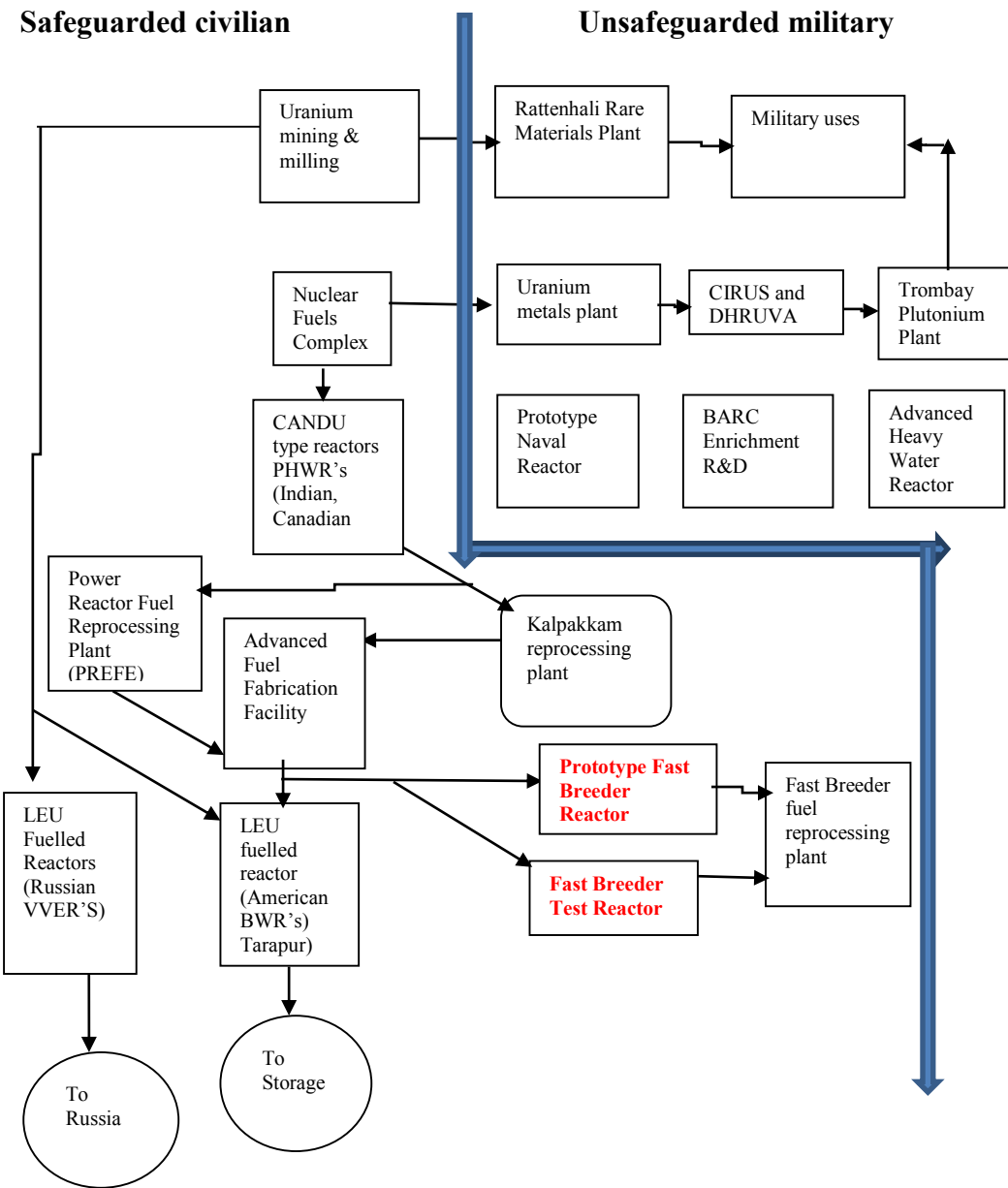


Figure 5: The MEA's safeguarded breeder plan

Sources: Adapted from Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views."

Congressional Research Service, December 22 2006. P 7

Dr. Frederick Mackie, Lawrence Livermore National Laboratory

In figure 5, the facilities to the left of the solid line were ones that the MEA designated as civilian while the ones to the right were the facilities that it retained on the unsafeguarded military side. The PFBR (and the FBTR) were on the safeguarded civilian side under this plan. The status implied that India would not be able to use the PFBR to produce weapons grade plutonium in case the US insisted on the more restrictive permanent IAEA safeguards on civilian facilities in order to approve the plan (a position it was likely to take). However, India could theoretically redesignate the PFBR as military in case it managed to convince the US to approve a separation plan with the more lenient voluntary offer safeguards, a formidable task given that the Bush administration's offer of a nuclear deal to India was itself a major concession (and the American acceptance of voluntary offer safeguards for civilian facilities would place India on par with the five formal nuclear weapons powers that can redesignate a civilian facility as military).

Finally, the PFBR's civilian status also affected the contours of the entire separation plan. The status of the second stage PFBR in the MEA's plan did not require the first stage PHWR's providing the start-up plutonium fuel to be placed on the military side. Consequently, there were more facilities on the civilian side, a move that would

increase the chances of the separation plan being accepted by Bush administration officials and ultimately the more non-proliferation minded US Congress.

Analysis

I deploy some insights from my theoretical framework to analyze the preceding debate. A key contribution of the constructivist analysis of the debate over the separation plan is the deconstruction of the supposedly unified separation plan portrayed in media accounts into two overlapping but definitely distinct rival separation plans: the MEA's safeguarded breeder plan and the DAE's unsafeguarded breeder plan. Both plans (or artifacts to use STS terminology) were intended by their progenitors to achieve very different ends.

For the DAE's technical specialists, the unsafeguarded breeder plan would serve three main purposes. First, it would enable India to access badly needed uranium fuel supplies from the international market to continue with the indigenous nuclear program. Second, the plan would be the bare minimum artifact that would meet American expectations to restore nuclear cooperation while retaining a substantial chunk of India's nuclear infrastructure for producing nuclear weapons including the PFBR. And third, the plan would enable the DAE to continue work on its pet initiative, the breeder program without any intervention whatsoever from the IAEA even if for limited non-proliferation related reasons.

For the MEA's generalists, the safeguarded breeder plan was intended to achieve three much broader strategic objectives. First, the plan would ultimately help to clinch the nuclear deal and complete the process of India's nuclear legitimization started by the July

2005 joint statement thereby paving the way for NPT holdout India's near total accommodation into the global nuclear order. Second, the successful consummation of the plan and the nuclear deal would dismantle the three decade old restrictions on a spectrum of high technologies including space and defense technology and allow India to access sophisticated US defense platforms for the first time. Such access to 'strategic technologies' was considered as vital by Indian elites for the country's emergence as a great power. And third, the plan would also ensure that India retained sufficient nuclear facilities on the unsafeguarded military side to allow India to keep increasing its military arsenal even as it accessed the aforementioned broader strategic benefits.

However, the crucial difference between the MEA's plan and that favored by the DAE was the status of the PFBR. In the broader decision-making calculus of the MEA that was predicated on strategic calculations pertaining not only to nuclear cooperation but also US-India relations, placing the breeder under safeguards and relying on DHRUVA and CIRUS's replacement and some first stage PHWR's to produce nuclear weapons seemed like a reasonable price to pay in exchange for the multiple strategic benefits emanating from a successful nuclear deal.

To summarize, deconstructing the separation plan into the MEA's safeguarded breeder plan and the DAE's unsafeguarded breeder plan demonstrates its *interpretative flexibility*, an interesting case of the technical contours of the separation of India's nuclear infrastructure being determined by social/political considerations

American views on safeguards and separation

The first clear indication by the Bush administration on the type of safeguards that it would support for Indian civilian nuclear facilities came on November 2 2005 in a testimony by Robert G. Joseph (Under Secretary for Arms Control and International Security) before the Senate Foreign Relations Committee (SFRC).²⁶⁰

In their clearest detailing to date of what the Indian Government must do to see the United States uphold its side of the July 18 nuclear agreement, Bush administration officials have stipulated that India sign a more restrictive safeguards agreement with the International Atomic Energy Agency than either the U.S. or any of the other four "recognised" nuclear weapon states has done. Testifying before the Senate Foreign Relations Committee on Wednesday, Under Secretary of State for Arms Control and International Security Robert G. Joseph said a "voluntary offer" safeguards arrangement of the kind the U.S. has with the IAEA would not be acceptable for India.Mr. Joseph stipulated two further preconditions: safeguards "must be applied in perpetuity" and "must confirm ... [that] nuclear materials in the civil sector should not be transferred out of the civil sector."²⁶¹

²⁶⁰ Senate Foreign Relations Committee. *Robert G. Joseph, under Secretary for Arms Control and International Security Prepared Remarks before the Senate Foreign Relations Committee*, November 2, 2005.

²⁶¹Varadarajan, Siddharth. "U.S. Raises the Bar on Nuclear Deal." *The Hindu*, Nov 04, 2005
Senate Foreign Relations Committee. *Robert G. Joseph, under Secretary for Arms Control and International Security Prepared Remarks before the Senate Foreign Relations Committee*, November 2, 2005.

American demands for India to offer its civilian nuclear facilities to permanent IAEA safeguards like non-nuclear weapon states instead of voluntary offer safeguards used by the P-5 were seen in India as a significant departure from the basic terms of the July 18 2005 joint statement.

Meanwhile, there was widespread speculation in the Indian media that the US had given India a blueprint to guide its separation effort in September 2005. The State Department was quick to quell such speculation to avoid giving the impression that the US was coercing India to implement a particular separation plan that would help advance US non-proliferation interests.

The US today said it has not given India any plan on how to go about separating its civilian and military nuclear facilities to help implement the landmark bilateral nuclear deal. "We haven't given a plan on how India should separate its civilian and military (nuclear) facilities," a State Department official told PTI (Press Trust of India) in response to reports that Under Secretary of State Nicholas Burns had in September presented Indian officials with a blueprint on how the Americans might go about in the exercise. New Delhi is said to have given back the blueprint saying it was capable of going about on its own.²⁶²

²⁶² "US Did Not Give India Plan to Separate Nuclear Facilities". (November 25 2005). Accessed on February 26 2014.
<http://news.outlookindia.com/items.aspx?artid=337622>

In the absence of an official separation blueprint released to the public by the Bush administration, I rely on a plan proposed in a December 19 2005 report by David Albright and Susan Basu (“Separating Indian Military and Civilian Nuclear Facilities”) of the Washington-based Institute for Science and International Security (ISIS) as a baseline to compare the positions advanced by the MEA and the DAE.²⁶³ I refer to the plan as the *baseline plan*. The plan was the lone publicly available unofficial American blueprint that provided detailed prescriptions regarding the approach that India should take in separating its nuclear infrastructure including the categorization of the breeder reactors.²⁶⁴ My attempt to compare the ISIS’s baseline plan with that of the DAE and the MEA should not be construed as my endorsement of the baseline plan as the official American position as the documentary evidence does not indicate any such support. Rather, the motive is to use the baseline plan as a crude American standard to compare and contrast the positions adopted by the MEA and the DAE.

The plan enjoined India to divide its nuclear infrastructure²⁶⁵ into three groups, designate its fast breeder reactors as part of its civilian program and place them in the

²⁶³Basu, David Albright and Susan. "Separating Indian Military and Civilian Nuclear Facilities." (December 19, 2005). Accessed on September 14 2011. <http://www.isis-online.org/publications/southasia/indiannuclearfacilities.pdf> (p 1-6)

²⁶⁴ Varadarajan, Siddharth. "U.S. Non-Proliferation Group Ups the Ante with Draft Separation Plan." *The Hindu*, Dec 21, 2005.

²⁶⁵ Research reactors (3), Power reactors (15 operating, 8 under construction and 3 planned), Breeder reactors (1 operating, 1 under construction), uranium enrichment (1 operating), spent fuel reprocessing (3), heavy water production plants (6), uranium processing (3 mines; 2 copper-mine tailing extraction units, 1 mill (uranium ore concentration) many uranium conversion facilities, 3 or 4 fuel fabrication plants).

See Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. P 8

first group under permanent IAEA safeguards. I modify and summarize the extensive three-tier classification table constructed by the authors for the purposes of this chapter.

Group 1 covers facilities that all states consider civilian in nature and that have no known connection to India's nuclear weapons program. Facilities in this group would be declared as civil and would be safeguarded. They would include power reactors, spent fuel reprocessing plants, and breeder reactors, which would all produce or utilize civil plutonium.

Group 2 shows facilities that are associated with India's nuclear weapons production complex. Most of these facilities would be declared as military facilities that would not be subject to safeguards. One exception is the Cirus reactor, which was purchased from Canada under a peaceful use pledge. If India declares this reactor as military, it would directly violate its commitment to Canada.

Group 3 lists known nuclear facilities in the naval fuel cycle. As discussed above, this group of facilities should be placed under safeguards.²⁶⁶

²⁶⁶ Basu, David Albright and Susan. "Separating Indian Military and Civilian Nuclear Facilities." (December 19, 2005). Accessed on September 14 2011. <http://www.isis-online.org/publications/southasia/indiannuclearfacilities.pdf> p1-2

Table 4- The trifurcation of the Indian nuclear program recommended by the baseline plan

Group	Facilities
Group 1. Civil Nuclear Facilities	<p>a) Fuel fabrication Enriched Fuel Fabrication Plant, New Uranium Oxide Fuel Plant, PHWR Fuel Fabrication Plant, Advanced Fuel Fabrication Facility, New Uranium Fuel Assembly Plant, MOX Breeder Fuel Fabrication</p> <p>b) Power reactors: Advanced Heavy Water Reactor (AWHR), Kaiga 1, 2, 3, 4, 5 and 6, KAPS 1 and 2, Kundankulam 1 and 2, MAPS 1 and 2, NAPS 1 and NAPS 2, RAPS 1, 2, 3, 4, 5, 6, 7 and 8, TAPS 1, 2, 3 and 4.</p> <p>c) Breeder reactors: Fast Breeder Test Reactor (FBTR) and the Prototype Fast Breeder Reactor (PFBR).</p> <p>d) Reprocessing plants: Power Reactor Fuel Reprocessing Plant (PREFRE), Kalpakkam Reprocessing Plant (KARP), Fast Reactor Fuel Reprocessing Plant (FRFRP) and Lead Minicell Facility.</p> <p>e) Enrichment facilities: Center for Advanced Technology, Rare Materials Project, Laser Enrichment Plant and Uranium Enrichment Plant</p>

	<p>f) Research Reactors</p> <p>Andhra University, Apsara, Purnima 1, 2 and 3, Zerlina, Compact High Temperature Reactor and Kamini</p> <p>g) Heavy Water Production Plants (Not subject to traditional safeguards in NPT states)</p> <p>Baroda, Hazira, Kota, Manuguru, Nangal, Talcher, Thal-Vaishet, Trombay and Tuticorin</p>
<p>Group 2.</p> <p>Fissile Material Production for Nuclear Weapons Plutonium Production²⁶⁷</p>	<p>a) Dedicated weapons grade plutonium production reactors and fabrication facilities</p> <p>Cirus²⁶⁸, Dhruva, Fuel Fabrication Plant, Plutonium Separation Plant and Plutonium Weapon Component Facility</p> <p>b) HEU Production</p> <p>Rare Materials Project (RMP) and Uranium Weapon Component Facility.</p> <p>c) Storage & Testing</p> <p>Nuclear Weapon Storage Site and Pokaran Nuclear Test Site</p>

²⁶⁷ Albright, David. "India's Military Plutonium Inventory, End 2004." (May 7, 2005), Accessed on November 7 2011. http://www.isis-online.org/uploads/isis-reports/documents/india_military_plutonium.pdf

²⁶⁸ This reactor was supplied by Canada in the 1950s and is pledged to peaceful use

Group 3. Naval Reactor Program	Advanced Technology Reactor Program, Rare Materials Project (RMP) and Nuclear Submarine Reactors. ²⁶⁹
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²⁶⁹ Basu, David Albright and Susan. "Separating Indian Military and Civilian Nuclear Facilities." (December 19, 2005). Accessed on September 14 2011. <http://www.isis-online.org/publications/southasia/indiannuclearfacilities.pdf> p3-6

Designating the PFBR as civilian and placing it (along with the FBTR) in the first group under permanent safeguards would mean that India would not be able to use the weapons grade plutonium produced by it for making nuclear weapons. The country would also lose the option to be able to use the PFBR to produce weapons grade plutonium at a future date.

Comparing the status of the PFBR recommended by the baseline plan with that of the DAE's unsafeguarded breeder plan and the MEA's safeguarded breeder plan provides vital clues regarding the positions of key first coalition relevant social groups and individuals with respect to the American position. The PFBR's unsafeguarded status in the DAE's plan is at odds with the safeguarded status espoused by the baseline plan. On the other hand, the safeguarded status of the breeders in the MEA plan is identical to the civilian categorization recommended by the baseline plan. One key conclusion that can be drawn is that at an important stage in the domestic debate within India, a powerful bureaucracy (MEA) advanced a position that was much closer to the American position than the final separation plan would suggest.

The second round of Indo-US negotiations on the contours of the separation plan were scheduled to begin on December 21, 2005 with Saran arriving in Washington to hand deliver the Indian draft separation plan. A December 16 2005 leaked American diplomatic cable described an optimistic National Security Adviser M. K. Narayanan assuring US Ambassador to India David Mulford that

Saran is bringing India's finished plan for civil/military nuclear separation in the hope that Congress will pass the required legislation in time for President Bush's upcoming visit to New Delhi. Narayanan, who crafted the plan, swore that the GOI (Government of India) had "pulled out all the stops," noting "if this plan doesn't satisfy, then I don't know what will."²⁷⁰

For his part, the Prime Minister also assured Mulford four days earlier that plans for separating Indian nuclear facilities were at a "fairly advanced stage."²⁷¹ Press articles published in the days leading up to Saran's visit provide interesting albeit limited insights into the bargaining games between the MEA and the DAE to get their respective versions of the separation plan to be presented as the official Indian plan by the Prime Minister.

The Prime Minister's Office (PMO) seems to have required the DAE to prepare a "number of options and scenarios for the proposed separation, involving the inclusion and exclusion of different facilities."²⁷² The DAE designed all scenarios "to ensure two minimum outcomes: preserving the flexibility and robustness of the Indian strategic programme, and ensuring the long-term energy security of the country based on the

²⁷⁰Mulford, David. "Narayanan Bullish on India's Civil Nuclear Separation Plan." (December 16 2005), Accessed on February 26 2014.

<http://cablegatesearch.net/cable.php?id=05NEWDELHI9489&q=plan%20separation>

²⁷¹

Mulford, David. "Pm Singh Affirms Indian Nuclear Separation Plan at Advanced Stage." (December 12 2005). Accessed on February 26 2014.

<http://cablegatesearch.net/cable.php?id=05NEWDELHI9335&q=plan%20separation>

²⁷² Varadarajan, Siddharth. "Stage Set for Nuclear Separation Talks " *The Hindu* December 20 2005.

development of indigenous resources and technologies.”²⁷³ Simply put, the second outcome referred to the DAE’s determination to ensure its ability to continue with the indigenous three stage program even as it came up with scenarios to separate India’s nuclear infrastructure as directed by the PMO.

The scenarios would be put before the PMO which would choose the one that would drive the Indian team’s negotiating position.²⁷⁴ The Indian negotiating team included two members from the MEA, two members of the DAE and Foreign Secretary Saran.²⁷⁵ As scheduled, Saran “handed over a document specifying the underlying principles that will cover the proposed separation of India’s civil and military nuclear facilities”²⁷⁶ to his American counterparts upon arriving in Washington on December 21 2005.

Specific details of the separation scenarios prepared by the DAE and the final separation plan approved by the PMO and handed over to the US by Saran are not available (Leaked American diplomatic cables during this period are also silent about the details of the separation plan. Perhaps, Saran’s hand-delivering of the Indian separation plan to his American counterparts was intended to minimize any chances of its leaking to the media and the public).

The press commentary indicates that the DAE won the internal debate over the MEA and succeeded in convincing the PMO to adopt its unsafeguarded breeder plan (or a

²⁷³ Ibid

²⁷⁴ Ibid

²⁷⁵ Ibid

²⁷⁶ Varadarajan, Siddharth. "Make the Indo-U.S. Nuclear Deal More Transparent " *The Hindu*, 19 January 2005.

version of it with the breeder outside safeguards) as the final Indian plan. A December 19 2005 article by Indrani Bagchi, diplomatic editor for the *Times of India* indicated that the plan that was to be handed over to the US would retain the breeders outside safeguards.

By all accounts, India will not place its fast breeder reactor at Kalpakkam under safeguards. Despite scare scenarios being generated in India by homegrown nuclear pundits that India might be writing off its nuclear option, the plan shows that such fears are groundless.²⁷⁷

The *Indian Express* also reported that the fast breeder reactor program, some of the indigenously developed power reactors required to fuel the breeders, all facilities at the Bhabha Atomic Research Center and the uranium enrichment facilities off Mysore were kept out of safeguards.²⁷⁸ So how did the DAE manage to win the debate within the Indian state and what strategies did it deploy to convince the PMO to adopt its plan and sideline that of the MEA?

I suggest two scenarios. First, the MEA's position within the Indian state could have been weakened by the American insistence that India place a majority of its nuclear facilities under the much stricter permanent IAEA safeguards rather than the more lenient voluntary offer safeguards in November 2005. The watertight separation specified by the US could have strengthened the DAE's hand in the internal policy debate within the Indian state convincing the PMO to react to the American demand by presenting a maximalist separation plan with the breeder outside safeguards.

²⁷⁷Bagchi, Indrani. "N-Separation Plan Ready." *Times of India*, Dec 19, 2005.

²⁷⁸Bagla, Pallava. "Us Shifting Goalpost on N-Deal: Atomic Energy Chief." *Indian Express*, Feb 06, 2006.

Second, the US did not raise the issue of the breeders in a formal manner before the second round of talks and did not exert pressure on India to take a final call.²⁷⁹ Both American and Indian negotiators had modest expectations from the second round and did not expect to arrive at a final separation plan. The discussion at this stage seemed to focus more on the broad principles that would underlie the plan and less on the exact number and status of nuclear facilities.²⁸⁰ The absence of significant American pressure with respect to the breeders except occasional enjoinders (as evident in the leaked cables) could have created an unconstrained environment in which the PMO felt that it could get away with the DAE's maximalist unsafeguarded breeder plan.

The final Indian plan (the DAE's unsafeguarded breeder plan or a variant of it) was circulated amongst key American senators and representatives. Predictably, the response was that it was neither credible nor defensible.²⁸¹ They felt that the list of civilian facilities was very short and an unacceptably high number of them had been categorized as military (as might be expected with the unsafeguarded second stage PFBR's dependence on multiple unsafeguarded first stage PHWRs for fuel).²⁸² Saran's two day parleys concluded without both sides agreeing on the principles that would guide the Indian separation plan and the number of civilian facilities to be safeguarded.²⁸³

²⁷⁹ Varadarajan, Siddharth. "India, Iran and the Nuclear Challenge" *The Hindu*, 16 January 2006.

²⁸⁰ Varadarajan, Siddharth. "Make the Indo-U.S. Nuclear Deal More Transparent" *The Hindu*, 19 January 2005.

²⁸¹ Varadarajan, Siddharth. "Make the Indo-U.S. Nuclear Deal More Transparent." *The Hindu* January 19 2006.

Krishnaswami, Sridhar. "'India's N-Separation Plans Not Credible.'" (January 14, 2006), Accessed on February 26 2014. <http://www.rediff.com/news/2006/jan/14ndeal1.htm>

²⁸² Bagla, Pallava. "Breaking up (a Nuclear Program) Is Hard to Do." *Science* 311, no. 5762 (February 10 2006): 765-66

²⁸³ Haniffa, Aziz. "No Progress Made on Indo-US Nuclear Deal

A January 16 2006 article in *The Hindu* suggests that the US formally raised the issue of the breeders for the first time during the third round of talks and called on the Indian side to place them under safeguards.²⁸⁴ The American objective was twofold: deny India the ability to use the PFBR to produce fissile material for nuclear weapons by demanding its placement under permanent IAEA safeguards and drag multiple first stage PHWR's feeding the PFBR that would otherwise end up on the unsafeguarded military side to the civilian side.

New Delhi: As India and the United States concluded their third round of technical talks on the planned separation and safeguarding of Indian civilian nuclear facilities this week, the status of the country's fast breeder programme is emerging as a key obstacle to the conclusion of an agreement acceptable to both sides, *The Hindu* has learnt. According to sources familiar with the ideas exchanged by both delegations, the U.S. team, headed by Under-Secretary of State for Political Affairs Nicholas Burns, is unwilling to accept India's position that the fast breeder, as an R&D programme, will not be put on the list of civilian facilities that are offered up for safeguards and inspections by the International Atomic Energy Agency (IAEA). . . . Thursday's meeting here was apparently the first time the Indian side formally got to learn of America's insistence on safeguarding the 20-year old Fast Breeder Test Reactor (FBTR) and Prototype Fast Breeder Reactor (PFBR) at Kalpakkam, near Chennai.

" (December 23, 2005). Accessed on February 14 2014.

<http://www.rediff.com/news/2005/dec/23nddeal.htm>

²⁸⁴ Varadarajan, Siddharth. "India, Iran and the Nuclear Challenge" *The Hindu*, 16 January 2006.

Even as recently as December last, following the conclusion of the second round of talks, well-placed Indian officials told *The Hindu* that the breeder issue had never been raised by the American side.²⁸⁵

The DAE's representatives in the Indian negotiating team seem to have prevailed over the MEA on the issue of the breeders resulting in the failure of the third round of talks. Following the failure of the third round, a number of articles criticizing the DAE began to appear in India's agenda setting English language newspapers. Consider this stinging January 23 2006 editorial in the *Indian Express*.

The failure of the latest round of consultations between Foreign Secretary Shyam Saran and US Under Secretary of State Nicholas Burns last week has been blamed on DAE's reluctance to put its fast breeder programme on the civilian list. Forget the Americans for a moment. Indian public has a right to know the nature of the breeder programme — is it civilian or military? The DAE apparently wants it both ways: a peaceful facility with future military options. It is this twisted logic, backed by decades of political self-deception, that has landed India in a nuclear mess. It neither has a successful civilian nuclear power programme nor a purposeful weapons programme.²⁸⁶

K. Subrahmanyam, the doyen of the Indian strategic community also attacked the DAE for its "breeder isolationism." He questioned the DAE's national security rationale

²⁸⁵ Varadarajan, Siddharth. "Safeguards for Breeder Reactors a Key Obstacle." *The Hindu*, Jan 21, 2006.

²⁸⁶"Atomic Lethargy." *Indian Express*, Jan 23, 2006.

and its research autonomy rationale advanced by Kakodkar as justifications for the PFBR's retention on the military side of the separation plan.

One of the bogeys raised by those who want to mire India in the status quo of technology thralldom and prevent the Indo-US agreement on exceptionalisation from the NPT to go through is that this is an attempt to cap our credible minimum nuclear deterrent. This is not a valid argument since the agreement under discussion with the US will leave out of safeguards not only Dhruva (100 MW) and CIRUS (40 MW) plutonium production reactors but also a few more 200 MW pressurised heavy water reactors in the military sector.....Now in the agreement to be negotiated, some civil nuclear reactors will be left out of the safeguards and can be used exclusively for military production. Each one of them is of 200 MW, twice the capacity of Dhruva. Therefore, if there is a decision to accelerate the reaching of the minimum credible deterrent, the proposed agreement facilitates it.....When under the proposed agreement four times the capacity of Dhruva will be available or weapons production with at least two civil reactors categorised military, if we choose to, it is ridiculous to talk of attempts at capping of our arsenal..... India may succeed with its fast breeder and thorium-energy economy. That cannot be stopped by breeders coming under safeguards, though it may get slightly slowed down. On the other hand, if Indian breeder isolationism fails, India will be pushed back on nuclear energy development by several decades. We have paid very heavy costs for our over-confidence on India's R&D (research and

development). That mistake should not be allowed to be repeated. What is called for today is a politico-strategic judgement with professional risk evaluation on Indian nuclear breeders' future development under safeguards, free of safeguards and phased-in safeguards. Logically, our agreement with the US should provide for phased-in safeguards.²⁸⁷

Clearly, there was intense resentment in the MEA over the DAE's perceived obstructionism on the issue of the breeders that was preventing the former from clinching the separation plan and paving the way for India to access the broader strategic benefits from the US-India strategic partnership. However, the MEA was constrained from excoriating the DAE in public as such an open castigation would provide key insider information to the Americans regarding a massive split in the Indian bureaucracy. It would also give the Indian public the impression that the MEA was trying to browbeat the DAE into silence inviting criticism from nationalists of a sell-out to the US.

It is here that like-minded actors in the Indian media ecosystem such as newspaper editors and strategic thinkers became useful as conduits through which the MEA could badger the DAE. I am not suggesting that the MEA top leadership explicitly directed newspaper editors and strategic thinkers to take on the DAE. I am merely arguing that by identifying the DAE's obstructionism on the breeders as the reason for the failure of the third round of US-India negotiations through selective leaks to the media by unnamed 'high-level' sources, the MEA was creating the climate within which

²⁸⁷ Subrahmanyam, K. "N-Capping Fears Unreal-India Has to Have New Technology." *The Tribune*, January 24, 2006.
<http://www.tribuneindia.com/2006/20060124/edit.htm#4>

actors supportive of an accommodating Indian negotiating position in order to clinch the nuclear deal (and the strategic partnership) could go after the DAE.

Predictably, DAE scientists perceived the repeated attacks in the press as a systematic effort by the MEA to create a policy climate in which the Prime Minister's Office could accept the latter's safeguarded breeder plan as the official Indian separation plan to be presented to the US.²⁸⁸ The absence of any public clarification by the MEA and the continued silence of the Prime Minister's Office also seemed like a tacit endorsement of the criticisms leveled at the DAE in the press.

I suggest that the DAE surmised at this juncture of the debate that it was losing its influence in the policymaking process in an increasingly adverse policy climate whipped up by the articles in the press. The time had come to counter the MEA's indirect facilitation and tacit approval of attacks against the DAE by deploying or feeding information to its own allies in the media. Kakodkar gave an interview to the *Indian Express*, the same newspaper that had carried editorials lambasting the DAE on February 6, 2006. The interviewer was Pallava Bagla, a science journalist sympathetic to the DAE's position on the separation plan. Kakodkar began by dismissing accusations that the DAE was adopting an obstructionist stance preventing forward movement on the nuclear deal.

Pallava Bagla: The impression is that the DAE is kind of becoming a stumbling block.

²⁸⁸ Ibid

Dr. Anil Kakodkar: I think DAE is mandated to sort of implement the country's atomic energy programme in accordance with national policies. National policies include the country's strategic interest and energy interest. So obviously DAE has to act in a manner where both are protected. We cannot compromise one for the other. Finally the question is, somebody has to determine or somebody has to identify where this intermediate interface lies. And I think we have done a most objective exercise.

Kakodkar then elaborated on the all important reason for retaining the breeders outside safeguards.

Bagla: So will placing the fast breeder reactor programme on the civilian list and hence under safeguards hurt India's efforts at maintaining in perpetuity the 'minimum credible deterrent' while hurting its need for long-term energy security?

Kakodkar: Yes, there can be no doubts on that. Both, from the point of view of maintaining long-term energy security and for maintaining the 'minimum credible deterrent', the Fast Breeder Programme just cannot be put on the civilian list. This would amount to getting shackled and India certainly cannot compromise one (security) for the other.²⁸⁹

Recall Kakodkar's declaration in August 2005 that the PFBR should be placed on the unsafeguarded military side of the separation plan and his advancement of the

²⁸⁹"The Fast Breeder Programme Just Cannot Be Put on the Civilian List." *Indian Express*, Feb 08, 2006. <http://fissilematerials.org/library/kak06.pdf>
p 1-5

national security rationale (“only that which is clearly of no national security significance, only that part will be civilian”)²⁹⁰ and the research autonomy/proprietary concerns rationale (“we are not going to put any developmental programme under safeguards”)²⁹¹ as justifications.

The DAE had so far managed to maintain a carefully calibrated ambiguity over which of the two rationales was more salient and restricted itself to insisting that the breeder be retained on the unsafeguarded military side during the public debate over the separation plan from August 2005 to February 2006. The ambiguity was made possible by the lack of any substantial pressure on the DAE to clarify the exact reason underlying its stance.

However, that room for ambiguity had shrunk with the MEA’s indirect enabling of the newspaper critiques and was set to altogether disappear given President Bush’s upcoming visit to India in early March 2006. The DAE’s continued ambiguity over the primary reason behind not safeguarding the breeders risked its placement on the safeguarded civilian side of the plan by an MEA eager to advance the nuclear deal and a PMO determined to announce the consummation of the ‘star’ agenda item during President Bush’s visit. It is in this constrained environment that the DAE was forced to explicitly delineate the more operative/salient rationale underlying the demand for the breeders to not be safeguarded. Pushed into a corner, Kakodkar finally identified the

²⁹⁰ Ibid

²⁹¹ Ibid

national security rationale as the dominant reason for the breeder to not be safeguarded as the preceding excerpt demonstrates.

Further, Bagla's phrasing of the question ("So will placing the fast breeder reactor programme on the civilian list and hence under safeguards hurt India's efforts at maintaining in perpetuity the 'minimum credible deterrent' while hurting its need for long-term energy security?") using language so specific that it was virtually repeated by Kakodkar in his answer indicates that the question was probably 'planted' as part of an agreement between the two and the interview was merely a carefully contrived (and maybe even rehearsed) exercise in getting the information that Kakodkar wanted out to the public.

Kakodkar then went on to explicitly downgrade the research autonomy rationale that he had cited on par with the national security rationale in August 2005 as the reason why the breeder should be kept outside safeguards.

Bagla: What you are saying is that you could well be diverting plutonium out of the breeder for security interests?

Kakodkar: I am not saying that. I am saying the sequential stages are linked through the fuel cycle. The fuel cycle is for the same infrastructure which also feeds the strategic programme and I don't have such a big infrastructure that I divide this saying, ek beta ye aap ke liye, ek beta ye aap ke liye (I can't divide the family saying this son goes to this part, the second to the other)

Bagla: So it is not merely a question of you trying to protect your intellectual property...

Kakodkar: That is right. But intellectual property is also an issue. It is not IPR issue in the sense of patents rights or something..... It is like this. I want to do something new, I want to try out some new idea. Now if I am doing it without safeguards I simply do it. Now when you do R&D, you cannot be sure that if you started with a particular strategy, you will be successful. You may have to change. Now, if you have to do R&D with an inspector breathing or looking over your shoulder, you have to tell him, look this is the way I am going to do. Now after some time you change your idea, you do it differently, now how do I implement that new idea if I am bound by this old one? I have to go through the whole paper work all over again. I will spend all my time doing that paper work, rather than research. There is a more fundamental question. If I am treated as an advanced country, where is the compulsion for me to do it? I will do R&D in an autonomous manner, finished. I have separated a domain and whatever comes from outside is in that domain. It is subject to full inspection, (with) no diversion.

Bagla: It essentially means the breeder is out of the circuit of safeguards.

Kakodkar: Yes, breeder has to be out.

Bagla: Obviously it means some of our power reactors will be out of the circuit of safeguards as they're what are feeding into it.

Kakodkar: Yes, but that proportion is something...²⁹²

Finally, Kakodkar went on to explicitly clarify that he would not relent on the issue of the breeders.

Bagla: "Tomorrow, if a suggestion comes, Dr Kakodkar as chief of DAE and AEC, please put the breeder programme under safeguards, you'd have no qualms?"

Anil Kakodkar: No, I will say that this is not in our strategic interest."²⁹³

Kakodkar also received support from Dr. S. K. Jain, chairman and managing director of BHAVINI, a new subsidiary of the Department of Atomic Energy formed to handle the fast breeders. Jain argued that application of safeguards and intrusive IAEA inspections would slow down the movement of material in organizational premises and delay the fast breeder reactor program.²⁹⁴ Clearly, the DAE was so convinced of the necessity to retain the breeders outside safeguards on the military side that it was prepared to openly break ranks with the MEA and defy the PMO.

Kakodkar also received crucial support from several second coalition retired scientists on the issue of the breeders.

The Indo-US nuclear deal is getting more explosive with each passing day. Top Indian nuclear scientists and engineers are upset with PM

²⁹²"The Fast Breeder Programme Just Cannot Be Put on the Civilian List." *Indian Express*, Feb 08, 2006. <http://fissilematerials.org/library/kak06.pdf>

p 1-5

²⁹³ Ibid.

²⁹⁴"Nuke Scientists Support AEC Chief's Contention." (February 06, 2006). Accessed on February 19 2014. <http://in.rediff.com/news/2006/feb/06nuke.htm>

Manmohan Singh for buckling under US pressure to include more reactors in the civilian list."Our nuclear scientists and engineers are upset at these developments since such a thing has never happened before. On January 20, 2006, during a meeting at BARC (Bhabha Atomic Research Center), we had explored the possibility of dashing off a protest letter to the PM opposing the pressure tactics of the Americans," said P K Iyengar, ex-chairman of the Atomic Energy Commission. Supporting present AEC chief Anil Kakodkar, he recalled that the BARC meeting was attended by several retired nuclear scientists and engineers. On Tuesday, another former AEC chief, Homi Sethna, had expressed his support to Kakodkar saying the Americans were changing their goal posts. On Wednesday, Iyengar echoed the same concerns. "We are all very agitated that they are changing their goal posts, and we are extending our full support to Anil Kakodkar in this crucial matter, which involves the security of our country. He is absolutely right in saying that fast-breeder reactors can't be included in the civilian list because it would affect our strategic interests," Iyengar told TOI (Times of India). The other key voice in the debate has been that of former chairman of the Atomic Energy Regulatory Board A Gopalakrishnan. He has been quoted as saying that the Dhruva and Cirus reactors at BARC were crucial to the Indian strategic programme.²⁹⁵

²⁹⁵ Laxman, Srinivas. "Indian Nuke Scientists Go Ballistic" *The Times of India*, Feb 9, 2006. http://articles.timesofindia.indiatimes.com/2006-02-09/india/27812204_1_nuclear-scientists-and-engineers-barc-civilian-list

Siddharth Varadarajan, Strategic Affairs Editor of *The Hindu* summarized the repeated MEA-led attacks on the DAE, the resulting panic amongst its ranks and Kakodkar's decision to publicly emphasize the national security implications of the breeder.

For the past few weeks, the Department of Atomic Energy (DAE) has been the subject of a smear campaign orchestrated by those who feel the Indo-U.S. agreement on civil nuclear cooperation will unravel unless the country's nuclear scientists quickly fall in line....Following that meeting (third round of talks), a number of articles and reports appeared in several Indian newspapers attacking the DAE and its scientists for refusing to place the breeder programme under safeguards and for generally being obstructionist..... Whether or not there was a pattern in this media reportage, the scientists certainly saw one. Not surprisingly, they felt bitter and aggrieved. The DAE might have drawn up a number of separation options but the choice of which one to select and present to the U.S. last December had been taken at the very highest level. Indeed, once Foreign Secretary Shyam Saran presented those ideas to his counterpart in Washington, Undersecretary of State for Political Affairs Nicholas Burns, the plan formally became an "Indian" plan and was no longer the product of a single department or ministry. Until that point, everything was fine.....It was only after the U.S. side — following the January meeting in Delhi — began denouncing the Indian plan as "inadequate" and "indefensible from the non-proliferation perspective"

that the high-decibel campaign against the scientists began. After a period of dignified silence, the Department of Atomic Energy has now sought to clear the air.²⁹⁶

Predictably, the PMO was not pleased with Kakodkar's decision to openly break ranks with the government and challenge the MEA on the issue of the breeders. It initially sought to downplay Kakodkar's interview as a departmental perspective that was one of many inputs in the government's decision-making process on the nuclear deal.

With the strategic establishment endorsing the stand of domestic political opponents of the Indo-US nuclear deal, the government got into damage limitation mode. In what is seen as an effort to project the Atomic Energy Commission's stand against the deal as just a "departmental view", the government asserted that on such policy matters, inputs would be taken from various ministries and strategic institutions before taking a final call.²⁹⁷

A majority in the Indian strategic community that had adopted positions closer to that of the MEA was also not pleased with the public articulation of India's strategic interests by a departmental head. Dr. G. Balachandran, an expert on technology controls, tried to debunk the arguments of Kakodkar and Jain.

²⁹⁶ Varadarajan, Siddharth. "Question Mark over Indo-U.S. Nuclear Deal" *The Hindu*, February 7 2006.

²⁹⁷ "Govt Defends Us Nuclear Deal". *The Economic Times*, February 8 2006.

http://articles.economictimes.indiatimes.com/2006-02-08/news/27421994_1_nuclear-deal-civilian-list-minimum-credible-deterrent

...It is not clear how listing the FBR (fast breeder reactor) will have a bearing on “maintaining long-term energy security”. IAEA safeguards have no bearing on the direction or progress of any peaceful nuclear programme that a country may choose to follow. It is high time Kakodkar is asked to specify precisely the manner in which listing FBR as a civilian programme will compromise India’s “long-term energy security. He (Jain) is correct in saying that IAEA inspectors’ presence may be necessary when safeguarded fissile material is removed from the reactor. However, that requires only that India inform IAEA in advance of the move so that they can send an inspector. It does not mean that the IAEA can dictate when and if the move can be made..... Decisions like removing fissile material from reactors in substantial quantities are not taken on an impulse. They are planned well in advance and the subsidiary agreements can be negotiated to take into account such transfers. Therefore there is no substance to the charge that IAEA inspections will “dampen the progress.” Therefore, the political establishment must require the DAE to explain why it feels that the FBR is essential for providing fissile material for India’s minimum deterrence and how this cannot be met by keeping four or more pressurised heavy water reactors out of the civilian list instead of the FBR.²⁹⁸

However, the posturing of the PMO and the MEA allies was largely in vain. Kakodkar had cleverly gone public a few days before the Prime Minister was to address

²⁹⁸"On the Fast Breeder Programme, Begin a Civil Debate." *Indian Express*, Feb 10, 2006.

the Indian Parliament and lay out the final contours of the separation plan (including the status of the breeders) ahead of President Bush's visit to India in March 2006.

Kakodkar's statement made it very difficult for the Prime Minister to implement the *safeguarded breeder plan* as that would now be portrayed by the latter's opponents as a capitulation to American pressure. Dismissing Kakodkar for insubordination was also out of question as that would expose the MEA and the PMO to the barbs of critics of bending over backwards to appease the US.

Dr. Kakodkar's interview was calculated to press Prime Minister Manmohan Singh to exclude FBRs from the civilian list, along with all facilities at Mumbai's Bhabha Atomic Research Centre, the uranium enrichment plant near Mysore, and at least two power reactors..... Dr. Kakodkar has capitalised on this and tried to checkmate the PMO. He knows the PM cannot sack him without attracting the charge of acting under US pressure.²⁹⁹

A helpless PMO summoned Kakodkar for a meeting in which he was given a sermon about how he should have waited for the Prime Minister's statement and that the government's strategic policy was evolved by various groups including the National Security Council, Cabinet Committee on Security and the Strategic Policy Group.³⁰⁰

²⁹⁹Bidwai, Praful. "Deep Divisions on Fast Breeders-Nuclear Deal in Peril?" *The Daily Star*, February 15 2006.

<http://archive.thedailystar.net/2006/02/15/d60215020432.htm>

³⁰⁰"Govt Defends US Nuclear Deal." *The Economic Times*, Feb 8, 2006,.

"After Red Flag, Dae Chief Told: Let the Pm Speak ". *The Indian Express*, Feb 07, 2006.

Prime Minister Singh also asked B. K. Chaturvedi, Cabinet Secretary and a member of the AEC to mediate between Kakodkar and Saran and arrive at a joint position.

Sources said that at his meeting with Chaturvedi, Kakodkar explained his side of the story, indicating that he went public with his views partly because he was under constant pressure to explain the kind of separation plan (of civilian and military nuclear reactors) that would be credible for the US. The nature of separation, he's learnt to have said, will have to take this into consideration to ensure that it does not negatively impact the credible minimum nuclear deterrent. On the fast breeder reactor programme, Kakodkar again made it clear that India could not afford to put it on the civil list as it would not be in its strategic interests.³⁰¹

Interestingly, Kakodkar acknowledged that he was under "constant pressure" to clarify the final shape of the separation plan. Clearly, significant pressure had been brought to bear on him from within the DAE (by the management of IGCAR and BHAVINI led by Jain) and outside (by the retired scientists) as both cohorts had a vested interest in the continuation of the status quo.

The PMO finally capitulated. Prime Minister Singh categorically stated that the fast breeders were still in the R&D stage and would not go under safeguards in his speech to the Indian Parliament on February 27, 2006. The speech sounded the death knell for the MEA's safeguarded breeder plan and indicated India's adoption of a more

³⁰¹ "After Kakodkar Meets Pm, Cab Secy Steps In." *The Indian Express*, Feb 09, 2006.

conservative negotiating posture in the upcoming negotiations with the US over the separation plan.

We have made it clear that we cannot accept safeguards on our indigenous Fast Breeder Programme. Our scientists are confident that this technology will mature and that the programme will stabilize and become more robust through the creation of additional capability. This will create greater opportunities for international cooperation in this area as well.³⁰²

The Bush administration made a political concession when it accepted India's offer to leave the breeders outside safeguards. An agreement was clinched a couple of hours before President's Bush's first press conference on his maiden visit to India. The *Indian Express* summarized the key terms of the final arrangement.

The central Indian obligation under the July pact was to separate the civilian and military programmes and place the former under international safeguards. The question of separation boiled down to the number of power reactors that India would put on the civilian list. India has 15 operating power reactors and seven under construction. Out of this 22, what would India offer? Would it be 10, 12, 14, 16, or 18? India's initial offer was barely 10 and the US, apparently, started at 18. The two sides have reportedly settled for 14. That precisely was the

³⁰²Text of Suo-Motu Statement Made by Prime Minister Manmohan Singh on Civil Nuclear Energy Cooperation with the United States in Parliament ". (February 27 2006). Accessed on February 26 2014. <http://www.hinduonnet.com/thehindu/nic/suomotuu.htm>

figure the national security adviser of the NDA government, Brajesh Mishra, had offered to put under safeguards in 2002. Equally exaggerated were the fears on putting the fast breeder programme under international safeguards. But once the UPA government conceded DAE's demand, the Bush administration took a political decision to leave the Prototype Fast Breeder Reactors outside the civilian list.³⁰³

Thus, India's final separation plan can be understood as a variant of the DAE's unsafeguarded breeder plan.

³⁰³ "In Each Other We Trust." *Indian Express*, March 03, 2006

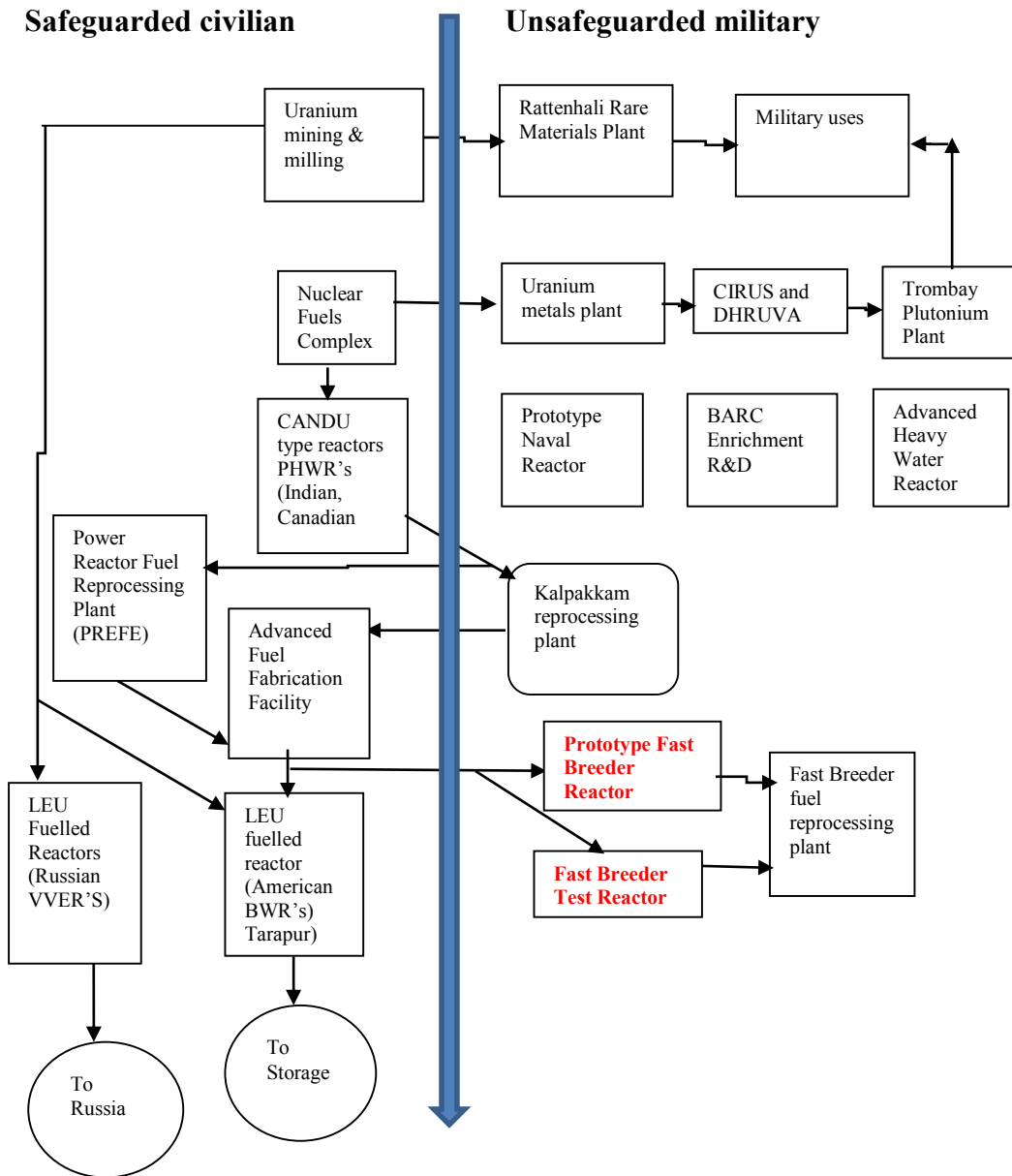


Figure 6: India's Final Separation Plan: A variant of the unsafeguarded breeder plan

Sources: Adapted from Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views."

Congressional Research Service, December 22 2006. P 7

Dr. Frederick Mackie, Lawrence Livermore National Laboratory

A small minority in India has argued that the entire debate over the breeders was orchestrated by the Indian government (although the documentary record and interviews do not support their allegations). Brahma Chellaney, an influential strategic thinker alleged that the Indian government stage-managed the debate over the breeders in order to divert attention from the sheer scale of the compromises that it was forced to make under the separation plan.

...India has gradually expanded the number of facilities it is sacrificing — from the “one or two” that the Vajpayee government offered to Dr. Singh’s furtive, incremental increases now totalling 37. To deflect attention from the gravity of what Dr. Singh was preparing to do, the government earlier this year actually orchestrated a public charade on the fast-breeder programme to take credit for “saving” the tiny experimental breeder and the under-construction prototype breeder (which together, according to US National Security Adviser Stephen Hadley, have “very limited capability”).³⁰⁴

³⁰⁴ Chellaney, Brahma. "India Capped " (May 20, 2006). Accessed on February 3 2014. <http://www.nuclearbharat.com/nuclear-bharat-data/other-issues-2006/110606.htm>

Dr. K. P. Vijaylakshmi, Associate Professor at the Center for Canadian, US and Latin American Studies at the Jawaharlal Nehru University in New Delhi also hinted that Kakodkar's public insubordination in February 2006 may have been part of a scripted performance in order to convince American negotiators into believing that Prime Minister Singh really had no room to make concessions on the breeders.

....do you think that the government at that level will not have a word.. I mean Anil Kakodkar is part of the government. This might have been a part of the agreed signaling that one does in a delicate sensitive subject such as this. Where you want to tell the United States, that look here, these are the no go zones. Don't go there. Okay? Never mind if I look like as if I'm a little angry with the government (inaudible) doesn't matter, but he might have been instructed to do so. Let me put it as bluntly as that. I don't know. I am not saying it. I have no clue, why.. what made that statement come? We were all puzzled as well because you would imagine that he's part of the negotiating team, he writes the negotiating positions, so why would he have to give this interview?..... It could be that he was worried that the direction of the negotiations were tending to compromise some of our indigenous things which only he was in a position to understand. And therefore he felt you know his own institutional pressures worked on him powerfully, because it's also not to be forgotten that the DAE is not just Mr Kakodkar, whole host of you know lot of subsidiary organizations and individuals. So the pressure from his own chaps also will be there. They might have told him that look where're you going with this? You know. Don't sit there and forget

about this..... You know such an important matter would have been conveyed to the PM (Prime Minister) in my view.³⁰⁵

The work on boundary objects by Star and Griesemer provides an interesting vantage point to understand the role of the nuclear deal in fast-tracking US-India relations. At the broadest level, the DAE's victorious unsafeguarded breeder plan (and more broadly the nuclear deal itself) can be understood as a boundary object that helped bring into greater alignment the overlapping yet differing strategic interests of the US and Indian elites. The plan managed to iron out the key misalignment in US-India relations following India's first nuclear test in 1974 that combined with Cold War-era strategic differences and India's inward focused socialist economy to hamper broad and sustained cooperation.

As a boundary object, the plan occupied different meanings for US and Indian elites or 'mainstream' relevant social groups. For American strategists, the plan was the technical component of a key enabling initiative (nuclear deal) that would pave the way for a strategic partnership with India, the largest and most important of the four "swing states" (the other three being Brazil, Indonesia, and Turkey)³⁰⁶ including deepening

³⁰⁵ Interview with Dr. K. P. Vijaylakshmi, Professor at Jawaharlal Nehru University. April 13 2010.

³⁰⁶ Richard Fontaine and Daniel Kliman of the National Bureau of Asian Research explained the concept of a swing state in an interview with Sonia Luthra.

"Global swing states are nations that possess large and growing economies, occupy central positions in a region or stand at the hinge of multiple regions, and embrace democratic government at home. Increasingly active at the regional and global level, they desire changes to the existing international order but do not seek to scrap the interlocking web of global institutions, rules, and relationships that has fostered peace, prosperity and freedom for the past six decades. In U.S. foreign policy, a focus on these nations can deliver a large geopolitical payoff because their approach to the international order is more fluid and open than that of more established powers like China or Russia. In addition, the choices they make—about whether to

economic engagement, big-ticket defense sales, defense technology cooperation, sale of nuclear reactors, counterterrorism collaboration, space cooperation, joint democracy promotion missions and higher education collaboration.

For Indian establishment relevant social groups, the plan was a key step that had to be completed to the satisfaction or at least reluctant acquiescence of the US in order to secure myriad benefits including access to foreign fuel and reactors, space technologies, high-end defense platforms, ‘mil-to-mil’ cooperation and increased access to American capital.

The passage of the nuclear deal, the boundary object (or a series of boundary objects consisting of the July 2005 joint statement, the March 2006 separation plan, the December 2006 Hyde Act, the August 2007 123 agreement and the December 2008 final congressional ratification of the agreement) and the resulting increase in the alignment of US and Indian elite interests ushered in a period of warmth in US-India relations not witnessed since the early 1960’s when the Kennedy administration’s efforts to help a desperate India with military equipment during the 1962 Sino-Indian border conflict

take on new global responsibilities, free ride on the efforts of established powers, or complicate the solving of key challenges—may, together, decisively influence the course of world affairs. Due to their mixed orientation and potentially outsized impact, these nations resemble swing states in the U.S. domestic context.”

Luthra, By Sonia. "India as a "Global Swing State": A New Framework for U.S. Engagement with India an Interview with Richard Fontaine and Daniel Kliman" (July 22, 2013). The National Bureau of Asian Research. Accessed on February 26 2014.
<http://www.nbr.org/research/activity.aspx?id=354>

resulted in a brief improvement in otherwise frosty relations. The period from 2008 to 2010 was widely considered as the ‘honeymoon’ phase in US-India relations with cooperation expanding in numerous domains including counterterrorism, defense sales, economic trade, higher education cooperation and Afghanistan. President Obama hosted Prime Minister Singh for his first State Dinner and also addressed the Indian Parliament during his maiden visit to India in 2010. He also conveyed the importance of US-India relations in remarks before the US-India Business Council on November 8 2010.

I believe that the relationship between the United States and India will be one of the defining and indispensable partnerships of the 21st century.³⁰⁷

Although the separation plan and the nuclear deal succeeded in elevating US-India relations to a ‘new normal,’ they did not bring about the revolution that was promised by the optimists on both sides. The relationship has weakened significantly since 2010 due to various reasons including the American inability to sell nuclear reactors in India due to a liability legislation enacted by the Indian Parliament, India’s rejection of American fighter aircraft for a multibillion dollar contract, persisting differences over Indian petroleum imports from Iran, uncertainty in India over the US exit strategy in Afghanistan, continued Indian frustration with US aid to Pakistan, concerns in the US pharmaceutical sector regarding the Indian policy of compulsory licensing of life-saving generic drugs by striking down patents, the arrest and strip search

³⁰⁷ "Remarks by the President to U.S.-India Business Council and Entrepreneurship Summit." *The White House-Office of the Press Secretary* (November 08 2010). Accessed on May 16 2014. <http://www.whitehouse.gov/the-press-office/2010/11/08/remarks-president-us-india-business-council-and-entrepreneurship-summit>

of Indian Consul General (New York) Devyani Khobragade by US Marshals and the dramatic slowdown in the Indian economic growth rate from around 8% to 4.5%.

To summarize, the boundary object called the nuclear deal did indeed succeed in bringing US and Indian elite interests in greater alignment but has failed to make congruent Indian strategic interests with that of the US (as many in Washington had expected in early 2005).

Conclusion

A constructivist analysis of the debate over the idea of separation and the status of the breeders in the separation plan throws up interesting insights. It demonstrates the range of arguments for and against the idea of separation and the wide gulf between two powerful bureaucracies within the Indian state over the status of the PFBR. A key insight from the DAE-MEA debate is that the latter's safeguarded breeder plan was identical to the American baseline plan in terms of the PFBR's status and that it could have become the final Indian separation plan but for Kakodkar's public intervention.

Another interesting feature of the debate in India is the complete absence of the Indian military, a powerful relevant social group from public discussions (although it was asked by the Prime Minister to formulate a separation plan in joint consultations with other groups including the DAE). An extensive search of the documentary record including leaked American diplomatic cables did not yield any information in this regard for the period under consideration (July 2005-March 2006). A tentative conclusion would be that the Indian military either played a completely private role in the articulation of India's nuclear policy or was a marginal player at this stage of the debate.

The first public statement by the Armed Forces was made a little later in December 2006 when it came out in support of US domestic waiver legislation (the Hyde Act amending the Atomic Energy Act of 1954 to exempt India and authorize President Bush to negotiate a bilateral 123 agreement -see Chapter 3) and declared that the clauses in the Act would not adversely affect India's strategic capability. The position of the military was opposite to that of the DAE and the retired scientists. Clearly, the statement by the hitherto silent Armed Forces was at the instigation of the PMO in order to counteract the credibility of the serving and retired scientists by pitting them against the military, another institution with public credibility (indicating the PMO's reluctance to accommodate the scientists as it did earlier during the debate over the breeders in early 2006). Notice how the Armed Forces expressed their support for the Act but were careful in identifying the political establishment (read PMO) as the final arbiter of India's nuclear policy unlike the DAE that insisted on the salience of its judgment claiming intimate knowledge of matters nuclear.

On the eve of the nuclear deal debate in Parliament (in December 2006 in the aftermath of the passage of the Hyde Act) Prime Minister Manmohan Singh has some good news. The Armed Forces have concluded that the legislation, passed by the US Congress, does not in any way hinder India's strategic capability. While the top services brass is still reading the fine print of the Henry J Hyde US-India Peaceful Atomic Energy Cooperation Act, internal discussions within the Chiefs of Staff Committee and the Defence Ministry support the deal as they are convinced that India's nuclear capability will not take a hit. The military

establishment believes that it is up to India's political establishment to accept or reject the Henry Hyde Act as the US Congress and not Parliament has passed it. After discussing the US legislation at the highest levels, the tri-service top brass expects Washington to take care of Indian concerns over the legislation in the bilateral 123 Agreement. The assessment of the military establishment is that Bush administration is as keen as the Manmohan Singh government on civilian nuclear trade and that the deal is a milestone in the already expanding Indo-US cooperation in high technology areas including defence. In the internal discussion, the top brass argued that even at the height of Cold War, Russians (Soviets) were never allowed to set foot into any Indian defence establishment. So it is up to the government to decide the level of engagement with the Americans in the nuclear field. The military's view, which is contrary to the Indian nuclear establishment, is understood to have been conveyed to the UPA government.³⁰⁸

The distrust in successive political leaderships regarding military involvement in the formulation of strategic policy (and of the military top brass in general)³⁰⁹ out of

³⁰⁸Gupta, Shishir. "Nuke Deal Gets Armed Forces Backing" *The Indian Express*, December 17 2006. Available at

http://expressindia.indianexpress.com/story_print.php?storyId=18773

³⁰⁹ "Bureaucracy 'Cooked up' Troop Movement Row: Ex-Army Chief Gen V K Singh". *The Times of India*, February 25, 2014. Available at

<http://timesofindia.indiatimes.com/india/Bureaucracy-cooked-up-troop-movement-row-Ex-Army-chief-Gen-V-K-Singh/articleshow/30964579.cms>

Pubby, Manu. "Lt-Gen a K Choudhary: 'Troop Movement Should've Been Avoided If They Knew (V K Singh's) Court Date'

" *The Indian Express*, February 21, 2014. Available at:

<http://indianexpress.com/article/india/india-others/troop-movement-shouldve-been-avoided-if-they-knew-v-k-singhs-court-date/>

concern that such a role would reverse the balance of civil-military relations (as has happened regularly in neighboring Pakistan) and the determination of India's nuclear scientists to be the final arbiter in matters nuclear seems to have relegated the military to a peripheral role in nuclear policy formulation only to be trotted out to rubber stamp pre-approved political positions and settle intra-state policy squabbles.

CHAPTER 3: THE INTERSECTION OF THE DEBATE OVER THE IRAN-PAKISTAN-INDIA (IPI) PIPELINE AND THE US-INDIA NUCLEAR DEAL

Introduction

Chapter 3 focuses on the period from March 2004 to February 2006 and attempts to provide a fine-grained description of the origin, evolution and intersection of the debate over the US-India nuclear deal with that of the IPI pipeline in India using concepts from the Science and Technology Studies (STS) literature. I rely on a careful review of the documentary record, semi-structured interviews and leaked American diplomatic cables released by *Wikileaks*.

The chapter is divided into four parts. The first part begins with a brief summary of the political setup in India following the 2004 national elections which persisted throughout the period under consideration. The second part of the chapter examines the convoluted history of the IPI pipeline, a multibillion dollar project that would transport Iranian natural gas through Pakistan to India in an overland pipeline. The idea of the pipeline was conceived in 1989 but the initiative was repeatedly delayed by the volatile relationship between India and Pakistan. I deploy Bijker's concept of *relevant social groups* from the Social Construction of Technology (SCOT) approach and the allied concept of *relevant social individuals* developed in Chapter 2 in order to focus on key individuals (and groups) in India that supported the pipeline and the meanings that they imparted to the initiative.

I modify Bijker's concept of a *technological frame* by combining it with insights from political science and international relations to obtain the concept of a *technopolitical frame* in order to better capture the political profiles of individual and collective actors while retaining the core organizing strength of the technological frame concept with respect to technology. I use the concept of a technopolitical frame to organize the regional cooperation strategy and its reliance on modern pipeline technology and natural gas to reshape the South Asian energy, economic and political milieu into a *regional cooperation frame*. The IPI pipeline can be understood as the most important and advanced element of the frame.

The third part of the chapter briefly moves way from the India-centric focus of the previous two sections and begins by accounting for the multiple factors that resulted in a major US strategic reorientation towards India in mid-March 2005. The factors included the preexisting support of Secretary of State Condoleezza Rice and her two associates for a long-term US-India strategic partnership that was motivated by geopolitical and economic considerations, President Bush's determination to transform US-India relations, the Pentagon's increasing interest in cementing a robust defense partnership, the appointment of Rice and her associates to key State Department positions in early 2005 and the barriers encountered by them in increasing high-technology trade with India due to US non-proliferation legislation. The centerpiece of the much broader framework for US-India cooperation that arose as a result of the strategic reorientation was a nuclear deal that would legitimize Indian nuclear weapons and dismantle the three decade-old

non-proliferation laws and technology denial regime thereby paving the way for a resumption of nuclear, space and high-technology (defense technology) cooperation.

I use the concept of a technopolitical frame and organize the new “decisively broader” strategic framework conceived by Rice and her two associates into a *global partnership frame*. The frame consisted of several components including global and regional security dialogues, defense cooperation and coproduction, WMD (Weapons of Mass Destruction) proliferation, space collaboration and increased economic engagement. I suggest that the nuclear deal can be understood as the centerpiece of the global partnership frame.

The fourth and final part of the chapter tracks the shift in the stance of two key previous backers of the pipeline and the regional cooperation frame in favor of the nuclear deal and the global partnership frame.

Background

I begin the first part of the chapter with a brief overview of the political dispensation and the broader energy milieu in India around 2004-05 that provides the context to understand the renewed Indian push for the long-delayed IPI pipeline and the actors that played a role in the subsequent debate.

The results of the national elections held in 2004 for India’s 545 member Lok Sabha (lower house of parliament) came as a surprise to political analysts expecting then Prime Minister Atal Behari Vajpayee’s Hindu nationalist Bharatiya Janata Party (BJP)-

led National Democratic Alliance (NDA) coalition government to win a second term.³¹⁰ The BJP could manage only 138 seats and the NDA's total tally was a disappointing 185 seats.³¹¹ The secular Congress Party led by Sonia Gandhi emerged as the single largest party with 145 seats and benefited from strong performances by its allies in the United Progressive Alliance (UPA) to wrest 217 seats.³¹²

Gandhi declined the Prime Minister's post in order to neutralize BJP leaders who repeatedly attacked her Italian origins during the fierce pre-election campaign and threatened to intensify their agitation in case Gandhi became Prime Minister.³¹³ She nominated Dr. Manmohan Singh, an academic economist credited with introducing reforms as finance minister in 1991 that liberalized India's socialist economy, triggering rapid though unequal economic growth.^{314 315}

³¹⁰ Kronstadt, K. Alan. "India's 2004 National Elections." edited by Congressional Research Service, July 12, 2004. p 2, 6.

³¹¹ Rediff.com. "Lok Sabha Elections 2004: Results at a Glance." (2004), <http://www.rediff.com/election/ls04detail.htm#cong>.

Kronstadt, K. Alan. "India's 2004 National Elections." edited by Congressional Research Service, July 12, 2004. p 6.

Rediff.com. "India Votes 2004." (2004), <http://specials.rediff.com/election/poll04.htm>

³¹² Rediff.com. "Lok Sabha Elections 2004: Results at a Glance." (2004), <http://www.rediff.com/election/ls04detail.htm#cong>

Kronstadt, K. Alan. "India's 2004 National Elections." edited by Congressional Research Service, July 12, 2004. p 6.

Rediff.com. "Lok Sabha: Verdict 2004" (2004), <http://specials.rediff.com/election/2004/may/17kbkls.htm>

³¹³ "Bjp Demands Debate on Foreign Origin Issue." *The Times of India*, April 18 2004.

Rediff.com. "'Foreign Origin' Will Continue to Be an Issue: Bjp" (May 13, 2004), <http://www.rediff.com/election/2004/may/13bjp5.htm>

³¹⁴"Sonia Gandhi Steps Aside." *The New York Times*, May 19 2004.

"Sonia Gandhi Turns Down India Pm Role." (May 19 2004), <http://www.dailymail.co.uk/news/article-303265/Sonia-Gandhi-turns-India-PM-role.html> .

"Sonia Gandhi." <http://timesofindia.indiatimes.com/topic/Sonia-Gandhi>

³¹⁵ Gandhi remained the president of the Congress party and was elected as the chairperson of the UPA making her the most powerful politician in the country. Her decision to remain party president while nominating Singh as Prime Minister raised interesting questions about the actual distribution of power between the two. One view is that the Gandhi-Singh diarchy functioned in "perfect harmony" with the former being in charge of political affairs and not interfering in the latter's governance responsibilities. A

A key ally that helped the UPA attain a simple parliamentary majority (272 seats) required to form the government was the Left front, an alliance of four communist parties that managed its best ever performance (62 seats) on the back of smashing victories in its traditional bastion of West Bengal and the southern state of Kerala.³¹⁶ The Left agreed to extend outside support to the UPA based on a 24 page “Common Minimum Programme,” a political contract that outlined the latter’s “main priorities, policies and programmes.”³¹⁷ The Left conditioned its continued support on the UPA government’s adherence to the common goals set forth in the Common Minimum Program.

Another political formation that further bolstered the UPA’s strength in Parliament was the Samajwadi (Socialist) Party, an independent regional party that depended heavily on the support of Muslims and farmers in the politically crucial north Indian state of Uttar Pradesh. The Samajwadi Party managed the fourth highest tally of

more critical view was that “Dr Singh is shouldering responsibilities without real power and Sonia Gandhi has power without responsibility.”

"Upa Drift in Second Term Has Congress in Tailspin." *India Today*, June 30, 2011

Malhotra, Inder. "Woes of Diarchy." *Deccan Chronicle*, June 15 2011.

Bhambhri, C P. "Do We Have a Prime Minister?" *The Economic Times*, January 21 2006.

"Untenable Mr Prime Minister ". *Organiser*, March 20 2011.

"Pm Good, Sonia Creating Problems!" *Hindustan Times*, May 29, 2011.

³¹⁶ Rediff.com. "India's Lok Sabha Elections 2004: Results at a Glance." (2004),

<http://www.rediff.com/election/ls04detail.htm#cong>

Kronstadt, K. Alan. "India's 2004 National Elections." edited by Congressional Research Service, July 12, 2004. p 6.

Rediff.com. "Lok Sabha: Verdict 2004" (2004), <http://specials.rediff.com/election/2004/may/17kbkls.htm>

³¹⁷ "National Common Minimum Programme of the Government of India

". (May 2004), <http://pmindia.nic.in/cmp.pdf>, p 24

Prasad, K.V. "Upa, Left Parties Release Cmp " *The Hindu*, May 28 2004

Staff, Reporter. " Left Support for Upa Based on Cmp' " *The Hindu*, April 27 2006.

36 seats³¹⁸ and supported the UPA from the outside without being a part of the government like the Left Front.³¹⁹

The outside support provided by the Left and the Samajwadi Party resulted in the UPA government securing 315 seats in Parliament, comfortably over the number required for a simple majority. The continued support of the Left in particular was crucial as its withdrawal would reduce the UPA government to a minority. The importance of the Left's continued support to the survival of Prime Minister Singh's UPA government gave the former an important voice on key economic and foreign policy issues through the common minimum program and periodic UPA-Left coordination committee meetings.

The communist Left's influence was noticeable in the less enthusiastic stance of the UPA government towards the US in the Common Minimum Program as compared to the previous NDA government that actively sought a strategic partnership. The compromise document was clear that "even as it pursues closer engagement and relations with the USA, the UPA government will maintain the independence of India's foreign policy position on all regional and global issues."³²⁰ The political contract also indicated

³¹⁸ Rediff.com. "India's Lok Sabha Elections 2004: Results at a Glance." (2004),

<http://www.rediff.com/election/ls04detail.htm#cong>.

Kronstadt, K. Alan. "India's 2004 National Elections." edited by Congressional Research Service, July 12, 2004. p 6.

Rediff.com. "Lok Sabha: Verdict 2004" (2004), <http://specials.rediff.com/election/2004/may/17kbkls.htm>.

³¹⁹"Mulayam Flays Upa Govt's Foreign Policy." *The Times of India*, November 7 2005.

Khan, Atiq. "Sp Props up a Kurmi Novice against Sonia." *The Indian Express*, April 14 2006.

Rediff India Abroad,. "Samajwadi Party May Walk out of Upa." (

July 02, 2006), <http://www.rediff.com/news/2006/jul/02upa.htm>

³²⁰ "National Common Minimum Programme of the Government of India

". (May 2004), <http://pmindia.nic.in/cmp.pdf>. p 22-23

that “traditional ties” with West Asia (Middle East) would be given a “fresh thrust” but refused to provide specifics (e.g. policies towards Iran).

I briefly describe the fragmented institutional architecture to manage energy in India. Energy planning in India was the responsibility of several ministries that lacked an overarching national energy policy until 2006. Moreover, the intersection of energy with geopolitics also brought in the foreign policy bureaucracy (Ministry of External Affairs) further complicating the energy policy formulation process. The energy planning infrastructure at the national level is shown in Figure 7.

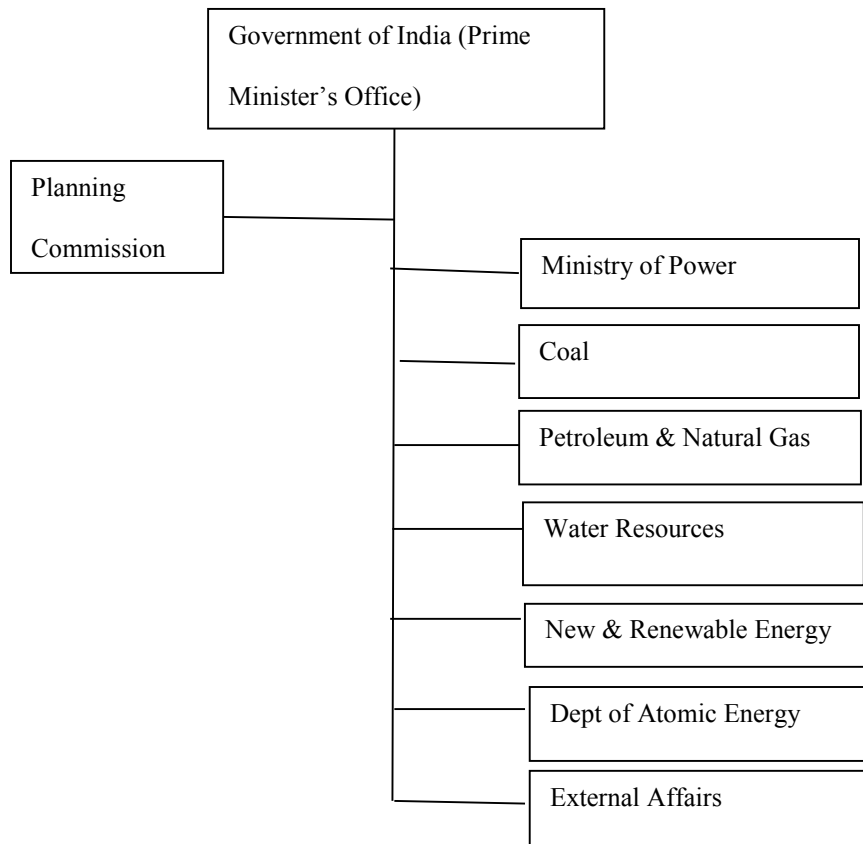


Figure 7: India's energy planning institutional architecture

Source: International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf p 451

Sharma, Devika. "Energy in India's National Security Strategy." (December 2010), http://www.idsa.in/nationalstrategy/eventDec10/WP_DevikaSharma.pdf p 7

The increase in demand for energy in India is the result of the country's rapid economic expansion that began with piecemeal reforms of its quasi socialist economy in the 1980's.³²¹ India's gross domestic product (GDP) expanded at an average annual rate

³²¹Panagariya, Arvind. "India in the 1980s and 1990s: A Triumph

of 5.7 % per annum in the 80's.³²² The growth rate accelerated to 6.1% per year in the decade from 1992-2002³²³ after the more "systematic and systemic" liberalization of the economy by then Prime Minister P. V. Narasimha Rao and finance minister Manmohan Singh³²⁴ as compared to 3.5 percent in the first three decades following independence in 1947.^{325 326} India's total primary energy demand increased from 209 Mtoe (million tons of oil equivalent) in 1980 to 537 Mtoe in 2005.³²⁷ India was the world's sixth largest energy consumer as of 2001 and accounted for 3.5% of global commercial energy demand.³²⁸ In 2007, the International Energy Agency (IEA) predicted that India would become the third largest energy consumer after China and the United States by 2030.³²⁹ Coal provided 39% of India's primary energy in 2005.³³⁰ Although the contribution of

of Reforms." (2004),

http://www.newschool.edu/uploadedFiles/TCDS/Democracy_and_Diversity_Institutes/Panagariya_India%20in%2080s%20and%2090s.pdf, p 5

³²² Planning, Commission. "Tenth Five Year Plan 2002-2007 Volume I Dimensions and Strategies." (December 21 2002), http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume1/10th_vol1.pdf, p 2

³²³ Arvind, Panagariya. "The Triumph of India's Market Reforms: The Record of the 1980s and 1990s." no. 554 (November 7, 2005), <http://www.cato.org/pubs/pas/pa554.pdf> p1

³²⁴ Panagariya, Arvind. "India in the 1980s and 1990s: A Triumph of Reforms." (2004),

http://www.newschool.edu/uploadedFiles/TCDS/Democracy_and_Diversity_Institutes/Panagariya_India%20in%2080s%20and%2090s.pdf p 5

³²⁵ Arvind, Panagariya. "The Triumph of India's Market Reforms: The Record of the 1980s and 1990s." no. 554 (November 7, 2005), <http://www.cato.org/pubs/pas/pa554.pdf> p1

³²⁶ GDP growth had begun to accelerate earlier and averaged 5.7% after piecemeal reforms were undertaken in the 1980's but accelerated further after 1991

Planning, Commission. "Tenth Five Year Plan 2002-2007 Volume I Dimensions and Strategies." (December 21 2002), http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume1/10th_vol1.pdf p 2

³²⁷ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf, p 444

³²⁸ Ibid

Energy and Resources Institute. "International Conference on "Biofuels 2012 – Vision to Reality"." (October 17-18 2005), http://www.teriin.org/index.php?option=com_events&task=details&sid=136

³²⁹ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf p 465

³³⁰ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf, p 444

Biomass declined from the 1980's, it still supplied 29% of total demand while oil accounted for 25%³³¹ and natural gas supplied 5%.³³²

The installed capacity of the Indian power sector at the beginning of the Planning Commission's Ninth Five Year Plan (1997-2002) was 84,893 MW (excluding 902 MW of wind capacity)³³³ that included 61,012 MW (71.86%) from thermal power plants, 21,568 MW from hydropower (25.40%) and 2,225 MW (2.62%) from nuclear power plants.³³⁴ Increasing demand and huge transmission losses due to power theft and the inability of loss-making state electricity boards to recover bills and invest in improvements³³⁵ resulted in peak deficits of 18% at the beginning of the Ninth Plan.^{336 337}

338

³³¹Ibid. p 445

³³² Ibid. p 445

³³³ Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 901

³³⁴ Ibid

³³⁵ In 2006, about 42% of the power supplied to New Delhi was unaccounted for (consumed without payments) due to widespread power theft. For comparison, transmission losses in China were a mere 3% around the same period.

Gregory, Mark. "India Struggles with Power Theft " (March 15 2006),

<http://news.bbc.co.uk/2/hi/business/4802248.stm>

³³⁶Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 902

³³⁷ In response, the Plan envisaged an ambitious capacity addition target of 40,245 MW but could manage only 19,015 MW (47%) taking the total installed capacity to 104917.50 MW in March 2002. The peak deficit was slightly lower at 12.6% due to improved Plant Load Factor (PLF) of thermal plants and lower than anticipated demand at the end of the Plan period. The Tenth Five Year Plan (2002-2007) assumed that commercial energy demand would grow at 6.6% per year during the Plan period and aimed at a capacity addition target of 46,939 MW.

Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes."

http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 901, 902, 760, 897

Planning, Commission. "Tenth Five Year Plan 2002-2007 Volume I Dimensions and Strategies."

(December 21 2002), http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume1/10th_voll.pdf p 2

³³⁸ The peak deficits were also a result of India's excessive focus on baseload generating plants and not enough peaking generation.

Conversations with Dr. M. V. Ramana, Associate Research Scholar in the *Program on Science and Global Security*, Woodrow Wilson School of Public and International Affairs, Princeton University.

Coal remained the dominant source, accounting for about 70% of electricity output^{339 340} while the share of hydropower declined to 14% in 2005.^{341 342} Domestic natural gas that was originally intended as petrochemical feedstock and for fertilizer production but was increasingly being used to generate electricity accounted for 10% of total installed capacity while nuclear power remained stagnant at 2.8%.³⁴³ The rest was supplied by renewables. The growing importance of natural gas in India's energy mix was clear to Dr. Rahul Tongia, a Senior Systems Scientist and Professor V.S. Arunachalam of the Carnegie Mellon University as early as 1999.

Natural gas has emerged as the fuel of choice for various uses.....A large proportion of upcoming IPP (Independent Power Producer) projects in India are expected to be based on natural gas (or an equivalent fuel capable of firing a gas turbine), far more than the availability of natural gas would suggest.....The capital costs have fallen during the nineties to about \$ 425/kW for overnight construction costs, which is about half that

³³⁹ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iaa.org/textbase/nppdf/free/2007/weo_2007.pdf p 445

Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 777

³⁴⁰ India has the third largest coal reserves in the world

International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iaa.org/textbase/nppdf/free/2007/weo_2007.pdf p 444-445

³⁴¹ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iaa.org/textbase/nppdf/free/2007/weo_2007.pdf p 445

³⁴² India's has substantial hydropower potential. However large projects have been stalled as a result of public resistance movements.

Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 761

³⁴³ Ibid p 762-63

of coal-based power plants. The two-year construction time is also very rapid, twice as quick as for coal plant.^{344 345}

The previous NDA government was also aware of the trajectory of increasing natural gas dependence and directed the Ministry of Petroleum and Natural Gas to release a roadmap (The Hydrocarbons Vision- 2025) in 2000 that laid down the “framework which would guide the policies relating to the hydrocarbons sector for the next 25 years.”³⁴⁶

The roadmap predicted that the role of natural gas would increase from 15% of total energy supply in 2001-02 to 20% in 2024-25 making it the fastest growing fossil fuel.³⁴⁷ It identified natural gas as the “preferred fuel of the future in view of it being an environmental friendly economically attractive fuel and also a desirable feedstock.”³⁴⁸

The roadmap also provided concrete estimates of rising demand through 2030. The demand estimates are reproduced in Table 5.

Table 5: Natural Gas demand in million standard cubic meters per day (mmscmd).

Years	Demand
1999-2000	110
2001-2002	151
2006-2007	231
2011-2012	313 ³⁴⁹

³⁴⁴ Arunachalam, Rahul Tongia & V. S. "Natural Gas Imports by South Asia: Pipelines or Pipedreams?" *Economic and Political Weekly* 34, no. 18 (May 1-7 1999): 1056.

³⁴⁹ As of April 2012, India's natural gas demand was 176 million standard cubic meters per day (mmscmd) Malik, Aman. "Imported Natural Gas May Fuel Power, Fertilizer Production" *Livemint*, April 22 2012. .

2024-2025	391
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Source: Report of the Sub-Group on development and utilization of natural gas (1999)

Ministry of Petroleum and Natural Gas. "India Hydrocarbon Vision- 2025 ", petroleum.nic.in/vision.doc

The roadmap noted that the present domestic gas availability (65 mmscmd) was inadequate to meet rising demand and recommended increased domestic production, imports and switching to liquid fuels.³⁵⁰ Indeed, a tripling of the domestic production from 12 bcm (billion cubic meters) per year in the early 1990's to 32.20 bcm in 2005-06³⁵¹ was not able to meet demand that rose faster from 11.9 bcm to 34.8 bcm during the

<http://www.livemint.com/Politics/zuHKPosqmeQ4oGH9zQGOLJ/Imported-natural-gas-may-fuel-power-fertilizer-production.html>

³⁴⁶ Ministry of Petroleum and Natural Gas. "India Hydrocarbon Vision- 2025 ", petroleum.nic.in/vision.doc p 1

³⁴⁷ Ministry of Petroleum and Natural Gas. "India Hydrocarbon Vision- 2025 ", petroleum.nic.in/vision.doc

³⁴⁸ Ministry of Petroleum and Natural Gas. "India Hydrocarbon Vision- 2025 ", petroleum.nic.in/vision.doc p 3

Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf (p 762-763)

Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): p.660.

³⁴⁹ As of April 2012, India's natural gas demand was 176 million standard cubic meters per day (mmscmd) Malik, Aman. "Imported Natural Gas May Fuel Power, Fertilizer Production" *Livemint*, April 22 2012. .

<http://www.livemint.com/Politics/zuHKPosqmeQ4oGH9zQGOLJ/Imported-natural-gas-may-fuel-power-fertilizer-production.html>

³⁵⁰ Ministry of Petroleum and Natural Gas. "India Hydrocarbon Vision- 2025 ", petroleum.nic.in/vision.doc Jackson P. M. et al. "The Future of Natural Gas in India: A Study of Major Consuming Sectors."no. 65 (October 2007), http://iis-db.stanford.edu/pubs/21994/Jackson_WP65_India_gas.pdf p 3

Corbeau A. S. "Natural Gas in India-Working Paper." (2010), http://www.iea.org/textbase/nppdf/free/2010/natural_gas_india_2010.pdf p 5

See also:

Planning Commission- Government of India. "Integrated Energy Policy: Report of the Expert Committee " (August 2006).

http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf p 27

Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 772

³⁵¹ Ministry of Petroleum & Natural Gas. "Basic Statistics on Indian Petroleum & Natural Gas." (2010-11), <http://petroleum.nic.in/petstat.pdf> p 8

same period.³⁵² India's total natural gas reserves (proven and estimated) increased to 1101 bcm in 2005³⁵³ with the majority of finds (787 bcm) located offshore³⁵⁴ but were still not sufficient to meet demand over the medium and long term.

The increasing requirement for natural gas imports and India's growing oil import dependence³⁵⁵ led the UPA government to promise in the Common Minimum Program that it would enhance overseas investments in the hydrocarbon industry and formulate an integrated energy policy.³⁵⁶ Transnational pipelines³⁵⁷ from neighboring gas-rich countries (Iran, Turkmenistan and Myanmar) to India that were economically and

Press Trust of India. "India, Iran to Discuss Gas Pipeline Deal." *Business Standard*, January 7, 2005.

International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf. p 444

³⁵² International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf. p 444

³⁵³ Gas, Ministry of Petroleum & Natural. "Basic Statistics on Indian Petroleum & Natural Gas." (2010-11), <http://petroleum.nic.in/petstat.pdf>. p 8

³⁵⁴ "Ministry of Petroleum and Natural Gas- Government of India." <http://petroleum.nic.in/ng.htm>

³⁵⁵ India has only 0.4% of the world's proven reserves of crude oil (as against 2.8% of the world's consumption). Domestic oil production has been stagnant since the 90's and recoverable reserves at the beginning of 2001 were estimated at a meager 733.70 million tonnes (mt) of crude. Meanwhile, imports (90 million tons) nearly doubled from 44% of total primary oil consumption in 1990 to 70% in 2005 in order to meet the rising demand from the transportation sector and accounted for 3% of world supply at a cost of \$18.36 billion. The Tenth Plan estimated that import dependence was likely to increase to 94% in order to meet the demand of 5.6 million barrels a day by 2030.

Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes." http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 762, 765

International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf p 445-446

The Energy and Resources Institute. "International Conference on "Biofuels 2012 – Vision to Reality"." (October 17-18 2005), http://www.teriin.org/index.php?option=com_events&task=details&sid=136

³⁵⁶ "National Common Minimum Programme of the Government of India". (May 2004), <http://pmindia.nic.in/cmp.pdf> p 22

³⁵⁷ Tongia and Arunachalam proposed a Trans-Asia Pipeline System that could supply gas to India (and Pakistan) from one of four potential suppliers (Turkmenistan, Iran, Qatar and Oman) and concluded that the system's "techno-economic viability appears straightforward" as early as 1999.

Arunachalam, Rahul Tongia & V. S. "Natural Gas Imports by South Asia: Pipelines or Pipedreams?" *Economic and Political Weekly* 34, no. 18 (May 1-7 1999) p 1054, 1057

technically feasible but had long been stalled by security and political factors assumed a new importance for the UPA government.³⁵⁸

The Iran-Pakistan-India pipeline (hereafter referred to as the “IPI pipeline”) was the most important of the transnational pipelines considered by India. It was first proposed in 1989 and would enable India to access cheap piped natural gas from Iran’s giant South Pars field via Pakistan, the transit country. Even preliminary negotiations on the project were held up due to tense India-Pakistan relations and periodic US opposition. The pipeline is the focus of the first half of this chapter and I describe the convoluted story of its origins, route, stagnation and vital role in strengthening the Iran-India strategic partnership in detail later in the chapter.

The Turkmenistan-Afghanistan-Pakistan-India pipeline (hereafter referred to as the “TAPI pipeline”) was a \$7.6 billion, 1050 mile pipeline that was first proposed in 1995.³⁵⁹ It would carry 33 bcm of gas from Turkmenistan’s vast Dauletabad gas field³⁶⁰ through Afghanistan and Pakistan into northern India³⁶¹ The project was in limbo due to the deteriorating security situation in Afghanistan throughout the nineties, the American

³⁵⁸ Planning Commission. "Tenth Five Year Plan 2002-2007 Sectoral Policies and Programmes."

http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf p 762-63

Corbeau, Anne-Sophie. "Natural Gas in India-Working Paper." (2010),

http://www.ica.org/textbase/nppdf/free/2010/natural_gas_india_2010.pdf p 6

Mulford, David. "For Secretary Bodman from Ambassador Mulford " (March 9 2005),

https://www.wikileaks.org/plusd/cables/05NEWDELHI1824_a.html

³⁵⁹ Daly, C.K.J. ""Collateral Damage" from Afghan Turmoil -- the Tapi Pipeline." *Huffington Post*, March 21 2012

"Energy Information Administration-India." (Nov. 21, 2011), <http://www.eia.gov/cabs/india/Full.html>

³⁶⁰ Although estimates of Turkmenistan’s gas reserves vary, it was among the ten countries with the largest natural gas reserves as of 2004.

Gleason, G. "Turkmenistan's Neutrality and Russia's New Southern Policy " *Eurasia Daily Monitor* Vol 1 no. 120 (November 3, 2004).

"Turkmenistan Facts." (2012), <http://travel.nationalgeographic.com/travel/countries/turkmenistan-facts/>

³⁶¹ Daly, C.K.J. ""Collateral Damage" from Afghan Turmoil -- the Tapi Pipeline." *Huffington Post*, March 21 2012

military intervention after 9/11³⁶² and India's volatile relations with Pakistan. The TAPI pipeline is geopolitically significant as it would make Central Asian gas available to the South Asian region via an overland pipeline for the first time.³⁶³

³⁶²Ahmad, Talmiz. "Advantages of Transnational Gas Pipelines" *The Hindu*, Apr 24, 2006

"Energy Information Administration-India." (Nov. 21, 2011), <http://www.eia.gov/cabs/india/Full.html>

³⁶³ Ahmad, Talmiz. "Advantages of Transnational Gas Pipelines" *The Hindu*, Apr 24, 2006

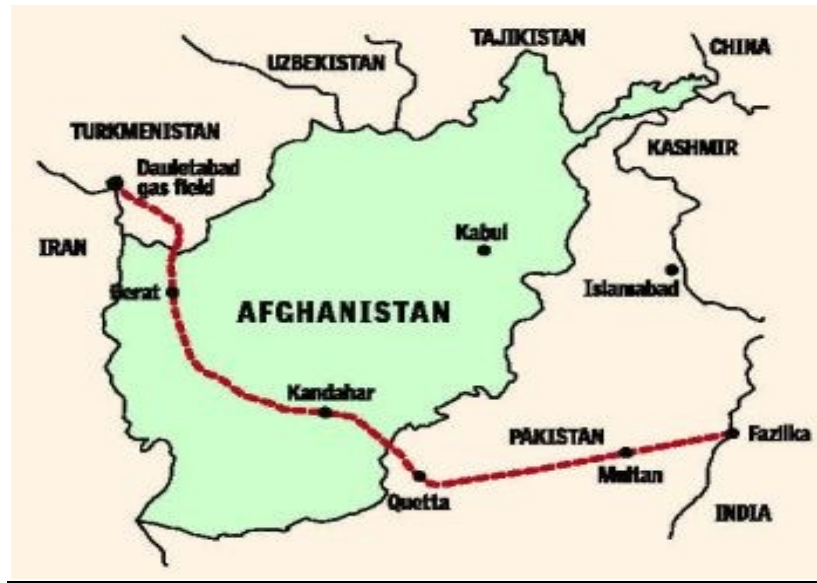


Figure 8: The Turkmenistan-Afghanistan-Pakistan-India pipeline (TAPI pipeline)

Source: Balakrishnan, Bhaskar. "Tapi Pipeline — More Than Just Gas" *The Hindu*, Oct 01, 2010.

The Myanmar-Bangladesh-India pipeline (hereafter referred to as the “MBI pipeline”) was initially proposed by Mohona Holdings Limited, a private Bangladeshi company in 1997.³⁶⁴ Major investments by Indian companies in Myanmar’s (formerly known as “Burma”) hydrocarbon sector by early 2000 led India to actively study the feasibility of a pipeline from Myanmar via Bangladesh.³⁶⁵ The \$1 billion, 181 mile pipeline would carry gas from Shwe in the Arakan (Rakhine) province of Myanmar³⁶⁶ to the Indian states of Mizoram and Tripura in the north-east and then to the city of Kolkata

³⁶⁴ Chandra, Varigonda Kesava. "The Pipeline That Wasn't: Myanmar-Bangladesh-India Natural Gas Pipeline " *Journal of Energy Security* (April 19 2012).

³⁶⁵ Ibid

³⁶⁶ Myanmar’s recoverable reserves were estimated at 2.46 trillion cubic meters in 2004.

Fong-Sam, Yolanda. "The Mineral Industry of Burma." (2004), <http://minerals.usgs.gov/minerals/pubs/country/2004/bmmyb04.pdf> p 6.3

in West Bengal via Bangladesh.³⁶⁷ The project was shelved due to India's fraught relations with Bangladesh and internal opposition within the latter.



Figure 9: The Myanmar-Bangladesh-India (MBI) pipeline.

Source: The Irrawaddy. <http://www2.irrawaddy.org/articlefiles/4325-ShweMap.gif>
Chandra, Varigonda Kesava. "The Pipeline That Wasn't: Myanmar-Bangladesh-India Natural Gas Pipeline" *Journal of Energy Security* (April 19 2012)

The domestic shortfall of natural gas in the face of growing demand (especially in the power sector) and the inability to rapidly execute transnational pipeline projects led India to consider more expensive Liquefied Natural Gas (LNG) imports via ships.^{368 369}

³⁶⁷Srivastava, Siddharth. "

India, Bangladesh Look to Turn a Corner" *Asia Times*, January 16, 2010.

Rediff.com. "Now an Indo-Myanmar Gas Pipeline

" (November 29, 2004), <http://www.rediff.com/money/2004/nov/29pipeline.htm>

³⁶⁸ Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project:

Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): p 660.

³⁶⁹ Natural gas when subjected to intense pressure and cooling becomes liquid at -162 degrees Celsius and is known as Liquefied Natural Gas (LNG). It is liquefied to enable its transportation between countries in large volumes using specially designed ships.

The additional cost of LNG imports as compared to piped gas resulted from the massive investments required to build transportation containers and regassification terminals on India's west coast.³⁷⁰ India began importing LNG from Qatar in February 2004³⁷¹ that met 17% of its total gas demand as of 2005.³⁷² In June 2004, India also considered procuring LNG from Iran after the latter offered a price (\$2.22 per million British thermal unit-mbtu) lower than that charged by Qatar (\$2.53 per mbtu) along with a 20% stake in the Husseinieh-Khush oil field.³⁷³

The dismal state of affairs with regards to progress on transnational pipelines began to change in the first half of 2004 following the appointment of Mani Shankar Aiyar as India's Minister for Petroleum and Natural Gas.

Theory

A summary of the theoretical framework adopted in Chapter 2 provides the background for the framework deployed in Chapter 3. My objective in chapter 2 was to understand the complex debate in India over the idea of separation of India's nuclear infrastructure and the safeguarded (civilian) or unsafeguarded (military) status of the breeder reactors in the separation plan. Towards this end, I borrowed from the literature

R.N. Malik and Mukesh Gupta, "Interstate Gas Network-Self-Sufficiency of Gas in India." *The Tribune*, March 4 2004.

Arunachalam, Rahul Tongia & V. S. "Natural Gas Imports by South Asia: Pipelines or Pipedreams?" *Economic and Political Weekly* 34, no. 18 (May 1-7 1999): 1057

³⁷⁰ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf, p 453

³⁷¹ International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf, p 445-46

"Energy Information Administration-India." (Nov. 21, 2011), <http://www.eia.gov/cabs/india/Full.html>.

³⁷² International Energy Agency. "World Energy Outlook 2007- China and India Insights." (2007), http://www.iea.org/textbase/nppdf/free/2007/weo_2007.pdf, p 445

³⁷³"Iran Offers Cheaper Lng Than Qatar." *Business Standard*, June 29,2004.

in the Science and Technology Studies (STS) field and used the concept of *relevant social groups*³⁷⁴ and the modified notion of *relevant social individuals* from the Social Construction of Technology (SCOT) approach in order to understand the meanings assigned by social groups and individuals to the idea of separation. The concepts helped to represent the debate over the idea of separation as a triangular contest between a first coalition that favored nuclear separation, a second coalition that was opposed to it and a third coalition that intermittently opposed separation while advancing radical alternatives. I tabulated the relevant social groups that comprised the three coalitions and juxtaposed the arguments of contending relevant social groups and individuals from the first, second and third coalitions.

In Chapter 3, I jettison the three-coalition framework developed in chapter 2, retain the concept of relevant social groups and relevant social individuals and more intensively deploy the latter in order to capture the role of key individuals in pushing the IPI pipeline and the nuclear deal.

I then adopt Bijker's concept of a *technological frame* developed further by other STS scholars and fuse the concept with frameworks from political science, international relations and ideas from media studies to develop the concept of a *technopolitical frame*. The concept helps to organize the IPI pipeline, the nuclear deal, the relevant social individuals and groups pushing them and the respective cooperation frameworks that eventually coalesced around the rival initiatives into contending technopolitical frames.

³⁷⁴ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 74-75

³⁷⁵ It also helps to better capture the political affiliations of the relevant social individuals and groups pushing the rival initiatives.

Wiebe E. Bijker explains that a technological frame acts as a bridge between the “social interactionist and semiotic views of technological development” and is helpful in “transcending the distinction between hitherto irreconcilable opposites: the social shaping of technology and the technological impact on society, social determinism and technical determinism, society and technology.”³⁷⁶ It is a broad concept that comprises “all elements that influence the interactions within relevant social groups and lead to the attribution of meanings to technical artifacts—and thus to constituting technology.”³⁷⁷

Bijker argues that a technological frame is built up when interaction “around” an artifact begins³⁷⁸ and “needs to be sustained continuously by actions and interactions.”³⁷⁹ The concept “structures the interactions among the actors of a relevant social group. Thus it is not an individual’s characteristic, nor a characteristic of systems or institutions; technological frames are located between actors, not in actors or above actors.”³⁸⁰ He reckons that technological frames “provide the goals, the ideas, and the tools needed for action. They guide thinking and interaction. A technological frame offers both the central problems and the related strategies for solving them. But at the same time the building up of a technological frame will constrain the freedom of members of the relevant social

³⁷⁵ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p. 196

³⁷⁶Ibid

³⁷⁷ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p. 123

³⁷⁸ Ibid

³⁷⁹Ibid p. 193

³⁸⁰Ibid p. 123

group. A structure is being created by actions and interactions. Within a technological frame not everything is possible anymore (the structure and tradition aspect), but the remaining possibilities are relatively clearly and readily available to all members of the relevant social group (the actor and innovation aspect).”³⁸¹ In other words, the “ongoing interactions with an artifact, within and between relevant social groups, results in the creation of a technological frame that bounds the attributions of meanings by relevant social groups.”³⁸²

Bijker used the concept to challenge traditional linear historical accounts of the search for a truly synthetic plastic material that described it as a four decade long process culminating in the invention of Bakelite by Leo Henricus Arthur Baekeland, a brilliant inventor who worked alone. Instead, he asked how Baekeland succeeded where numerous chemists with access to the same resources failed.³⁸³ Bijker’s core argument was that Baekeland’s work cannot be labeled as purely scientific, technical, social or economic but must be understood as a collection of heterogeneous activities. The explanatory concept of a technological frame comprising knowledge, goals, values and artifacts captured this heterogeneity.³⁸⁴

Bijker began by describing the widespread perception among nineteenth century chemists of an imminent natural plastics scarcity due to their exotic location and technological advances (vulcanization of rubber) that gave rise to new relevant social

³⁸¹Ibid p. 192

³⁸² Ibid p. 282

³⁸³ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 101

³⁸⁴ Ibid p 272

groups favoring industrial applications.³⁸⁵ He concentrated on three variants (Parkesine, Ivoride and Celluloid) that attempted to solve the scarcity problem and create an artificial plastic by trying to modify nitrocellulose.³⁸⁶

Bijker's motive behind describing the stories of the three variants was to sketch the cultural background, describe the relevant social groups that later became involved in the social construction of Baekelite and highlight common problem solving strategies (e.g. finding the right solvent to temper the flammability of nitrocellulose) that can be observed during the forty year search.³⁸⁷ He argued that Parkesine did not generate a technological frame because the interactions around it ended quickly. The interactions around Celluloid increased its stability and were accompanied by the emergence of a relevant social group of Celluloid chemists. "The continuing interactions of these chemists gave rise to and were structured by a new technological frame."³⁸⁸ Ivoride failed because its inventors could not maintain uniform quality.³⁸⁹

Bijker used the concept of a technological frame to capture the diverse activities of the relevant social group of celluloid chemists and their common patterns of thinking in order to produce the first man-made plastic.³⁹⁰ The activities included trying to alter celluloid's production process to utilize its flammability and development of new applications, searching for cheaper raw materials, trying to harness the phenol-

³⁸⁵ Ibid p 105-106

³⁸⁶ Ibid p 106, 110

³⁸⁷ Ibid p 115

³⁸⁸ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 123

³⁸⁹ Ibid p 107-109

³⁹⁰ Ibid p 122-123

formaldehyde condensation reaction and promising a fully synthetic plastic.³⁹¹ Celluloid succeeded to a certain extent but could not solve the problem of flammability of nitrocellulose that was seen as important by several relevant social groups.³⁹² The elements that Bijker considered in the technological frame of Celluloid chemists included “goals, key problems, problem solving strategies (heuristics), requirements to be met by problem solutions, current theories, tacit knowledge, testing procedures, and design methods and criteria.”³⁹³ He concluded that the “social construction of an artifact (e.g. Celluloid), the forming of a relevant social group (e.g. celluloid engineers) and the emergence of a technological frame (e.g. the Celluloid frame) are linked processes.”³⁹⁴

Bijker pointed out that Baekeland was able to adopt different problem solving strategies than the ones employed by celluloid chemists as his prior involvement (research) in electrochemical studies in Berlin and consultancy in United States (Niagara Falls) resulted in his successive socialization in the ‘thinking cultures’ of the relevant social group of photochemists and electrochemists. The successive socializations resulted in Baekeland’s acquisition of elements from the photochemist technological frame and later the electrochemist technological frame.³⁹⁵ The acquisition of the elements from the two frames endowed him with a specific research style (e.g. systematic investigation of

³⁹¹Ibid

³⁹² Ibid p 114

³⁹³Ibid 123

³⁹⁴ Ibid p 193

³⁹⁵ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 141-143

all variables) that was different from that of the celluloid chemists and enabled him to think “outside the box.”³⁹⁶

Bijker proposes the concept of *inclusion* in a technological frame to better explain the implications of Baekeland’s simultaneous membership in different relevant social groups and technological frames for his research style. The degree of inclusion of an actor in a technological frame “indicates to what extent the actor’s interactions are structured by that technological frame. If an actor has a high degree of inclusion, this means that she thinks, acts, and interacts to a large extent in terms of that technological frame. It is expected that actors who are contemporaneously member of different relevant social groups will have different degrees of inclusion in the associated technological frames.”³⁹⁷ Baekeland’s high degree of inclusion in the photochemist and electrochemist technological frames resulted in his thinking being influenced to a large extent by the two frames that emphasized understanding all the possible variables in a reaction instead of chemical analysis (the research style of celluloid chemists).³⁹⁸

Bijker concludes by using the concept of *stabilization* to describe the social construction of the artifact Bakelite. He describes the processes that led to the gradual “condensation” or increasing fixity of one specific meaning of the artifact *bakelite* that followed a series of four temporary and unstable *bakelites*.³⁹⁹

³⁹⁶ Ibid p 127, 133

³⁹⁷ Ibid p 143

³⁹⁸ Ibid p 144-145

³⁹⁹ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p 151

I also draw from a paper by Aibar and Bijker (1997) that focused on a town planning controversy and deployed a more refined version of the concept of technological frames to understand, analyze and organize the debate that developed around the extension plan (Cerda plan)⁴⁰⁰ for Barcelona city designed by Ildefons Cerda, a Catalan civil engineer and former progressive deputy in the Spanish Parliament.⁴⁰¹ The authors considered town planning as a form of technology and the city as a giant artifact.⁴⁰²

Different relevant social groups such as Cerda, city council, the Spanish government, civil engineers, architects and land owners participated in the debate and assigned different meanings to the extension.⁴⁰³ The authors highlighted center-state tensions (Ministry of Development vs City Council)⁴⁰⁴ and interministerial clashes (Home Ministry vs Ministry of Development) over jurisdictional issues stemming from professional rivalries (Architects vs Civil engineers).⁴⁰⁵ Two rival interpretations (technological frames) of the extension were built up by the interaction within and between various relevant social groups.⁴⁰⁶ The authors referred to them as the *engineer's frame* and the *architect's frame*.⁴⁰⁷ They began by reconstructing the engineer's frame using the Cerda plan as an exemplary artifact.⁴⁰⁸ The key problems in this frame were the unhygienic conditions, narrow roads and traffic congestion that prevented rapid

⁴⁰⁰ Bijker, Eduardo Aibar and Wiebe E. "Constructing a City: The Cerda Plan for the Extension of Barcelona." *Science, Technology, & Human Values* 22, no. 1 (1997). p 3,6.

⁴⁰¹ Ibid. p. 7

⁴⁰² Ibid. p 6

⁴⁰³ Ibid p 10

⁴⁰⁴ Ibid p 7

⁴⁰⁵ Ibid p 7-10

⁴⁰⁶ Ibid p 13

⁴⁰⁷ Ibid

⁴⁰⁸ Ibid

development of the city. Theories of hygiene,⁴⁰⁹ a capitalist developmental model of unlimited growth based on the growth of cities, the centrality of science and technology as a basis for government policy and the importance of new relevant social groups (engineers and hygienists) in society were key assumptions that underpinned the design of the Cerda plan.⁴¹⁰ The engineer's frame proposed an unlimited extension and serious reform of the old city with large number of expropriations as a solution to the aforementioned problems.⁴¹¹

On the other hand, the architect's frame ignored the traffic and hygiene problems articulated by the engineer's frame.⁴¹² The frame aimed to reduce expropriation, maintain private property, preserve the hierarchical layout of the old city and its bourgeois-proletariat divide.⁴¹³ The frame and its resulting extension plan favored building social differences into the city in order to maintain the elite-poor divide and urban control.⁴¹⁴ The purpose of the extension plan was to augment and not replace the old city.⁴¹⁵

A third less apparent frame that was built around the emerging working-class movement intermittently manifested itself through riots and protests.⁴¹⁶ The *working class frame* adopted strategies such as appropriation of streets-inside and beyond the working class areas in a challenge to the hierarchical class structure of the city, attacking

⁴⁰⁹ Ibid

⁴¹⁰ Bijker, Eduardo Aibar and Wiebe E. "Constructing a City: The Cerda Plan for the Extension of Barcelona." *Science, Technology, & Human Values* 22, no. 1 (1997). p 14

⁴¹¹ Ibid p 13

⁴¹² Ibid p 14

⁴¹³ Ibid

⁴¹⁴ Ibid

⁴¹⁵ Ibid p 13

⁴¹⁶ Ibid

traditional institutions of social control such as police stations and erecting barricades in order to impede the mobility of the bourgeoisie's capitalist city.⁴¹⁷

The authors conclude that the structure of the debate between relevant social groups that supported rival technological frames for control over the extension of Barcelona is in accordance with Bijker's third configuration of the model for sociotechnical change. The outcome of the contest between powerful relevant social groups backing equally powerful technological frames was an initial inability to reach consensus and the eventual resort to rhetorical mechanisms to reach a compromise.⁴¹⁸ In other words, no side decisively won the battle. The Royal Decree of 1860 was the compromise solution (or an "amortization of vested interests" in Bijker's language). It approved the Cerda plan's layout of streets and blocks, ignored his economic plans and building bylaws and entrusted the city council to deal with those issues.⁴¹⁹

Modern Barcelona's architecture incorporates elements from both the engineer's frame and architect's frame. It has mobility and traffic as well as a hierarchical layout and high-building density. The completion of only the first stage of the extension process and the interruptions caused by the insurrections from the workers serves as evidence for the presence of the working class frame.⁴²⁰

A study by Ibsen (2009) that employed a refined version of the concept of technological frames (and the theory of two-party democracies from the political science

⁴¹⁷ Bijker, Eduardo Aibar and Wiebe E. "Constructing a City: The Cerda Plan for the Extension of Barcelona." *Science, Technology, & Human Values* 22, no. 1 (1997). p 15

⁴¹⁸ Ibid p 16

⁴¹⁹ Ibid p 17

⁴²⁰ Ibid p 19

field) to focus on the commercial aircraft manufacturing industry duopoly dominated by Boeing and Airbus also provides the theoretical background for my study. Ibsen investigated why Boeing's version of fly-by-wire technology gave pilots ultimate authority over the aircraft's flight computer whereas the opposite was true in the Airbus version.⁴²¹ Both corporations moved from older mechanical flight control systems to fully computerized fly-by-wire technology around the same time.⁴²² Ibsen reckoned that the two versions of fly-by-wire technology were the cornerstones of two different technological philosophies that resulted from ideological alliances between the corporations and different relevant social groups.

Airbus perceived its version of fly-by-wire technology as the future technological norm.⁴²³ It forged a new alliance with the relevant social group of airlines, made their pilots capable of operating its flight control system and incorporated the system in every successive model (fleet commonality) thereby locking in its customer base.⁴²⁴ In other words, Airbus's flight control system was the cornerstone of a broader "technological frame of dependence"⁴²⁵ that was designed to cater to the needs of the relevant social group of airlines and maintain their support.⁴²⁶

⁴²¹Ibsen, Alexander Z. "The Politics of Airplane Production: The Emergence of Two Technological Frames in the Competition between Boeing and Airbus." *Technology in Society* 31, no. 4 (November 2009).p 342

⁴²² Ibid p 342-343

⁴²³Ibsen, Alexander Z. "The Politics of Airplane Production: The Emergence of Two Technological Frames in the Competition between Boeing and Airbus." *Technology in Society* 31, no. 4 (November 2009).p 348

⁴²⁴Ibid p 347-348

⁴²⁵Ibid p 345

⁴²⁶ Ibid

On the other hand, Boeing's "technological frame of accommodation"⁴²⁷ adhered to the technological norm that already existed. The corporation forged an alliance with pilots by designing its planes with flight control systems that resembled and even artificially mimicked older mechanical control systems. Boeing's planes gave the ultimate authority to the pilot over the computer.⁴²⁸ Boeing's successive models also incorporated similar technology but the benefits went to the relevant social group of pilots and not airlines.⁴²⁹

The debate during the period under consideration in this chapter includes many actors with a strong political background pushing initiatives such as the IPI pipeline and the nuclear deal that have a significant technical component. Although Bijker's concept of a technological frame is useful in organizing the rival initiatives, supporting actors, and the respective cooperation frameworks into contending technological frames, its basic orientation is more geared towards capturing the role of actors with a technical background (e.g. engineers, scientists etc).

I modify the concept of a technological frame in order to increase its elasticity, enabling it to capture the political profiles of individuals and groups that pushed for the pipeline and the nuclear deal respectively without losing the core ability of the concept to organize rival initiatives, individual and collective actors supporting them and the respective cooperation frameworks that developed around the initiatives into contending

⁴²⁷Ibid p 347

⁴²⁸ Ibid p 348

⁴²⁹ Ibid

frames.⁴³⁰ I draw from insights in the political science/international relations field and fuse them with ideas from media studies to develop the concept of a technopolitical frame.

The Essence of Decision: Explaining the Cuban Missile Crisis authored by Graham T. Allison and Philip Zelikow in 1999 had a major impact in the areas of political science and international relations. The book was an update of the 1972 classic bearing the same name published by Allison, then associate professor at Harvard University that transformed the aforementioned fields.

The original book had advanced three conceptual models (Model I, II and III) to examine and explain puzzles in foreign affairs by deploying the models to analyze the central puzzles of the Cuban Missile Crisis from different angles. The updated version published in 1999 responded to the criticisms of the original book leveled by prominent scholars in the intervening years by sharpening the theoretical models and revisiting the preexisting evidence on the Cuban Missile Crisis to draw new conclusions. The updated version also incorporated recently declassified material from the US and the Soviet archives to explain President John F. Kennedy's decision to impose a naval blockade and Soviet leader Nikita Khrushchev's motivations in positioning missiles in Cuba.⁴³¹

⁴³⁰ Bijker, Wiebe E. *Of Bicycles, Bakelites, and Bulbs: Towards a Theory of Sociotechnical Change*. Cambridge Massachussets: MIT Press, 1997. p. 196

⁴³¹ Ikenberry, G. John. "Essence of Decision: Explaining the Cuban Missile Crisis, 2nd Ed Graham T. Allison and Philip Zelikow" *Foreign Affairs* (May/June 1999).
<http://www.foreignaffairs.com/articles/54845/g-john-ikenberry/essence-of-decision-explaining-the-cuban-missile-crisis-2nd-ed>

Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999.p viii-ix

The authors began by reorganizing the conceptual approach intuitively used by a majority of foreign policy analysts to explain the behavior of national governments classified as Model I in the original book into a more comprehensive conceptual model identified as the Rational Actor Model (RAM or Classical Model or Model I).⁴³² The authors incorporated more recent insights from psychology, rational choice approaches and game theory to better flesh out Model I.⁴³³

In seeking to explain a national government's actions, Model I collapses all its sub-units/complexities into one "black box" or notional state (e.g. Black box labeled-"US government").⁴³⁴ Foreign affairs related events are understood as the actions chosen solely by the national government.⁴³⁵ The basic unit of analysis is understood as the choice made by a government after choosing from a menu of possible options in order to maximize strategic goals and objectives.⁴³⁶

A key organizing concept in Model I is the assumption that the national government is a *Unified National Actor*, an anthropomorphized entity identical to an individual with one set of preferences and choices and a single estimate of the consequences that follow from each choice.⁴³⁷ The Model I analyst focuses on the problem faced by the government and assumes that the actions taken by it are a rational, value maximizing response to the problem.⁴³⁸

⁴³² Ibid. p 4

⁴³³ Ibid. p ix.

⁴³⁴ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 391.

⁴³⁵ Ibid.p 24

⁴³⁶ Ibid. p 24

⁴³⁷ Ibid. p 24

⁴³⁸ Ibid. p 24

The actions of a national government are further contextualized by understanding its key objectives/vital national interests/strategic goals.⁴³⁹ The analyst also seeks to make explicit the full spectrum of options available to the government.⁴⁴⁰ Subsequently, the chain of causality following the enactment of each option is tracked to obtain a series of consequences that are then understood in cost-benefit terms.⁴⁴¹

As stated earlier, the choice exercised by the state is presumed to be a rational value maximizing⁴⁴² one, enacted after a careful evaluation of all possible alternatives and the cost-benefit ratios of their respective consequences under conditions of perfect information and unlimited time.⁴⁴³ Simply put, the alternative with the most favorable cost-benefit ratio will be chosen by a state against other options with less favorable ratios.⁴⁴⁴ The Model I analyst also puts himself/herself in the shoes of the national government being examined and marshals evidence (statements of government officials and government papers) to construct a coherent narrative that justifies the eventual action taken by the state as necessarily value maximizing following the requisite cost-benefit due diligence of the available options.⁴⁴⁵ To summarize, the likelihood of a particular course of action/choice made by the government results from its values and objectives, perceived alternative courses of action that could have been adopted instead of the

⁴³⁹ Ibid. p 24

⁴⁴⁰ Ibid. p 24

⁴⁴¹ Ibid. p 24

⁴⁴² Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999.p 24-25

⁴⁴³ Ibid.p 24

⁴⁴⁴ Ibid.p 25

⁴⁴⁵ Ibid. p 25

particular choice, estimates of the cost-benefit ratio of the consequences of each alternative and the state's own parameters to evaluate the ratios.⁴⁴⁶

The authors provide an example of Model I in action by deploying it to examine the central puzzle of the Cuban missile crisis, the Soviet decision to install strategic missiles in Cuba, an action that dramatically escalated the Cold War and resulted in a US-Soviet standoff.⁴⁴⁷ The analyst converts the puzzle into a question: "Why did the Soviet Union decide to install missiles in Cuba?"⁴⁴⁸ A number of inter-linked sub-questions focusing on the goals, objectives, options, their cost-benefit ratios and respective consequences are solved to arrive at an answer. As stated in broad terms earlier, the assumption underlying the entire exercise is that the government is a rational, unitary actor interested and capable of making a value maximizing choice after weighing the cost-benefit ratios of all the available options under conditions of unlimited time and perfect information.

The RAM model's effectiveness lies in its simplicity and logical straightforward reasoning style. By collapsing the heterogeneous sub-units of the state into a black box representing a unified purposive actor, its choices are explained as the decisions taken by a rational and value-maximizing individual after a careful evaluation of alternative options in order to achieve a specific pre-ordained objective.⁴⁴⁹ The choices are also justified by pointing to the incentives and pressures generated by the "international

⁴⁴⁶ Ibid.p 25

⁴⁴⁷ Ibid.p 5

⁴⁴⁸ Ibid.p 5

⁴⁴⁹ Ibid. p 401-402

strategic market” as possible motivations that pushed the government to act in a certain way.

Further, a complete explanation or “satisfactory big picture” for the state’s actions is obtained by understanding other factors such as the prevalent national mood/attitudes that may created the political/emotional ecosystem for a particular course of action.⁴⁵⁰ However, the RAM’s approach of blackboxing the heterogeneous state into an anthropomorphized, rational actor that takes a large action in response to “large reasons” renders it unable to analyze certain equally important alternative possibilities having to do with the internal dynamics of the state.⁴⁵¹ Large actions often result from the additive effect caused by innumerable and often contradictory smaller actions taken by individuals at various organizational levels with only partially compatible understandings of national objectives, organizational missions and political compulsions.⁴⁵²

Allison and Zelikow introduce the Organizational Behavior Model (Model II), an alternative conceptual lens that complements and improves on the externally focused Model I by concentrating on the *intranational* mechanisms within a government to explain a foreign affairs puzzle.⁴⁵³ The authors draw from literature in organizational studies, sociology, political science and business to refine the Model II introduced by Allison in the original book.⁴⁵⁴

⁴⁵⁰ Ibid. p 390-391

⁴⁵¹ Ibid. p 5

⁴⁵² Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 5.

⁴⁵³ Ibid. p 5

⁴⁵⁴ Ibid. p ix

Organizational theory with its focus on specific “logic, capacities, culture and procedures of the large organizations that constitute a government,”⁴⁵⁵ serves as the foundation of Model II. The fundamental premise is that government is not a homogenous black box with a capacity for rational, purposive action as assumed by Model I but a vast, heterogeneous coalition of loosely allied organizations with substantial autonomy.⁴⁵⁶ Although powerful individual government leaders (such as the President) are structurally atop this coalition, they rely on various organizations to spot problems, generate multiple options and recommend a course of action.⁴⁵⁷ In order to function efficiently and deliver results to top government leaders within usually tight timelines, organizations have to possess pre-existing patterns of rehearsed procedures to coordinate the actions of large numbers of individuals.⁴⁵⁸

Consequently, organizations evolve standard patterns of behavior (standard operating procedures-SOP’s) to spot, analyze and solve a problem.⁴⁵⁹ SOP’s can also be understood as “rules according to which things are done.”⁴⁶⁰ Such rules/ patterns of behavior arise out of and get deeply embedded in an organization’s culture through years of repetition resulting in their reflexive deployment in response to a problem even if it is of a different nature as compared to prior ones. Although SOP’s enable an organization to

⁴⁵⁵ Ibid. p 5-6

⁴⁵⁶ Ibid. p 143

⁴⁵⁷ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 143

⁴⁵⁸ Ibid.p 143

⁴⁵⁹ Ibid. p 143

⁴⁶⁰ Ibid. p 143

easily coordinate the actions of numerous individuals to perform an action or solve a problem, they also make the organization appear overly formal or sluggish.⁴⁶¹

The SOP's/routines ensure that the output/solution produced by each semi-autonomous organization within government is at variance with others and only partially determined/coordinated by government leaders such as the President.⁴⁶² Thus, government behavior is no longer the deliberate choice of a rational, individualized monolith (as assumed by Model I) but is instead the output of the standard patterns of behavior/rules adopted by large, semi-autonomous organizations.⁴⁶³ Put another way, the subjects in Model II are never entire governments or specific individuals but organizations with clear purposes and deeply embedded practices.⁴⁶⁴ Although set programs and rigid routines honed over the years are indispensable for the operation of efficient organizations, such practices result in a sequential process of generating alternatives.⁴⁶⁵ The process results in a restricted menu of options in which the successful alternative is chosen simply on the basis of its compliance with relevant rules and not necessarily due to its ability to solve a problem.⁴⁶⁶

The basic unit of analysis of the organizational behavior paradigm is the understanding of foreign affairs issues as the output of routine and only partially controllable organizational processes. It is also assumed that the existing organizational

⁴⁶¹ Ibid. p 169-170

⁴⁶² Ibid. p 143-144

⁴⁶³ Ibid. p 143

⁴⁶⁴ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. p 144

⁴⁶⁵ Ibid. p 152

⁴⁶⁶ Ibid. p 152

capacity, especially in terms of its ability to deploy pre-existing physical assets constitutes the outer boundaries of the possible choices available to government leaders faced with a problem.⁴⁶⁷ A corollary of the preceding statement is that the capabilities of organizations provide the constraints within which leaders must take decisions in responding to an issue.⁴⁶⁸

Any effort by a government leader to endow an organization with a new capability in addition to its existing ones to confront a current problem often results in the organization's utilization of that additional capability to solve future problems leaving the current one to be handled by pre-existing SOP's.⁴⁶⁹ To summarize, organizations play a vital role in providing the information to government leaders that serves as the basis for choices, defining the outer boundaries of options, constraining the range of actions possible by their capabilities and producing a partially controllable solution to the problem through standard practices and culture.⁴⁷⁰

Another analytical assumption of Model II is the appreciation that multiple specialized organizations with different SOP's handle only facets of a complex foreign affairs problem resulting in numerous often contradictory outputs. Government leaders are often powerless to ensure harmony and perfect coordination among various organizations on account of their incredibly crowded schedules and the size of the organizations. Consequently, the "factored problems and fractionated power" of

⁴⁶⁷Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 164

⁴⁶⁸ Ibid. p 164

⁴⁶⁹ Ibid. p 165

⁴⁷⁰ Ibid. p 166

organizations is a key part of Model II's explanatory strategy to unpack the reasons behind the actions of government.⁴⁷¹

In seeking to explain a foreign affairs puzzle, a Model II analyst begins by trying to understand the organization's stated mission and the objectives specified therein⁴⁷², its operational objectives, special capacities, culture, definition of success, maximum capacity to obtain information, criteria for recruitment and stability/turnover of personnel, decision-making experience and distribution of rewards.⁴⁷³

He/She then probes deeper to look at the targets set by the organization, the constraints faced by it in performing a critical task,⁴⁷⁴ the sequential attention ordinarily accorded to objectives,⁴⁷⁵ the relevant SOP's⁴⁷⁶ and programs and repertoires that the standard procedures are embedded in.⁴⁷⁷ The analyst then combines knowledge of the aforementioned factors with an understanding of the general tendencies of organizations uncovered by organizational theorists such as the propensity to avoid uncertainty,⁴⁷⁸ the tendency to maximize autonomy,⁴⁷⁹ the instinctive drive of an organization to restrict itself to a problem-directed, SOP constrained search in response to a 'non-standard'

⁴⁷¹ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 167

⁴⁷² Ibid. p 167

⁴⁷³ Ibid. p 167

⁴⁷⁴ Ibid. p 168

⁴⁷⁵ Ibid. p 169

⁴⁷⁶ Ibid. p 169

⁴⁷⁷ Ibid. p 170

⁴⁷⁸ Ibid. p 170

⁴⁷⁹ Ibid. p 170

problem and its reflexive quest to come up with a simple, non-disruptive solution in the “neighborhood of the current alternative.”⁴⁸⁰

Further, the Model II analyst also takes note of conditions under which an organization may be forced to shed its default bureaucratic inertia and go in for dramatic change. The conditions usually include budgetary feast, prolonged budgetary famine and dramatic performance failures.⁴⁸¹ Finally, the broader national tensions between the principle of decentralization that results in the devolution of responsibilities to an organization for better execution of a solution versus the necessity to centralize authority in order to ensure coordination between numerous organizations with their own SOP’s is explored by the analyst.⁴⁸²

Faced with the question as to why the Soviet Union positioned nuclear capable missiles in Cuba in 1962, the Model II analyst disaggregates the black box of the Soviet state into its constituent organizations.⁴⁸³ The straightforward question asked by the Model I analyst (why did the Soviet Union station missiles in Cuba in 1962?) is reframed by the Model II analyst into a more complex one: From what organizational context, pressures, and procedures did the Soviet Union’s decision to place missiles in Cuba in 1962 emerge?⁴⁸⁴

The analyst tries to understand the existing components of Soviet organizations, their self-proclaimed functions, SOP’s for acquiring raw information (e.g. the SOP’s of

⁴⁸⁰ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 171

⁴⁸¹ Ibid. p 171-172

⁴⁸² Ibid. p 173

⁴⁸³ Ibid. p 404

⁴⁸⁴ Ibid. p 5-6

Soviet bureaucracies to obtain information about the capabilities of American strategic forces and their intentions), the standard rules for defining deployable options (e.g. the clandestine positioning of medium range ballistic missiles in Cuba instead of building new intercontinental range ballistic missiles to bridge the ‘missile gap’ with the US) and the institutional mechanisms to implement them (e.g. approving the clandestine installation of missiles in Cuba).⁴⁸⁵ The answer to the fundamental question is derived by identifying the relevant Soviet organizations and making explicit their patterns of behavior from which the decision to station missiles in Cuba emerged.⁴⁸⁶ However, one drawback of Model II is that in trying to explain the actions of government as products of organizational behavior, it does not assign sufficient weight to the role of individuals at key positions in the organizations.⁴⁸⁷

Individuals are assumed to be passive agents molded by the organizational cultures they are embedded in and impelled to act by structural forces rather than active agents who can go beyond the constraints imposed by organizational routines.⁴⁸⁸ Another lacuna in Model II is its inability to sufficiently grasp that government decisionmaking is an inherently complex process involving multiple participants not just at the level of organizations and their routines but also at the level of individuals embedded at various

⁴⁸⁵ Ibid. p 5-6

⁴⁸⁶ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 5-6

⁴⁸⁷ Ibid. p 273

⁴⁸⁸ Ibid. p 273

levels in the government hierarchy.⁴⁸⁹ Thus, policy outcomes can result from multiple factors that cannot be explained away as a product of organizational routines.⁴⁹⁰

The authors propose a third conceptual model (Model III-Government Politics Model) drawing on literature from public policy studies that focuses on the role of individuals who constitute a government in policymaking.⁴⁹¹ Model III pays particular attention to the politics or “bargaining games” and procedures between key individuals and others in the national government⁴⁹² by which their “competing perceptions and preferences are combined.”⁴⁹³ Thus, governmental behavior is explained as the result of bargaining games between powerful individuals within and between organizations.⁴⁹⁴

The premise of Model III is that the “apparatus of each national government constitutes a complex arena” for an intranational bargaining game⁴⁹⁵ that cannot be collapsed into a black box or massively simplified as a conglomerate of organizational routines. To explain a particular government action, a Model III analyst focuses on the top political leaders of the national government and the interactions between a central team of players surrounding them that includes the top officials of major organizations and others with outsized influence.⁴⁹⁶ The analyst then concentrates on the politics involving successive concentric circles of lower level players including mid-level

⁴⁸⁹ Ibid. p 263

⁴⁹⁰ Ibid. p 263

⁴⁹¹ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999.p ix, 392

⁴⁹² Ibid. p 6

⁴⁹³ Ibid. p 392

⁴⁹⁴ Ibid. p 255

⁴⁹⁵ Ibid. p 255-256

⁴⁹⁶ Ibid. p 255-256

bureaucrats, the media, NGO's and ultimately the public to understand their impact on the central team's decision making calculus.⁴⁹⁷ A crucial difference between Model III and Model I is that the former does not assume that players automatically focus on the foreign affairs problem at hand with the explicit intention of rationally solving it. A Model III analyst assumes that players are not only motivated by strategic goals but also influenced by organizational beliefs and even personal goals.⁴⁹⁸

The distributed nature of power among central players and the often profound disagreements that result between players or groups of players on the merits of a particular course of action necessitate bargaining games pitting the power, preferences and acumen of a player/set of players against another.⁴⁹⁹ The victory of one group results in the implementation of its preferred action while a stalemate between competing groups results in a product distinct from what any group wanted.⁵⁰⁰

Thus, a Model III analyst attempts to explain a particular government action by identifying the key players, focusing on their bargaining games, making explicit the rival coalitions, describing the domino effects caused by one player's actions on another, highlighting the constraints imposed by time and emergence of other issues on the horizon of key players and taking note of the complex effects caused by the 'fog of war' (confusion, miscommunication etc).⁵⁰¹ The

⁴⁹⁷ Ibid. p 255-256

⁴⁹⁸ Ibid. p 255

⁴⁹⁹ Ibid. p 256

⁵⁰⁰ Ibid. p 256

⁵⁰¹ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. p 257.

analyst is also careful to not lose sight of the role played by foreign actors in an intranational game (e.g. the role played by US ambassador to India David Mulford during the debate over the US-India nuclear deal in India from 2005-2008).⁵⁰²

In order to understand the interactions between rival groups and within each group in the course of government decision-making, the analyst has to focus on additional factors such as the agency problem, the positions of the players, the decision-making rules, the framing of issues and agendas, the presence or absence of 'group think' and the complexity of joint decisions in case of a stalemate.⁵⁰³ The position of a player strongly influences the stand that he or she will take on an issue though other factors also play a substantial role.

The basic unit of analysis of the government politics paradigm is the understanding that governmental action is neither a rational decision nor just a product of organizational routines but an intranational political resultant that results from the bargaining games between key players with unequal power and influence along regularized channels.⁵⁰⁴ The paradigm requires the analyst to ask four key sub-questions in order to ultimately explain the grand question as to why a government undertook a particular action.

The sub-questions are: 1) Who plays? 2) What factors shape the perceptions, preference and positions of the participants/players? 3) What are the

⁵⁰² Ibid. p 260

⁵⁰³ Ibid. p 264

⁵⁰⁴ Ibid. p 295

factors that determine each player's impact on the results? and 4) How does the bargaining game combine the aforementioned factors to yield a governmental decision/action?⁵⁰⁵ In addition to focusing on the factors dealing with position, power and group dynamics, the analyst is also required to grapple with the personality of a player/players, the compatibility or lack thereof of personalities within the cabinet and the resulting impact on the decision-making process.⁵⁰⁶

An important aspect of Model III analysis is its acceptance that different players in the bargaining game will see different faces of the issue by virtue of their positions, organizational interests, personal beliefs, personality traits and the action channel in which the issue is raised.⁵⁰⁷ The structuring and pre-selecting effect of regularized action channels in determining the players that will eventually participate in the bargaining game and the way in which a particular issue will be resolved also needs to be studied by the analyst.⁵⁰⁸

The authors demonstrate the utility of Model III to better understand government actions by deploying it to answer the puzzle posed by the Soviet decision to station missiles in Cuba. As stated earlier, the authors begin with the assumption that the Soviet decision was the product of a series of bargaining games involving powerful players or factions along specific action channels.⁵⁰⁹

⁵⁰⁵ Ibid. p 296

⁵⁰⁶ Ibid. p 298

⁵⁰⁷ Zelikow, Philip and Graham Allison. *Essence of Decision: Explaining the Cuban Missile Crisis* Addison Wesley Longman, 1999. P 299-300

⁵⁰⁸ Ibid. p 301

⁵⁰⁹ Ibid. p 6

The preceding discussion of the three conceptual models yields an important modification to my STS based theoretical framework. Bijker's concept of a technological frame is modified to obtain the broader and more elastic concept of a *technopolitical frame* that is better able to capture the role played by political actors (both individual and collective) in pushing initiatives with a significant technical component such as the IPI pipeline and the nuclear deal.

The Iran-Pakistan-India (IPI) pipeline

The second part of the chapter begins with an examination of the complex history of the IPI pipeline, a multibillion dollar proposal that would carry Iranian natural gas via Pakistan into India in an overland pipeline. The idea of a transnational overland natural gas pipeline from Iran to India was first mooted in 1989 by Ali Shams Ardekani-the acting Deputy Foreign Minister of Iran and Dr. R. K. Pachauri, Director General of The Energy and Resources Institute (TERI) in India and chairman of the Intergovernmental Panel on Climate Change (IPCC).^{510 511}

⁵¹⁰ Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): p 662
Temple, David. "The Iran-Pakistan-India Pipeline- the Intersection of Energy and Politics " (April 2007), http://www.ipcs.org/pdf_file/issue/1396977112IPCS-ResearchPaper8-David.pdf. p.6
Pachauri, R. K. "The Pipeline of Peace." *The Indian Express*, January 21, 2003.
Pachauri, R. K. "What Lies Beneath." *Hindustan Times*, June 25 2012.

⁵¹¹ Although Pachauri's claim has not been disputed, there are some alternative explanations of how the idea of the overland gas pipeline originated. The Islamabad Policy Research Institute has suggested that the idea of piping Iranian natural gas to South Asia was first proposed by Malik Aftab Ahmed Khan, a Pakistani civil engineer in an article titled "'Persian Pipeline" in the mid-1950's. Abbas Maleki, an assistant professor of political science at Sharif University of Technology in Tehran and Iran's deputy foreign minister (1988–1997) reckoned that the possibility of piping Iranian natural gas to Pakistan and India was discussed as early as 1979 before the Iranian Revolution but was rejected at the time due to the pipeline's length, unfavorable economics and tense Indo-Pak relations. S. K. Verma of Jawaharlal Nehru University suggested that the idea of the tri-nation overland pipeline was suggested by Pakistan in 1989 with the backing of BHP Billiton Ltd, an Australian mining company based on a technical feasibility analysis.

The \$4.5 billion (initial estimated cost)⁵¹² 1660 mile overland pipeline would carry natural gas from Assaluyah city close to Iran's giant South Pars field through Pakistan into northern India.⁵¹³ The IPI pipeline would have a diameter of 56 inches and traverse 683.5 miles through Iran, 621 miles through Pakistan and approximately 372 miles in India.⁵¹⁴ In Pakistan, the pipeline would pass through Baluchistan and Sindh provinces and would either join the mid-section of the Hazira-Bijapur-Jagdishpur (HBJ) pipeline in India or directly reach New Delhi.⁵¹⁵ The Energy and Resources Institute estimated that the capacity of the pipeline would be 3 billion cubic feet per day (bcfd).⁵¹⁶

Dr Noor ul Haq & Khan Muhammad Nawaz. "Iran-Pakistan Peace Pipeline",

<http://ipripak.org/factfiles/ff124.pdf> p1

Maleki, Abbas. "Iran-Pakistan-India Pipeline: Is It a Peace Pipeline?" (September 2007),

http://web.mit.edu/cis/pdf/Audit_09_07_Maleki.pdf p.3

Verma, Shiv Kumar. "Energy Geopolitics and Iran-Pakistan-India Gas Pipeline." *Energy Policy* Vol 35 (January 17 2007): p 3286

⁵¹² The eventual cost of the project would nearly double to \$7.42 billion as of June 2005 due to a rise in steel prices.

Kumar, Manoj. "India, Pak to Start Gas Pipeline by 2006." *The Tribune*, July 14 2005.

⁵¹³ "Aiyar Moots Pan-Asian Gas Grid." *The Indian Express*, February 15 2005.

Maleki, Abbas. "Iran-Pakistan-India Pipeline: Is It a Peace Pipeline?" (September 2007),

http://web.mit.edu/cis/pdf/Audit_09_07_Maleki.pdf p 1-2.

Institute, Energy and Resources. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17.

⁵¹⁴ Dr Noor ul Haq & Khan Muhammad Nawaz. "Iran-Pakistan Peace Pipeline",

<http://ipripak.org/factfiles/ff124.pdf> p 6

⁵¹⁵ Institute, Energy and Resources. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17

"Gail to Extend Hazira-Bijapur-Jagdishpur Pipeline to Haldia ". (Jun 23, 2005),

http://www.gasandoil.com/news/south_east_asia/54398bb1589a42aa9a10b9e5f9db9c08

⁵¹⁶ Institute, Energy and Resources. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17

"Energy Information Administration-India." (Nov. 21, 2011), <http://www.eia.gov/cabs/india/Full.html>

⁵¹⁷ The IPI pipeline would save India \$300 million a year in energy transport costs⁵¹⁸ with total savings of approximately \$10 billion over 10 years.⁵¹⁹ Potential trade through the pipeline could be worth \$5 billion.⁵²⁰ Pakistan would get \$700 million in annual transit fees.⁵²¹ The pipeline would also provide Iran with a steady source of economic revenue amidst strict international sanctions.⁵²²



Figure 10: The proposed route of the IPI overland pipeline.

Source: Luft, Gal. "Iran-Pakistan Pipeline: Iran's New Lifeline" (May 29 2009), <http://blogs.law.harvard.edu/mesh/2009/05/iran-pakistan-pipeline-irans-new-lifeline/>

⁵¹⁷ Talmiz Ahmad of the Indian Petroleum Ministry conveyed that the pipeline would supply 90 mmscmd of gas to India and 60 mmscmd to Pakistan. More recently, *The Business Standard* reported in 2009 that Iran would supply 30 mmscmd each to Pakistan and India and the pipeline's capacity would eventually increase to 150 mmscmd.

Ahmad, Talmiz. "Advantages of Transnational Gas Pipelines." *The Hindu*, Apr 24, 2006

Pathak, Kalpana. "India Has No Plan to Shelve Ipi Gas Pipeline." *Business Standard*, May 26 2009.

⁵¹⁸ Verma, Shiv Kumar. "Energy Geopolitics and Iran-Pakistan-India Gas Pipeline." *Energy Policy* Vol 35 (January 17 2007): p 3283

⁵¹⁹ Ibid p 3285

⁵²⁰ Ibid p 3283

⁵²¹ Ibid

⁵²² An estimate of the amount that Iran would receive from the IPI pipeline each year could not be obtained despite an extensive search as of December 17 2013.

Initially, the official Indian reaction to the IPI (overland) pipeline was skeptical.⁵²³ India remained apprehensive about Pakistan's involvement in the project due to fears of a potential supply disruption in case of a military conflict⁵²⁴ and concerns about a possible terrorist attack along the pipeline's route through the restive Baluchistan province.⁵²⁵ The strategic community in India was also worried that Pakistan could use the pipeline as a bargaining chip in the Kashmir dispute⁵²⁶ and the substantial transit fees would bolster its economy.⁵²⁷

However, the favorable economics of the pipeline kept India interested and it signed two Memoranda of Understanding (MOU) with Iran in July and November of 1993 as part of a strategy of direct bilateral engagement in order to minimize Pakistan's role in the negotiations.⁵²⁸

Although Pakistan's civilian government signed a preliminary agreement with Iran for the construction of a pipeline from the South Pars field to the port city of Karachi in 1995,⁵²⁹ the idea of extending the pipeline to India was initially opposed by the Pakistani military. The government there also linked progress on the pipeline to the Kashmir dispute negotiations.⁵³⁰ Around this period, India favored a direct undersea

⁵²³ Pachauri, R. K. "The Pipeline of Peace." *The Indian Express*, January 21, 2003.

⁵²⁴ Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): p 663

⁵²⁵ Pachauri, R. K. "What Lies Beneath." *Hindustan Times*, June 25 2012.

⁵²⁶ Ford, Neil. "Iran; Good Geology, Bad Geography." *Power Economics* (December 20, 2004).

⁵²⁷ Pachauri, R. K. "On Track with Teheran: Shift in India's West Asia Strategy." *Times of India*, 2001.

⁵²⁸ Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): p 662
Ministry of Petroleum and Natural Gas. "Opportunities." <http://petroleum.nic.in/natoppu.htm>.

⁵²⁹ Khan, Dr Noor ul Haq & Muhammad Nawaz. "Iran-Pakistan Peace Pipeline", <http://ipripak.org/factfiles/ff124.pdf>. p 2

⁵³⁰ B.Raman. "Pipedreams over Pipelines" (March 31 2005), <http://www.southasiaanalysis.org/%5Cpapers14%5Cpaper1314.html>

pipeline from Iran but the state of pipeline technology at the time would have resulted in a “shallow-sea” project off the Pakistani coast on its continental shelf.⁵³¹ The project was opposed by Pakistan as it would allow the Indian navy within its Exclusive Economic Zone (EEZ).⁵³² The undersea option was also found to be 60% more expensive than the overland option.⁵³³

Dr. Pachauri, the proponent of the overland pipeline on the Indian side teamed up with Shirin Taherkheli, a US ambassador of Pakistani descent to work on a project funded by the United Nations Development Program (UNDP) that aimed to build trust between India and Pakistan through trilateral discussions over energy cooperation between the two countries and Nepal with the eventual aim of transferring habits of cooperation to the IPI pipeline negotiations.⁵³⁴ Two politicians were invited from the Indian and Pakistani sides. Jaswant Singh, a senior member of the Bharatiya Janata Party who later served as the Minister for External Affairs in the Vajpayee government and Mani Shankar Aiyar, a Member of Parliament belonging to the Congress Party represented the Indian side.⁵³⁵ Pachauri and Taherkheli’s prescient Track-II efforts would pay off handsomely as Aiyar would later play an important role in resurrecting and

⁵³¹Diwanji, Amberish K. "Geo-Political Issues Set to Dominate Proposed Gas Pipeline from Iran to India." (April 13, 2000), <http://www.rediff.com/business/2000/apr/13gas.htm>

⁵³²Ibid

⁵³³"Teri, Pakistan Body to Study Indo-Iran Gas Pipeline Project." *Business Standard* July 10 2001.

⁵³⁴ Energy and Resources Institute. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17

Pachauri, R. K. "What Lies Beneath." *Hindustan Times*, June 25 2012.

⁵³⁵ Ibid

pushing for the execution of the IPI (overland) pipeline following his appointment as Petroleum Minister in May 2004.

The overland pipeline was stuck for the next four years (1995-1999) as the tense India-Pakistan relationship prevented the completion of a feasibility study.⁵³⁶ Meanwhile India continued its bilateral engagement with Iran and signed a preliminary agreement in 1999.⁵³⁷

Indian Prime Minister Atal Behari Vajpayee's bus diplomacy in February 1999 to Pakistan led to speculation that progress would be made on the IPI (overland) pipeline along with other bilateral issues that hampered India-Pakistan relations but the optimism was misplaced.⁵³⁸ Prospects for the pipeline's execution improved significantly after the military government in Pakistan led by Pervez Musharraf reversed its opposition to the project, delinked it from Kashmir⁵³⁹ and gave concrete security assurances⁵⁴⁰ in the aftermath of Bill Clinton's visit to South Asia in 2000. Despite Pakistan's security guarantees, India was not ready to firmly commit to the overland option especially in the light of recent advances in pipeline technology that increased the techno-economic

⁵³⁶ Wöstmann, Alexander. "Iran-Pakistan-India Gas Pipeline Plan Stuck in Political Dilemma." (Jun 14, 2000), http://www.gasandoil.com/news/south_east_asia/ea8dfa9a553a5ee5d3d805810cb52cfd

⁵³⁷ Khan, Dr Noor ul Haq & Muhammad Nawaz. "Iran-Pakistan Peace Pipeline", <http://ipripak.org/factfiles/ff124.pdf> (p 2)

⁵³⁸ Sengupta, Ramananda. "India-Iran Gas Pipeline: A Transit Challenge" (January 22 2003), <http://www.rediff.com/news/2003/jan/22ram.htm>

⁵³⁹ B.Raman. "Pipedreams over Pipelines" (March 31 2005), <http://www.southasiaanalysis.org/%5Cpapers14%5Cpaper1314.html>

⁵⁴⁰ Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): 663,667

viability of a direct deep sea pipeline from Iran outside Pakistan's Exclusive Economic Zone.⁵⁴¹

Pachauri continued to support the overland option on the Indian side and suggested several mechanisms that could be adopted to ensure security of supplies including the participation of an international consortium (World Bank, Asian Development Bank and Indian and Pakistani corporations), contract clauses specifying that India would pay only for the gas actually received, stiff penalties for the disruptor state, introduction of Japan and South Korea as downstream consumers (gas from the pipeline would be shipped via Indian terminals to the two countries) and export of electricity produced in India from Iranian gas back to Pakistan.⁵⁴² He also suggested that India could abrogate its commitments under the Indus Water Treaty and stop water flows to Pakistan if the latter withheld gas supplies.^{543 544} The overland pipeline was an issue on the agenda of the historic Agra Summit where Indian and Pakistani leaders attempted to bridge all outstanding disputes but failed to do so.⁵⁴⁵

⁵⁴¹ Diwanji, Amberish K. "Geo-Political Issues Set to Dominate Proposed Gas Pipeline from Iran to India." (April 13, 2000), <http://www.rediff.com/business/2000/apr/13gas.htm>

Pachauri, R K. "On Track with Teheran: Shift in India's West Asia Strategy." *Times of India*, 2001.

⁵⁴² Pachauri, R K. "On Track with Teheran: Shift in India's West Asia Strategy." *Times of India*, 2001.

Pachauri, R. K. "The Pipeline of Peace." *The Indian Express*, January 21, 2003.

⁵⁴³ Devraj, Ranjit. "Iran's Gas Pipeline May Turn South Asia's Peace Pipe." (October 14 2004), <http://www.antiwar.com/ips/devraj.php?articleid=3775>

⁵⁴⁴ Pachauri also directed his Energy and Resources Institute to initiate a 9 month joint study along with the Hydrocarbon Development Institute of Pakistan (HDIP) in order to "take stock of the present status of the proposals to bring natural gas into India and Pakistan; identify the crucial bottlenecks in implementing the projects and propose possible solutions to the problems identified."

"Teri, Pakistan Body to Study Indo-Iran Gas Pipeline Project." *Business Standard* July 10 2001.

⁵⁴⁵ Sunit Arora and N Vidyasagar. "Will They Smoke the Pipe(Line) of Peace?" *The Times of India*, July 22 2001.

<http://www.teriin.org/upfiles/pub/articles/art207.pdf>

Determined to realize the overland pipeline, Pachauri justified its economic and strategic benefits in the *Indian Express* and attacked the undersea option preferred by Indian foreign policy mandarins for supply security reasons as expensive.

What makes this arrangement even more attractive is the prospect of supply at a very reasonable price reported to have been discussed at \$1.80 per million metric British thermal units (mmBtu) delivered to the Indian border. This is almost half the price of imported liquefied natural gas.....The economic benefits to India would be huge..... The deep sea pipeline option bypassing Pakistan is favoured by Indian decision-makers for obvious reasons, but this would saddle us with a far more expensive solution.....⁵⁴⁶

A joint feasibility study conducted by Iran and India for a deep sea pipeline outside Pakistan's Exclusive Economic Zone⁵⁴⁷ came to the conclusion that it would be ten times as expensive as the overland option.⁵⁴⁸ The sheer difference in cost made the cheaper overland pipeline much more attractive to Indian policymakers despite their concerns about the security of supplies.

The political environment was also becoming more conducive for the overland option. A thaw in India-Pakistan relations at the beginning of 2004 provided a political

⁵⁴⁶ Pachauri, R. K. "The Pipeline of Peace." *The Indian Express*, January 21, 2003.

"Mea Unrelenting on India-Iran Onland Gas Pipeline Via Pak." *The Financial Express*, May 8 2003.

Pachauri, R. K. "The Pipeline of Peace." *The Indian Express*, January 21, 2003.

⁵⁴⁷ "India, Iran Plan Oil Pipeline Outside Pak Eez." (February 20, 2003),

<http://www.rediff.com/money/2003/feb/20pipeline.htm>

⁵⁴⁸ Diwanji, Amberish K. "A Pipeline through Pakistan." (August 18 2004),

<http://www.rediff.com/money/2004/aug/18spec.htm>

window for the execution of the IPI pipeline for the first time in years.⁵⁴⁹ A year earlier, India-Iran relations received a boost on the eve of Iranian President Mohammad Khatami's visit to India as the chief guest at the latter's annual Republic Day parade (energy cooperation was a key item on the agenda although there was no significant movement on the pipeline).⁵⁵⁰

I categorize Mani Shankar Aiyar (hereafter referred to as "Aiyar"), a Member of Parliament from the Congress party, Minister for Petroleum and Natural Gas in the United Progressive Alliance Government of Prime Minister Manmohan Singh and a participant in the Track-II energy cooperation discussions organized by Pachauri and Taherkheli as my first relevant social individual.⁵⁵¹

⁵⁴⁹Diwanji, Amberish K. "A Pipeline through Pakistan." (August 18 2004),

<http://www.rediff.com/money/2004/aug/18spec.htm>

Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): p 662

Pourriahi, S. "Politics and the 'Pipeline of Peace'." *Asia Times*, January 22, 2003

Verma, Shiv Kumar. "Energy Geopolitics and Iran-Pakistan-India Gas Pipeline." *Energy Policy* 35 (January 17 2007): p 3286

⁵⁵⁰Ramachandran, Sudha. "The Glue That Bonds India, Iran." *Asia Times*, January 12 2005.

"India, Iran Ink New Delhi Declaration". (January 25, 2003),

<http://www.rediff.com/news/2003/jan/25iran.htm>

"India, Iran Sign New Delhi Declaration." *The Economic Times*, Jan 25, 2003.

Sengupta, Ramananda. "India-Iran Gas Pipeline: A Transit Challenge

" (January 22 2003), <http://www.rediff.com/news/2003/jan/22ram.htm>

<http://www.rediff.com/news/2003/jan/22ram.htm>

Pachauri, R. K. "The Pipeline of Peace." *The Indian Express*, January 21, 2003.

⁵⁵¹ Institute, Energy and Resources. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17

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Minister for Petroleum and Natural Gas-Mani Shankar Aiyar- Congress party

The Prime Minister appointed Aiyar⁵⁵² as the Cabinet Minister for Petroleum and Natural Gas in May 2004.⁵⁵³ *India Today* magazine noted that Aiyar was appointed Petroleum

⁵⁵² Aiyar was born on April 10 1941. He was 12 when his father died in a plane crash plunging his well-off family into near poverty. Aiyar was able to continue his education at the prestigious Doon School in Dehradun after his mother negotiated a reduced fee and taught classes. He was disenchanted by the financial and social disparity between him and other students at school. The experience shaped Aiyar's political views and he became a Marxist by the time he graduated with a B.A. in Economics from St. Stephen's College, University of Delhi. Aiyar went on to acquire an M.A. in Economics from Trinity Hall, Cambridge University and was a member of its Marxist Society. Although Aiyar attempted and cleared the Indian Foreign Service Examination, he was nearly rejected due to a report detailing his "radical days" in Cambridge sent by the British Information Service to the Indian government. Aiyar was accepted after Jawaharlal Nehru's personal intervention. He joined the Indian Foreign Service and served as the Consul-General of the Indian embassy in Karachi, Pakistan from 1978-1982. The last 5 years of Aiyar's 26 year career in the Service was spent on deputation at the Prime Minister's Office under former Prime Minister Rajiv Gandhi. His friendship with Rajiv became his passport to politics. Aiyar quit the Service in 1989 to join politics and was elected to the Parliament in 1991 after winning from the Mayiladuthurai constituency in the southern state of Tamil Nadu on a Congress party ticket. He recalled in an interview with *The Telegraph* that his political philosophy consists of four basic principles- "secularism, democracy, non-violence and socialism." Aiyar was a special invitee to the Congress Working Committee (CWC) and served as the Chairman of the party's Department of Political Training and Department of Policy Planning and Co-ordination. He served three terms in Parliament and was known for his outspoken comments criticizing neoliberal reforms and for urging his party to return to its Nehruvian socialist roots. He is also a firm supporter of stronger India-Pakistan relations. Aiyar recently hosted a documentary series titled "Inside Pakistan" aired by NewsX channel.

Thakurta, Paranjay Guha. "Energy Security: Mani Shankar Aiyar Slams Upa for Bowing to Us." (October 1, 2010), <http://business.rediff.com/slide-show/2010/oct/01/slide-show-1-maverick-mani-slams-upa-for-bowing-before-us.htm>

Sarkar, Bishakha De. "'The IB Ultimately Came to the Conclusion That I Was Indeed a Marxist, but of the Groucho Variety' " *The Telegraph*, May 18 2008.

"Tamil Nadu-Key Candidates-Mani Shankar Aiyar." <http://ibnlive.in.com/politics/keycandidate/344.html>
Rajya, Sabha. "Detailed Profile: Shri Mani Shankar Aiyar."

<http://india.gov.in/govt/rajyasabhampbiodata.php?mpcode=2133>

Sarkar, Bishakha De. "'The Ib Ultimately Came to the Conclusion That I Was Indeed a Marxist, but of the Groucho Variety' " *The Telegraph*, May 18 2008.

India Today Conclave,. "Mani Shankar Aiyar Member of Parliament, Rajya Sabha, Congress." (March 18, 2011), <http://conclave.intoday.in/story/mani-shankar-aiyar/3072/37.html>

Mani Shankar Aiyar,. "The Business of Business Will Henceforth Be the Business of the Nation." <http://www.rediff.com/news/may/19mani.htm>

Foster, Peter. "India's Champagne Socialist." *The Telegraph*, August 29, 2007.

"India Prospering but Not Indians: Mani Shankar Aiyar." *The Economic Times*, Oct 21, 2011.

"Water Security, Even More Than Energy, Will Impinge on Future India-Pakistan Relations." *Daily Times*, June 06, 2005.

Haniffa, Aziz. "Relations with Pak Should Be India's Top Priority: Aiyar." (January 30 2012), <http://www.rediff.com/news/slide-show/slide-show-1-relations-with-pak-should-be-indias-top-priority-aiyar/20120130.htm>.

Minister as a temporary measure and would eventually make way for his replacement (Congress party veteran and Gandhi family loyalist Satish Sharma).⁵⁵⁴ Aiyar also confirmed that the Petroleum Ministry portfolio was initially entrusted to him as a temporary responsibility⁵⁵⁵ in addition to his primary Ministry for *Panchayati Raj* (rural self-governance) portfolio.⁵⁵⁶ However, Satish Sharma was not cleared by the Congress party and Aiyar continued as the Petroleum Minister.⁵⁵⁷

Aiyar did not possess in-depth knowledge or work experience in the petroleum sector but quickly acquainted himself with the basics and came up with ambitious plans.⁵⁵⁸ *The Economist* noted with some satisfaction that

Thapar, Karan. "Dialogue Never Hurt Anyone: Mani Shankar." (December 1 2008), <http://ibnlive.in.com/news/dialogue-never-hurt-anyone-mani-shankar-aiyar/79446-3.html>.

⁵⁵³Thakurta, Paranjay Guha. "Energy Security: Mani Shankar Aiyar Slams Upa for Bowing to Us." (October 1, 2010), <http://business.rediff.com/slide-show/2010/oct/01/slide-show-1-maverick-mani-slams-upa-for-bowing-before-us.htm>

Gopinath, Vrinda. "It's Below the Waist but Its Time Has Come: Veshti Vogue." *The Indian Express*, May 30 2004.

Special, Correspondent. "Tamil Nadu Secures 12 Berths " *The Hindu*, May 23, 2004

"The Union Council of Ministers ". *The Hindu*, May 24, 2004

⁵⁵⁴Sahgal, Priya. " Nation: Economic Ministers- Cabinet Showcases " *India Today*, May 02, 2005

⁵⁵⁵ Thapar, Karan. "Aiyar: Ministers Are Dead Men Walking " (2006), <http://ibnlive.in.com/news/aiyar-ministers-are-dead-men-walking/6024-4-2.html>

Conclave, India Today. "Mani Shankar Aiyar Member of Parliament, Rajya Sabha, Congress." (March 18, 2011), <http://conclave.intoday.in/story/mani-shankar-aiyar/3072/37.html>

⁵⁵⁶ "Mani Now Knows How to Fry in Oil, Plans New Dish." *The Economic Times*, August 19 2004.

"Indian Oil and Gas-Aiyar's Dream-Pipelines Promise to Bring Energy and, Perhaps, Unity ". *The Economist*, February 24 2005.

Thapar, Karan. "Aiyar: Ministers Are Dead Men Walking " (2006), <http://ibnlive.in.com/news/aiyar-ministers-are-dead-men-walking/6024-4-2.html>.

Conclave, India Today. "Mani Shankar Aiyar Member of Parliament, Rajya Sabha, Congress." (March 18, 2011), <http://conclave.intoday.in/story/mani-shankar-aiyar/3072/37.html>

⁵⁵⁷ Thapar, Karan. "Aiyar: Ministers Are Dead Men Walking " (2006), <http://ibnlive.in.com/news/aiyar-ministers-are-dead-men-walking/6024-4-2.html>.

Conclave, India Today. "Mani Shankar Aiyar Member of Parliament, Rajya Sabha, Congress." (March 18, 2011), <http://conclave.intoday.in/story/mani-shankar-aiyar/3072/37.html>

⁵⁵⁸ "Mani Now Knows How to Fry in Oil, Plans New Dish." *The Economic Times*, August 19 2004.

when Mani Shankar Aiyar, an ebullient diplomat turned politician, was made India's oil minister nine months ago, he was told that it was no more than a “temporary charge” and that he could return to his main interests—village-level government and tribal affairs—once a suitable candidate became available. But this has not happened. Instead, Mr Aiyar is transforming a government department better known for the illicit allocation of petrol-pump licences to politicians' families and friends into a significant player on the international stage.⁵⁵⁹

His first major step was to resurrect the long delayed IPI (overland) pipeline and to push for clearance from the Prime Minister to negotiate with Pakistan in mid-August of 2004.⁵⁶⁰ Aiyar was strongly supported by Pachauri, the original conceiver of the idea of the pipeline and its proponent over the years.⁵⁶¹

What were the reasons behind Aiyar’s decision to resurrect the pipeline a mere four months after taking over the Petroleum Ministry? I suggest that the first reason had to do with energy security. The worldwide increase in energy prices in 2004⁵⁶² had sparked concerns about energy security in Asian countries including India. There was also a widespread perception among Indian policymakers including Aiyar that the rapidly growing Indian economy was energy deficient and that its reliance on imported (oil) and natural gas would only increase in the future.⁵⁶³ Further, China’s rapid acquisition of oil

⁵⁵⁹ "Indian Oil and Gas-Aiyar's Dream-Pipelines Promise to Bring Energy and, Perhaps, Unity ". *The Economist*, February 24 2005.

⁵⁶⁰ Diwanji, Amberish K. "A Pipeline through Pakistan." (August 18 2004), <http://www.rediff.com/money/2004/aug/18spec.htm>

⁵⁶¹ Ibid

⁵⁶² Stanley, Bruce. "International Energy Agency Warns of Energy Crisis" (May13 2004), <http://www.countercurrents.org/peakoil-stanley130504.htm>

⁵⁶³ Ministry of Petroleum and Natural Gas. "India Hydrocarbon Vision- 2025 ", petroleum.nic.in/vision.doc

and gas assets around the world for its growing economy⁵⁶⁴ led to a determination among Indian policymakers to not be left behind.⁵⁶⁵ Aiyar's position as Petroleum Minister obligated him to pursue initiatives that would enhance India's hydrocarbon energy security and the IPI pipeline was one such initiative.

The second motive was Aiyar's consistent support for better India-Pakistan relations.⁵⁶⁶ He provided a brief history of his own efforts in this regard and the reasons why India must strive for cordial relations with Pakistan at a lecture in New Delhi in January 2011.^{567 568}

Fifteen years ago, in a book called "Pakistan Papers," largely comprising a long dispatch I wrote in my last days as Consul-General of India in Karachi, which I was surprisingly permitted by the government to publish as representing my "personal views", I had first suggested a process of "uninterrupted and uninteruptible dialogue" as the only way forward for our two countries. My suggestion had no takers then. It has no takers now.....I belong to that minority (in the Indian establishment)

⁵⁶⁴ "China, Iran Sign Biggest Oil & Gas Deal." *China Daily*, October 31 2004.

Haider, Ziad. "Oil Fuels Beijing's New Power Game " *YaleGlobal* (11 March 2005), <http://yaleglobal.yale.edu/content/oil-fuels-beijings-new-power-game>

⁵⁶⁵ Luce, Edward. "Head to Head in the Quest for National Energy Security" *Financial Times*, November 17, 2004.

⁵⁶⁶ Devraj, Ranjit. "Energy-South Asia: Gas Pipelines to India Not Pipe Dreams" *Inter Press Service News Agency*, June 8 2004.

⁵⁶⁷ Aiyar, Mani Shankar. "Way Forward in India-Pakistan Relations" *The Hindu*, January 24, 2011
"Water Security, Even More Than Energy, Will Impinge on Future India-Pakistan Relations." *Daily Times*, June 06, 2005.

Haniffa, Aziz. "Relations with Pak Should Be India's Top Priority: Aiyar." (January 30 2012), <http://www.rediff.com/news/slide-show/slide-show-1-relations-with-pak-should-be-indias-top-priority-aiyar/20120130.htm>.

Thapar, Karan. "Dialogue Never Hurt Anyone: Mani Shankar." (December 1 2008), <http://ibnlive.in.com/news/dialogue-never-hurt-anyone-mani-shankar-aiyar/79446-3.html>

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⁵⁶⁸ Chapter 3, pg 49

that thinks there are three compelling reasons why India should proactively engage with Pakistan. First, for the domestic reason that a tension-free relationship with Pakistan would help us consolidate our nationhood, the bonding adhesive of which is secularism. Second, for the regional reason that regional terrorism can be effectively tackled only in cooperation with Pakistan and not in confrontation with it. Third, for the international reason that India will not be able to play its due role in international affairs so long as it is dragged down by its quarrels with Pakistan.⁵⁶⁹

Aiyar's consistent support for enhanced India-Pakistan relations also explains his participation in the Track II discussions organized by Pachauri and Taherkheli in 1996.⁵⁷⁰ The multibillion dollar pipeline with its capacity to hardwire a long-term energy-economic relationship between India and Pakistan and tie a significant fraction of their energy securities to the maintenance of normalcy in relations would make an important contribution towards achieving Aiyar's dream of an amicable relationship between the feuding nations. In other words, the flow of natural gas from Iran to India via Pakistan in an overland pipeline was not just an initiative to bring energy from an energy surplus nation (Iran) to an energy deficient one (India) at reasonable cost. It would also contribute towards reducing the volatility in India-Pakistan relations by incentivizing both countries to maintain peace in order to ensure the smooth functioning of the pipeline

⁵⁶⁹ Aiyar, Mani Shankar. "Way Forward in India-Pakistan Relations" *The Hindu*, January 24, 2011

⁵⁷⁰ Energy and Resources Institute. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17

Pachauri, R. K. "What Lies Beneath." *Hindustan Times*, June 25 2012.

(the pipeline has often been referred to as the “peace pipeline” in the Indian and international press).⁵⁷¹

Evidence for my claim can be discerned in an interview Aiyar gave to the *Himal SouthAsian* magazine in July 2005, a year after his appointment as Petroleum Minister. I suggest that the views expressed by Aiyar on the IPI pipeline in July 2005 are also applicable to the period around August 2004 when he resurrected the pipeline and pushed for political clearance to begin negotiations.

Himal: How can a gas pipeline be a confidence building measure?

Aiyar: The pipelines from Iran and Myanmar would merge India's economic interests with those of Pakistan and Bangladesh, which would be the transit countries. Sending ships with LNG (Liquefied Natural Gas) on the high seas to Haldia or Gujarat (from Iran) may satisfy our energy needs, but there would be no peace implications.⁵⁷²

Clearly, Aiyar was quite prepared to accept the risk of the pipeline resulting in Indian dependence on Pakistan and the potential vulnerability associated with such dependence in his eagerness to consummate the project and tap its “peace implications.”

The third reason behind Aiyar’s decision to resurrect the pipeline early into his tenure as Petroleum Minister was his Nehruvian socialist worldview formed during his school years and honed through college.⁵⁷³ An important facet of that worldview was

⁵⁷¹ Gonzalez, Amy Goodman & Juan. "Us-India Nuke Deals Raise Fears of Escalated Indo-Pakistan Arms Race." (July 24 2009), http://www.democracynow.org/2009/7/24/with_lucrative_nuke_deals_with_india
Lobe, Jim. "Iran Sits Pretty in World's Hottest Region " (July 22, 2005),
<http://www.antiwar.com/lobe/?articleid=6722>

⁵⁷² Aiyar, Mani Shankar. " "Enmeshed Economies Will Bring Us Together"." *Himal SouthAsian* July 2005

⁵⁷³ For a detailed description of the evolution of Aiyar’s socialist worldview and his radical leftist college activism, refer to footnote 164 on page 45.

opposition to American foreign and economic policy.⁵⁷⁴ The pipeline was an ideal initiative to enact Aiyar's agenda of going against the grain of US foreign policy in the Middle East that aimed to contain and isolate Iran.

Aiyar's push for the pipeline came at the right time. A fragile India-Pakistan peace process initiated in 2004⁵⁷⁵ that led to some improvement in relations provided a favorable atmosphere for his pursuit of the initiative. To summarize, the IPI pipeline was simultaneously a product of the India-Pakistan rapprochement as well as an important initiative that would strengthen ties between the two countries by addressing their energy deficits, increasing economic interaction and incentivizing political stability.

The potential of the pipeline to improve India-Pakistan relations was significant enough as such a normalization would reshape the South Asian milieu. An equally important implication of a successfully executed IPI pipeline would be a strengthening of the Iran-India strategic partnership announced in 2003. I provide a brief overview of the general trajectory of Iran-India relations from the Cold War period as it helps to understand the importance of the IPI pipeline to the relationship.

Despite claims by Iranian and Indian diplomats that Iran and India share a civilizational bond, the improvement in relations between the two countries since their inception as modern states is a relatively recent phenomenon. Iran-India relations were lukewarm during the Cold War as Iran under Mohammad Rezā Shāh Pahlavī was an

⁵⁷⁴ Ganguli, Amulya. "Nuclear Deal Standoff Exposes Myopia of Indian Political Class." (June 28 2008), <http://www.boloji.com/index.cfm?md=Content&sd=Articles&ArticleID=5298>

Aiyar, Mani Shankar. "American Diary" (July 30 2012), <http://www.outlookindia.com/article.aspx?281668>

⁵⁷⁵ Diwanji, Amberish K. "A Pipeline through Pakistan." (August 18 2004), <http://www.rediff.com/money/2004/aug/18spec.htm>

American ally in the Middle East whereas ‘non-aligned’ India was closer to the Soviet Union.⁵⁷⁶ Despite the Shia-Sunni divide, Iran forged closer ties with Pakistan, a decision motivated by the proximity of both countries to the US and their antagonism towards the Soviet Union.⁵⁷⁷

The Iranian Revolution of 1979 and the advent of Ayatollah Ruhollah Khomeini did not dramatically change the tone and tenor of Iran-India relations as the Islamic Republic of Iran continued to strengthen ties with neighboring Pakistan rather than India.⁵⁷⁸ Relations deteriorated further due to India’s support for the Soviet invasion of Afghanistan in 1979,⁵⁷⁹ the Khomeini regime’s position on Kashmir that favored Pakistan, its assertive position on the status of Muslims in India⁵⁸⁰ and India’s refusal to condemn outright the Iraqi invasion of Kuwait.⁵⁸¹

The first major improvement in Iran-India ties occurred in 1990 following the Soviet Union’s collapse, the desire of Indian policymakers for an ally in the Islamic world to counter Pakistan and the increasing American pressure on Iran.⁵⁸² A more urgent rationale for improving relations was the converging interest of both countries in backing the Northern Alliance warlords against the Pakistan backed-Taliban following the Soviet withdrawal from Afghanistan.⁵⁸³ Shiite Iran’s concerns about the threat posed by the

⁵⁷⁶ Ramachandran, Sudha. "The Glue That Bonds India, Iran." *Asia Times*, January 12 2005.

⁵⁷⁷ "Pak-Iran Relation since 1947." <http://www.iranembassy.pk/en/political-section/591-pak-iran-relation-since-1947.html>

⁵⁷⁸ Ibid

⁵⁷⁹ Harsh V. Pant "India and Iran: An ‘Axis’ in the Making?" *Asian Survey* XLIV, no. 3 (MAY/JUNE 2004): p 370.

⁵⁸⁰ Ibid.p 371

⁵⁸¹ Ibid. p 371

⁵⁸² Ibid. p 372

⁵⁸³ Ramachandran, Sudha. "The Elephant in India and Iran's Room." *Asia Times*, November 21 2009.

Sunni Pakistan backed Taliban to its security interests in Afghanistan led it to reevaluate its relations with India leading to a spate of diplomatic exchanges throughout the 1990's.⁵⁸⁴ C. Raja Mohan, a veteran Indian strategic analyst hailed India's improving relations with Iran as a major accomplishment of the country's foreign policy.

Rapprochement with Iran in the mid-1990s has been a major accomplishment of India's foreign policy..... Iran has emerged as India's gateway to Afghanistan and Central Asia and beyond to Europe. And above all, it's our neighbour's neighbour to the west.⁵⁸⁵

Iran also began to view India as a cheap supplier of high-technology products and as a strategic partner to counter American attempts to isolate and contain it.⁵⁸⁶ Relations improved further in 2002 when India offered to develop Iran's Chabahar port in response to a massive Chinese undertaking to develop the port of Gwadar on the Pakistani coast that would provide it access to the Indian Ocean.⁵⁸⁷

⁵⁸⁴ Ramachandran, Sudha. "The Glue That Bonds India, Iran." *Asia Times*, January 12 2005.

⁵⁸⁵ Mohan, C. Raja. "This Man Is the New Iran President, He Just Made India's Job a Lot Tougher" *The Indian Express*, June 26, 2005

⁵⁸⁶ Ramachandran, Sudha. "The Glue That Bonds India, Iran." *Asia Times*, January 12 2005.

Pandian, S. "The Political Economy of Trans-Pakistan Gas Pipeline Project: Assessing the Political and Economic Risks for India." *Energy Policy* 33 (March 2005): 665.

⁵⁸⁷ Jaffrelot, Christophe. "A Tale of Two Ports-Gwadar and Chabahar Display Chinese-Indian Rivalry in the Arabian Sea" *YaleGlobal*, (January 7 2011), <http://yaleglobal.yale.edu/content/tale-two-ports>

Bedi, Rahul. "India Begins Use of Chabahar Port in Iran Despite International Pressure" *The Telegraph*, March 1 2012.

Jacob, Jayanth. "Chabahar Port Plan on Fast-Track" *Hindustan Times*. September 13, 2011.



Figure 11: The Chinese built port at Gwadar on the Pakistani coast and the Indian built Chabahar port on the Iranian coast.

Source: Jaffrelot, Christophe. "A Tale of Two Ports-Gwadar and Chabahar Display Chinese-Indian Rivalry in the Arabian Sea" *YaleGlobal*, (January 7 2011), <http://yaleglobal.yale.edu/content/tale-two-ports>

Indian policymakers believed that the Chabahar port would not only balance the perceived Chinese naval presence in the Indian Ocean but also provide India access to landlocked Afghanistan that was long denied by Pakistan.⁵⁸⁸ Chabahar was also important for the effective implementation of a trilateral agreement between India, Iran and Afghanistan to provide preferential tariff reductions to Indian goods destined for Central Asia arriving at the port.⁵⁸⁹

Iran-India relations received a new impetus in 2003 under the BJP led-NDA government with Iranian President Mohammad Khatami's visit to India as chief guest of

⁵⁸⁸ Jaffrelot, Christophe. "A Tale of Two Ports-Gwadar and Chabahar Display Chinese-Indian Rivalry in the Arabian Sea" *YaleGlobal*, (January 7 2011), <http://yaleglobal.yale.edu/content/tale-two-ports>

⁵⁸⁹ Ibid

its Republic Day Parade.⁵⁹⁰ Georgetown University academic Christine Fair explained the profound implications of the Khatami visit that was undertaken two months before the American invasion of Iraq.

In January 2003, Mohammed Khatami, the president of Iran, visited India as that country's chief guest for India's Republic Day celebration. This is an honor customarily accorded only (to) India's closest friends. During the course of Khatami's visit, he and the Indian prime minister, Atal Bihari Vajpayee, signed the New Delhi Declaration, which boldly set forth the vision of a "strategic partnership" between the two countries. Two months later, Iranian and Indian warships conducted joint naval exercises. Indian arms sales to Tehran are said to be in the works, and India has agreed to help train Iranian military personnel. Bilateral exchanges of defense and intelligence officials have become routine. Indian aeronautical engineers will help Iran maintain and upgrade its Russian-made MiG-29 fighter aircraft. According to some press accounts, New Delhi will have the right to use Iranian military bases for combat operations against Pakistan should another Indo-Pakistani war break out. India has also agreed to assist in the development of Iranian port facilities and with the construction of road and rail links in Iran. The two countries, along with Russia, have talked of creating a Russo-Iranian-Indian transport corridor. Such a trade route, if fully developed, could have a major impact on political and strategic as

⁵⁹⁰ "High-Profile Khatami Visit Begins Friday". *The Times of India*, January 23, 2003. Ved, Mahendra. "Khatami's Visit Will Boost Ties" *The Times of India*, January 25, 2003.

well as economic realities in the region. Clearly, something potentially significant is transpiring in relations between New Delhi and Tehran.⁵⁹¹

Harsh Pant, an associate with the King's Center for Science and Security Studies at the King's College in London also agreed that

by designating Khatami as the chief guest at its 2003 Republic Day celebrations, India not only underlined the historically friendly relations but also sent out a strong signal that Iran remains a significant player in regional political and security arrangements.⁵⁹²

The two countries inked agreements worth over US\$25 billion.⁵⁹³ Bilateral trade also increased following the visit increasing trade from \$913 million in 2002-03 to \$1.18 billion in 2003-04.⁵⁹⁴ To summarize, Khatami's visit and the bold "Delhi Declaration" laid the basis for an across the board Iran-India strategic partnership.

The Iran-India strategic partnership was not restricted to strategic and military cooperation alone. An important pillar of the strengthening relationship that was a key agenda item in Indo-Iranian discussions in 2003 was energy cooperation. Iran had the world's fourth largest oil reserves.⁵⁹⁵ It also possessed the second largest natural gas reserves in the world (26.6 trillion cubic meters as of 2004) after Russia.⁵⁹⁶ Indian policymakers were increasingly interested in Iran's enormous energy resources as a

⁵⁹¹ Fair, C.Christine. "The "Strategic Partnership" between India and Iran." (April 2004), http://stage-wilson.p2technology.com/sites/default/files/asia_rpt_120rev_0.pdf. p 1

⁵⁹² Harsh V. Pant "India and Iran: An "Axis" in the Making?" *Asian Survey* XLIV, no. 3 (MAY/JUNE 2004): p 371

⁵⁹³ Ramachandran, Sudha. "The Glue That Bonds India, Iran." *Asia Times*, January 12 2005.

⁵⁹⁴ Ibid

⁵⁹⁵ Energy Information Administration. "Country Analysis Brief-Iran ". (Octobr 16 2012), <http://www.eia.gov/countries/country-data.cfm?fips=IR>

⁵⁹⁶ Afrasiabi, Kaveh. "China Rocks the Geopolitical Boat." *Asia Times*, November 6 2004.

possible option to meet the perceived growing energy shortage of the expanding Indian economy. Iran's natural gas reserves could theoretically meet the Indian economy's energy demand for up to 200 years⁵⁹⁷ and the long-delayed IPI pipeline assumed renewed significance (although no progress was made on the initiative in the 2003 meeting due to tense India-Pakistan relations). However, Aiyar's resurrection and advocacy for the pipeline in late 2004- early 2005 in a climate of increasing India-Pakistan bonhomie increased the prospects that negotiations over the initiative would begin in earnest eventually leading to its successful execution.

A functioning IPI pipeline would concretize an economic and energy relationship between India and Iran (in addition to hardwiring such a relationship between India and Pakistan). A greater alignment in Indian and Iranian energy-economic interests brought about by the pipeline (and other energy cooperation initiatives such as a multibillion dollar deal to import Liquefied Natural Gas (LNG) from Iran to India via ships and Indian acquisition of Iranian oil and gasfields) would strengthen the Iran-India strategic partnership announced in 2003.

Notice that Aiyar also referred to the energy security and peace implications of another nascent initiative, the Myanmar-Bangladesh-India (MBI) pipeline in addition to the IPI pipeline in the July 2005 interview. Further, the documentary record indicates that he was also considering a third transnational pipeline initiative, the extension of the Turkmenistan-Afghanistan-Pakistan (TAP) pipeline to India.

⁵⁹⁷ Verma, Shiv Kumar. "Energy Geopolitics and Iran-Pakistan-India Gas Pipeline." *Energy Policy* Vol 35 (January 17 2007): 3284-85.
Ramachandran, Sudha. "The Elephant in India and Iran's Room." *Asia Times*, November 21 2009.

Even before India joins the Turkmenistan-Afghanistan-Pakistan or the TAP pipeline project, petroleum minister Mani Shankar Aiyar has thought of making TAP a TAPI (by including India)...Given the huge requirement of gas in India, both TAP as well as the \$4 billion plus Iran-India-Pakistan gas pipeline project as also the Myanmar-Bangladesh project are being given top priority.⁵⁹⁸

Clearly, the IPI pipeline was not just a standalone initiative but was being considered in tandem with the MBI pipeline and the TAPI project as part of a regional cooperation strategy that would not only address a part of India's (and South Asia's) energy needs but would also foster increased economic integration and incentivize stability in South (and West) Asia.⁵⁹⁹ I suggest that the IPI pipeline was the most important element of the emerging regional cooperation strategy. An excerpt from the aforementioned July 2005 interview given by Aiyar serves as evidence.

Himal: Are (you) already looking beyond to a South Asian energy grid?

Aiyar: Our historical truth is that we were one economy that was broken up. So we must work for integration after the past decades of disintegration. We need enmeshed economies and people's interaction across the frontiers. Without exaggerating the importance of the pipeline project as a peacebuilding exercise, I have no doubt it will make a major contribution.⁶⁰⁰

⁵⁹⁸ "The Aiyar Formula of Tapping Global Gas Reserves." *The Financial Express*, June 7 2005.

⁵⁹⁹ Aiyar, Mani Shankar. " "Enmeshed Economies Will Bring US Together"." *Himal SouthAsian* July 2005

⁶⁰⁰ Aiyar, Mani Shankar. " "Enmeshed Economies Will Bring Us Together"." *Himal SouthAsian* July 2005

Aiyar's regional cooperation strategy with its goal to reshape the energy and political landscape in South Asia through transnational pipelines was an ambitious venture as each of its three pipeline elements presented problems. The IPI pipeline, the most important and advanced element of the strategy would be hard to consummate given the complex negotiations over disparate issues including the price of natural gas, project structure, financing mechanisms, security arrangements, arbitration mechanisms, termination clauses and almost certain US opposition given its frictions with Iran. Despite the aforementioned difficulties, the IPI pipeline was still the most plausible of three pipelines given the formidable obstacles in the way of the MBI pipeline and the TAPI project. The MBI pipeline was hampered by India's fraught relations with both Myanmar and Bangladesh (the transit country)⁶⁰¹ and the low amounts of political capital invested by India in improving relations (as compared to Pakistan and Iran).

The TAPI pipeline's execution was held hostage by the deteriorating security situation in Afghanistan and the uncertainty over the credibility of Turkmenistan's reserve estimates. Although the regional cooperation strategy with its focus on South (and West) Asia appeared somewhat overly optimistic (except for the more certain prospects of its most plausible element, the IPI pipeline), it was only a cornerstone of Aiyar's ultimate goal. He suggested in a February 2005 speech at the Third Asia Gas Buyer's Summit⁶⁰² (an event that brought Asian energy supplier and consumer countries

⁶⁰¹ Bajpae, Chietigj. "India, China Locked in Energy Game" *Asia Times*, March 17, 2005

⁶⁰²"Aiyar Moots Gas Grid to Map Asia." *The Financial Express*, February 15 2005.

Special, Correspondent. "Mani Shankar Aiyar Moots Asian Gas Grid" *The Hindu*, February 15 2005.

on a single stage) that the regional cooperation strategy should be expanded to the rest of Asia through the bold idea of an Asian Gas Grid (hereafter referred to as the “Grid”).

The Grid would consist of a network of natural gas pipelines traversing Asia that would end the West’s dominance over the world’s hydrocarbon resources,⁶⁰³ connect gas surplus nations to gas deficient ones, provide energy security at reasonable cost, generate revenues and incentivize stability.

Mr Mani Shankar Aiyar, today mooted the idea of a gas grid connecting Asian countries....."Asia, which is sitting on 55 per cent of the world's gas reserves, has no pan-continental union.....Asian natural gas players should come together to form an Asian gas grid which will enable member countries to maximise gains, end the dominance of western nations and ensure energy security and economic growth in Asia.".....
"In the face of a surge in demand for gas in the Asian region, where India and China are becoming major buyers, it should be possible to make available gas from Iran to China by extending the proposed Iran-Pakistan-India pipeline to South China," the Minister said.⁶⁰⁴

Figure 6 reproduces the conception of the Asian Gas Grid advanced by Talmiz Ahmad, a former Ministry of External Affairs official with extensive foreign connections who was transferred to the Petroleum Ministry to assist Aiyar’s pipeline diplomacy.⁶⁰⁵

⁶⁰³ Ibid

⁶⁰⁴ Bureau. "Aiyar Moots Asian Gas Grid " *The Hindu-Business Line*, February 15 2005.

Ministry of Petroleum and Natural Gas. "Petroleum Minister Proposes Setting up of Asian Gas Grid- Third Asia Gas Buyer's Summit Inaugurated in Delhi" (February 14 2005), <http://pib.nic.in/newsite/erelease.aspx?relid=7080>

"India for Asian Gas Grid to End West Dominance ". *The Tribune*, February 15 2005.

⁶⁰⁵ "Green Signal". *Business Standard* February 11, 2005.

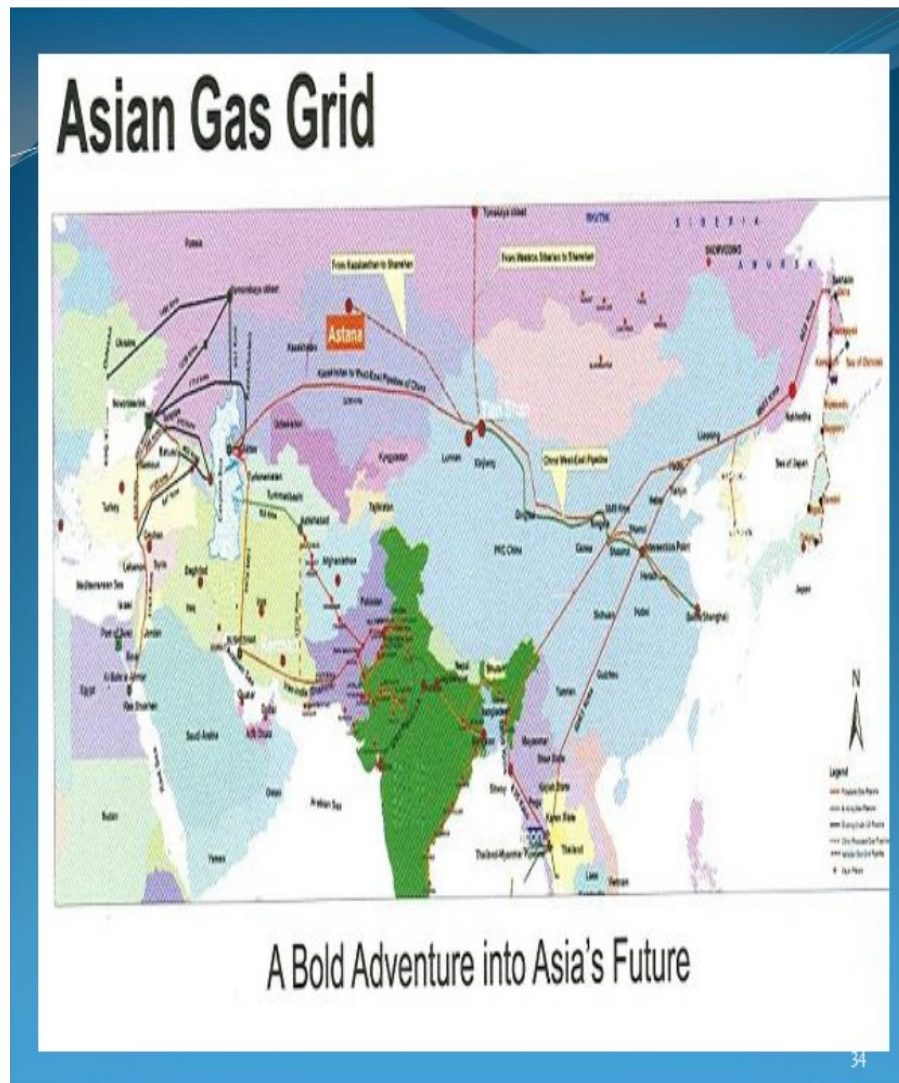


Figure 12: The Asian Gas Grid

Source: Ahmad, Talmiz. "Global Energy Security and India's Energy Diplomacy." (September 27 2010), http://www.ief.org/_resources/files/content/lecture-series/presentation-on-global-energy-security-and-india-energy-diplomacy-ief-riyadh.pdf. p (slide) 34

The documentary evidence indicates that Aiyar's proposal of an Asian Gas Grid in February 2005 was not a onetime statement. As will be shown later, he would continue supporting the idea through January 2006 when he was ousted from the Petroleum Ministry and advocated for the initiative as recently as December 2013 in an article on the US-Iran nuclear deal.⁶⁰⁶

Aiyar's advocacy of the Grid was based on his firm belief that the Grid's ability to reshape the Asian energy, economic and political landscapes would ultimately lead to the emergence of an Asian Energy Community on the lines of the European Coal and Steel Community that was formed post-World War II. The Asian Energy Community would serve as a precursor to greater Asian economic and political integration just as the European Coal and Steel Community paved the way for Europe's economic and political integration (European Union).⁶⁰⁷ The emergence of an Asian Energy Community would have profound implications for US preeminence in Asia.

⁶⁰⁶Aiyar, Mani Shankar. "Asia's Quest for Energy Security " *Frontline*, February 11 - 24, 2006.

Aiyar, Mani Shankar. "Lovraj Kumar Memorial Lecture " (2010), <http://www.indianoilandgas.com/data-pdfs/Press-lovraj.pdf>

Aiyar, Mani Shankar. "Asian Gas Grid! Why Not? ." *The Week*, November 29, 2013

http://week.manoramaonline.com/cgi-bin/MMOnline.dll/portal/ep/theWeekContent.do?tabId=13&contentId=15604655&programId=10350717&categoryId=-193221&BV_ID=@@@

Jishnu, Latha. "Iran-India Gas Pipeline Laid Low by Geopolitics" *Down to Earth*, December 30, 2013.

<http://www.downtoearth.org.in/content/iran-india-gas-pipeline-laid-low-geopolitics>

⁶⁰⁷ Ridding, Edward Luce and John. "India Conjures Powerful Vision of 'Pipeline Diplomacy' " *Financial Times*, January 20, 2005

Aiyar, Mani Shankar. "Asia's Quest for Energy Security " *Frontline*, February 11 - 24, 2006.

"Treaty Establishing the European Coal and Steel Community, Ecsc Treaty." (October 15 2010),

http://europa.eu/legislation_summaries/institutional_affairs/treaties/treaties_ecsc_en.htm

Aiyar, Mani Shankar. "Asia's Quest for Energy Security" *Frontline*, February 11 - 24, 2006.

Giridharadas, Anand. "India Proposes Transcontinental Pipeline to Chinese" *The New York Times*, April 19, 2005.

U.S. pre-eminence in the world is linked to energy in three inter-related ways: first, through its direct and indirect control of the world's hydrocarbon trade, second, through the seignorage it derives from the 'petro-dollar' and third, from its ability, as the world's only major maritime power, to "secure" (or block) sea lanes of communication vital to the energy imports of other countries. An Asian energy grid would, however, reduce the U.S. strategic thrust in the region along all three vectors.⁶⁰⁸

Clearly, Aiyar's idea of a continent-spanning Grid, "a bold adventure into Asia's future" was a very ambitious proposal. The problems associated with the three pipeline elements of the regional cooperation strategy would be magnified manifold in the case of the pan-continental Grid with its vast distances across disputed borders (e.g. India-China border), uncertainty over funding mechanisms and pricing and security arrangements. However, I suggest that situating the IPI pipeline in the regional cooperation strategy that consisted of two other pipelines (MBI and TAPI) and situating the South (and West) Asia focused regional cooperation strategy in turn into the continent wide Asian Gas Grid helps to not only understand the IPI pipeline's centrality in the South Asian milieu but also its potential to alter the Asian landscape.

Minister for External Affairs- K. Natwar Singh- Congress Party

Aiyar's effort to push the IPI pipeline and other elements of the regional cooperation strategy was roundly endorsed by a powerful relevant social individual,

⁶⁰⁸ Varadarajan, Siddharth. "Power Grids and the New Silk Road in Asia " *The Hindu*, July 11, 2005.

Minister for External Affairs K. Natwar Singh (hereafter referred to as “Natwar”).⁶⁰⁹ Natwar found a willing partner in his Pakistani counterpart Khurshid M. Kasuri. The duo “recognized the importance of availability and access to energy resources in the region around South Asia” and “agreed that the Ministers of Petroleum and Natural Gas could meet to discuss the issue in its multifarious dimensions” in a joint statement issued after a September 4, 2004 meeting.⁶¹⁰ Natwar was also supportive of Iran-India relations.⁶¹¹ The documentary record suggests that there was significant cooperation (or at least agreement) between Natwar and Aiyar over India’s hydrocarbon energy security challenge and the IPI pipeline’s importance as the most plausible element of the regional cooperation

⁶⁰⁹ Natwar was a long time Gandhi family loyalist and career diplomat turned politician. He was appointed as the Minister for External Affairs by Prime Minister Singh in May 2004. Natwar was born on May 16 1931 in Rajasthan (Bharatpur), graduated from New Delhi’s elite St Stephen’s College and went on to study at Cambridge University (Corpus Christi College) and later Peking University in China. Natwar joined the Indian Foreign Service in 1953, rose to become the Secretary in the Ministry of External Affairs and was appointed as a member on Prime Minister Indira Gandhi’s Secretariat (1966 to 1971). He also served as the Secretary General of the 7th Non-Aligned Summit organized in New Delhi in 1983. Natwar quit the Foreign Service after an illustrious 31 year career during which he led several Indian foreign missions and was elected to the Lok Sabha (lower house of the Indian Parliament) in 1984 on a Congress party ticket. He also served as the Minister of State in the Ministry of External Affairs from 1986-1989. Natwar’s strong non-aligned credentials were well known as was his vocal opposition to the Iraq war. Infact, anti-nuclear activist Praful Bidwai expressed satisfaction over Natwar’s appointment to the Ministry of External Affairs in 2004 and hoped that he would “bring his strongly non-aligned perspective and his experience in multilateral diplomacy to bear upon our foreign policy. Under the NDA (previous government), this became obsessively pro-US to the point that India almost sent troops to Iraq.” “Biographical Sketch- Member of Parliament 12th Lok Sabha- Shri K. Natwar Singh”.

<http://parliamentofindia.nic.in/ls/lok12/biodata/12rj09.htm>.

"Congress Veterans Return to Power after Nine Years

". (May 22, 2004), <http://www.rediff.com/election/2004/may/22profiles.htm>

"Profile: Natwar Singh." (December 6 2005), http://news.bbc.co.uk/2/hi/south_asia/4414748.stm.

"The Golden Pumpkin-Natwar Singh's Iraq War Statement Puts Him in a Tight Spot." *India Today*, April 7, 2003.

K. Natwar Singh. "In the Name of Liberation " *Frontline*, September 13-26 2003.

Bidwai, Praful. "Celebrating the Bjp's Departure" *Kashmir Times*, May 31 2004.

⁶¹⁰ "Text of Kasuri-Natwar Press Conference." *Daily Times*, September 07, 2004

⁶¹¹ Agencies. "India-Iran Ties Set to Hit New High " *The Times of India*, February 22, 2005,.

strategy in South Asia. Consider Natwar's valedictory address at the *Petrotech-2005* conference in New Delhi on January 19 2005.

I thought I should accept his invitation to deliver this Valedictory Address to reassure all of you of the close and symbiotic relationship that has been built between my concern for the long term security interests of our country and the Petroleum Minister's concern for ensuring our Energy Security. The reasons for this are simple, even stark: as India marches on the path of sustained economic growth, achieving levels of 6-7% of GDP growth per annum, its demand for energy, particularly for oil and gas, continues to soar.....The challenge before us is clear.....we have to set up engagements with foreign governments and companies to establish binding arrangements that will provide us with assured supplies to meet the urgent needs created by our growth. Here, the tasks of the External Affairs and the Petroleum Ministries coalesce.....One of the most significant challenges before Indian diplomacy is the setting up of trans-national oil pipelines that would economically carry natural gas from supply points thousands of kilometres away and reach India by crossing different countries.....India has before it three specific pipeline proposals:

- (i) the Myanmar-Bangladesh-India pipeline;
- (ii) the Iran-Pakistan-India pipeline; and,
- (iii) the Turkmenistan-Afghanistan-Pakistan-India pipeline.

...I am also aware of the important discussions that have taken place recently between the Iranian and Indian Petroleum Ministers on the Iran-

India pipeline.....I see in these pipelines the same potential to link our region and set up a new paradigm in regional cooperation and friendship. Indeed, with the use of modern technology and investment, they can constitute the vibrant arteries of our progress and prosperity.⁶¹²

Prime Minister Manmohan Singh- Congress Party

The most powerful supporter of the IPI pipeline and the South Asia focused regional cooperation strategy that was wrapped around it on the Indian side was Prime Minister Manmohan Singh (hereafter referred to as the “Prime Minister” or “Singh”). The Prime Minister shared the anxieties of Aiyar and Natwar regarding India’s energy security challenge as evidenced in a November 2004 article in the *Financial Times* that quoted him as saying that energy security was the next most important priority for the Indian government after food security.⁶¹³ His statement four months later at the January 2005 Petrotech conference seemed to suggest that an important reason for the energy security issue being his top priority was China’s global hydrocarbon assets acquisition campaign.

India's prime minister warned on Sunday that China had moved ahead in securing worldwide oil and natural gas supplies, the bluntest expression yet of energy worries among Indian leaders. In the last two weeks, they have pursued a series of energy deals that have surprised global

⁶¹² Bhasin, Avtar Singh. "India's Foreign Relations 2005."

http://www.mea.gov.in/Uploads/PublicationDocs/186_foreign-relations-2005.pdf. p 12, 13, 17, 18

⁶¹³ Luce, Edward. "Head to Head in the Quest for National Energy Security" *Financial Times*, November 17, 2004.

markets."..... "We can no longer be complacent and must learn to think strategically, to think ahead, and to act swiftly and decisively."⁶¹⁴

Singh had also promised to accelerate the peace dialogue with Pakistan following his nomination to power in May 2004.⁶¹⁵ The IPI pipeline provided an excellent opportunity to work towards enhancing India's energy security and improving India-Pakistan relations. Singh found an enthusiastic partner in General Pervez Musharraf, his Pakistani counterpart who sought to include India as the end-user of Iranian gas in order to reduce the cost of gas for the gas-dependent Pakistani power grid and legitimize the military government by normalizing India-Pakistan relations. The importance accorded by both leaders to the IPI pipeline was expressed in the short joint statement that was issued after their first official meeting in New York on September 24, 2004. The statement emphasized the need for Confidence Building Measures in order to increase trust between the two countries. Significantly, the only Confidence Building Measure that was cited was the IPI pipeline and the statement called for the initiative to be viewed in the "larger context of expanding trade and economic relations between India and Pakistan."^{616 617}

⁶¹⁴ Bradsher, Keith. "Alert to Gains by China, India Is Making Energy Deals." *The New York Times*, January 17, 2005.

⁶¹⁵ "Will Manmohan Singh Make a Good Indian Pm?". (May 26 2004,),

http://news.bbc.co.uk/2/hi/talking_point/3726221.stm

"Manmohan Singh Isolated on Pakistan: Wikileaks." *Hindustan Times*, March 15, 2011.

⁶¹⁶ "India - Pakistan Joint Statement." (September 24, 2004), <http://pmindia.nic.in/speech-details.php?nodeid=21>

⁶¹⁷ The joint statement's specific singling out of the pipeline as the key Confidence Building Measure was interpreted in India as a window of opportunity by Pachauri's Energy and Resources Institute to realize it given the Indian-Pakistani rapprochement

The Prime Minister also formally authorized Aiyar on February 9, 2005 to initiate negotiations on the pipeline with Iran and Pakistan in his capacity as the head of the Cabinet of Ministers.^{618 619} Overall, bilateral negotiations between the three countries would proceed along three separate tracks (as Pakistan would also negotiate with Iran). Any preliminary trilateral arrangement that would result from the three sets of bilateral negotiations would again require Cabinet sanction on the Indian side. The Cabinet also affirmed its support for the regional cooperation strategy by directing Aiyar to negotiate with Bangladesh and “other countries” (presumably Turkmenistan and Myanmar).

The regional cooperation frame

Clearly, Aiyar and the powerful relevant social individuals that backed him (especially Natwar and the Prime Minister) understood that pipelines linking gas-surplus and gas-deficient nations in South (and West) Asia would not just meet a portion of India’s energy security requirements at reasonable cost. They would also concretize a network of inter-state relationships, create mutual interdependencies, foster regional economic integration and incentivize political stability. In other words, pipeline technology and natural gas molecules had the

Institute, Energy and Resources. "Iran-India Gas Pipeline: Prospects Brighten for a 21st Century Silk Route." (September 30 2004),

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=17

See also: "How a Thirst for Energy Led to a Thaw". *Bloomberg Business Week* November 14, 2004

⁶¹⁸"Cabinet Nod for Oil Ministry to Negotiate Gas Pipelines ". *The Hindu- Businessline*, Feb 10, 2005
Mulford, David. (February 11 2005),

https://www.wikileaks.org/plusd/cables/05NEWDELHI1113_a.html

⁶¹⁹ Aiyar also received authorization to negotiate with Turkmenistan but did not initiate discussions citing the need to first study the Asian Development Bank’s feasibility report on the project.

"Ministry of Petroleum and Natural Gas- Government of India." <http://petroleum.nic.in/ng.htm>

potential to literally hardwire and eventually transform relationships between countries, thereby reshaping the economic and political landscape of South Asia to India's immense benefit. A good example was the IPI pipeline as its execution would contribute towards normalizing India-Pakistan relations and reinforcing Iran-India relations.

I use the concept of a technopolitical frame to organize the regional cooperation strategy pushed by Aiyar that relied on modern pipeline technology and natural gas to achieve its myriad energy security, economic and political stability goals into a *regional cooperation frame*. The IPI pipeline can be understood as the most important and advanced element of the frame.

The frame arose due to many of the same factors that resulted in the 'rebirth' of the IPI pipeline. The factors were China's global hydrocarbon assets acquisition spree, a rapidly growing Indian economy perceived by policymakers as energy deficient, Aiyar's appointment as Petroleum Minister, his socialist worldview, the receptivity of Pakistani leaders and India's 2003 strategic partnership with Iran. The regional cooperation frame was by no means a solitary effort of an overzealous Aiyar. He was supported by powerful relevant social individuals including Natwar and the Prime Minister.⁶²⁰ Although the duo actively supported Aiyar's South Asia focused regional cooperation frame, they were not interested in his pan-Asian vision embodied by the Asian Gas Grid.

⁶²⁰ "Natwar Backs Transnational Pipelines for Regional Ties". *The Times of India*. January 19, 2005, . Agencies. "India-Iran Ties Set to Hit New High " *The Times of India*, February 22, 2005,. Varadarajan, Sidharth. "Asia, Africa Should End Energy Dependence: Manmohan " *The Hindu*, April 24, 2005

US Ambassador to India- David Mulford- US Embassy in New Delhi

The American embassy in New Delhi had been keenly watching the building momentum behind the IPI pipeline with growing concern. I suggest that the reasons for the American opposition to the pipeline were relatively straightforward.

The US antipathy towards Iran and its determination to isolate and contain the latter arose from the sudden souring of relations following Iranian cleric Ayatollah Khomeini's meteoric rise to power in the wake of the Iranian revolution of 1979 that displaced Shah Mohammad Reza Pahlavi, longtime Iranian monarch and steadfast US ally. A particularly painful and humiliating memory for an entire generation of American politicians was the dramatic storming of the US Embassy in Teheran by Iranian student revolutionaries in November 1979 resulting in a prolonged hostage crisis involving 66 captured Americans.⁶²¹ The crisis was an important factor in the defeat of then US President Jimmy Carter and the ascent of Ronald Reagan.⁶²²

⁶²¹ "Iran Hostage Crisis Fast Facts". (September 15, 2013), <http://www.cnn.com/2013/09/15/world/meast/iran-hostage-crisis-fast-facts/>

⁶²² "Jan. 20, 1981 | Iran Releases American Hostages as Reagan Takes Office

". *The New York Times*, January 20, 2012

http://learning.blogs.nytimes.com/2012/01/20/jan-20-1981-iran-releases-american-hostages-as-reagan-takes-office/?_r=0

"Carter on Iranian Hostage Crisis: 'I Prayed More Than Any Time Else in My Life'." *Voice of America*, October 31, 2010.

<http://www.voanews.com/content/carter-on-iranian-hostage-crisis--i-prayed-more-than-any-time-else-in-my-life-106445998/129536.html>

Relations deteriorated further following Iranian support for the Beirut bombing that killed 241 American servicemen in 1983,⁶²³ intense Iranian resentment over the American decision to provide refuge to the Shah, the US move to terminate diplomatic relations, impose economic sanctions and support Iraq during the Iran-Iraq war, Iran's support for Hezbollah in Lebanon (and Hamas in Gaza) against US ally Israel and the American policy of sanctions and regime change in the nineties. Although the US and Iran did cooperate briefly against the Sunni Taliban in Afghanistan following the September 11 2001 attacks on the twin towers, American suspicions regarding Iran's nuclear program and classification under the "Axis of Evil" combined with Iran's support for attacks on American soldiers in Iraq deepened the hostility in US-Iran relations as of 2005.

The pipeline would give Iran more leverage to influence the foreign policy calculus of Pakistan and India through its control over a significant fraction of their energy securities (although the level of influence could be reduced by implementing Pachauri's recommendations on the project structure). The Iranian regime would also benefit from the assured supply of substantial foreign exchange earnings from the large Indian market, revenues that would not only undercut American economic sanctions⁶²⁴ but also undermine the US strategy of diplomatically isolating Iran. The pipeline would

⁶²³ Friedman, Thomas E. "Beirut Death Toll at 161 Americans; French Casualties Rise in Bombings; Reagan Insists Marines Will Remain." *The New York Times*, October 23 1983.

<http://www.nytimes.com/learning/general/onthisday/big/1023.html>

Phillips, James. "The 1983 Marine Barracks Bombing: Connecting the Dots" (October 23, 2009), <http://blog.heritage.org/2009/10/23/the-1983-marine-barracks-bombing-connecting-the-dots/>

⁶²⁴ Ganguly, Sumit. "India Needs Energy, and the Us" (September 02, 2005), <http://www.rediff.com/news/2005/sep/02sg.htm>

also strengthen the Iran-India strategic partnership that was announced in 2003, an alignment that would go against the grain of the US strategy in the Middle East that was geared towards isolating and containing Iran.

American concerns regarding the IPI pipeline led then US Ambassador to India David Mulford (hereafter referred to as “Mulford”) to meet Aiyar on February 11 2005 (two days after Aiyar received the green light from the Prime Minister and his Cabinet of Ministers to proceed with negotiations). The proceedings of that meeting were faithfully recorded in a February 15 2005 diplomatic dispatch to Washington D.C. that was later released by *Wikileaks*. The contents of the cable are revealing. A worried Mulford warned Aiyar to back-off the pipeline as any Indian investment in the initiative would invite American sanctions under the Iran-Libya Sanctions Act. It is here that the strength of the support extended to Aiyar by his political backers comes to the fore. Aiyar specifically cited the February 9 2005 Cabinet clearance to remind Mulford that the full weight of the Indian government was behind the pipeline (including that of Natwar and the Prime Minister: the former a cabinet member and the latter the head of the cabinet).

In a February 11 meeting with Indian Petroleum and Natural Gas Minister Mani Shankar Aiyar, the Ambassador raised USG (United States Government) concerns about Indian investments in the development of Iran's petroleum resources given Iran's nuclear activities and its support for terrorism. The Ambassador said he recognized India's growing energy needs but was obliged to alert India to our concerns, which are based on US policy and US law. Aiyar responded that India's

energy security and, by extension, its national security compelled it to look towards Iran for gas.....Aiyar contended that a major "strategic" hurdle had been crossed with the Indian cabinet's decision to authorize him to pursue energy deals with Iran and Pakistan..... In contrast to his often provocative and sometimes anti-American pronouncements and writings, Aiyar was thoughtful, reasonable and insightful. He stood his ground firmly on Iran, but did not use the opportunity to vent against our approach, something he may have been quick to do in earlier incarnations⁶²⁵

Aiyar's firm riposte convinced Mulford that the former would not back down from the IPI pipeline. Perhaps, Mulford also sensed that Aiyar's successful resistance stemmed from the support that he enjoyed from Natwar and the Prime Minister. The matter had to be escalated. Mulford wrote a detailed dispatch to then US Energy Secretary Samuel Bodman on March 9 2005, less than a month after being rebuffed by Aiyar (and a week before newly confirmed US Secretary of State Condoleezza Rice's trip to India). The dispatch was later released by *Wikileaks*. Mulford began by highlighting India's potential to emerge as a major economic and political player in the future. He then pointed out the centrality of energy security considerations to India's developmental ambitions and noted Aiyar's determination to pursue the IPI pipeline and another element

⁶²⁵ Mulford, David. "Aiyar Defends Iran-India Oil and Gas Relationship." (February 15 2005), <http://www.cablegatesearch.net/cable.php?id=05NEWDELHI1175>
Aiyar, Mani Shankar. "The Pipeline We Lost " *The Week* March 22, 2013
<http://week.manoramaonline.com/cgi-bin/MMOnline.dll/portal/ep/theWeekContent.do?tabId=13&contentId=13714735&programId=10350717&categoryId=-193221>

of the regional cooperation frame, the TAPI pipeline. Mulford then suggested that the floundering energy track of the preexisting US-India Economic Dialogue be elevated into a separate Energy Dialogue.

The Energy Dialogue would serve two purposes. First, it would attempt to shape the emerging regional cooperation frame to ensure that the frame would not undermine American interests in Asia. I suggest that such an objective would translate into US support for the TAPI pipeline with its route through US controlled Afghanistan bypassing Iran ⁶²⁶ and the MBI pipeline⁶²⁷ that would cement Myanmar-India relations at the expense of China's influence in that resource-rich country. However, the objective would also translate into resolute American opposition to the IPI pipeline, the centerpiece of the regional cooperation frame. Towards this end, the second objective of the Energy Dialogue would consist of getting India to jettison the IPI pipeline by 'encouraging' it to procure natural gas from American ally Qatar instead.

You (Bodman) already know from our meeting last November my views on the emerging India, a vibrant, multi-faceted democracy.....Most big players here predict several decades of sustained robust economic growth, thanks in part to India's youthful population.....will lift India into the top ranks of global economic and political powers. Energy is at the heart of the Indian agenda because there is consensus that India will not

⁶²⁶ "U.S. Companies Eye Trans-Afghan Pipeline". (January 19 2005),
<http://www.energybulletin.net/stories/2005-01-19/us-companies-eye-trans-afghan-pipeline>

"A South Asian "Peace Pipeline"". *Bloomberg Business Week*, June 26, 2005

⁶²⁷ Ganguly, Sumit. "India Needs Energy, and the Us" (September 02, 2005),
<http://www.rediff.com/news/2005/sep/02sg.htm>

Chandra, Varigonda Kesava. "The Pipeline That Wasn't: Myanmar-Bangladesh-India Natural Gas Pipeline " *Journal of Energy Security* (April 19 2012).

be able to achieve its aspirations without secure and reliable energy supplies..... The Energy track of the (US-India) ED (Economic Dialogue) has historically been its most active track.....These activities, however, have drifted somewhat in recent times. The Foreign Ministry has told us that launching a revived energy dialogue -- similar to what India has with the EU -- will be a priority for Foreign Minister Natwar Singh's April 5 visit to Washington.....For this UPA government....energy security is a high national security priority -- in many ways it is the tail that is driving Indian foreign policy. Petroleum and Natural Gas Minister Mani Shankar Aiyar is widely regarded as the brightest and most successful of the UPA ministers. He has significantly raised his Ministry's profile, usurping the international role that the Foreign Ministry earlier monopolized.....India has transformed its position on participating in trans-Pakistan gas pipelines to take advantage of energy supplies in Iran and Turkmenistan.....It is important for these reasons that we engage in an energy security dialogue..... We could influence Indian energy policy such that it follows a path conducive to U.S. economic, political, security, and global environmental interests. We have reported on India's growing oil and gas relationship with Iran. A renewed and invigorated high level exchange could allow us to exert some influence on this Indo-Iran energy relationship and to encourage forays in other directions, such as the burgeoning India-Qatar ties.⁶²⁸

⁶²⁸ Mulford, David. "Revitalizing the Us-India Energy Relationship" (March 9 2005), https://www.wikileaks.org/plusd/cables/05NEWDELHI1824_a.html

However, Mulford also seemed to realize that merely goading India to do more business with Qatar under the aegis of the Energy Dialogue would not be enough to get it to abandon the IPI pipeline. He also beseeched Bodman to consider another option under the ambit of the Energy Dialogue, greater American flexibility on civil nuclear cooperation with India in exchange for reciprocal concessions from India on issues vital to US policy. I suggest that one of the aforementioned reciprocal concessions that would be demanded from India in exchange for greater American flexibility on civil nuclear cooperation would be a commitment to abandon the IPI pipeline (especially since Mulford called for greater American flexibility on civil nuclear cooperation immediately after suggesting that the US weaken India's drive for the IPI pipeline by encouraging it to buy natural gas from Qatar under a dedicated Energy Dialogue).

India has established an ambitious civil nuclear power program, which will be a small but increasingly important part of the country's energy mix. Its efforts, however, are being stymied because it is now encountering a critical shortage of natural uranium fuel.....This presents us an opportunity where we can leverage flexibility on our part to move Indian policy in other issues of importance to us, and fold civil nuclear issues into the broader matrix of cooperative efforts with an emerging economy as important as India.⁶²⁹

In other words, Mulford advised Bodman to reexamine a particular nuclear status quo that had been a key irritant in US-India relations in order to wean India off the IPI

⁶²⁹Ibid

pipeline. The nuclear status quo in question was the three decade old US-led international fuel and technology embargo imposed on India following its first nuclear test in 1974 that prevented the country from accessing uranium, nuclear reactors and dual use technologies on the international market.⁶³⁰ The sanctions combined with other factors (internal mismanagement, local protests and the Indian Department of Atomic Energy's (DAE) commissioning of new reactors to justify its funding despite the uranium shortfall) to slow the expansion of the Indian nuclear program.⁶³¹ The ambitious targets set by the Department of Atomic Energy were not met and India had 15 operating Pressurized Heavy Water Reactors (PHWR's) that produced 3310 MWe or 3% of the country's total electricity as of 2005.⁶³² Even these reactors were being operated below their full capacity due to an acute shortage of nuclear (natural uranium) fuel.

Interestingly, Mulford also suggested to Bodman that civil nuclear cooperation with India could yield economic benefits for the US although he did not envision American reactor sales to India given the prevailing restrictions imposed by the post-1974 US fuel and technology embargo.

⁶³⁰ Indo-US nuclear cooperation did not completely cease immediately after the imposition of sanctions following the 1974 test and intermittent collaboration did continue. The US initially approved an emergency shipment of fuel to the US constructed Tarapur reactors after the 1974 test and later agreed to transfer its fuel-supply commitments to France.

Conversations with Dr. M. V. Ramana, researcher in the Program on Science and Global Security at Princeton University

See Chapter 4 for a more indepth discussion of the complex American reaction to the 1974 test.

⁶³¹ The internal mismanagement of the Department of Atomic Energy also played an important role in compounding the shortage of natural uranium that had existed since the program's inception and that had been aggravated by the sanctions. Local opposition against new mines and the DAE's unplanned addition of reactors to justify its funding worsened the uranium shortage

Mian, Zia, and M V Ramana. "Wrong Ends, Means, and Needs: Behind the U.S. Nuclear Deal With India." *Arms Control Today*, February 2006.

Gadekar, Surendra. "India's Nuclear Fuel shortage." *Bulletin of Atomic Scientists*, August 6 2008.

Also, see chapter 2 page 10

⁶³² See chapter 2 page 10 for a detailed explanation of the structure of the nuclear program

We have been impressed, as was NRC (Nuclear Regulatory Commission) Commissioner Jeffrey Merrifield during his February 8-11 visits to various nuclear power stations in India (Ref B), at the maturity and sophistication that the Indian civil nuclear establishment has achieved as a power generating utility. There ought to be activities that DOE (Department of Energy) and its labs could conduct which would be comply fully with current law and with NSG (Nuclear Suppliers Group) obligations but still respond positively to Indian requests for a broader civil nuclear power relationship.....India's current nuclear fuel crunch is pushing the GOI (Government of India) to move in unproven and potentially dangerous directions, such as use of MOX (Mixed-Oxide) fuel in their boiling water reactors and developing a complex fast breeder reactor. We should use this cooperation to assure that U.S. interests are clearly understood and recognized as the Indian civil nuclear industry comes of age.....For example, the United States could support nuclear safety at the aging Indian reactors by permitting the plants to acquire U.S. safety-related equipment under the NSG's safety exception. We could consider reviewing our policy of blocking India's efforts to acquire uranium for civil nuclear power from other countries, as long as it is consistent with NSG obligations. Both these steps could be used to leverage placement of additional Indian facilities under IAEA (International Atomic Energy Agency) safeguards.....We could support

Indian participation in events sponsored by the nuclear power industry within the United States.⁶³³

Notice that although the US was not opposed to the TAPI pipeline and the MBI project, its opposition to the IPI pipeline would still severely damage the regional cooperation frame as the IPI pipeline was the centerpiece of the frame and the obstacles to the other two initiatives (security situation in Afghanistan in the case of the TAPI pipeline and India's fraught relations with Bangladesh and Myanmar in the case of the MBI pipeline) were even more formidable.⁶³⁴

It is tempting to identify Mulford's suggestion of American flexibility on civil nuclear cooperation to get India off the IPI pipeline as the origin of the historic US-India nuclear deal that would be announced four months later in July 2005. However, the documentary record and excerpts from a key insider interview in the next section demonstrate that the real reasons for the emergence of the nuclear deal were primarily techno-military-strategic. Mulford's line of thinking would only play an important role in the final 'packaging' of the nuclear deal as a solution to India's energy woes and a counter-offer to the IPI pipeline.

The American strategic reorientation in favor of India and the idea of a nuclear deal

The third part of the chapter begins by exploring the actors, institutions and events that resulted in an American strategic reorientation to explicitly support India's 'rise' in

⁶³³ Mulford, David. " Revitalizing the US-India Energy Relationship " *Wikileaks*, March 9 2005 <http://wikileaks.org/cable/2005/03/05NEWDELHI1824.html>

⁶³⁴ Varadarajan, Siddharth. "Power Grids and the New Silk Road in Asia " *The Hindu*, July 11 2005.

mid-March 2005. An understanding of the factors that led to the aforementioned reorientation also helps to grasp the origins of the idea of a nuclear deal that would later put paid to the IPI pipeline. Such an exploration necessitates a brief detour from the India centric focus of the preceding sections to the corridors of the US State Department as the idea of a strategic reorientation and a nuclear deal was first conceived there by US Secretary of State Condoleezza Rice's associates and later approved by her. I will later demonstrate how Natwar and the Prime Minister bought into Rice's ideas and decisively shifted away from the IPI pipeline and the regional cooperation frame in April and July of 2005 respectively. The attrition of Aiyar's two political backers would eventually lead to the abandoning of the IPI pipeline, severe damage to the regional cooperation frame and Aiyar's dismissal from the Petroleum Ministry.

Philip Zelikow-Counselor to Secretary of State Condoleezza Rice

On March 25 2005, a major US strategic reorientation towards India was announced in a State Department background briefing ostensibly convened to convey the Bush administration's decision to resume the sale of F-16 fighter aircraft to Pakistan after a gap of fifteen years. The official conducting the briefing (later identified as Philip Zelikow,⁶³⁵ counselor to then Secretary of State Condoleezza Rice in the State Department) announced that it would henceforth be US policy to help India become a major world power in the 21st century.

Secretary Rice's trip (to South Asia) last week capped months of work on thinking through American strategy towards South Asia.....The

⁶³⁵ Zelikow confirmed in an interview that he had posed as "State Department Official One" at the March 25 2005 meeting.

Administration has made a fundamental judgment that the future of this region as a whole is simply vital to the future of the United States.....

Let me start with India. The first Bush Administration did a lot to spotlight the significance of the relationship to India.....And that culminated in some things like, in 2004, the announcement of the next steps and strategic partnership, export controls, high-tech cooperation. This year the Administration made a judgment that the next steps and strategic partnership, though very important, wasn't broad enough to really encompass the kind of things we needed to do to take this relationship where it needed to go, and so the President and the Secretary developed the outline for a decisively broader strategic relationship. Secretary Rice presented that outline last week to Prime Minister Singh. Its goal is to help India become a major world power in the 21st century. We understand fully the implications, including military implications, of that statement.⁶³⁶

Zelikow then described the strategic, energy and economic components of the new “decisively broader” strategic partnership.

First, strategic dialogue. The strategic dialogue will include global issues, the kinds of issues you would discuss with a world power. Regional security issues, things like the (2004 Asian) tsunami situation or Nepal. And India's defense requirements, high-tech cooperation, expanding the current High Technology Cooperation Group and manufacturing

⁶³⁶ "Background Briefing by Administration Officials on U.S.-South Asia Relations." (March 25, 2005), <http://www.fas.org/terrorism/at/docs/2005/StatePressConfer25mar05.htm>

licenses, even working towards U.S.-India defense co-production. Thus, it would follow that the U.S. will respond positively to the current Indian request for information on its bid to sell...India its next generation of multi-role combat aircraft and the U.S. will work with U.S. companies that seek to participate in the competition for this sale. That's not just F-16s. It could be F-18s.....Naturally, we maintain a common interest in preventing WMD proliferation and we hope India can join in the Proliferation Security Initiative, and the Secretary raised that issue with her Indian interlocutors as well. So you have this very robust strategic dialogue; in parallel, there's an energy dialogue that would include civil, nuclear and nuclear safety issues. Keep building the next steps in strategic partnership process that's already underway and establish a working group on space.....Economic dialogue. We have had an economic dialogue. Frankly, it needs to get a little more juice. So the economic dialogue is going to be revitalized with the discussion of energy, trade, commerce, environment and finance.⁶³⁷

Zelikow's focus on defense cooperation with India including the American willingness to sell fighter aircraft is interesting and provides a key part of the explanation behind the US offer of a nuclear deal to India as we shall see later. The abrupt American strategic reorientation in favor of India was the brainchild of three key actors in the State Department: Secretary of State Condoleezza Rice, her counselor Philip Zelikow and Deputy Secretary of State Robert Zoellick.

⁶³⁷ "Background Briefing by Administration Officials on U.S.-South Asia Relations." (March 25, 2005), <http://www.fas.org/terrorism/at/docs/2005/StatePressConfer25mar05.htm>

The new policy is due fundamentally to the strategic vision of Secretary Rice, Deputy Secretary of State Robert B. Zoellick, and Counselor Philip Zelikow, who fashioned this bold initiative to advance the president's long-standing desire for a transformed relationship with India.⁶³⁸

President George W. Bush

I provide a brief overview of the circumstances that resulted in the trio managing to fundamentally reorient the US strategic posture towards India in 2005. The documentary record indicates that President George W. Bush was in favor of improving US-India relations as a presidential candidate in 1999, barely a year after India's multiple nuclear tests. Robert Blackwill, former US ambassador to India (2001-03) recalled that Bush was impressed by India's democratic credentials.⁶³⁹

When I asked then-Governor Bush in early 1999 about the reasons for his obvious and special interest in India, he immediately responded, "a billion people in a functioning democracy. Isn't that something? Isn't that something?" The concept of democratic India, a heterogeneous, multilingual, secular society with its vibrant press and respect for the rule of law, has a particular appeal for this president.⁶⁴⁰

⁶³⁸ Tellis, Ashley J. "South Asian Seesaw: A New U.S. Policy on the Subcontinent." (May 2005), <http://www.carnegieendowment.org/files/PB38.pdf> p 2

⁶³⁹ Pramit Pal Chaudhuri, a foreign affairs correspondent for the *Hindustan Times* and a Bernard Schwarz Fellow at the Asia Society confirmed in a personal interview that "Bush himself I don't think actually supported the agreement for any of those reasons.....from what his aides, people like like (National Security Adviser) Stephen Hadley, Bob Blackwill who met Bush on a regular basis they say he liked you only because you are a democracy. He took democracy, for him it was like a religion. And even before he became President he used to tell his aides, that I want this new relationship with India, because it's a democracy of a billion people. And I can't believe we don't have a relationship with this country. You people are talking about China and you people are going on about software. For me its about democracy and I am determined that a democracy get this get a relationship with the United States."

Interview with Pramit Pal Chaudhuri

⁶⁴⁰Blackwill D. Robert. "A New Deal for New Delhi" *Wall Street Journal* March 21, 2005.

Secretary of State- Condoleezza Rice

Bush is also reported to have expressed an interest in India as early as 2000 when he was being coached on foreign policy issues by the “vulcans” (a group of foreign policy advisers led by Condoleezza Rice).⁶⁴¹ Rice was a firm believer in balance of power politics and recommended in an article in *Foreign Affairs* in 2000 that a new administration must pay more attention to India, conceptually de-link it from Pakistan and consider it as a counterweight to China.

China's success in controlling the balance of power depends in large part on America's reaction to the challenge. The United States must deepen its cooperation with Japan and South Korea and maintain its commitment to a robust military presence in the region. It should pay closer attention to India's role in the regional balance. There is a strong tendency conceptually to connect India with Pakistan and to think only of Kashmir or the nuclear competition between the two states. But India is an element in China's calculation, and it should be in America's, too. India is not a great power yet, but it has the potential to emerge as one."⁶⁴²

President Bush found a willing partner in India's then Prime Minister Atal Behari Vajpayee, leader of the country's right wing Hindu nationalist Bharatiya Janata Party (BJP) led coalition government (known as the National Democratic Alliance-NDA).

⁶⁴¹ Mann, James. *Rise of the Vulcans-the History of Bush's War Cabinet*. Penguin Group, 2004.
Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005), <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf>. p 5.

Luce, Edward. "Bush's Love of India Will Outlast Him" *Financial Times*, August 31 2006.

⁶⁴² Rice, Condoleezza. "Promoting the National Interest." *Foreign Affairs*, January - February 2000. P 56
Pant, Harsh V. *The U.S-India Nuclear Pact- Policy, Process and Great Power Politics*: Oxford University Press, 2011. p 64

Vajpayee termed the US and India as “natural allies” and was eager to break away from Cold-War era and post-1998 nuclear test-related tensions⁶⁴³ in favor of a strategic partnership. Bush and Vajpayee met in November 2001 in the post 9/11 milieu and “affirmed their commitment to qualitatively transform India-U.S relations”⁶⁴⁴

Rice’s support for greater US-India engagement in the *Foreign Affairs* article was not a one-time pre-election statement. As National Security Adviser in the first Bush administration, Rice explicitly reiterated the desire of the administration to broaden the

⁶⁴³ U.S-India relations were lukewarm during the Cold War due to American support for Pakistan and India’s tilt towards the Soviet Union. Another major irritant in the U.S-India relationship was the mutual recrimination that followed Non-proliferation Treaty non-signatory India’s 1974 nuclear test that repurposed American (and Canadian) civil nuclear assistance for military purposes and the lead role of the U.S in erecting a sanctions regime that denied India access to nuclear fuel, reactors and dual use technologies on the international market. The American and international nuclear embargo slowed the Indian nuclear program and had an adverse impact on the two U.S built Boiling Water Reactors (BWR’s) at Tarapur. The nuclear issue continued to be a bone of contention between American and Indian diplomats throughout the eighties and the nineties and impeded a broader U.S-India engagement despite an improvement in relations following the collapse of the Soviet Union and the liberalization of India’s quasi-socialist economy. India’s multiple nuclear tests in 1998 resulted in a fresh round of American sanctions that temporarily halted the building momentum in the U.S-India relationship. The consultations following the tests between Deputy Secretary of State Strobe Talbott and Minister for External Affairs Jaswant Singh was the most comprehensive engagement between the two countries on the nuclear issue but was eventually unsuccessful as India refused to accept the non-proliferation benchmarks set by the Clinton Administration. Although the Clinton administration supported India during its 1999 Kargil conflict with Pakistan and President Clinton’s maiden visit to India in 2000 was successful, the nuclear issue remained the primary ‘irritant’ to an enhanced relationship at the end of the administration’s term. Ties began to improve during the first Bush administration in the post 9/11 milieu with an expansion of defense cooperation but only incremental progress was made on resolving nuclear differences.

Ganguly, S. Paul Kapur and Sumit. "The Transformation of U.S-India Relations: An Explanation for the Rapprochement and Prospects for the Future." *ASIAN SURVEY* XLVII, no. 4 (JULY/AUGUST 2007). p 643-648

Source: Singh, Jaswant. *In Service of Emergent India- a Call to Honor*: Indiana University Press 2007. p 253, 262-63

Source: Agencies. "Clinton Blew up During Kargil Talks" *The Times of India* July 12, 2004.

Chellaney, Brahma. "The Clinton Visit: Hype and Reality." (2000),

<http://www.rediff.com/news/2000/mar/27clint.htm>

⁶⁴⁴ Parthasarathy, Malini. "Bush, Vajpayee Talk over Phone " *The Hindu*, September 10 2000.

Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005),

<http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> p 5

"Statement of Principles for U.S.-India High Technology Commerce." (February 5 2003),

<http://www.bis.doc.gov/internationalprograms/statementprinciplesindia.htm>

"What Is the Htcg?". (2002), http://www.bis.doc.gov/internationalprograms/htcw_archives.htm

US-India relationship in the US National Security Strategy released in September 2002. Although the Strategy acknowledged that significant differences existed between the US and India over the latter's nuclear and missile programs, it also highlighted the increasing convergence on multiple strategic issues ranging from protecting sea lanes of communication to ensuring 'stability' in Asia. Based on the perception that US and Indian interests were increasingly converging, the Strategy affirmed that the US would transform the bilateral relationship with India without seeking concessions on the nuclear weapon and missile development fronts.⁶⁴⁵

Philip Zelikow-Counselor to Secretary of State Condoleezza Rice

The language on India in the Strategy was drafted by Dr. Philip Zelikow, now the White Burkett Miller Professor of History at the University of Virginia.⁶⁴⁶ Zelikow revealed in a personal interview that the ambitious language on India in the Strategy was a result of his own experiences as the Director of the Aspen India Strategy Group, a Track II dialogue launched in January 2002 consisting of regular discussions involving US and Indian policy elites. The discussions convinced Zelikow of the untapped potential of the US-India relationship and the significance of India in the 21st century.

Bob (Robert) Blackwill (was) the Ambassador to India for some years.

When I was out of government but (was) friendly to the government in the winter of 2001-2002 late 2001....Bob asked me if I would consider

⁶⁴⁵ "The National Security Strategy of the United States of America." (September 2002), <http://merln.ndu.edu/whitepapers/USnss2002.pdf> p 27

⁶⁴⁶ Interview with Dr. Philip Zelikow, Counselor to Secretary of State Condoleezza Rice in the State Department. November 24 2010.

Kessler, Glenn. "Close Adviser to Rice Plans to Resign" *Washington Post*, November 28 2006.
Chaudhuri, Primit Pal. "The Man Behind the Deal " *Hindustan Times*, December 04, 2006.

developing a Track II dialogue with India. I was then the director of something called the Aspen Strategy Group. and.... I thought this was a terrific idea and I developed it....that....since.....has become perhaps the most important of all the various Track II dialogues that have arisen in recent years.....So I began to learn more about India and I thought a lot about it and had long believed that the U.S relationship with India was an area of untapped potential.....And the language about India that appears in the National Security Strategy in 2002 is language that I drafted.⁶⁴⁷

Undersecretary of State Robert B. Zoellick

Then Undersecretary of State Robert B. Zoellick, the third actor responsible for America's strategic reorientation in favor of India in early 2005 differed from the Rice-Zelikow duo in that he was primarily interested in a US-India partnership in order to secure and maintain US access to India's large markets. He was the first cabinet official in the Bush administration to visit India in his capacity as the US Trade Representative in August 2001.

This trip builds on Zoellick's visits to Asia, Latin America, and Europe earlier this year and underscores the importance the Bush Administration places on its ties with India. Zoellick is the first Cabinet official in the Bush Administration to visit India and the first U.S. Trade Representative to visit India in more than a decade."With the economic

⁶⁴⁷ Interview with Dr. Philip Zelikow, Counselor to Secretary of State Condoleezza Rice in the State Department.

reforms of the last decade, India is emerging as an important player in the global trading system," said Zoellick.⁶⁴⁸

The geopolitical motivations of Rice and Zelikow would later meld perfectly with the economic considerations of Zoellick as the trio would be appointed to powerful positions in the US State Department in early 2005.

The Pentagon (top brass)

Meanwhile, a powerful relevant social group in the US was increasingly interested in a defense cooperation relationship with India in 2002-03. The Pentagon was increasingly keen to participate in more frequent US-India joint military exercises as it would increase trust and “interoperability” of equipment. The increase in trust would raise the prospect of Indian participation in US military interventions in the Middle East. It would also create an enabling environment for the US to gain a toehold in the vast and growing Indian defense market through Indian purchases of major US weapons platforms. Such purchases would also be strategically significant as India would become dependent on the US for spares and maintenance thereby giving the latter valuable leverage over the former’s foreign policy. Siddharth Varadarajan, Strategic Affairs Editor for *The Hindu* newspaper explained that

as the strategists of the Bush administration surveyed the post-Iraq war world, they asked themselves whether this failure could somehow be turned into the pillar of a new approach. One where India’s obvious

⁶⁴⁸Office of the United States Trade Representative "U.S. Trade Representative Robert B. Zoellick Visits India August 8-10." (August 8 2001), http://www.ustr.gov/archive/Document_Library/Press_Releases/2001/August/US_Trade_Representative_Robert_B_Zoellick_Visits_India_August_8-10.html

military strengths were recognised, including the reality of its nuclear weapons, and an attempt made to harness its abilities so that they could further U.S. interests in the region. If the Iraq fiasco had demonstrated, inter alia, the limits of unilateralist hegemony, could the outsourcing of hegemony to countries like India help transcend those limits? Not surprisingly, the first branch of U.S. government to realise the promise this new relationship held was the Pentagon. Even during the first four years of the Bush administration, Donald Rumsfeld (Secretary of Defense) and Douglas Feith (Undersecretary of Defense for Policy) had sought to deepen military-to-military ties with the Indians, with the stress first on exercises and interoperability leading eventually to the sale of equipment.⁶⁴⁹

US Ambassador to India Robert Blackwill (2001-2003) characterized the burgeoning US-India defense relationship as a “vibrant, visible, and expanding aspect of the transformed U.S-India relationship” that began from “virtually no interaction in January 2001” to “seven major military exercises” by May 2003.⁶⁵⁰ However, the eagerness of the Pentagon to further improve “mil-to-mil” ties was often frustrated by an Indian government that repeatedly conditioned any increase in defense cooperation to the US dismantling the three decade old non-proliferation laws and the technology denial regime hampering the Indian nuclear program since 1974.

⁶⁴⁹ Varadarajan, Siddharth. "The American Dilemma at the NSG " *The Hindu*, Aug 28, 2008

⁶⁵⁰ Blackwill, Robert D. "U.S.-India Defence Cooperation " *The Hindu*, May 13 2003.
Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005), <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> p 5

A U.S. envoy made a final push with a top Indian official in early July that year (to get India to send ‘peacekeeping’ troops to Iraq in 2003). “Future generations of Americans will be grateful for India’s help,” he said. “But what can you do for us now? Are you prepared to lift the restrictions on our civil nuclear programme?” the official asked. The envoy had no answer. He returned empty handed.....⁶⁵¹

In fact, India’s National Security Adviser Brajesh Mishra reckoned that the entire prospect of a long term US-India strategic partnership (including a robust defense cooperation relationship) was being held hostage by US non-proliferation laws and the technology denial regime. Mishra enjoined the US to amend the laws in a May 7, 2003 speech at the Council on Foreign Relations.

In the world order defined by the Cold War, India and US were not really allies though, to be fair, nor were they enemies.....In the post-Cold War world (and even in the post-9/11 world order), the situation is dramatically different. We have shared geo-political interests and economic opportunities, which can bind an enduring partnership..... I have been saying very candidly that a trinity of issues-high technology, commerce, civilian nuclear energy cooperation and collaboration in space can take the Indo-US relationship to a qualitatively new level of partnership..... Here again, I have to say that the obstacles come from remnants of cold war thinking and are not in consonance with our mutual interests...it defies logic to place obstacles on civilian applications of

⁶⁵¹ Varadarajan, Siddharth. "The American Dilemma at the NSG " *The Hindu*, Aug 28, 2008

our nuclear programme and developmental projects of our space programme.....US regulations and laws are constraining factors, but rules and legislation can be amended to respond to changed situations.⁶⁵²

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Harsh Pant, an associate at King's College in London characterized the non-proliferation regime as a fundamental obstacle to a strategic partnership (and a strong defense relationship) in *The US-India Nuclear Pact- Policy, Process and Great Power Politics*.

Despite the upswing in Indo-US ties, the nuclear non-proliferation regime denying civilian nuclear technology to India with its larger restrictive implications cross the entire high technology spectrum had been a fundamental irritant in this relationship. And it was left to the Bush administration to resolve this obstacle, allowing US India ties to reach their full potential.....It was clear to both the US and India that the road to a healthy strategic partnership between the two democracies goes through nuclear energy cooperation.”⁶⁵⁴

⁶⁵² “India, United States and the New World Order: Prospects for Cooperation,” speech of India’s National Security Advisor at the Council on Foreign Relations, New York. May 7, 2003. [asr2.myweb.uga.edu/.../.](http://asr2.myweb.uga.edu/.../)

⁶⁵³ Mishra also confirmed in a personal interview that “when I met the people from the Bush administration, I said to them I needed, apart from lifting of sanctions against India , I needed high technology exchange, about which there was already an agreement with between Mr (Ronad) Reagan (former US President) and Mr. (Rajiv) Gandhi (former Indian Prime Minister). So I needed permission for export of dual use items, and I needed co-operation in civilian use of nuclear energy. So this is what I conveyed to them.”

Interview with Brajesh Mishra, former Indian National Security Adviser, April 21 2010

⁶⁵⁴ Pant, Harsh V. *The U.S-India Nuclear Pact- Policy, Process and Great Power Politics*: Oxford University Press, 2011.p 23, 40

The aforementioned statements by Mishra and Pant should not be construed to mean that an American nuclear rapprochement with India was the only way to improve US-India relations.⁶⁵⁵ Rather, my intention in including the quotes is to suggest that a significant portion of the Indian elite was either convinced or deliberately sought to impress upon the US that the non-proliferation regime with its restrictive implications across the high-technology spectrum was the key obstacle to rapid improvement in the US-India relationship.

(Former) Secretary of State Colin Powell

Then Secretary of State Colin Powell was aware of the obstacle posed by US non-proliferation laws to an across-the-board US-India strategic partnership with a strong defense cooperation component in 2002-03. Although he was sympathetic to Mishra's demand for greater cooperation on the "trinity of issues," he was also wary of the damage to the non-proliferation regime that would be caused by an amendment of US non-proliferation laws. Consequently, he supported an incremental "glide path" that would attempt to increase cooperation on the trinity of issues through a set of reciprocal, interlocking measures without fundamentally altering US non-proliferation laws.

There were a basket of issues that they (the Indians) were always asking us about... we nicknamed it 'The Trinity'. How could you help us? How can we expand our trade in high tech areas, in areas having to do with space launch activities, and with our nuclear industry..... We have been trying to be as forthcoming as we can because it's in our interest to be

⁶⁵⁵ Conversations with Dr. M. V. Ramana, Associate Research Scholar in the Program on Science and Global Security at Princeton University.

forthcoming; but we also have to protect certain red lines that we have with respect to proliferation, because it's sometimes hard to separate within space launch activities and industries and nuclear programmes, that which could go to weapons and that which could be solely for peaceful purposes.....And the 'glide path' was a way of bringing to closure this debate."⁶⁵⁶

The Next Steps in Strategic Partnership (NSSP)

The “glide path” consisted of expanding the modest High Technology Cooperation Group (HTCG) set up by the US and India in November 2002 (it’s aim was to merely “provide a forum for discussing US-India high-technology trade issues”⁶⁵⁷) into the more ambitious but still incremental Next Steps in Strategic Partnership (NSSP) initiative. The NSSP aimed to improve US-India relations through incremental cooperation in civilian nuclear activities, civilian space programs and high technology trade without fundamentally changing US non-proliferation laws constraining India’s nuclear program.⁶⁵⁸

⁶⁵⁶ Krishnaswami, Sridhar. "U.S., India Close to Agreement on 'Trinity' " *The Hindu*, October 06, 2003

⁶⁵⁷ Parthasarathy, Malini. "Bush, Vajpayee Talk over Phone " *The Hindu*, September 10 2000.

Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005), <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> p 5

"Statement of Principles for U.S.-India High Technology Commerce." (February 5 2003),

<http://www.bis.doc.gov/internationalprograms/statementprinciplesindia.htm>

"What Is the Htcg?". (2002), http://www.bis.doc.gov/internationalprograms/htcw_archives.htm

⁶⁵⁸ The initiative was announced on January 14 2004 by Colin Powell. It was the first major initiative after the unsuccessful post-1998 talks between Indian Minister for External Affairs Jaswant Singh and his American counterpart Deputy Secretary of State Strobe Talbott that attempted to address the nuclear differences between the U.S and India. The main premise of the NSSP was that the U.S would not let “India’s anomalous status within the global nonproliferation regime becomes an impediment to the close relationship desired by both sides.”

The initiative envisaged incremental collaboration in three key areas: civilian nuclear activities, civilian space programs and high technology trade in order to enhance U.S-India relations. Another significant area of cooperation was an expanded dialogue on missile defense.

The initiative would consist of multiple rounds and was designed to proceed through a series of reciprocal steps to enhance trust by establishing habits of cooperation

The NSSP arose out of three realizations on the part of the Bush administration: 1) India would not dismantle its nuclear weapons as long as Pakistan and China possessed them 2) The administration also began coming around to the view that "India's nuclear weapons did not pose a threat to U.S. security and the United States' larger geopolitical interests, and could in certain circumstances actually advance American strategic objectives in Asia and beyond." 3) The deliberate/accidental transfer of sensitive technologies associated with Weapons of Mass Destruction (WMD's) and missile systems from the Indian public and private sectors to other states was a greater threat to American security than New Delhi's possession of nuclear weapons: a perception that gained strength after 9/11.

The Bush administration went along with the NSSP despite India's refusal to give up its nuclear weapons and conform to the non-proliferation benchmarks set up by the previous Clinton administration. In return for access to American technologies, India had to ensure that it would "not seek to use these commodities to advance its own strategic programs or permit their unlawful export, nor countenanced the diffusion of its own advanced capabilities to any foreign entity."

Put another way, India's main commitment under the NSSP was the institutionalization of "comprehensive export controls that conformed to the best international standards."

The NSSP was an incremental initiative that would consist of multiple rounds and was designed to proceed through a series of reciprocal steps to enhance trust by establishing habits of cooperation between the two governments. The First Round (Phase I) of the NSSP concluded on September 21 2004.

The first round included the implementation by India of "measures to address proliferation issues and ensure that U.S.- origin goods and technologies are used in accordance with U.S export-control requirements." After being satisfied by India's compliance, the U.S modified its export control regulations to allow increased technology collaboration with the Indian commercial space programs and permitted exports to "power plants at safeguarded nuclear facilities." More specifically, the U.S removed the Indian Space Research Organization (ISRO) headquarters from the Department of Commerce's Entities List and allowed dual use exports. It also waived licensing requirements for the export of low level dual use items (EAR99 and XX999) to ISRO subordinate entities. Finally, the U.S adopted a positive "presumption of approval" policy in place of the previous "presumption of denial" policy for exports to India of "balance-of-plant" portion of a safeguarded Indian nuclear facility in order to expand civilian nuclear cooperation.

Tellis, Ashley J. "India as a New Global Power: An Action Agenda for the United States." (2006), http://carnegieendowment.org/files/CEIP_India_strategy_2006.FINAL.pdf p 13

"Next Steps in Strategic Partnership with USA" -'India and the United States of America Agree to Expand Cooperation in Three Specific Areas: Civilian Nuclear Activities, Civilian Space Programmes, and High Technology Trade". *Outlook* January 13 2004.

Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005), <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> p 6, 7

Juster, Kenneth I. " A New Strategic Partnership for the U.S. And India " *The Wall Street Journal* October 1, 2004.

"Announcement on U.S.-India Next Steps in Strategic Partnership

". (September 2004), <http://www.bis.doc.gov/news/2004/us-indianextstep.htm>

Ereli, Adam. "United States - India Joint Statement on Next Steps in Strategic Partnership." (September 17, 2004), <http://2001-2009.state.gov/r/pa/prs/ps/2004/36290.htm>

between the two governments. The First Round (Phase I) of the NSSP concluded on September 21 2004.⁶⁵⁹

The results of the first round of the NSSP were modest⁶⁶⁰ and the two countries seemed destined for a long and convoluted road to a strategic partnership given the

⁶⁵⁹ Tellis, Ashley J. "India as a New Global Power: An Action Agenda for the United States." (2006), http://carnegieendowment.org/files/CEIP_India_strategy_2006.FINAL.pdf p 13

'Next Steps in Strategic Partnership with USA' -'India and the United States of America Agree to Expand Cooperation in Three Specific Areas: Civilian Nuclear Activities, Civilian Space Programmes, and High Technology Trade". *Outlook* January 13 2004.

Tellis, Ashley J. "India as a New Global Power-an Action Agenda for the United States." (2005), <http://www.carnegieendowment.org/files/Tellis.India.Global.Power.FINAL.pdf> p 6, 7

Juster, Kenneth I. " A New Strategic Partnership for the U.S. And India " *The Wall Street Journal* October 1, 2004.

"Announcement on U.S.-India Next Steps in Strategic Partnership

". (September 2004), <http://www.bis.doc.gov/news/2004/us-indianextstep.htm>

Ereli, Adam. "United States - India Joint Statement on Next Steps in Strategic Partnership." (September 17, 2004), <http://2001-2009.state.gov/r/pa/prs/ps/2004/36290.htm>

⁶⁶⁰ The documentary evidence and leaked American diplomatic cables indicate that there was significant opposition to the modest NSSP initiative in the Indian scientific establishment. A frustrated Indian Atomic Energy Commission opposed the NSSP due to the limited American cooperation that was the result of the initiative's inability to fundamentally alter U.S non-proliferation laws and its conservative interpretation by the State Department mid-level bureaucracy. Dr. Anil Kakodkar, the Chairman of the Atomic Energy Commission was outspoken in his opposition to the NSSP. Kakodkar repeatedly emphasized the importance of indigenous fast breeder reactors in meeting India's energy security needs and could barely contain his cynicism regarding the upcoming NSSP Phase II in an interview with *The Hindu* "Interviewer: Will the dialogue with the U.S., Next Steps in Strategic Partnership, be of any use to India for developing our nuclear power technology? Kakodkar: I don't think so."

Increasingly, even the Indian Space Research Organization that had benefited more than the Atomic Energy Commission in Phase I was expressing its frustrations over the limited American cooperation in the space domain in Phase II.

A January 4 2005 leaked American diplomatic cable described a meeting between Mulford and S. Jaishankar, Joint Secretary (Americas) in the Ministry of External Affairs in which the latter warned the former that Kakodkar was the "first among equals in the Indian scientific establishment" and had the "ability to set the tone for other agencies." He could "retard progress in other areas of NSSP cooperation (export controls, defense research and space)" if he felt that "India's nuclear sector will not benefit" from NSSP Phase II. Jaishankar appealed for a "more liberal interpretation of nuclear safety collaboration in Phase II" in order to secure Kakodkar's buy-in and continue with the NSSP process. Jaishankar was right. Mulford cabled Washington two weeks later that the Atomic Energy Commission was actively trying to block the NSSP within the Indian scientific establishment after concluding that there was nothing for it in the upcoming Phase II.

The non-cooperation of the Atomic Energy Commission also manifested itself in delays in responding to the American request to formulate export control legislation: a requirement for the continuation of Phase II. Quizzed by the American Embassy regarding the delay, the Ministry of External Affairs reiterated its inability to continue improving U.S-India ties without Kakodkar's (and his Atomic Energy Commission's) support for Phase II.

incremental nature of the initiative and the determination of its American supporters to not breach US non-proliferation laws. To summarize, although the NSSP was able to improve nuclear, space and high-technology cooperation (the trinity of issues cited by Mishra), the initiative was not able to transform US-India relations at a rapid pace due to the American determination to not dilute its non-proliferation commitments.

However, the aforementioned state of affairs changed quickly in early 2005 when Condoleezza Rice was confirmed as the Secretary of State on January 27 to succeed Colin Powell⁶⁶¹ and Zoellick was nominated as her Undersecretary.⁶⁶² The two brought in Zelikow as “counselor” to Rice.⁶⁶³ Former US ambassador to India Robert Blackwill noted in a March 21 2005 op-ed in the *Wall Street Journal* that the trio’s favorable views towards India were without precedent in the State Department.

...never in the history of the U.S.-India relationship has the State Department's seventh floor had three policy makers with a global

Subramanian, T.S. "'Fast-Breeder Reactors More Important for India' " *The Hindu*, November 24 2004.
Mulford, David. " Isro Chairman: Help Us Maintain Momentum in Space Cooperation." (February 14 2005),

https://www.wikileaks.org/plusd/cables/05NEWDELHI1136_a.html

Mulford, David. "Indian Initiatives to Further High-Tech, Biotech and Nuclear Cooperation " (January 4 2005),

https://www.wikileaks.org/plusd/cables/05NEWDELHI72_a.html

Mulford, David. "Mea Warns of Nuclear Impasse in Nssp " (January 20 2005),

https://www.wikileaks.org/plusd/cables/05NEWDELHI551_a.html

Mulford, David. "26463: Challenges and Opportunities in India " *The Hindu* (March 28 2011),

<http://www.thehindu.com/news/the-india-cables/the-cables/article1576947.ece>

Mulford, David. "Restoring Momentum to Our Nssp Relationship " (January 31 2005),

https://www.wikileaks.org/plusd/cables/05NEWDELHI759_a.html

⁶⁶¹ Babington, Charles. "Rice Is Confirmed Amid Criticism." *Washington Post*, January 27 2005.

⁶⁶² Interview with Philip Zelikow, Counselor to Secretary of State Condoleezza Rice

Tellis, Ashley J. "South Asian Seesaw: A New U.S. Policy on the Subcontinent" (May 2005),

<http://carnegieendowment.org/files/PB38.pdf>. (p 2-3).

⁶⁶³ Kessler, Glenn. "Close Adviser to Rice Plans to Resign" *Washington Post*, November 28 2006.

Chaudhuri, Pramit Pal. "The Man Behind the Deal " *Hindustan Times*, December 04, 2006.

"Conference on Germany in the Modern World at Harvard University."

http://www.germanconference.org/2009/bios/philip_zelikow.php

orientation toward India. (Usually it has had none.) State today has the secretary herself, Deputy Secretary Robert Zoellick, who was the first Bush cabinet member to visit India in 2001, and Counselor Philip Zelikow, who directed for several years the most prestigious nongovernmental dialogue (Aspen India Group) between the U.S. and Indian strategic elites.⁶⁶⁴

Philip Zelikow-Counselor to Secretary of State Condoleezza Rice

The trio of Rice, Zoellick and Zelikow was almost immediately assigned the task of coming up with a way to mollify India following the decision of the Bush administration to resume the sale of F-16 fighter aircraft to Pakistan as a reward for its cooperation in the Global War on Terror (the sale had been banned after the American president could no longer certify that Pakistan was not pursuing nuclear weapons in 1990 following the end of the Cold War).⁶⁶⁵ India had already protested preliminary press reports of the sale⁶⁶⁶ and some sort of US reassurance was necessary before the official announcement in order to prevent a setback to the improving US-India relationship. I rely on an interview with Zelikow to get an insider's view of the initiative that was considered by the trio in order to mollify India. Zelikow recollected that he began by trying to expand the Colin Powell approved NSSP's high-technology trade prong around early

⁶⁶⁴ Blackwill D. Robert. "A New Deal for New Delhi" *Wall Street Journal* March 21, 2005.

⁶⁶⁵ The ban on the sale of F-16's had been imposed in 1990 under the Pressler Amendment on suspicion that the country was in possession of a nuclear bomb. The decision to resume the sale of fighter aircraft was prompted by repeated requests from Pakistani officials as a reward for cooperation in nabbing Al Qaeda terrorists.

Sen, Ashish Kumar. "Pervez, Bush Discuss F-16 Sale" *The Tribune*, December 6 2004.

Kessler, Glenn. "India Protests Possible Sale of Fighter Jets to Pakistan" *Washington Post*, March 17, 2005

⁶⁶⁶Kucera, Joshua. "To Pakistan, with Thanks." *Slate*, Oct. 4, 2004.

Boese, Wade. "U.S.-Pakistani F-16 Deal up in the Air" *Arms Control Today*, November 2004.

Sen, Ashish Kumar. "Pervez, Bush Discuss F-16 Sale" *The Tribune*, December 6 2004.

March 2005. However, he found it impossible to expand high-technology trade in a major way due to US non-proliferation laws that restricted the scope of cooperation available under the NSSP.

Coming into the second term, the new team...Secretary Rice and her deputy secretary Bob (Robert) Zoellick who's now the President of the World Bank, both had the job of figuring out how to implement the President's decision on F-16s to Pakistan and so there was this question about what should we do about India that might offset the blow....Zoellick essentially threw me at this problem of F-16's, Pakistan and India.....because when you looked at the problem of what you could do more with India in say technology-transfer or trade it turned out to be a very difficult problem because the nuclear issue had worked its way through American law and regulation to actually hinder almost all kinds of advanced trade with India in one way or another. By the time you're looking at this problem in 2004 or 2005 is ... the difficulty then of bringing India into high-technology trade that is so caught up and related to the non-proliferation regimes that are meant by the international community to protect against the dangers of astray (presumably, a reference to state proliferation).⁶⁶⁷

Zelikow did not specify the meaning of the term "high technology trade." I suggest that ascertaining the possible meaning/meanings of the term from other sources (leaked American diplomatic cables) combined with a brief analysis of the ongoing

⁶⁶⁷ Interview with Philip Zelikow, Counselor to Secretary of State Condoleeza Rice. November 24 2010.

events at the time in the Indian defense sector provides a critical part of the explanation for the American strategic reorientation towards India (and the origin of the nuclear deal) in mid-March 2005. A February 16 2005 leaked cable authored by Mulford (a few days before Zelikow's unsuccessful attempts to expand "high-technology trade" with India under the NSSP) suggests that one meaning of the term "high technology trade" was defense technology trade.

In a February 10 meeting sponsored by the US- India Business Council (USIBC) and the Confederation of Indian Industries (CII), senior Indian and US defense company representatives suggested that to expand the bilateral defense market, the USG (United States Government) should reform its export licensing process, showcase how NSSP and other progress make the US a more reliable supplier, and consider more co-production with Indian manufacturers.....Suggestions for doing this included releasing a profile of how many dual-use BIS (Bureau of Industry and Security-Department of Commerce) and munitions list DTC (Directorate of Defense Trade Controls) licenses have been granted since NSSP was launched, what areas NSSP has facilitated or removed export licensing requirements for, the processing times for licenses, and a breakdown of licenses granted by industry..... Indian industry asked for more co-production, and joint research and development, as a way to make US tenders more attractive to the GOI (Government of India).⁶⁶⁸

⁶⁶⁸ Mulford, David. "Us Embassy Cable - 05newdelhi1230.Improving Us-India Defense Cooperation: Industry Offers Ideas " (2005-02-16), <http://cables.mrkva.eu/cable.php?id=27118>

Recall that the Pentagon had been interested in entering the Indian defense market in 2002-03 and that its efforts to enhance defense cooperation were frustrated by an Indian government that conditioned such cooperation to the dismantling of non-proliferation laws and the technology-denial regime.⁶⁶⁹ Another key reason for the inability of the US to enter the lucrative Indian defense market (annual purchases of \$14 billion)⁶⁷⁰ can be discerned in the February 16 cable. India was a picky defense customer that was not content with purchasing American arms “off the shelf” but also insisted on technology transfer and coproduction in a bid to achieve self-reliance in the production of major weapons platforms.⁶⁷¹ A good example was the Indian Air Force’s \$10.4 billion global tender for 126 Multi-Role Combat Aircraft (MMRCA) announced in 2004, India’s largest defense contract and one of the world’s largest defense import orders in recent years.⁶⁷² It’s technology transfer requirement⁶⁷³ (also known as ToT-“transfer of technology” in defense parlance) would obviously require the US to transfer defense technology to India if it was to secure the multibillion dollar contract (and a strategic partnership with India through the sale of a weapons platform crucial to Indian security).⁶⁷⁴

⁶⁶⁹ Chapter 3, p 81.

⁶⁷⁰ Mulford, David. "Challenges and Opportunities in India " (March 28, 2011), <http://www.thehindu.com/news/the-india-cables/the-cables/article1576947.ece>

⁶⁷¹ Mulford, David. "Defense Minister Upbeat on Indo-Us Relations But..." (March 28, 2011), <http://www.thehindu.com/news/the-india-cables/the-cables/article1576942.ece>

⁶⁷² "The Twists and Turns of India's Biggest Defence Deal". *Deccan Chronicle*, January 31, 2012
Somini Sengupta and Salman Masood,. "Courting a Pair of South Asia Partners" *The New York Times*, March 27 2005.

PTI. "India to Ink \$11 Billion Mmrca Deal with Rafale by Next Month: Indian Air Force Official" *The Economic Times*, Sep 8, 2012.

⁶⁷³ "Dassault Deal: 108 Rafale Jets May Be Manufactured in India". *The Economic Times*, Feb 1, 2012.

⁶⁷⁴ A February 6 2012 article by Ramesh Phadke on the website of the Institute for Defense Studies and Analysis (IDSA): a premier Indian think tank stated that the French company Dassault Aviation that

It is here that the US non-proliferation laws and the technology denial regime served as a major impediment. Although the non-proliferation laws and the technology denial regime had been originally erected to constrain the Indian nuclear (and space) program, they were also hampering a significant expansion of the growing US-India defense relationship by preventing the US from transferring defense technology to India, a key requirement to clinch defense contracts with an India eager to achieve self-reliance.⁶⁷⁵ Yet, it was increasingly urgent for the US to enter the Indian defense market as a significant player given the lucrative near and long-term acquisitions that a ‘rising’ India was likely to make. Moreover, other countries (Russia, France and Israel) were already competing fiercely for Indian defense contracts and were likely to claim a huge share of the future Indian defense pie unless the US failed to overcome its transfer of

eventually won the MMRC contract “will be expected to transfer all the requisite ‘knowledge’ for safe and efficient operations of this fourth generation fighter..... India would thus look for real value for money in Transfer of Technology (ToT) and life cycle costs.”

Phadke, Ramesh. " Rafale Wins the Mmrc Competition
" (February 6, 2012),

http://www.idsa.in/idsacomments/RafaleWinstheMMRCACompetition_rphadke_060212.

⁶⁷⁵ Even as recently as September 2012, Rama Lakshmi, a staff writer for the *Washington Post* noted in an article that U.S non-proliferation laws and technology sanctions were constraining the U.S-India defense relationship.

“The strategic defense partnership between the United States and India should have been a match made in heaven. The first is the world’s biggest arms manufacturer; the second is among the biggest arms importers. But the legacy of decades of mistrust, together with lingering barriers to technology transfer, continues to dog defense trade between two allies whose relationship President Obama said would be “one of the defining partnerships of the 21st century.”.....Many of the problems date back to the fallout of the U.S sanctions imposed on India in the wake of its nuclear tests, a move that froze technology sharing.”
The article was written three years after the passage of the U.S-India nuclear deal that largely dismantled the technology denial regime. Surely, the non-proliferation related impediments to an expansion of the U.S-India “high-technology” cooperation (especially defense technology cooperation) would have been daunting in early 2005 before the passage of the nuclear deal.

Rama Lakshmi. "U.S. Defense Firms Trying to Find Bigger Foothold in India." *The Washington Post*, September 1 2012.

technology handicap. American losses would not just be economic but also strategic as big-ticket defense sales were a key building block for a long-term strategic partnership.

History had come full circle. Ironically, it was the sanctioner (US) that was feeling sanctioned by the non-proliferation laws and the technology denial regime it had erected following India's nuclear tests as they had grown into a formidable "Gordian Knot"⁶⁷⁶ that was now impeding the ability of the US to transfer defense technologies to India, a passport to enter the Indian defense market and construct a long-term strategic partnership. Put another way, the expansion of US-India relations (especially in key sectors like defense cooperation) was constrained by a structural obstacle, India's relationship to the non-proliferation regime.

So..... the result (of the non-proliferation laws) then was what I (Zelikow) sometimes call a structural ambivalence in American policy towards India. That is at the level of...the leadership people wanted to improve relations with India, they really did.....But at the same time a large part of the government couldn't improve relations with India, because they.... could not and in some cases did not want to get around the fundamental structural obstacle created by... India's longtime relationship to all these international (non-proliferation) agreements.....⁶⁷⁷

⁶⁷⁶ Term used by Philip Zelikow to describe the labyrinth of non-proliferation laws and the technology denial regime.

⁶⁷⁷ Interview with Philip Zelikow, Counselor to Secretary of State Condoleezza Rice. November 24 2010.

The incremental NSSP initiative that sought to increase US-India engagement in the nuclear, space and high-technology trade domains without amending US non-proliferation laws had failed to remove the structural obstacle.

They (U.S and Indian governments) had worked very hard in 2004 to try to solve this problem incrementally, at the margins, step by step (through the NSSP). And my conclusion was that that effort had basically failed and was likely to continue to fail.....⁶⁷⁸

**Philip Zelikow-Counselor to Secretary of State Condoleezza Rice,
Undersecretary of State Robert Zoellick**

Recall that Zelikow and Zoellick were generally supportive of a US-India strategic partnership before their appointment to key positions in the State Department (with the former's support being motivated by broad geopolitical considerations⁶⁷⁹ while the latter's support was a result of economic considerations). I suggest that their preexisting orientation in favor of a strategic partnership led them to solve the structural problem afflicting US-India relations in a particular way. The duo adopted a broader approach and used the F-16 sale to Pakistan and the inability to increase high-technology trade with India as a pretext to fundamentally reexamine the basic US strategic posture towards a growing India and the necessity of the "Gordian knot" (US non-proliferation laws and the technology denial regime).

⁶⁷⁸ Interview with Philip Zelikow, Counselor to Secretary of State Condoleezza Rice. November 24 2010.

⁶⁷⁹ Pramit Pal Chaudhuri, a foreign affairs correspondent for the *Hindustan Times* and a Bernard Schwarz Fellow at the Asia Society confirmed the geopolitical considerations motivating Zelikow's support for a U.S-India strategic partnership.

"What persuaded Zelikow?.....It was a mish-mash of US concerns from terrorism to technology, China to democracy. It was geopolitics with a capital G." Chaudhuri, Pramit Pal. "The Man Behind the Deal" *Hindustan Times*, December 04, 2006.

So....(Robert) Zoellick essentially said we ought to broaden this problem.....we're thinking about this too narrowly. Think more broadly about how to just.....use this Pakistan issue perhaps even as an occasion for just rethinking (the) basic stance with India.....⁶⁸⁰

The duo concluded that progress towards an across the board strategic partnership would require decisively resolving the issue of India's relationship to the non-proliferation regime.

My judgment was that the only (way) to address this problem decisively was to cut the Gordian knot.....So I came to the conclusion that we ought to try to just view this in a bold stroke that the only way to handle the problem was by trying to grandfather India into the non-proliferation system which meant accepting that they are a nuclear weapon state and trying to normalize their status. Either I separately or Zoellick separately but somehow we discussed these ideas with Secretary Rice.....And then we took off for India. It's hard for me to remember....how fully developed this idea was before we went to India but it was already emerging.⁶⁸¹

⁶⁸⁰ Ibid

⁶⁸¹ Interview with Philip Zelikow, Counselor to Secretary of State Condoleezza Rice

See also:

Chaudhuri, Pramit Pal. "The Man Behind the Deal" *Hindustan Times*, December 04, 2006.

Twining, Daniel. "

Was the U.S.-India Relationship Oversold?." (April 26, 2012),

http://shadow.foreignpolicy.com/category/topic/science_technology

Kessler, Glenn. "Senate Backs Far-Reaching Nuclear Trade Deal with India" *Washington Post*, October 2, 2008

Kessler, Glenn. "Close Adviser to Rice Plans to Resign" *Washington Post*, November 28, 2006

Perkovich, George. "Faulty Promises-the U.S.-India Nuclear Deal" (September 2005),

<http://carnegieendowment.org/files/PO21.Perkovich.pdf> (p 1)

The resolution of the “Gordian knot” through recognition of India’s nuclear weapons and its grandfathering into the NPT would obviously require the US to alter its strategic posture towards India (from a posture towards an NPT outlier cum Soviet ally with nuclear weapons to a posture towards an emerging India with which the US shared strategic interests). In other words, the US would have to change its strategic posture towards India from Cold War era hostility/indifference and post Cold War era ambivalence (and post 9/11 measured acceptance) to outright support.

To summarize, the idea for some sort of strategic reorientation towards India with a nuclear deal as its centerpiece was conceived in the State Department by a tiny three member coterie in early March 2005. It is reasonable to assume that the trio would have discussed their ideas with other like-minded colleagues or subordinates during this period in an attempt to build support.⁶⁸² Note that the nuclear deal emerged due to geopolitical, military and economic considerations and had little to do with India’s energy security needs at this point.

Secretary of State Condoleezza Rice

Rice, the most powerful member of the trio arrived in India on March 16 for the ostensible purpose of providing reassurances regarding the F-16 sale (it had not yet been officially announced). She merely noted that the F-16 sale to Pakistan had figured in her discussions with Natwar during a post-meeting joint press conference and assured rather vaguely that “we are going to continue to have broad discussions about the security

⁶⁸² Conversations with Dr. Hugh Gusterson. January 2013

needs, about the defence needs of India....”⁶⁸³ Her generic assurances did not entirely satisfy Natwar. Although he refrained from sharply criticizing the F-16 sale, Natwar nevertheless pointed out that “it might create some complications” and “our views with regard to F-16s are well known.”⁶⁸⁴

Another irritant in the otherwise amicable press conference was the disagreement between the two leaders over the IPI pipeline that was being pursued enthusiastically by Aiyar. Rice expressed reservations over the pipeline and offered a broad but ill-defined US-India Energy Dialogue. Her objection to the initiative was the first public objection by a high-level Bush administration official.

I think our views concerning Iran are very well known by this time and we have communicated to the Indian government our concerns about gas pipeline cooperation between Iran and India..... We do need to look at the broader question of how India meets its energy needs over the next decades.....we believe that a broad energy dialogue should be launched with India.....⁶⁸⁵

Clearly, the American opposition was not just to the pipeline but to the broader relationship that New Delhi seemed determined to forge with Iran and the ramifications of improving Indo-Iranian relations for both the US policy towards Iran and its broader Middle East strategy.

⁶⁸³ "Joint Press Conference by External Affairs Minister Natwar Singh and Us Secretary of State Dr. Condoleezza Rice". (March 16, 2005), <http://www.indianembassy.org/prdetail1119/%09--joint-press-conference-by-external-affairs-minister-natwar-singh-and-us-secretary-of-state-dr.-condoleezza-rice->

⁶⁸⁴Ibid

⁶⁸⁵ Ibid

Minister for External Affairs- K. Natwar Singh- Congress Party

Natwar was firmly committed to the IPI pipeline (as evidenced in his support for the initiative at the 2005 Petrotech conference and his acquiescence in the February 2005 Cabinet approval) and rebuffed Rice's objections. More importantly, his statement was also a riposte to Rice's demand that India realign its Iran policy to not impede US strategic interests.

As you know the discussions are going on between the Petroleum Minister of Government of India Shri (Honorable) Mani Shankar Aiyar and his counterpart in Iran and in Pakistan. As Secretary of State said, the energy requirements of India are growing exponentially.....We have traditionally good relations with Iran. We expect Iran will fulfill all its obligations with regard to the NPT. We have no problems of any kind with Iran.⁶⁸⁶

Rice quickly repositioned the still evolving techno-military-strategic nuclear deal into an energy security alternative to the pipeline under the ambit of the US-India Energy Dialogue. The repositioning was apparent in a media briefing presided over by a Ministry of External Affairs spokesperson immediately after the Rice-Prime Minister meeting. The details provided at the briefing suggest that Rice began by noting the untapped potential of the US-India relationship. She then informed the Prime Minister about America's strategic reorientation in favor of India and laid out an outline for a decisively broader strategic partnership. Finally, Rice repositioned the still evolving idea of a nuclear deal motivated by techno-military-strategic considerations into an energy security alternative

⁶⁸⁶ Ibid

to the pipeline under the ambit of the Energy Dialogue. Her broader aim in repositioning the nuclear deal was now not only to pave the way for a US-India strategic partnership but also to scuttle the pipeline and significantly retard the budding Iran-India relationship.

She (Rice) said that given the many points of complementarities that we have and areas in which we can cooperate, this could be an extraordinary relationship between our two countries in the next several decades. On defence cooperation, she expressed United States' keen interest to emerge as a reliable partner and source for defence hardware and technology. She particularly welcomed the excellent cooperation between the two countries on organizing relief during the recent (Asian) Tsunami disaster (2004) and said that the speed and the scale on which India deployed its naval and air fleet was deeply admirable.....As far as the morning conversation goes the need was felt to have an energy dialogue in which such issues and concerns, if there are any, can be sorted out. There is an understanding on the need to use nuclear energy for our development purposes, for our normal purposes. That understanding was obvious this morning and therefore there was also this shared interest from both sides.⁶⁸⁷

⁶⁸⁷Briefing by MEA Official Spokesperson on Dr. Condoleezza Rice's Meeting with Pm Manmohan Singh ". (March 16, 2005), <http://www.indianembassy.org/prdetail1118/%09--briefing-by-mea-official-spokesperson-on-dr.-condoleezza-rice%27s-meeting-with-pm-manmohan-singh->

Secretary of State Condoleezza Rice, her counselor Philip Zelikow and the memo

Clearly, Rice's trip to India was a successful one going by her largely amicable press conference with Natwar (except for the pipeline issue and India's relations with Iran) and the constructive meeting with the Prime Minister. It was now time to flesh out the nascent outline of a strategic partnership and situate the nuclear deal as its centerpiece. Towards this end, Rice and Zelikow drafted a secret memo that was initially sent to Zoellick, the top echelons of the State Department and ultimately President Bush. Although the memo has not been made public and Zelikow did not reveal its contents in a personal interview, he did provide broad clues regarding its details. The memo predicted India's role in the 21st century, called for the US to forge a long-term strategic partnership with India for geopolitical reasons and situated the nuclear deal as the key enabling initiative that would pave the way for the partnership.

On the way back from India, in that (March 2005) trip.... Rice summoned me up into her cabin on the plane and we sat down and she in effect dictated to me the substance of a memorandum she wanted to send to President Bush....I took it down and then when I got back I wrote up the memo I thought she wanted to write..... I sent it around to handful of people including Zoellick, Steve Krasnow , the head of the Policy Planning Staff (State Department) and Nick (Nicholas) Burns (then undersecretary of state for political affairs). I think Nick may have just been coming on board by then by March 05. And then finalized the memo and this is one of the most important state papers of the second term of the Bush administration. The memo has not been made public

but it's a very important document. You'll see actually the memo lays out the whole idea in detail. It lays out the geopolitical rationale for it (the nuclear deal) in detail. And actually it forecasts the role of India in the 21st century and then basically makes a strategic argument about, now is kind of a key moment of flux, how do we want to position ourselves in relation to this moment? It even analogized the strategic decisions we made about building up Western Europe in the early nineteen fifties, building up Japan in early nineteen fifties.....not in the security sense, but in the political economic sense as building them up as healthy centers of democratic power. That though they would disagree with us on many things as they got stronger, fundamentally their values and approach to the world were compatible with ours....It (memo) looked at this successful model..... And in a way we saw India as another pivotal region at the southern part of the Euroasian landmass that would probably, whatever it did for good or ill would probably have a rippling effect for good or ill throughout South and Central Asia. Indeed one of the points that was made in this memorandum to the President was that we ought to rename this bureau of South Asia in the State Department- a bureau of South and Central Asia.....Rice sent the memo forward to the President whom I think (inaudible)....heartily agreed with it. The nuclear deal was fully foreshadowed in this memorandum which was probably written in... towards the end of March of 2005. Probably

in the week or two after Rice's return from India. Now we circled back to the F-16's and Pakistan.^{688 689}

The memo was the blueprint for a major US strategic reorientation towards India. The March 25 2005 State Department background briefing (that I started the section with) in which Zelikow publicly announced the US decision to support India's rise to world power status (but refused to divulge anything about the still evolving nuclear deal that was yet to go through the inter-agency consultation process in the US) indicates that the memo was ultimately approved by President Bush.

The Global Partnership Frame

The US strategic reorientation towards India was the result of multiple factors including the preexisting support of three key actors for a strategic partnership motivated

⁶⁸⁸ Interview with Philip Zelikow, Counselor to Secretary of State Condoleezza Rice. November 24 2010. See also

Chaudhuri, Pramit Pal. "The Man Behind the Deal" *Hindustan Times*, December 04, 2006.

Was the U.S.-India Relationship Oversold?." (April 26, 2012),

http://shadow.foreignpolicy.com/category/topic/science_technology

Kessler, Glenn. "Senate Backs Far-Reaching Nuclear Trade Deal with India" *Washington Post*, October 2, 2008

Kessler, Glenn. "Close Adviser to Rice Plans to Resign" *Washington Post*, November 28, 2006

Perkovich, George. "Faulty Promises-the U.S.-India Nuclear Deal

" (September 2005), <http://carnegieendowment.org/files/PO21.Perkovich.pdf> (p 1)

⁶⁸⁹ The documentary evidence corroborates one of the recommendations made by Rice and Zelikow in the memo asking the President to reorganize the State Department's Bureau of South Asia into the Bureau of South and Central Asia. Replying to a question on Afghanistan at the State Department Correspondents Association Inaugural Newsmaker Breakfast on January 5, 2006 Rice revealed that "we will need to look at Afghanistan in its regional context. When I was in Central Asia, I was very much struck that the countries of Kyrgyzstan, of Kazakhstan, even of Tajikistan, very much see Afghanistan as a part of the region that is Central Asia. One of the things that we did in the State Department was to move the Central Asian republics out of the European bureau, which really was an artifact of their having been states of the Soviet Union, and to move them into the bureau that is South Asia, which has Afghanistan, India and Pakistan. And so I think it represents what we're trying to do, which is to think of this region as one that will need to be integrated, and that will be a very important goal for us. That whole South Asia region I expect to be very high on my list of priorities. Enhancing the relationship with India will be extremely important." "Remarks at the State Department Correspondents Association's Inaugural Newsmaker Breakfast." (January 5, 2006), <http://2001-2009.state.gov/secretary/rm/2006/58725.htm>

by geopolitical and economic considerations, the commitment of President Bush to transforming US-India relations, the growing interest of the Pentagon in securing a defense partnership, the appointment of the trio in key positions in the State Department in mid-2005 and the difficulty encountered by them in enhancing high-technology trade with India due to US non-proliferation laws.

The centerpiece of the new strategic framework was a nuclear deal that would recognize (and legitimize) India's nuclear weapons and dismantle the post-1974 American fuel and technology embargo thereby allowing for a resumption in nuclear, space and high-technology (defense technology) cooperation. I use the concept of a technopolitical frame and organize the new strategic framework proposed by Rice, Zelikow and Zoellick into a *global partnership frame*. The March 25 2005 State Department background briefing indicates that the frame had several elements including discussions on key global and regional security issues, high-technology (defense) cooperation and defense coproduction, WMD proliferation, civilian nuclear cooperation, space cooperation and economic engagement. The nuclear deal can be understood as the most important element of the global partnership frame that would remove the obstacles for other elements of the frame such as defense cooperation to develop more rapidly.

The main source of the global partnership frame's strength was President Bush's support for Rice's decision to take up the bold ideas enunciated by Zelikow and Zoellick. His support not only allowed Rice the latitude to come up with the idea of a nuclear deal as the path to a US-India strategic partnership, but also enabled her to win the inter-

agency debate in the US from April-July 2005. A detailed analysis of the inter-agency debate is outside the scope of this chapter.

To summarize, a powerful rival technopolitical frame began emerging at the end of March 2005 as a serious challenger to the regional cooperation frame. The nuclear centerpiece of the emerging global partnership frame and its other elements were still evolving and would be announced to the world in July 2005 after interagency deliberations in the US during Prime Minister Singh's trip to Washington.

The fourth and final part of the chapter focuses back on India and begins by tracking the shift in the positions of Natwar and the Prime Minister from April 2005 to July 2005 in favor of the nuclear deal and the global partnership frame at the expense of the pipeline and the regional cooperation frame.

Minister for External Affairs-Natwar Singh-Congress party

Rice's offer of the global partnership frame and her ample indication of the increased American willingness to come to terms on the nuclear issue had an immediate impact on Natwar, one of Aiyar's primary backers. He quickly repositioned himself as the principal proponent of the emerging frame.

Whatever may or may not have been Natwar's views when he was in government, it remains a matter of record that the former foreign minister was one of the main architects of India's new relationship with the US.⁶⁹⁰

⁶⁹⁰ "Irony: Nuke Deal Was Natwar Baby". *Times of India*, Aug 8, 2006, .

Natwar also indicated his support for the nascent nuclear deal in an April 14 2005 joint press conference with Rice in Washington D.C. The duo began by informing the press that the Energy Dialogue would be headed by US Energy Secretary Samuel Bodman and Deputy Chairman of India's Planning Commission Montek Singh Alhuwalia⁶⁹¹ and would consist of three tracks: civil nuclear cooperation, hydrocarbons and clean technologies.⁶⁹² Natwar praised the American side for the Energy Dialogue offer and expressed satisfaction with "the fresh approach they have brought to bear on a subject that is of such vital importance for us,"⁶⁹³ a reference presumably to the American rethink underway on civil nuclear cooperation.

However, Natwar's enrollment into the emerging global partnership frame and its nuclear centerpiece came at the expense of the pipeline and the regional cooperation frame. He desisted from a frank rebuttal (a departure from his combativeness in the March 2005 press conference) when Rice indirectly expressed her reservations over the IPI pipeline by pointing to the increasing Indian investments in the Iranian petroleum sector at the April 2005 press conference.⁶⁹⁴ Natwar was also no longer enthusiastic about Aiyar's regional cooperation frame and sought to minimize Aiyar's role in the nascent US-India Energy Dialogue that would serve as a shell for the evolving nuclear deal. An

⁶⁹¹ "Remarks with Indian Minister of External Affairs Natwar Singh Following Meeting." (April 14, 2005), <http://2001-2009.state.gov/secretary/rm/2005/44662.htm>

"Energy Dialogue with U.S Begins." *The Financial Express*, Jun 02, 2005

⁶⁹²"Remarks with Indian Minister of External Affairs Natwar Singh Following Meeting." (April 14, 2005), <http://2001-2009.state.gov/secretary/rm/2005/44662.htm>

See also: "Secretary Bodman Announces U.S. / India Energy Dialogue". (May 31, 2005), <http://energy.gov/articles/secretary-bodman-announces-us-india-energy-dialogue>

⁶⁹³ Ibid

⁶⁹⁴"Remarks with Indian Minister of External Affairs Natwar Singh Following Meeting." (April 14, 2005), <http://2001-2009.state.gov/secretary/rm/2005/44662.htm>

April 11 2005 leaked diplomatic cable reveals Natwar assuring Mulford that Aiyar would not be allowed to interfere with the agenda of the newly announced Energy Dialogue. Although Aiyar's position as Petroleum Minister would have made him an important player in the agenda-setting discussions of the Dialogue, Natwar's intervention led him to subsequently inform Mulford that he would not be coming to the US to meet Energy Secretary Bodman.⁶⁹⁵ Aiyar had lost one of his two major political backers.

Natwar's acceptance of the global partnership frame and the nuclear deal at the expense of the regional cooperation frame and the pipeline seemed to arise out of a realization that India would not be able to have both given the hostility in US-Iran relations.

Prime Minister Manmohan Singh-Congress Party

Natwar had jumped ship to support the global partnership frame and the evolving nuclear deal but the same was not true of the Prime Minister, Aiyar's second and more powerful political backer. The Prime Minister continued to support the IPI pipeline in a joint statement with General Pervez Musharaff at the end of the latter's three day visit to India to take forward the India-Pakistan peace process. The statement declared that the Petroleum and Natural Gas Ministers of India and Pakistan would meet in May to discuss the pipeline.⁶⁹⁶ The Prime Minister also reiterated his support for the regional cooperation frame at the Asian-African Conference in Jakarta on April 23, 2005.

⁶⁹⁵Mulford, David. "Energy Minister Cancels Trip to U.S. ." (April 11 2005), https://www.wikileaks.org/plusd/cables/05NEWDELHI2719_a.html

⁶⁹⁶ "Highlights of Indo-Pak Joint Statement". (April 18, 2005), <http://www.rediff.com/news/2005/apr/18mush6.htm>

While our continents include major producer (s) and consumers of energy, the framework within which we produce and consume energy is determined elsewhere. We must address this anomaly.⁶⁹⁷

However, the Prime Minister's support for the pipeline and the regional cooperation frame did not automatically mean that he was wholly uninterested in the global partnership frame and its nuclear centerpiece. Two leaked cables (April 29 and May 13 2005) indicate that the Prime Minister's Office had already directed the respective ministries to draft comprehensive export control legislation ("The Weapons of Destruction and their Delivery Systems-Prevention of Unlawful Activities Bill, 2005"). The bill would regulate trade and transfer of dual use technologies and was passed by the Indian Parliament in record time (May 13 2005).⁶⁹⁸ India's passage of export-control legislation had been a key American precondition for increased flexibility on civilian nuclear cooperation even during the NSSP. Clearly, the Prime Minister was setting up the requisite non-proliferation framework in India in order to send a strong signal of interest to Rice and her associates battling for the nascent nuclear deal in the inter-agency debate that was taking place around the same time in the Bush administration. He was also interested enough in the defense element of the global partnership frame to allow his Defense Minister Pranab Mukherjee to sign the "New Framework for the US-India Defence Relationship" with US Secretary of Defense Donald Rumsfeld.

⁶⁹⁷"Prime Minister's Statement at the Asian African Conference." (April 24 2005), <http://pib.nic.in/newsite/erelease.aspx?relid=8741>

⁶⁹⁸Robert Blake, Jr. "New Indian Export Control Law in the Making." (April 29 2005), https://www.wikileaks.org/plusd/cables/05NEWDELHI3270_a.html
Robert Blake, Jr. "Indian Parliament Passes Landmark Wmd/Export Control Law" (May 13 2005) https://www.wikileaks.org/plusd/cables/05NEWDELHI3652_a.html

The initiative for the new agreement, senior diplomatic sources told rediff.com had come from the PentagonAccording to the new agreement, the framework for the US-India Defence Relationship 'will support, and will be an element of, the broader US-India strategic partnership.'⁶⁹⁹

The more recent timing of the Prime Minister's decision to formulate comprehensive non-proliferation legislation and his acquiescence in the signing of the defense framework agreement raises the possibility as to whether he too à la Natwar had shifted to the nuclear deal and the global partnership frame at the expense of the pipeline and the regional cooperation frame. The contents of a July 9 2005 interview given by the Prime Minister to journalists aboard Air India One dispel any notion of such a shift.

Questioner: When you visit the United States next week, the issue of the Iran gas pipeline is bound to come up.

Singh: This is an affair between Iran and us and Pakistan. If the three countries agree, that should be the end of the matter.

Questioner: Have they (Americans) been saying, 'You drop this one (pipeline) and we will give you this (nuclear deal)?'

Singh: We are not a client state!⁷⁰⁰

The statements analyzed so far indicate that the Prime Minister was clearly interested in the evolving nuclear deal and the global partnership frame but still believed

⁶⁹⁹Haniffa, Aziz. "India, Us Sign New Defence Framework" (June 29, 2005), <http://ia.rediff.com/news/2005/jun/29pranab1.htm>

⁷⁰⁰"India's Foreign Relations- 2005 ". (2005), <http://meaindia.nic.in/staticfile/meapublication/foreign%20relations%202005.pdf>. pg 304-305

that he could simultaneously pursue the pipeline and the regional cooperation frame (in contrast to Natwar's decisive break away from the latter in favor of the former). I suggest three reasons for the Prime Minister's equipoise between the nuclear deal and the global partnership frame on the one hand and the pipeline and the regional cooperation frame on the other.

First, the nuclear deal was still winding its way through the inter-agency process in the US. It is reasonable to assume that the Prime Minister could not be absolutely sure whether the still evolving initiative would survive the bruising inter-agency debate as other actors outside the narrow initial decision-making loop comprising Rice and her associates were getting involved. The mid-level bureaucracy in the State Department had a history of cautious policy-making with respect to India⁷⁰¹ and was bound to be skeptical of the rather radical global partnership frame. The Prime Minister could be hedging his bets by not letting go of the IPI pipeline and the regional cooperation frame amidst the uncertainty that surrounded the fate of the nuclear deal and the global partnership frame.

Second, the US had not exerted considerable pressure on India to choose between the pipeline and the regional cooperation frame on the one hand and the nuclear deal and the global partnership frame on the other (although there were ample indications that India would eventually have to make that choice in Rice's March 2005 press conference). The lack of American pressure may have allowed the Prime Minister the maneuvering

⁷⁰¹ "Here's How to Kill a Good Idea-the Two Countries Would Have Been Closer but for 'Nagging Nannies' in the Us Bureaucracy ". *Outlook*, July 11, 2005
Tellis, Ashley J. "India as a New Global Power: An Action Agenda for the United States." 2005. P 7-8

space to defer making a decision between the two initiatives and their respective technopolitical frames and simultaneously support both.

Third, the Prime Minister's equivoque position could have resulted from the stance of the Left front, a four party communist alliance that provided crucial parliamentary support to prop up his rickety Congress Party led- United Progressive Alliance (UPA) government. The Left front opposed Rice's attempts to get India to abandon the pipeline in March 2005⁷⁰² and the Prime Minister's acquiescence with the signing of the defense framework agreement with the US in June. Consider this July 1 2005 press release issued by the Polit Bureau of the Communist Party of India (Marxist): the largest faction in the Left Front that criticized the defense framework pact.

The framework agreement on US-India defence relationship is fraught with serious consequences for India's strategic and security interests. It will also have a direct bearing on India's foreign policy.....What is unstated in this agreement is the US aim of containment of China using India as a counter-weight.The UPA government has taken this step without any public debate and discussions within the country.⁷⁰³

It is conceivable that the Left's attentiveness to any perceived change in the government's position on the IPI pipeline coupled with its criticism of the defense framework pact could have forced the Prime Minister to balance his interest in the nuclear deal and the global partnership frame with a reiteration of support for the pipeline

⁷⁰² "Democracy in Nepal & Us Pressure on India". (March 17 2005), <http://cpim.org/content/democracy-nepal-us-pressure-india>
"Iran-Pak-India Gas Pipeline". (June 14 2005), <http://cpim.org/content/iran-pak-india-gas-pipeline>.

⁷⁰³ "India-Us Defence Ties". (July 1 2005), <http://cpim.org/content/india-us-defence-ties>

and the regional cooperation frame. A July 12 2005 leaked American diplomatic cable describes the Prime Minister being caught by surprise by the Left's fierce criticism of the defense framework agreement. It also recommended that the US occasionally allow the Prime Minister more time to pacify/outmaneuver his leftist allies that were crucial for the survival of his government.

(Defense Minister) Mukherjee returned from the US determined to defend the (defense framework) agreement against Left criticism and was backed by the PM (Prime Minister), but the unexpected virulence and determination of the Left criticism has compelled the UPA (government) to devote considerable time and energy to respond to the allegations that the DefMin sold out....The Left's ability and determination to maintain momentum on this issue, however, clearly caught the UPA (government) by surprise. It should not have done so, as Communist opposition to the agreement is ideologically consistent. No Communist party can safely acquiesce to such an agreement, and the Communists, facing elections in their strongholds of Kerala and West (West) Bengal, are in no mood to compromise..... While in the final analysis, we should ignore the left and proceed ahead at full steam, we should recognize that the UPA (government) may require an occasional pause to let Indian public opinion catch up with the rapid pace of transformation in our bilateral relationship.⁷⁰⁴

⁷⁰⁴ Robert Blake, Jr. "36415: Pm and Pranab Scoff at Leftist Criticism of U.S. Defence Ties: We Should Too" (July 12 2005), <http://www.thehindu.com/news/the-india-cables/the-cables/36415-pm-and-pranab-scoff-at-leftist-criticism-of-us-defence-ties/article1576915.ece>.

Minister for Petroleum and Natural Gas-Mani Shankar Aiyar-Congress Party

I suggest that the Prime Minister's equipoise between the initiatives and their respective technopolitical frames provided Aiyar the political space necessary to keep pursuing the pipeline and the regional cooperation frame. Aiyar began by leading a delegation to Pakistan from June 4-8.⁷⁰⁵ A feasibility study conducted by BHP Billiton, an Australian consultancy firm that confirmed the IPI pipeline's technical and commercial viability served as the reference point for Aiyar's discussions with his Pakistani counterpart (Amanullah Khan Jadoon).⁷⁰⁶ The interest shown by the Pakistani side led Aiyar to claim at a press conference that the construction of the pipeline could begin as early as 2006.⁷⁰⁷ The two countries agreed to constitute a Joint Working Group at the Secretary Level that would hold regular meetings (3-6 times before 2005 end) and report on the progress to the respective petroleum ministers.⁷⁰⁸

Aiyar's next stop was Iran (June 11-14 2005). The two sides had already completed six rounds of ministerial talks and nine rounds of official talks.⁷⁰⁹ An agreement was reached to set up a special Joint Working Group to ensure that the

⁷⁰⁵ "Ministry of Petroleum and Natural Gas- Government of India." <http://petroleum.nic.in/ng.htm>

⁷⁰⁶ The report stated that the pipeline would be buried at a depth of 0.9-1.5 meters and would rely on fiber-optic cable sensing systems with a back-up satellite link for monitoring. Maintenance units would be placed every 93 miles with the capability to rectify disruptions within 2-3 days. BHP also suggested that India and Pakistan construct storage facilities that could hold gas for upto 15 days. There would 11-12 compressor stations and supplies could be maintained at 80% bypassing a disabled station. A consortium of companies would be held responsible for the security of the pipeline and the compressor stations. To address India's concerns about the safety of supplies, BHP suggested that the point of gas off-take for Pakistan be located about 37 miles from the Indian border with no further off-take point. To summarize the BHP report concluded that the project was technically and financially viable.

PTI. "Iran-India Pipeline Is Viable & Safe" *The Economic Times*, Jun 6, 2005, .

⁷⁰⁷ "India Upbeat on Iran Gas Pipeline." (June 6 2005), <http://news.bbc.co.uk/2/hi/business/4611209.stm>

⁷⁰⁸ "Ministry of Petroleum and Natural Gas- Government of India." <http://petroleum.nic.in/ng.htm>

⁷⁰⁹ Kumar, Manoj. "India, Pak Move Towards Energy Agreement " *The Tribune*, June 6 2005.

construction of the pipeline would start by early 2006.⁷¹⁰ Aiyar and his Iranian counterpart also initialed a separate \$20 billion deal proposed in January 2005 to annually import 5 million tons of Iranian Liquefied Natural Gas (LNG) via ships to India.⁷¹¹ A June 20, 2005 leaked American diplomatic cable described Aiyar triumphantly briefing Mulford about his successful visits to Pakistan and Iran (although the excerpt also indicates differences over pricing between Aiyar and his Iranian interlocutors).

Aiyar said that Pakistani Foreign Ministry officials had told him that Musharraf is personally monitoring all deliberations regarding the pipeline.....He (Aiyar) thinks the project will cost about \$4-5 billion and the economics will depend on the price demanded by the Iranians.....Aiyar said he believes that the IPI pipeline is an "idea whose time has come," but the idea is only now "crystallizing" and it requires a lot of work.....Aiyar explained to the Iranians that gas in India is used primarily in the power and fertilizer industries, both of which have controlled output pricing. If output prices are controlled at reasonable rates then input prices for the gas have also to be reasonable or there won't be any buyers for it. The Iranians, however, kept talking about the opportunity cost of gas sold at the reasonable prices that Aiyar think will justify the pipeline.⁷¹²

⁷¹⁰ "Ministry of Petroleum and Natural Gas- Government of India." <http://petroleum.nic.in/ng.htm>

⁷¹¹ Banerjee, Soma. "The Great Game " *The Economic Times*, Jun 16, 2005.

⁷¹²Mulford, David. "Ambassador's Meeting with Petroleum and Natural Gas Minister Aiyar " (June 20 2005), http://www.wikileaks.org/plusd/cables/05NEWDELHI4679_a.html

Aiyar also made a formal offer to visiting Chinese Premier Wen Jiabao to extend the IPI pipeline across India into South China via Myanmar, an important leg of the Asian Gas Grid.⁷¹³

Oil minister Mani Shankar Aiyar on Monday sought to lubricate the wheels of diplomacy between New Delhi and Beijing by proposing to extend the proposed \$4.16 billion gas pipeline from Iran up to China's southern region. "There has been no separate detailed consideration of energy cooperation between India and China (but) in my interactions with Chinese officials (on the sidelines of summit meeting between PM Manmohan Singh and Chinese premier Wen Jiabao), I raised the issue of extending the Iran-India gas pipeline to south China via Myanmar," Aiyar said. Aiyar's vision is to take the pipeline across the heart of India to Myanmar via Bangladesh and then enter China, establishing part of his proposed 'Asian energy grid'. Aiyar feels linking up with China will stop Pakistan from wilfully closing the tap on India ever as any disruption will also hit the Chinese hard.⁷¹⁴

A year into his tenure, Aiyar's energetic actions won accolades in the media. *India Today* magazine ranked him as the No. 1 "star performer" in the UPA government for his "out of the box" ideas in its May 2005 edition.⁷¹⁵ *Business Week* featured him in its "Stars of Asia: Agenda Setters" section in early June.⁷¹⁶

⁷¹³ "India Proposes to Extend Pipeline to China". *Asia Times*, April 13, 2005

⁷¹⁴ "Aiyar Brings China into Pipeline Loop". *The Economic Times*, April 11, 2005.

⁷¹⁵ "Ranking the Ministers-Upa Ministers Performance in First Year of Power." *India Today*, May 30 2005

⁷¹⁶ "Stars of Asia: Agenda Setters-Mani Shankar Aiyar-Minister, Petroleum & Natural Gas, India." *Business Week* (June 2005), <http://images.businessweek.com/ss/05/06/0528asiastars/source/5.htm>

To summarize, the negotiations conducted by Aiyar over the pipeline with Pakistan and Iran were at a sufficiently advanced stage as of late June-early July 2005 for him to envision construction getting underway six months later in 2006 (although cost and security concerns continued to pose problems). Although the Chinese leadership did not comment on Aiyar's offer to extend the IPI pipeline through India to China, it also did not immediately reject his offer indicating a certain level of interest. Aiyar was able to push the pipeline and the regional cooperation frame despite the loss of Natwar due to the Prime Minister's continued balancing act between the two initiatives (pipeline and the nuclear deal) and their respective technopolitical frames (regional cooperation and global partnership frame).

Secretary of State Condoleezza Rice

However, the Prime Minister's ability to maintain equipoise between the two initiatives and the technopolitical frames they were embedded in would soon come under severe strain as he left for Washington on July 16 2005 on a five day visit to the US.

Rice had won the debate within the Bush administration over the idea of a radical nuclear overture towards India due to the backing of President Bush and with the help of the Pentagon.⁷¹⁷ She also managed to convince the President that the US should offer the

⁷¹⁷ Zelikow's recollections about the manner in which Rice won the debate over the nuclear deal in the Bush administration is worth mentioning. "I remember one meeting for instance that was convened in, I think, in (National Security Adviser) Steve Hadley's office. It turned out that the representatives of the Defense Department were highly sympathetic with what we were trying to do. Douglas Feith was still the undersecretary of defense for policy at this time, and on this issue Feith and I had a pretty good meeting of the minds. And I think Secretary Rumsfeld was also sympathetic.....The big opposition in the U.S government came from within the non-proliferation community. Fortunately for our purposes, at this time, (Undersecretary of State for Arms Control and International Security)John Bolton had already been moved out (of the State Department following his appointment as the United States Permanent Representative to the United Nations). Uh.. Bob Joseph (Senior Director for Proliferation Strategy, Counterproliferation and Homeland Defense and later Bolton's successor) had the key job in the State Department and he and his

nuclear deal to India in a ‘make or break’ summit meeting with the visiting Prime Minister instead of a more incremental NSSP-like format that would involve an initial announcement followed by prolonged negotiations over nuclear cooperation with subsequent progress (if any) announced during the President’s maiden visit to India in 2006.⁷¹⁸

However, Rice’s victory was not total. The deal’s passage through the inter-agency process had resulted in a number of non-proliferation conditions being added to

allies at the NSC (National Security Council) staff with some sympathy from Steve Hadley who’d long been associated with these issues and was sensitive to them, uh.. nuclear issues and proliferation issues of all kinds..were a Hadley forte. That meant that they were a center of concern and some resistance but not all-out resistance. Condi (Condoleezza Rice) had very early on won the President’s support in general for the idea and with the Pentagon on our side, we were able to do a pretty good job of winning the argument inside the U.S government”

Interview with Dr. Philip Zelikow, Counselor to Secretary of State Condoleezza Rice

See also: Perkovich, George. "Faulty Promises: The U.S.-India Nuclear Deal." (September 2005),

<http://www.carnegieendowment.org/files/po21.perkovich.pdf>. p 1-2

⁷¹⁸ Zelikow recollected that there was debate in the Bush administration over the choreography/format of “how this (nuclear deal) will be done and deployed?...There were really two basic models for how you would launch this initiative. The first model was what you could call a big bang which you announce upfront that this is what we’re going to do. That we seek to bring India in...to the non-proliferation regime accepting the fact that they have nuclear weapons. A second track would have been to introduce the idea as an idea to be considered, and then have prolonged negotiations to decide whether to go forward with the idea that would occur pretty much in public. So the second version, its an initiative but not a decision. And then so the interesting counter-proposal that was then put forward from within the U.S government, now we’re in the vicinity of late May and early June of 2005 is that at the summit in July of 05 we should have already been scheduled, we would announce this as an initiative and say that this is something that we’re prepared to consider, and then would promise that we will make a decision on how to go forward at our next summit meeting in say 2006. My view was that this proposal was a death would be a death sentence. That if you adopted the second route, that the idea would be killed by its many enemies both in Washington and in Delhi. In I feared that the attitude on Capitol Hill would be so hostile to this idea, that if you consulted at length with Capitol hill on whether to do it, it would eventually be killed. coz India did not have a built-up constituency on Capitol Hill. All these other interests had a whole network of institutional beliefs and axioms had grown up around these old positions. And they were well manned and well armed. Uh... so in a in a way the only way to take this fortress was with a coup de main. That argument came I made that argument that argument I remember coming to a head around the time I was with Rice at the G-7 foreign minister’s meeting that was in London I think in June of 2005. By this time Nick Burns is beginning to get involved in this too. And as an as an ally. Rice gets the argument again, endorses it and wins it.”

Interview with Dr. Philip Zelikow, Counselor to Secretary of State Condoleezza Rice

Perkovich, George. "Faulty Promises: The U.S.-India Nuclear Deal." (September 2005),

<http://www.carnegieendowment.org/files/po21.perkovich.pdf>. p 1-2

the basic idea conceived by Rice in March 2005. The Prime Minister received the first draft of the nuclear deal in Frankfurt on the way to Washington.

When the first draft of J18 (the July 18 2005 joint statement that outlined the basic terms of the nuclear deal) was faxed to the Prime Minister's plane at Frankfurt en route to Washington, it was so full of nonproliferationism that Anil Kakodkar, the Chairman of the Atomic Energy Commission, saw red. A message was immediately sent to the (advance team of) Indian negotiators to stand down and not agree to anything until the PM arrived. What ensued was a bitter fight, first within the Indian camp, and then between the Indians and the Americans. In the end, Dr. Rice and President Bush had to intervene.⁷¹⁹

The intervention seems to have temporarily calmed tempers. The sequence of events indicates that a modified draft of the nuclear deal with less 'onerous' non-proliferation clauses was presented by Rice to Natwar and the Prime Minister on the evening of July 17 2005 upon their arrival in Washington. Rice's memoirs provide a good insider view of the contrasting attitudes of the two Indian leaders towards the modified draft. It also reinforces my claim made earlier in the section that Natwar was more enthusiastic about the nuclear deal and the global partnership frame than the more circumspect Prime Minister. Rice recalled that

the two leaders (Bush and Singh) were expected to sign a framework document to end the moratorium on nuclear trade and pave the way for a

⁷¹⁹ Varadarajan, Siddharth. "The American Dilemma at the NSG" *The Hindu*, August 28, 2008.

full agreement on civil-nuclear cooperation. I met the day before (July 17 2005) with my Indian counterpart Natwar.... in his suite at the Willard Hotel.....Natwar was adamant. He wanted the deal, but the prime minister wasn't sure he could sell it in New Delhi. We pushed as far as we could toward agreement. Finally, Natwar said that he would take the document to the prime minister and let me know. That evening, Nick Burns (undersecretary of state for political affairs) asked to see me....“It isn't going to work,” Nick said. “The foreign minister tried, but the prime minister just can't sign on to the agreement.”.....I called the President. “It isn't going to work. Singh just can't make it happen,” I said. “Too bad,” he answered and didn't press further.⁷²⁰

However, the persistent Rice was in no mood to take no for an answer. She claims that it was her repeated exhortations on the morning of July 18, a couple of hours before the Prime Minister's scheduled meeting with President Bush that brought the former on board. Notice Natwar's equally ceaseless efforts (in concert with Rice) to convince the Prime Minister and the profound role of domestic factors (Left's opposition) in the Prime Minister's decision-making calculus on the nuclear deal.

I (Rice) woke up at 4:30 A.M and sat straight up in bed. *I am not letting this go down*, I thought. I called Nick at 5:00 A.M. “I am not prepared to let this fail. Arrange for me to see the prime minister,” I said. The meeting with the President was set for ten. “How about breakfast at

⁷²⁰Rice, Condoleezza. *No Higher Honor: A Memoir of My Years in Washington* 1ed. New York: Crown Publishers November 1, 2011. p 438

eight?” Nick called while I was exercising to say that the prime minister didn’t want to meet. “Get the foreign minister,” I answered. Natwar picked up the phone.....“Natwar, why won’t the PM see me?” “He doesn’t want to tell you no,” he said. “I’ve done my best. I told him that the United States wants to take this thirty-year millstone from around your neck. You should do it. But he can’t sell it in New Delhi.” I wasn’t ready to surrender. “Ask him again,” I pleaded. A few minutes later, Natwar called to say that the prime minister would receive me at his hotel at 8 A.M.....I entered the prime minister’s suite and sat there with Natwar and his boss.....“Mr. Prime Minister, this is the deal of a lifetime. You and President Bush are about to put U.S-Indian relations on a fundamentally new footing. I know it’s hard for you, but it’s hard for the President too. I didn’t come here to negotiate language-only to ask you to tell your officials to get this done. And let’s get it done before you see the President.”⁷²¹

On the Indian side, an article in the *Times of India* confirmed that Natwar “broke a deadlock in the last-minute negotiations with the Americans after a closed door meeting with Rice on the morning of July 18.”⁷²² More recently, the Prime Minister confirmed the claims made by Rice in her memoirs regarding his reluctance to go in for the nuclear deal due to concerns about the adverse political fallout in India.

Prime Minister Manmohan Singh on Saturday agreed that former US national security adviser (and secretary of state) Condoleezza Rice was

⁷²¹ Ibid p 438-439

⁷²² "Irony: Nuke Deal Was Natwar Baby". *Times of India*, Aug 8, 2006, .

correct in noting in her recent book that he had initially in 2005 been reluctant to back the Indo-US nuclear deal as he felt unsure whether Indian public opinion would back the initiative.....⁷²³

The lobbying efforts of Rice and Natwar paid off. Rice recollected that Prime Minister Singh, a mild-mannered man who speaks slowly and softly, pushed back (in response to her repeated exhortations on the morning of July 18 2005) but eventually gave the nod to his people (negotiators) to try again.⁷²⁴

Prime Minister Manmohan Singh-Congress Party (the July 18 2005 joint statement)

The result of the Prime Minister's monumental decision to allow his negotiators to engage their American counterparts one more time a couple of hours before his meeting with President Bush on the morning of July 18 was the July 18 2005 joint statement that announced the nuclear centerpiece of the global partnership frame.⁷²⁵

The terms of the nuclear deal were radical. Bush conferred defacto recognition on India's nuclear weapons by categorizing the country as a "responsible state with advanced nuclear technology."⁷²⁶ He also committed to modify US domestic non-proliferation laws and convince allies to amend international export control guidelines in order to allow India to access nuclear reactors, fuel and dual use technologies on the

⁷²³Deshpande, Rajeev. "'Condolezza Rice Right, I Was Unsure of Indo-US N-Deal in 2005' " *The Times of India*, Nov 13, 2011.

Jacob, Jayanth. "How Manmohan Singh Came around on Nuclear Deal " *Hindustan Times*, November 13, 2011.

⁷²⁴ Ibid p 438-439

⁷²⁵ "Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 2005), <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

⁷²⁶ Ibid

international market after a gap of thirty years. For his part, the Prime Minister committed to separate India's hitherto intermeshed nuclear program into civilian and military spheres in a phased manner and to place the civilian ones under International Atomic Energy Agency (IAEA) safeguards.⁷²⁷

The preceding narrative (especially Rice's repeated exhortations to the Prime Minister despite the latter's reluctance) suggests that the US was more interested in the nuclear deal than India, contrary to conventional views that would expect the weaker power (India) to be more interested in a nuclear rapprochement with the superpower (US). Comparing the relative costs and benefits imposed by the post-1974 nuclear status quo on the US and India and the reversal of such costs and benefits in the years following India's second round of nuclear tests in 1998 provides a key part of the explanation for the American determination to initiate a nuclear rapprochement with India.

The post-1974 nuclear status quo imposed considerable costs on India. As of 1997, the Indian nuclear program was under the US-led international fuel and technology embargo for more than two decades. The status quo hampered the growth of the Indian civil nuclear program, affected other related sectors of the economy and made the unrecognized nuclear weapons program and space program the target of the non-proliferation regime. On a broader level, the status quo combined with other Cold War era differences (e.g. India's tilt towards the Soviet Union and US support for Pakistan) to sour an already difficult US-India relationship, decreasing India's ability to get the US to pressure arch-rival Pakistan. There was no benefit that accrued to India from the embargo

⁷²⁷Ibid

(except for indirect ones such as greater focus on indigenous technologies in the Indian nuclear and space programs).

In comparison, the costs imposed by the embargo on the US were very low as compared to the benefits until 1997. The embargo was strategically beneficial to the US as its economic consequences were a significant factor that deterred Indian leaders at the helm of an already tottering economy from conducting additional tests to follow up on the lone 1974 test. The sanctions were also strategically useful in that they made an example out of India to deter the other nations of the world with nuclear ambitions to not cross the rubicon. The economic cost of not being able to access the Indian civilian nuclear sector was not prohibitive for the US given the foreign exchange constrained Indian economy's inability to buy a large number of American reactors. The difficulty in accessing the broader Indian market given the resentment caused by the embargo was not a major concern for the US as it did not have major commercial interests in India given the insular, quasi-socialist economy with its 'Hindu rate of growth' and stifling bureaucracy. The foreign policy costs for the US from the embargo (loss of influence in India) were also minimal as India had always maintained a non-aligned foreign policy even before the sanctions. To summarize, the post-1974 nuclear status quo was more beneficial to the US and more costly for India until 1997.

However, three key developments in the 1990-1998 timeframe began to alter the prevailing cost-benefit balance. First, the international strategic milieu underwent a seismic shift with the collapse of the Soviet Union and the emergence of an economically

ascendant China on the American radar as a future strategic competitor, effectively ending the Nixon-Mao anti-Soviet pact.

The second key development was the change in the structure of the Indian economy, a result of a major rightward shift in its polity that provided the political space for then Prime Minister P.V. Narasimha Rao and his Finance Minister Manmohan Singh to liberalize the hitherto insular economy. The resulting increase in economic growth rates, the rise of the Indian IT industry with extensive linkages to US firms and the ascent of a broader BPO (Business Process Outsourcing) complex providing 'back-office' cost-cutting services to American corporations significantly increased US commercial interests in India by 1997. The third development that decisively altered the post-1974 cost-benefit balance was India's second round of nuclear tests in 1998 that led to its emergence as a full-fledged nuclear weapons power with a versatile nuclear arsenal (including a thermonuclear weapon with a yield that is still controversial in India). The major strategic benefit for the US from the post-1974 sanctions, crimping the Indian nuclear arsenal by preventing another nuclear test was gone.

As of 2005, the Iraq war traumatized Bush administration was staring at a worsening strategic scenario characterized by blistering Chinese economic growth rates combined with steady rise in military spending, emergence of Iran with alleged nuclear ambitions as the preeminent power in the Persian Gulf and the reemergence of Russia under an assertive Putin. The strategic benefits from the post-1974 sanctions of containing the Indian nuclear weapons program had been neutralized in 1998 but the strategic cost of not being able to harness growing Indian economic and military power to

advance American strategic interests were beginning to mount. The penalty for such an inability would potentially be steep if some sort of grand strategic understanding however unlikely developed between China, India and Russia, Asia's 3 large nuclear armed powers (representatives of the three countries had been meeting annually although the events were little more than photo-ups given the deep distrust between India and China and the persisting suspicions in China-Russia relations).

Meanwhile, the Indian civilian nuclear sector, albeit constrained by fuel shortages in the short term, looked set for a slow but independent trajectory in the medium to long term through the expansion of second stage fast breeders. The rapidly growing and increasingly lucrative Indian defense sector was being dominated by longtime ally Russia and penetrated by America's European economic rivals. India was in the midst of an unprecedented military modernization of its armed forces, presenting an invaluable opportunity for a supplier to not only secure lucrative contracts but also get a handle on Indian foreign policy. Yet, accessing the Indian defense sector was almost impossible for the US given the labyrinthine nature of the post-1974 sanctions regime that made the sale of any high-tech weaponry very difficult. To summarize, the post-1974 benefit-cost balance in favor of the US was significantly eroded in 1998 and reversed by 2005 and incremental initiatives such as the NSSP failed to elicit Indian cooperation. It is this altered cost-benefit ratio, the personal affinity of President Bush for India and the ascendance of India friendly personnel onto key positions in the State Department that resulted in the American nuclear overture towards India.

Although the American offer of a nuclear deal was generous in terms of the magnitude of the concessions given to India, it was by no means a nuclear carte blanche. India was expected to separate its hitherto intermeshed nuclear program into civilian and military spheres and place the civilian facilities under permanent IAEA safeguards. However, the debate over the separation plan (August 2005-March 2006) that followed (covered in detail in Chapter 2) indicates that the Bush administration retained a laser-like focus on concluding the nuclear deal and securing the broader strategic benefits rather than ensuring the placement of the maximum number of reactors by India under safeguards.

In fact, the administration allowed India to retain the strategically significant Prototype Fast Breeder Reactor (PFBR) on the unsafeguarded military side of the separation plan and acquiesced to the final separation plan in March 2006 that allowed India to place only 14 out of 22 reactors (65% of its nuclear program) under safeguards. The generous plan allowed India to retain 8 reactors including the PFBR on the unsafeguarded military side and also permitted India to build additional facilities if required. The only objective of the Bush administration in the negotiations over the separation plan seemed to be to secure a bare minimum number of Indian reactors under safeguards to ensure that the more non-proliferation inclined US Congress would not torpedo the nuclear deal and the US-India strategic partnership.

To summarize, the key objective of the Bush administration was always to consummate a nuclear deal, even if very favorable to India, in order to clear the obstacles in the path of a long-term strategic partnership. The obvious American calculation was

that the benefits of such a strategic partnership would far exceed the non-proliferation cost of the nuclear deal. The only American insistence from the outset of the nuclear deal was that India commit to not testing a nuclear weapon again in exchange for American nuclear cooperation.

A brief exploration of the reasons that led the Prime Minister to go in for the nuclear deal (in addition to the incessant prodding by Rice and Natwar) reveals a variety of possibilities including his warm personal relationship with President Bush,⁷²⁸ concerns about India's long-term energy security and access to American high-technology,⁷²⁹ a determination to secure his legacy as the leader who ended India's nuclear isolation,⁷³⁰ a firm resolve to eradicate the Cold War era distrust between the US and India⁷³¹ and a

⁷²⁸. Brahma Chellaney, Professor of Strategic Studies at the New Delhi based Center for Policy Research argued that the warm personal relationship between the Prime Minister and President Bush played an important role in his decision to go in for the nuclear deal. Raj Chengappa, a reporter for the *India Today* magazine agreed.

Chellaney, Brahma. "George W. Bush and Manmohan Singh - Nuclear Soulmates?" (January 20 2009), <http://in.reuters.com/article/2009/01/20/idINIndia-37547520090120>
Chengappa, Raj. "How the Deal Was Clinched " *India Today*, September 7, 2007.

⁷²⁹ Dr. Sanjaya Baru served as the former media advisor and official spokesperson for the Prime Minister from 2004 to 2008: the period when the nuclear deal was negotiated. He contended that Singh supported the nuclear deal because of his belief that it would enhance India's long-term energy security and boost Indo-U.S high-technology trade.

Baru, Sanjaya. "India and the World – Economics and Politics of the Manmohan Singh Doctrine in Foreign Policy. ." ISAS Working Paper. No. 53 (November 14 2008.): 12, 22-23.

⁷³⁰ Harsh Pant, a Reader in International Relations in the Defence Studies Department, at Kings College, London⁷³⁰ noted that the Prime Minister signed the deal in order to secure his legacy as the person who ended India's nuclear apartheid.

Pant, Harsh V. *The U.S-India Nuclear Pact- Policy, Process and Great Power Politics*: Oxford University Press, 2011. p 68.

⁷³¹ Pramit Pal Chaudhuri, foreign affairs editor for the *Hindustan Times* recalled in a personal interview that the nuclear agreement was essentially a *trust deficit alleviation initiative* for Singh: an American demonstration of its bona fides to India that would eradicate the toxic legacy of its previous Cold War era pro-Pakistan policies.

"For Manmohan Singh, the Prime Minister, he's very clear, he told (Senator) John Kerry when Kerry asked him on a visit here, what is this nuclear deal all about and Manmohan Singh (said) it's about trust, that we need roughly speaking as his aides told me, Prime Minister's aides told me, that we need something to eradicate the degree of distrust that existed, the legacy of distrust that was created by the Cold War, by (America's) Pakistan policies and so on, that exists between the United States and India and it had to be something very large.

desire to extract a nuclear legitimacy pound of flesh from the US in exchange for aligning India with the American containment strategy against China.⁷³²

The nuclear centerpiece of the global partnership frame had emerged completely. President Bush and Prime Minister Singh also announced the global partnership frame by declaring their resolve to “transform the relationship between their countries and establish a global partnership.”⁷³³ They envisaged deeper engagement in a wide range of fields under the proposed partnership including economic cooperation, energy and environmental tie-ups, democracy promotion, non-proliferation cooperation, high technology trade and space cooperation.⁷³⁴

Interview with Prमित Pal Chaudhuri, strategic affairs editor for the Hindustan Times

⁷³² Critics of the nuclear deal like Prabir Purkhayastha, an energy analyst with ties to the Left front and a member of the Delhi Science Forum suggested in a personal interview that the Prime Minister extracted a nuclear legitimacy price from the US in exchange for enrolling India into the US vision for Asia. “Manmohan’s issues are I think very clear and they are in some sense very limited. He felt that as finance minister he had changed India’s economic processes. The Nehruvian policies which were in vogue, he had changed it and he had successfully brought (the) Indian economy to a different position. He also felt, that given the world where the Soviet Union is no longer there, that a similar kind of maneuver was necessary, in strategic and foreign affairs and India needs to align much more with the United States, and that will make India a global player.....The sticking point was that if the U.S does not accept India as a nuclear weapons power, officially then India cannot perform that maneuver clearly. So that was the concession that U.S was willing to give at that point that if you’re willing to strategically align with me, my vision of Asia...(because) if you look at the strategic map of Asia, you will find that after Japan there’s nothing. The whole arc upto India, only with Pakistan you get a strategic ally. Till that point there’s nothing in the whole arc and that’s an arc that is dominated therefore by China. So, if India comes in, certainly the strategic arc, India, Australia, Japan provide an arc of balance against China strategically. So U.S was willing to pay a price and I think, giving legitimacy Indian nuclear weapons aspirations was a price U.S was willing to pay, if India’s willing to walk into its strategic embrace.”

Interview with Prabir Purkhayastha, an energy analyst with ties to the Left front

Note: Purkhayastha’s asked me to clarify that his personal views differ substantially from his interpretation of the Prime Minister’s motivations. He held that he personally did not believe in the concept of legitimacy for nuclear weapons as they were by their very nature illegitimate and were possessed by an “illegitimate club.”

⁷³³ "Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 18 2005), <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

⁷³⁴ The two leaders announced the launching of a new CEO Forum “to harness private sector energy and ideas to deepen the bilateral economic relationship” and a U.S-India Knowledge Initiative on Agriculture under the revitalized U.S-India Economic Dialogue. The duo also committed to support the new U.S-India Global Democracy Initiative in countries “that seek such assistance, institutions and resources that strengthen the foundations that make democracies credible and effective.” Satisfaction was expressed over

The radical terms of the grand nuclear bargain and the expansive contours of the global partnership frame outlined in the July 18 2005 joint statement indicate that the Prime Minister completely bought into the nuclear deal and the global partnership frame. However, his support came at the expense of the pipeline as evidenced in an interview he gave to the *Washington Post* two days later. The Prime Minister characterized the advanced nature of negotiations over the IPI pipeline as preliminary and expressed doubts about its economic feasibility, doubts that he had never raised before in the period from August 2004 (when Aiyar first resurrected the pipeline) to late June-early July 2005 (when there was tremendous momentum in favor of the pipeline following Aiyar's trips to Pakistan and Iran).

Washington Post: Can you discuss India's discussions with building a gas pipeline with Iran?

Singh: As far as the pipeline is concerned, only preliminary discussions have taken place. We are terribly short of our energy supply and we desperately need new sources of energy.....But I am realistic enough to realize that there are many risks, because considering all the uncertainties of the situation there in Iran. I don't know if any international consortium of bankers would probably underwrite this.⁷³⁵

the recent consummation of the "New Framework for the U.S.-India Defense Relationship as a basis for future cooperation, including in the field of defense technology." A Science and Technology Framework Agreement would be signed, space cooperation would be enhanced through the U.S.-India Working Group on Civil Space Cooperation and Indian organizations would be removed from the U.S Department of Commerce's Entity List.

"Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 18 2005), <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

⁷³⁵Interview: Indian Prime Minister Singh". *Washington Post*, July 20, 2005.

The documentary record does not indicate a steep rise in global natural gas prices⁷³⁶ that would have made the pipeline economically unviable thereby affecting the Prime Minister's decision-making calculus. There is also no indication of a dramatic deterioration in India-Pakistan relations that would have threatened the route of the IPI pipeline or a rapid Sino-Iranian rapprochement⁷³⁷ that would have opened up the possibility of an alternative pipeline (Iran-Pakistan-China pipeline) resulting in the Prime Minister's decision to jettison the project.

Moreover, the Prime Minister was also conspicuously silent on the regional cooperation frame that he had actively supported in the past. The Prime Minister's shift following that of Natwar was in effect a defection of Aiyar's second major political backer from the pipeline and the regional cooperation frame. Praful Bidwai, a veteran journalist and anti-nuclear activist was quick to notice the shift.

India, one of the world's big guzzlers of energy, is caught between the search for future supplies of vanishing resources, especially petroleum, and opting for nuclear power. In recent years India has been gravitating towards the first option.....India moved towards signing a deal for a 2,600 km-long pipeline carrying natural gas from Iran through Pakistan. The \$7.4 billion project has been seen as the star of the country's energy show. Yet, 10 days ago, the government's preference suddenly shifted

⁷³⁶ "Natural Gas Prices-Statistical Review of World Energy 2013." *British Petroleum*, 2013. <http://www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy-2013/review-by-energy-type/natural-gas/natural-gas-prices.html>

⁷³⁷ Although the Sino-Iranian relationship was on a generally upward trajectory as of June 4, 2005. Gundzik, Jephraim P. "The Ties That Bind China, Russia and Iran" *Asia Times*, June 4 2005. <http://www.atimes.com/atimes/China/GF04Ad07.html>

towards nuclear power.....This is strange considering that nuclear power accounts for under three percent of India's electricity, and less than one percent of its energy consumption, and that the country's experience with nuclear energy, especially safety, has not been happy. What explains the shift is not so much energy planners' calculations, technical factors, or social considerations, as geopolitical calculations. Crucial here is Prime Minister Manmohan Singh's July 17-20 visit to Washington, where he signed a far-reaching nuclear cooperation agreement with President George W. Bush.....This (July 20 2005 Washington Post interview) has been widely seen as Singh's effort to placate Washington, which has repeatedly voiced its opposition to the pipeline.....Politically and strategically, the nuclear power paradigm fits in with an alliance with the U.S.....The pact will also keep India closely aligned with the global North, which accounts for the bulk of international nuclear supplies.....By contrast, the oil pipeline would be a symbol of South-South economic cooperation and political solidarity, which the U.S. quietly opposes, as it opposes any developing country group that it can't control.....Singh supported South-South energy cooperation at the 50th anniversary of the Afro-Asian Conference in Jakarta in April.....But now Singh seems to be retreating from it, citing purely commercial and technical grounds.....⁷³⁸

⁷³⁸ Bidwai, Praful. "U.S. Nuclear Deal with India Blocks Deal for Iran Pipeline" (July 30 2005), <http://www.monitor.net/monitor/0508a/copyright/indiapactiranpipeline.html>
See also: Muralidharan, Sukumar. "Sacrifice of the Pipeline" *Himal SouthAsian*, March 2006
Koshy., Ninan. "India and the Iran Vote in the Iaea" *Foreign Policy in Focus* (October 27, 2005), http://www.fpi.org/articles/india_and_the_iran_vote_in_the_iaea.

Further evidence for the Prime Minister's shift can be discerned in his August 3 2005 speech to the Indian Parliament in which he justified the decision to go in for the global partnership frame and the nuclear deal.⁷³⁹ Singh proposed that India should take advantage of the access to the international market provided by the nuclear deal and add 30,000-40,000 MW from 2005-2020, a ten-fold increase in its nuclear capacity over fifteen years. Further, the Prime Minister also explained his vision of a large civilian nuclear program incubating high-tech firms that would help India grow rapidly.

The United States is a superpower today. We want to move towards a multi-polar world. But how do you become part of a multi-polar world?.....If India grows in the next ten years at the rate of eight to ten per cent per annum, then we will probably become the third or the fourth largest economy in the world and the world will respect us.

.....engagement with the United States is essential in the world that we live in. This is not an alliance; this is not a military alliance. This is not an alliance against any other country.....energy security is the key to India's emergence as a strong and powerful nation in the years to come.....Coal is plentiful. But greater use of coal can result in environmental hazards....We are dependent on hydrocarbon imports for meeting seventy per cent of our requirements. That is too large a dependence. Therefore, in our quest for energy security, we must widen

⁷³⁹ Debates, Lok Sabha. "Statement Made by the Prime Minister on 29.7.05 Regarding His Recent Official Visit to the United States of America " (August 3 2005), <http://164.100.47.132/LssNew/Debates/textofdebatedetail.aspx?sdate=08/03/2005> PM in Parliament. "Pm's Reply to the Lok Sabha Debate on His Us Visit." (August 3, 2005), <http://pmindia.nic.in/pmsinparliament.php?nodeid=13>

the options that are open to us and nuclear energy is one such option
..... Therefore, if that (joint) statement is translated into concrete
realities, I think, that will mean a new era for the growth of civilian
nuclear energy sector in our country. My own vision is that the next 15-
20 years we should add about 30,000-40,000 megawatts of nuclear
capacities.....If we have a large nuclear power programme and
auxiliarisation, around that, it will grow a very large number of hi-tech
firms^{740 741}

One key analyst who joined the chorus supporting the Prime Minister's new
nuclear expansion targets was Dr. V. S. Arunachalam, a professor at the Carnegie Mellon
University and an experienced government scientist who served five Prime Ministers.⁷⁴²
Arunachalam unveiled his projections in a presentation at the Carnegie Endowment of
International Peace on September 12, 2005. He began by noting that India needed to
sustain a rapid economic growth rate in excess of 8% in order to significantly improve its
Human Development Index (HDI). Key constraints that restricted average growth rates to
about 5-7% in the last few years was the shortage of power, huge transmission and
distribution losses and the massive subsidies for the agricultural sector that included
provision of free power. Arunachalam then predicted that India needed to install a

⁷⁴⁰PM in Parliament. "Pm's Reply to the Lok Sabha Debate on His Us Visit." (August 3, 2005
) , <http://pmindia.nic.in/pmsinparliament.php?nodeid=13>

⁷⁴¹ The Prime Minister also reiterated the same nuclear expansion target of 40,000 MW by 2015 in his
independence day speech on August 15 2005
"Text of Prime Minister's Independence Day Speech". *Rediff.com*, August 15,
2005. <http://ia.rediff.com/news/2005/aug/15speech.htm>

⁷⁴² Arunachalam, Dr. V.S. "Nuclear Power and Energy Security in India
" (September 12, 2005), <http://carnegieendowment.org/2005/09/12/nuclear-power-and-energy-security-in-india/1qco>

whopping 250 GW (Gigawatt) by 2015 to achieve an average annual growth rate of 8%. Given India's current installed capacity of 120 GW, a massive additional 135 GW would be needed in the next ten years. Arunachalam proposed the installation of 34GW of additional nuclear capacity in a ten year time span (2005-2015) in order to help achieve the overall expansion target.⁷⁴³

His scenario would significantly expand the contribution of nuclear power in India's energy mix from 5.06% in 2005 assuming current rates of capacity addition (figure 13) to 14.60% in 2015 (figure 14).⁷⁴⁴

⁷⁴³ As of early 2013, the actual nuclear capacity addition in India has been about 2 GW. Current rates of expansion point to an additional 4.5 GW being added by 2015 (about one eighth of the capacity projected by the Prime Minister and Arunachalam)

Conversation with Dr. M. V. Ramana, Associate Research Scholar, Program on Science and Global Security, Princeton University.

⁷⁴⁴ Arunachalam, Dr. V.S. "Nuclear Power and Energy Security in India" (September 12, 2005), <http://carnegieendowment.org/2005/09/12/nuclear-power-and-energy-security-in-india/lqco>

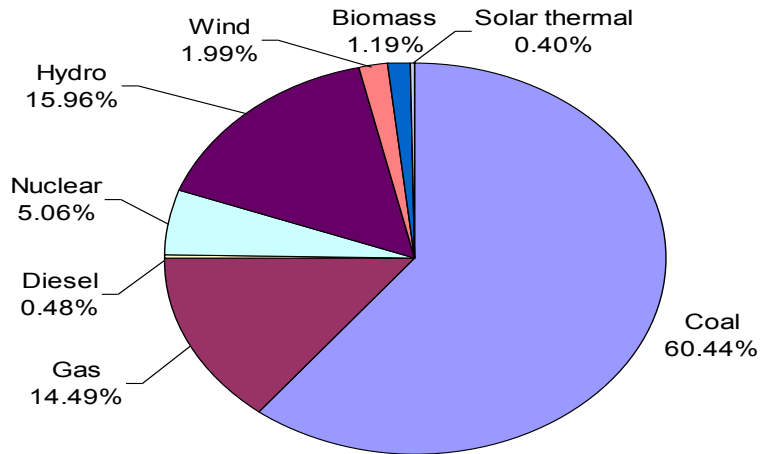


Figure 13: Same Fuel Mix as now (2015)

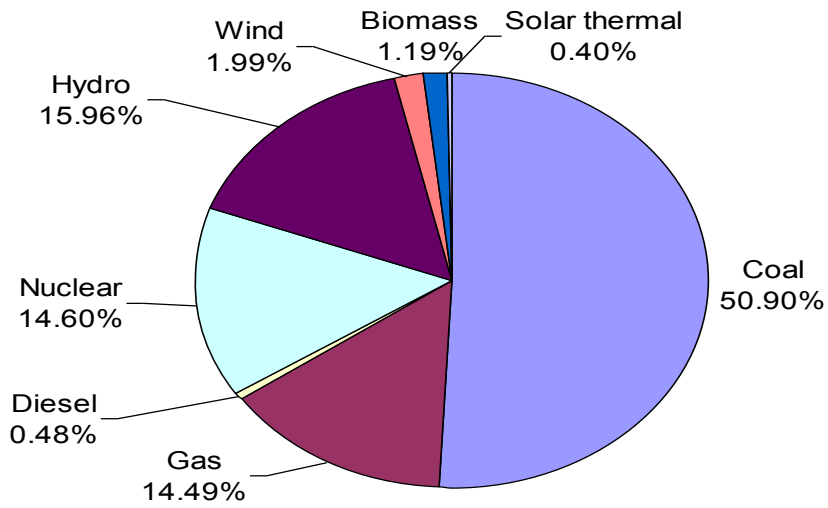


Figure 14: Aggressive Nuclear Capacity Addition (2015)

It must be pointed out that Arunachalam had strong incentives to provide technical judgements supporting the Prime Minister's expansion targets. After all, he was an Indian American with strong ties to successive Indian governments⁷⁴⁵ and in favour of improved US-India relations.

The Prime Minister did reiterate that "our government is committed to make the gas pipeline a reality" in the August 3 2005 speech in a bid to allay concerns that had arisen over his remarks on the initiative in the *Washington Post* interview.⁷⁴⁶ However, his subsequent decision to risk the fate of the IPI pipeline by voting against the Iranian nuclear program at the International Atomic Energy Agency (IAEA) in September 2005 instead of abstaining despite Iranian warnings indicates that either his reassurance was an empty promise or he had quickly changed his mind after the statement under American pressure. I briefly describe the events leading up to the vote and demonstrate that the Prime Minister decided to vote against Iran despite being forewarned by the Iranian leadership that such a move would have adverse implications for Iran-India energy relations including the pipeline.

The crisis over the Iranian nuclear program began on August 8 2005 following the decision of the newly elected Ahmadinejad government to resume uranium enrichment after the collapse of negotiations between Iran and the EU3 (Great Britain, France and Germany). The response of the EU3 and the US was to formulate a tough resolution that would censure Iran for its nuclear program and pave the way for its referral to the

⁷⁴⁵ Conversations with Dr. M. V. Ramana

⁷⁴⁶ PM in Parliament. "Pm's Reply to the Lok Sabha Debate on His Us Visit." (August 3, 2005), <http://pmindia.nic.in/pmsinparliament.php?nodeid=13>

Security Council for potential sanctions. The resolution would be tabled by the US-EU3 coalition at the September 25 2005 board meeting of the IAEA. Obviously, the US-EU troika wanted India to vote in favor of the resolution. American pressure on India to support the resolution in the days leading up to the meeting was relentless and intense.⁷⁴⁷

An August 23 2005 leaked American diplomatic cable described Mulford warning Natwar that India's stance on the Iranian nuclear program at the IAEA would play into the debate in the US Congress over the nuclear deal.⁷⁴⁸ California Congressman Tom Lantos severely criticized alleged statements of solidarity attributed by the Iranian media to Natwar over that country's nuclear program during a hearing on the nuclear deal at the House International Relations Committee on September 8 2005. He bluntly warned the Indian government that its refusal to go along with the American demands on Iran would bury the nuclear deal.⁷⁴⁹ The *New York Times* also informed its readers that Bush administration officials had asked India to choose

⁷⁴⁷ Maitra, Ramtanu. "India Bends under US Pressure"
" *Asia Times*, Sep 27, 2005

Varadarajan, Siddharth. "The Unravelling of India's Persian Puzzle " *The Hindu*, September 27 2005.

⁷⁴⁸ Mulford, David. "Natwar Reserved on Us-India Nuclear Understanding." (August 23 2005),
<http://www.cablegatesearch.net/cable.php?id=05NEWDELHI6485>

⁷⁴⁹ "So, Just Who Is Tom Lantos?." (September 15, 2005),
<http://www.rediff.com/news/2005/sep/15spec1.htm>

Haniffa, Aziz. "Indian Foreign Minister 'Dense': Us Congressman." (September 09, 2005),
<http://in.rediff.com/news/2005/sep/09aziz.htm>

Diplomatic, Correspondent. "Lantos' Remarks Unparliamentary, Says New Delhi" *The Hindu*, September 11 2005.

who is the best partner to meet its surging energy needs - Iran with its natural gas resources or the West with its ability to help in developing Indian civilian nuclear power.^{750 751}

Moreover, the US had made it clear that an abstention vote by India would not be acceptable. On the other hand, Iran was also determined to get India to either vote against the resolution or more likely abstain. Ahmadinejad adeptly cleared a separate multibillion dollar Liquefied Natural Gas (LNG) deal to import Iranian natural gas via ships to India (initialed by Aiyar during his visit to Iran in June 2005) a few days before the September 2005 meeting as an inducement to influence India's decision-making calculus.

Other diplomatic sources point out that during his meeting with PM Manmohan Singh on August 31, (Ali) Larijani (Iran's top nuclear negotiator) put a phone call through to Iranian president Mahmoud Ahmedinejad. During the chat with Manmohan, Ahmedinejad himself cleared the LNG (Liquefied Natural Gas) deal. On his return to Tehran, Larijani declared, "The issue of exporting Iran's LNG to India has been finalised."⁷⁵²

⁷⁵⁰Weisman, Steven R. "India Balks at Confronting Iran, Straining Its Friendship with U.S. ." *New York Times*, September 15, 2005.

⁷⁵¹ *The Economist* reported that Bush "pressed India on Iran" during a September 13 2005 meeting with Prime Minister Singh in New York. It also noted that "all of this bodes ill for another important issue in Indo-Iranian relations: a planned \$4 billion project to pipe Iranian gas through Pakistan to India.....it looks as if its abandonment may turn out to be part of the price America demands for its friendship."

"For Us, or against Us?-an Iranian Spanner in the Strategic-Partnership Works ". *The Economist*, September 15 2005.

Weisman, Steven R. "India Balks at Confronting Iran, Straining Its Friendship with U.S." *New York Times*, September 15, 2005.

R. Suryamurthy & Manoj Kumar,. "Pm's Us Visit to Decide Fate of Indo-Iran Gas Pipeline" *The Tribune*, September 11 2005.

⁷⁵² Sudarshan, V. "Indo-Iran Ties- Nukewarm" *Outlook Magazine*, October 10 2005.

Iran's willingness to use the LNG deal as an inducement to influence India's vote indicated that a vote in support of the resolution by the latter would have adverse consequences for the LNG deal due to the downgrading of Iran-India relations. The chill in Iran-India relations resulting from an Indian vote in favor of the resolution would also adversely affect the prospects of the IPI pipeline. Despite being forewarned about the adverse impact of India's support for the resolution on the LNG deal and the pipeline, the Prime Minister gave the green signal for Natwar to vote in favor of it.

In New York at the time after the UN General Assembly summit, Natwar famously, on the night of the vote, called the Prime Minister Manmohan Singh in Chandigarh, finance minister P Chidambaram and defence minister Pranab Mukherjee, all of whom were travelling, to take a consensus of the Cabinet Committee on Security (CCS) before instructing India's ambassador Sheel Kant Sharma at the IAEA to vote against Iran's nuclear ambitions. This was reaffirmed by the MEA (Ministry of External Affairs) in a statement on September 29, when it refuted a media report. The statement said, "The external affairs minister was fully involved in the decision-making process. The external affairs minister consulted all members of the Cabinet Committee on Security and the Prime Minister before communicating the government's decision to our ambassador to (at) the IAEA."⁷⁵³

⁷⁵³ "Irony: Nuke Deal Was Natwar Baby". *Times of India*, Aug 8, 2006, .
"Mea Consulted Pm on Iran Issue". *TheTribune*, September 30, 2005, .

Notice that the Prime Minister finalized India's stance on the resolution at the IAEA in consultation with Natwar and did not involve Aiyar. He was not absolutely required to do so as Aiyar was not a member of the Cabinet Committee on Security. However, it is not unreasonable to argue that Aiyar normally would have been consulted given his deep involvement in negotiating the LNG deal and the IPI pipeline that would suffer a setback if India voted in favor of the resolution. It appears that the Prime Minister and Natwar were in no mood to let Aiyar get in the way of their decision to secure the nuclear deal and the global partnership frame by respecting the American sensitivities on Iran. Further, Natwar's intervention earlier in April 2005 to exclude Aiyar from the nascent Energy Dialogue raises the possibility that Aiyar's exclusion from the pre-vote consultation process was the second time he was consciously marginalized by his two political backers.

India's vote in favor of the resolution was in stark contrast to other leading nations of the Non-Aligned Movement such as South Africa and Malaysia and major powers including China and Russia that abstained.⁷⁵⁴ The vote also went against India's traditional position on the Iranian nuclear issue that was skeptical of Western claims that Iran was trying to acquire nuclear weapons and supportive of its right to develop nuclear energy for peaceful purposes as a signatory of the Non-proliferation Treaty (NPT). One reason proffered by Indian diplomats to explain the vote was that India was not in favor

⁷⁵⁴ Koshy., Ninan. "India and the Iran Vote in the Iaea" *Foreign Policy in Focus* (October 27, 2005), http://www.fpi.org/articles/india_and_the_iran_vote_in_the_iaea.

of another nuclear weapons power in its neighborhood that would complicate its deterrence calculus.

The American success in cajoling/coaxing India to break away from its traditional position on the Iranian nuclear program in September 2005 by linking India's vote to the fate of the nuclear deal raises an interesting question regarding the timing of the American nuclear overture to India in mid-2005. Did Rice broadly anticipate a worsening of US-Iran relations in the near future and the possibility of using a nuclear rapprochement with India to deprive Iran of its key energy customer and passive international backer as early as March 2005? (instead of simply repackaging a techno-military-strategic nuclear deal resulting from purely American strategic considerations into an energy security counter offer for the IPI pipeline in March 2005 as I argued earlier in the chapter?) In other words, was the curtailment of the Iranian nuclear program and the broader containment of Iranian strategic ambitions a primary consideration in Rice's decision to offer India a nuclear deal right from the outset in 2005? The documentary record including the internal correspondence in leaked American diplomatic cables and my interviews did not provide any evidence to pursue the aforementioned line of inquiry.

Minister for Petroleum and Natural Gas-Mani Shankar Aiyar-Congress Party

An increasingly marginalized Aiyar tried to allay the apprehensions of the press regarding the prospects of the pipeline (and the LNG deal) following India's September vote.

India's petroleum minister Mani Shankar Aiyar Tuesday allayed apprehensions that the proposed 7.4 billion Iran-Pakistan-India gas

pipeline project and its 22 billion dollar deal to import liquefied natural gas (LNG) from Tehran was in danger, following India voting against Iran's nuclear plans.⁷⁵⁵

Contrary to his empty reassurances, the pipeline (and the LNG deal) was indeed in danger as India's vote provoked an angry energy backlash from Iran that resulted in the cancellation of the LNG deal. The message from Iran was clear; another Indian vote in support of the resolution at the crucial November 2005 IAEA meeting would put paid to the pipeline⁷⁵⁶ and by extension knock out the centerpiece element of the regional cooperation frame.

Clearly, American pressure tactics played an important role in influencing India to vote in favor of the resolution against Iran. However, it is also clear that the Prime Minister and Natwar were determined to push through the nuclear deal and the global partnership frame of their own volition (following their respective shifts in April and July 2005) by respecting American sensitivities on Iran despite a clear indication from Iran that such a course of action would endanger the pipeline and damage Iran-India relations. Given the importance of the pipeline to the regional cooperation frame, it is also clear that the Prime Minister and Natwar were prepared to sacrifice the frame.

I suggest that India's September 2005 vote can also be understood as the first visible clash between the nuclear deal and the global partnership frame on the one hand

⁷⁵⁵ "Vote against Iran Would Not Affect the Gas Pipeline Project: Indian Minister." *People's Daily*, September 27, 2005.

Lancaster, John. "India to Proceed with Natural Gas Pipeline" *The Washington Post* September 27, 2005

⁷⁵⁶ Koshy, Ninan. "India and the Iran Vote in the Iaea" *Foreign Policy in Focus*, October 27, 2005.

and the pipeline and the regional cooperation frame on the other. Clearly, the deal and the global partnership frame had won the first clash. A second victory also appeared imminent at the next IAEA meeting scheduled for November. The fate of the pipeline and the regional cooperation frame still being pursued by a completely marginalized Aiyar⁷⁵⁷ appeared all but sealed.

Left Front

Unexpected help for Aiyar's tottering pipeline and the regional cooperation frame appeared in the form of the Left front's fierce opposition to the September vote. As stated earlier, the Left had already protested the government's decision to sign the defense framework agreement, a key element of the global partnership frame in June 2005.⁷⁵⁸ It also voiced serious objections to the July 18 2005 joint statement that laid out the basic terms of the nuclear deal.⁷⁵⁹ The Iran vote angered the Left further and deepened the suspicion among its leaders that India was aligning its foreign policy to suit American interests in exchange for the nuclear deal and the global partnership frame. Left leaders called on the Prime Minister to reverse India's vote at the upcoming November meeting of the IAEA Board.

The Left On Wednesday attempted to climb policy making heights by demanding a review of the anti-Iran vote before the November meeting of the IAEA. The government, which is under intense domestic pressure to explain the paradigm shift in diplomacy, however, was non-committal

⁷⁵⁷ "Energy Conductor". (September 23 2005), <http://www.emergingmarkets.org/Article/1017534/Energy-conductor.html>

⁷⁵⁸ Chapter 3 Pg 89-90

⁷⁵⁹ "Indo-U.S Joint Statement." (July 21 2005), <http://cpim.org/content/indo-us-joint-statement>

on India's stand at the November meeting. The Left parties argued that the vote against Iran will hamper economic ties with Iran, including the gas pipeline and LNG projects.....The Iran issue will be taken up on Thursday at the all India strike by Left-affiliated trade unions.⁷⁶⁰

The Left's determination to prevent the realignment of India's non-aligned foreign policy in favor of the US led it to not only launch a political attack on the government but also question the ambitious nuclear expansion targets enunciated by the Prime Minister in his August 3 2005 speech (and Dr. V.S. Arunachalam in his presentation at the Carnegie Endowment).

Prabir Purkhayastha, an experienced energy analyst at the Delhi Science Forum with ties to the Left published an article in *People's Democracy*, the weekly organ of the Communist Party of India (Marxist): the largest faction of the Left. Purkhayastha began by revising downwards the overall installed capacity that India would require by 2015. He anticipated that India would only need to add a maximum of 60 GW to the current installed capacity of 120 GW (2005) for a total of around 185 GW by 2015: a substantially reduced overall demand estimate as compared to the Arunachalam scenario (an additional 135 GW for a total of 250 GW by 2015).

One of the justifications given for India's Iran vote in International Atomic Energy Agency (IAEA) was that India's future energy interests demand a decisive shift to nuclear energy and the US support in removing the sanctions on India is strategically vital.....The problem

⁷⁶⁰ "Tale End: Left Doesn't Buy Govt's Story on Iran Vote". *The Economic Times*, September 29 2005. "India's Surrender on Iran Nuclear Issue". (September 25 2005), <http://cpim.org/content/indias-surrender-iran-nuclear-issue>

with this set of argument(s) is that even if we take the most optimistic of nuclear energy predictions and a pessimistic hydro-carbon scenario, nuclear energy can at best meet about 5 per cent of India's primary energy needs by 2015 while the hydrocarbon requirements are about 40 per cent..... While the Department of Power has estimated that India needs close to 50,000 MW every five years (these are the Energy Power Survey estimates), in actual practice, the increase in demand has been in the range of 25,000 MW-30,000 MW for the last 15 years. Even if we take 60,000 MW as the minimum requirement in the next 10 years, India needs to reach an installed capacity of about 185,000 MW from the current base of 123,000 MW.⁷⁶¹

After readjusting the total installed capacity that would be required by 2015 downward, Purkhayastha then provided details about India's energy mix and the rising profile of natural gas as compared to the marginal role of nuclear power.

India's current mix of different sources of electricity is given in the tables below.

Installed Capacity (2005)

Fuel	MW	Percentage
Thermal	81,681	66.4
Hydro	31,865	25.9
Nuclear	3,310	2.7
Renewable	6,158	5

⁷⁶¹ Purkayastha, Prabir. "Energy Security, Energy Policy and Nuclear Energy " *People's Democracy* XXIX no. 46 (November 13, 2005).

Total	123,014	
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Thermal Mix Fuel Terms

Fuel	MW	Percentage
Coal	68,308	83.63
Gas	12,172	14.90
Oil	1,202	1.47
Total	81,682	

India's power sector has a preponderance of thermal (66.4 per cent) with some hydro (25.9 per cent). The proportion of nuclear energy in the installed capacity is very low.....its impact on the Indian power scene is relatively marginal. One significant factor in the current thermal mix is the emergence of gas as a major source. Starting from almost nothing in the early 1990s, today it is about 15 per cent in the thermal mix (about 12 per cent in the total energy mix) and is the fastest growing sector to boot.⁷⁶²

Finally, Purkhayastha systematically pointed out the multiple problems that would confront attempts to rapidly expand nuclear power capacity as envisaged by the Prime Minister and Arunachalam.

⁷⁶² Ibid

If we take into account the additional 60,000 MW (our estimates) or 100,000 MW (Department of Power's Estimates) that need to be added...If we take the best-case scenario for nuclear power, India could add about 30,000 MW of nuclear power by 2015 (Dr Arunachalam, former Scientific Advisor and now a Fellow in Carnegie Mellon University, US, has talked about adding 30,000 MW by 2015). The problems with such a trajectory are the following.....The three stage fuel cycle that we have been working on by which our main fuel would be thorium is not ready....Available natural uranium in India can sustain at most a programme of 10,000 MW for the life-cycle (40 years) of these plants. A small group – the Nuclear Suppliers group -- can turn off natural or enriched uranium supply as has already happened for the Tarapur reactors. Annual planned addition in the Tenth and the Eleventh Plan is around 500 MW currently against 3,000 MW required under this scenario, an immediate and a sudden increase of 6 times. Even if we take the most conservative of figures, the capital cost per MW of nuclear power is in the range of 6 crore per MW as against 2.5-3 crore for gas and about 4 crore for coal.....And for a country, which claims that it does not have enough resources for making public investments in the power sector, we would be committing capital for 30,000 MW of nuclear power, which could fund about 45,000 MW coal-fired plants or 60,000 MW gas-based plants.....So before we embark on a programme of this magnitude, the country has to have a serious debate on the pros and cons

of such a policy.....Certainly, such a policy should not emanate from the exigency of signing a defence or a nuclear agreement with the US.⁷⁶³

The Left's opposition to the realignment of India's foreign policy that stemmed from its anti-imperial communist ideology was not the only factor responsible for its contestation of the September vote.

Another important reason was domestic political considerations. Assembly elections were scheduled in five states (Assam, Kerala, Tamil Nadu, West Bengal and Pondicherry) and three of them (West Bengal, Kerala and Assam) had significant Muslim populations perceived to be more opposed to India's Iran vote than the majority Hindu community. Politicizing the Iran vote and courting the support of the Indian Muslim community had the potential to not only help the Left retain its traditional bastions of West Bengal and Kerala: two states crucial to its political survival, but also make inroads into the key north Indian state of Uttar Pradesh that was due for assembly elections in 2007. The Left's success in gaining Muslim votes from the upcoming state-assembly elections by politicizing the Iran vote issue would come at the expense of Prime Minister Singh's Congress party, the Left's coalition ally at the national level but opponent at the state level that had traditionally relied on the Muslim vote bank to win elections.

Prime Minister Manmohan Singh-Congress Party

Predictably, the Left's politicizing of the Iran vote led an alarmed Prime Minister to convene a meeting of his Congress Party's "core group" on September 30 2005. An October 5 cable by the US Embassy's Robert Blake described the details of the meeting

⁷⁶³ Ibid

gleaned from party insiders. Notice that Defense Minister Pranab Mukherjee, a key member of the core group was concerned about the effect of the Iran vote and the Left's opposition on the Congress party's support among Muslims ahead of state assembly elections but calculated that the damage would be limited.

Congress insiders have been rattled by the harsh criticism of India's IAEA vote against Iran..... On September 30, the "core group" of Congress, consisting of Congress President Sonia Gandhi, PM Singh and senior ministers Pranab Mukherjee, Arjun Singh, Shivraj Patil, Ghulam Nabi Azad, and Mrs. Gandhi's Political Secretary Ahmed Patel met at the Prime Minister's residence. "Hindu" Editor Harish Khare, quoting senior sources within Congress, claimed that the PM apologized for not consulting the leadership, and blamed the US for giving India only 12 hours to make a decision, rather than 48. After protracted discussion, the group purportedly agreed that the Iran decision was the only "realistic" choice, as Iran "had not been a helpful neighbor." Defense Minister Mukherjee argued that while the Iran decision would alienate Muslims, they would not abandon Congress "on the basis of a vote in some distant forum."⁷⁶⁴

However, a January 12 2006 leaked cable by Mulford indicated that the Prime Minister did not share Mukherjee's confidence regarding the ability of the Congress Party

⁷⁶⁴Mulford, David. "Congress Moves to Calm Coalition Jitters" (October 5 2005), <http://www.cablegatesearch.net/cable.php?id=05NEWDELHI7759>
Robert Blake, Jr. . "Indian Government Aggressively Defending Its Vote on Iran " (September 26 2005), <http://www.thehindu.com/news/the-india-cables/the-cables/article1538128.ece>

to hold onto the support of Muslims in the upcoming assembly elections in West Bengal, Kerala and Assam.

Responding to Senator (John) Kerry's appreciation of India's support on Iran (in September 2005), Singh underlined India's opposition to Tehran's nuclear ambitions. That being said, India is a country with 150 million Muslims and 25 million Shia. Moreover, he cautioned, elections are coming up in three to four months in states with significant Muslim populations (West Bengal, Kerala and Assam). "I have to be sensitive to this," the PM warned⁷⁶⁵

To summarize, the Left's opposition to the September vote made it more difficult for the Prime Minister and Natwar to vote a second time in favor of the resolution condemning Iran's nuclear ambitions at the IAEA, as evidenced in the Prime Minister's equivocation ahead of the February 2006 meeting (the November 2005 meeting was postponed to February 2006 to give the Ahmadinejad regime more time to alter Iran's nuclear policy after the drubbing in September).⁷⁶⁶ The Left's scathing public criticism of the September vote, its stout defense of the pipeline's energy security merits and its politicizing of the vote in order to court the Indian Muslim community increased the pressure on the embattled Prime Minister to direct the Indian representative at the IAEA

⁷⁶⁵ Mulford, David. "Codel Kerry Probes for an Indian Bottom Line on Nuclear Separation " (2006-01-12), https://www.wikileaks.org/plusd/cables/06NEWDELHI264_a.html
Mulford, David. "Energy and Trade Dominate Codel Gillmor's Meeting with Indian Parliamentarians " (January 19 2006)
https://www.wikileaks.org/plusd/cables/06NEWDELHI396_a.html

⁷⁶⁶Ibid
Mulford, David. "India Noncommittal on Iran, Curious to Know Other's Voting Plans." (February 2 2006), <http://www.thehindu.com/news/the-india-cables/the-cables/51571-india-noncommittal-on-iran/article1544906.ece>

to abstain in February 2006. An abstention vote would have two consequences. First, it would prevent Iran from cancelling/downgrading Aiyar's already tottering pipeline, thereby shoring up the most important element of the regional cooperation frame. Second, an abstention vote would deal a serious blow to the prospects of the nuclear deal in the US Congress and stall the momentum of the global partnership frame.

Clearly, the Left's opposition to the Iran vote put the Prime Minister in a tight spot ahead of the crucial February 2006 IAEA meeting. To complicate matters further for the besieged Prime Minister, Natwar, his steadfast ally in pushing for the nuclear deal and the global partnership frame reversed his stand on the Iran vote. The reason for Natwar's sudden reversal was not difficult to discern. He was named as a non-contractual beneficiary by the Volcker Committee (headed by Paul Volcker, former Chairman of the US Federal Reserve), a body setup to investigate abuses in the Iraqi Oil for Food Program⁷⁶⁷ on October 29 2005. The Committee's allegation that Natwar had reaped illegal profits from a "deal allotting 4 million barrels of oil to the Swiss company" that "allegedly made illegal "surcharge" payments to (Saddam) Hussein's government" quickly snowballed into a political crisis in India.⁷⁶⁸ Prominent newspapers carried articles detailing Natwar's role in the 'oil for food' scam and the main opposition BJP began to vigorously campaign for his dismissal.

⁷⁶⁷The program allowed the regime of former Iraqi dictator Saddam Hussein to use the revenues generated by selling a limited amount of oil to procure food and other essential items.
Lancaster, John. "India's Foreign Minister Fired in Oil-for-Food Scandal" *Washington Post*, November 7, 2005

⁷⁶⁸ Ibid

.....the charges (against Natwar by the Volcker Committee) have mushroomed into a political crisis for the (Congress) party and Prime Minister Manmohan Singh, who on Monday summoned the foreign minister to his official residence and demoted him to the post of minister without portfolio, according to a statement issued by the prime minister's office. The prime minister's move came after days of equivocation by the government, which first seemed inclined to support the foreign minister, but then retreated after the main opposition Bharatiya Janata Party began campaigning for his removal.....The report has touched off a frenzy of reports in Indian media detailing alleged connections between the Swiss firm and another company run by a close friend of (Natwar) Singh's son, Jagat.⁷⁶⁹

Natwar had expected the Prime Minister, the Congress party and even the Left to come to his defense but quickly turned bitter after finding himself without any backers. A November 7 2005 cable by Mulford explained the reasons behind Natwar's isolation.

There was no evidence that the heavy-hitters in Congress were ready to come to Natwar's aid in his hour of need. The press speculated that most within Congress would not be unhappy to see Natwar go, as his legendary arrogance has come to haunt him..... The Left Parties were among the first to call for a GOI (Government of India) investigation of the Volcker Report allegations, however, and will likely distance themselves from Natwar. Proud of their relatively clean record

⁷⁶⁹ Lancaster, John. "India's Foreign Minister Fired in Oil-for-Food Scandal" *The Washington Post*, November 7, 2005.
<http://www.washingtonpost.com/wp-dyn/content/article/2005/11/07/AR2005110700781.html>

on corruption, the Communists have always been quick to criticize Congress on that score.⁷⁷⁰

Natwar's reversal of position on India's Iran vote was in essence a parting shot of a bitter employee aware of his inevitable dismissal to retard the momentum of the Prime Minister's pet initiative, the nuclear deal and the global partnership frame by infuriating the US over India's Iran policy. A livid Prime Minister dismissed Natwar on November 7 2005.

The last nail in the coffin was driven in by Natwar himself when on Sunday he directly repudiated the government's stand on an issue of extreme importance, the Iran vote in the IAEA.....Clearly Natwar had no intentions of resigning, but was also intent on queering the pitch for the carefully crafted policy by the prime minister on non-proliferation and Iran and US. This was unacceptable to the prime minister, who was reportedly livid with Natwar over his statements.⁷⁷¹

The Prime Minister did give Natwar a "clean chit" two days following his dismissal in a move intended to protect the image of the Congress party that had come under attack by the media.⁷⁷² Although Natwar had championed the nuclear deal and the

⁷⁷⁰ Mulford, David. "The Upa Descends Deeper into the Volcker Report Quagmire- Natwar Veers to the Left " (November 7 2005), <http://wikileaks.org/cable/2005/11/05NEWDELHI8535.html>

⁷⁷¹ Bagchi, Indrani. "Natwar Played His Own Worse Enemy" *The Times of India*, Nov 8, 2005.

PTI. "Natwar for Revision of India's Iaea Vote" *The Times of India*, Nov 7, 2005.

TNN. "Timely Exit" *The Times of India*, Nov 9, 2005, .

Lancaster, John. "India's Foreign Minister Fired in Oil-for-Food Scandal" *Washington Post*, November 7, 2005

⁷⁷² Rao, M Rama. "Indian Prime Minister Gives Clean Chit to Natwar Singh in the Volcker Controversy." *Asian Tribune*, November 9 2005.

<http://www.asiantribune.com/news/2005/11/09/indian-prime-minister-gives-clean-chit-natwar-singh-volcker-controversy>

global partnership frame and had played an important role (along with Rice) in bringing an initially hesitant Prime Minister on board, the latter was now more committed to the deal and the frame. Natwar's exit resulted in the Prime Minister also assuming control over the Ministry of External Affairs.

Minister for Petroleum and Natural Gas-Mani Shankar Aiyar-Congress Party

Next, the Prime Minister turned his attention to Aiyar as the latter continued to support the pipeline's extension to China and the regional cooperation frame⁷⁷³ in a January 13, 2006 speech in Beijing.

Asia is the fount of oil and gas in the 21st century.....We are pushing forward with the proposed Iran-Pakistan-India pipeline.....I believe there is an important lesson of history to be learned in this context. We can either behave like the Europe of the 19th century which played Kipling's Great Game between Empires to secure exclusive access to raw materials and markets that would deny access to rivals - that is what led, at bottom, to the terrible slaughter of the two World Wars - or we in Asia at the commencement of the 21st century could consider instead the example of the European Coal and Steel Community which has eventually resulted in the European Union of today emerging as one of the strongest economic entities in the world. Is it not possible that the establishment of an Asian Oil and Gas Community could progressively

⁷⁷³ Srivastava, Siddharth. "India Looks East for Gas" *Asia Times*, September 28, 2005
PTI. "India Seeks Asian Oil and Gas Grid" *The Economic Times*, November 25, 2005.
Sanjay Dutta. "Russia Backs India's Oil Game" *The Times of India*, November 21, 2005.

result in the realisation of the Indian Prime Minister's dream of an Asian Economic Community in the early part of the 21st century?⁷⁷⁴

The speech was the last straw for a Prime Minister determined to ensure progress on the nuclear deal and the global partnership frame ahead of President Bush's maiden visit to India in March 2006. The Prime Minister relieved Aiyar of the Petroleum Ministry and reassigned him to the relatively less important Ministry of Youth Affairs and Sports as part of a major cabinet reshuffle on January 29, 2006.⁷⁷⁵ The reason for Aiyar's exit from the Petroleum Ministry was immediately clear to the media that attributed the dismissal to his support for the pipeline and the regional cooperation frame.

By common consent, Aiyar has been adjudged as the best-performing minister in the Manmohan Singh government all these months. But why was his portfolio taken off and left with only the Panchayat Raj and Youth Affairs Ministry? Because, Aiyar's views and actions (on) oil diplomacy have not been in sync with the ruling establishment.

He single-handedly pursued the India-Pakistan-Iran strategic pipeline plan, despite the confusing signals that the Manmohan Singh government has been giving on the issue.⁷⁷⁶

Although the aforementioned press article claims that Aiyar "single-handedly" pursued the pipeline, I have shown that he had the firm support of Natwar and the Prime

⁷⁷⁴Aiyar, Mani Shankar. "Asia's Quest for Energy Security " *Frontline*, February 11 - 24, 2006.

⁷⁷⁵ TNN. "Cabinet Reshuffle: Pm May Keep External Affairs" *The Times of India*, Jan 29, 2006.

⁷⁷⁶ Iype, George. "Sonia Loyalists Rewarded in Cabinet Expansion " (January 30, 2006), <http://www.rediff.com/news/special/iype/20060130.htm>

PTI. "New Faces in Manmohan's Cabinet" *The Times of India*, Jan 29, 2006.

Bidwai, Praful. "Sacrificing Sovereignty " (January 28 2006),

http://www.tni.org/archives/archives_bidwai_sovereignty

Minister till April and July 2005 respectively. A more accurate conclusion would be that Aiyar's backers turned their backs on him in favor of the nuclear deal and the global partnership frame.

US Ambassador to India- David Mulford- US Embassy in New Delhi

Aiyar's dismissal also pleased Mulford who expressed satisfaction over the Prime Minister's decision in a January 30, 2006 leaked cable.

Prime Minister Manmohan Singh announced a major cabinet shuffle...on January 29.....In the most significant development, the GOI (Government of India) replaced Petroleum Minister Mani Shankar Aiyar with Murlu Deora (Aiyar was retained and was given Panchayati Raj (rural self governance), Youth Affairs & Sports as a consolation prize.).....Our Foreign Ministry contacts welcomed Aiyar's departure, commenting that his energy diplomacy had encroached on MEA (Ministry of External Affairs) turf too many times, leading to MEA appeals to the Prime Minister's Office to intercede.One analyst at Petrowatch, an industry publication in Mumbai, noted that Aiyar's dismissal removes a powerful supporter of the Iran Pipeline project and speculated that it could signal a shift in the GOI's energy-related foreign policy..... Unlike Aiyar, who cultivated a reputation for anti-Americanism, (his replacement) Murlu Deora has been associated with the US/India relationship for years. Lacking Aiyar's ambitions (or entrepreneurial zeal), he will be a more cautious Minister. The Cabinet shuffle contained lots of good news for the USG (United States

Government)...the demotion of Aiyar was the most significant indicator.⁷⁷⁷

Aiyar's exit from the Petroleum Ministry and his replacement by Murli Deora removed the foremost supporter of the pipeline and the regional cooperation frame. However, one final obstacle remained ahead of the February 2006 IAEA meeting for the Prime Minister: retaining the support of the Indian Muslim community ahead of state assembly elections in the face of courting by the Left through its politicizing of the September vote. The Prime Minister announced the setting up of a new Minority Affairs Ministry and Minister in the cabinet reshuffle.

.....Many view the setting up of this ministry (minority affairs) as a purely political decision, as the Congress is eager to regain confidence of the minority (Muslim) communities in north India.⁷⁷⁸

On February 4 2006, India voted a second time (along with 26 other countries) to refer Iran to the Security Council taking the Iranian nuclear issue outside the ambit of the IAEA and paving the way for possible economic sanctions (and military action).⁷⁷⁹ The vote cemented India's commitment to the nuclear deal and the global partnership frame and severely compromised the prospects of the pipeline and the regional cooperation frame. The nuclear deal and the global partnership frame had won a second and decisive

⁷⁷⁷ Mulford, David. "Upa Cabinet Shuffle Good for America." (January 30 2006), <http://www.thehindu.com/news/the-india-cables/article1538143.ece>

⁷⁷⁸ "Sonia Loyalists Rewarded in Cabinet Expansion". (January 30, 2006), <http://www.rediff.com/news/special/iype/20060130.htm>
PTI. "New Faces in Manmohan's Cabinet" *The Times of India*, Jan 29, 2006.
Bidwai, Praful. "Sacrificing Sovereignty" (January 28 2006), http://www.tni.org/archives/archives_bidwai_sovereignty

⁷⁷⁹ "Iaea Refers Iran to the Unsc". (February 04, 2006), <http://in.rediff.com/news/2006/feb/04iran.htm>

victory over the pipeline and the regional cooperation frame through India's February vote.

Minister for Petroleum and Natural Gas-Mani Shankar Aiyar-Congress Party

The ousted and embittered Aiyar lamented in a recent memorial lecture that the civil nuclear deal effectively derailed the momentum of the Iran-Pakistan-India gas pipeline.....And because IPI lies frozen, India is not yet party to even the first axis of the Asian Gas Grid which could assure our energy security not only till we (r)each the Valhalla of thorium driven energy security but even thereafter to maintain the diversity of our energy basket.⁷⁸⁰

Conclusion

The narrative so far has argued in the main that US disapproval of the pipeline, offer of a nuclear deal and the resulting change in the positions of the Prime Minister and Natwar played an important role in Aiyar's dismissal and his pet initiative's loss of momentum. The reader may question the premise of the aforementioned narrative and posit an alternative one in which the Prime Minister recognized the infeasibility of the pipeline at the very outset but let Aiyar proceed with the negotiations in order to give the US the impression that India was serious about the initiative to secure better terms for the nuclear deal. Aiyar was only dismissed because he refused to back-off an initiative that was all along intended as a ruse to obtain greater leverage in negotiations with the US.⁷⁸¹

⁷⁸⁰ Aiyer, Mani Shankar. "Lovraj Kumar Memorial Lecture" (2010), <http://www.indianoilandgas.com/data-pdfs/Press-lovraj.pdf>

⁷⁸¹ Conversations with Dr. Chris Kennedy, Assistant Professor in the Environmental Science and Policy Department at George Mason University

However, the documentary evidence, leaked American cables or insights from my semi-structured interviews do not provide sufficient evidence to construct such an alternative narrative.

The intersection of the debate over the US-India nuclear deal and the global partnership frame on the one hand and the IPI pipeline and the regional cooperation frame on the other can also be understood as a contest between two foreign policy paradigms wrapped around their respective energy security initiatives. Aiyar's vision of regional multilateral integration via pipelines with the IPI pipeline as its centerpiece initially backed by Natwar and the Prime Minister crashed headlong into an alternative vision of Indo-US bilateral strategic integration through myriad engagements (including in particular defense cooperation) with the nuclear deal at its core that was eventually backed by Natwar and the Prime Minister but opposed/ignored by Aiyar. The concept of technopolitical frames helped to organize the multiple elements of the two aforementioned paradigms or visions while the concept of relevant social individuals and relevant social groups enabled an understanding of the actors pushing each paradigm and shift in allegiances that resulted in the victory of the nuclear deal/Indo-US bilateralism over the IPI pipeline/regional integration during the 2005-2008 period.

However, the downed IPI pipeline/regional integration paradigm has refused to fade away from India's national discourse. I provide a brief review of the current status of the two initiatives (the nuclear deal and the pipeline) and their respective technopolitical frames in order to highlight their trajectories since the consummation of the nuclear deal in 2008 and the resulting gains/losses. Despite claims by the Indian and American sides

that substantial nuclear commerce (India promised to buy 10,000 MWe worth of nuclear reactors following the nuclear deal⁷⁸² approximately equivalent to \$50 billion worth of business) would ensue in the aftermath of the nuclear deal, American nuclear corporations have been deterred from entering the Indian nuclear market due to concerns over the perceived stringency of a liability legislation enacted by the Indian Parliament.⁷⁸³

Manmohan Singh on Friday (January 3 2014) rated the signing of the nuclear deal with the US as the best moment of his 10-year term as India's Prime Minister. The irony is that five years after the landmark agreement not a single US nuclear firm has been able to make much headway in taking commercial advantage of it, adversely impacting the strategic partnership.⁷⁸⁴

Although the aforementioned quote is right in pointing out that US nuclear corporations have not benefited in the aftermath of the nuclear deal through large orders from India, it errs in its conclusion that the lack of progress on the commercial nuclear front has damaged the global partnership frame. A key achievement of the nuclear deal:

⁷⁸²Ramana M.V and Suvrat Raju. "Nuclear Extravagance in Washington"
" *The Hindu*, September 26 2013.

<http://www.thehindu.com/opinion/lead/nuclear-extravagance-in-washington/article5168341.ece>

Ramana M.V. and Suvrat Raju. "

The Impasse over Liability Clause in Indo-U.S. Nuclear Deal

" *The Hindu*, October 15, 2013.

http://india.blogs.nytimes.com/2013/10/15/the-impasse-over-liability-clause-in-indo-u-s-nuclear-deal/?_r=0

⁷⁸³ Ramana M. V. and Suvarat Raju. "Nuclear Extravagance in Washington

" *The Hindu*, September 26 2013.

<http://www.thehindu.com/opinion/lead/nuclear-extravagance-in-washington/article5168341.ece>

⁷⁸⁴ Chaudhury, Dipanjan Roy. "Pm's N-Deal That Changed Landscape of India-Us Ties Stalled over Nuclear Liability Act." *The Economic Times*, January 6 2014

http://articles.economictimes.indiatimes.com/2014-01-06/news/45918562_1_india-us-ties-nuclear-liability-act-west-asia

dismantling the export control system has started yielding rich dividends. The virtually non-existent defense commerce between the two countries has taken off with the US bagging several multibillion dollar defense contracts as a September 27, 2013 White House factsheet noted with some satisfaction. The purchase of US military equipment by India has also been accompanied by a sharp increase in joint military exercises (the US now holds more military exercises with India than any other country),⁷⁸⁵ meeting the Pentagon's goal of bringing about greater 'interoperability' between the two militaries.

....the U.S.-India defense relationship remains a major pillar of the strategic partnership between our two countries. Defense trade has reached nearly \$9 billion, and both governments are committed to reduce impediments, ease commercial transactions, and pursue co-production and co-development opportunities to expand this relationship.....U.S.-sourced defense articles have enhanced the capabilities of the Indian armed forces, demonstrated by the use of C-130J and C-17 transport aircraft to support flood relief operations and Indian peacekeeping operations. India is also the first nation to deploy the P8-I Poseidon, a state of the art maritime surveillance aircraft.....U.S. and Indian services participate in a range of bilateral exercises, including: MALABAR, YUDH ABHYAS, and RED FLAG. India accepted an invitation to participate in the 2014 Rim of the Pacific Exercise (RIMPAC) in Hawaii,

⁷⁸⁵ "U.S.-India Security and Defense Cooperation." *Center for Strategic and International Studies*. <http://csis.org/program/us-india-security-and-defense-cooperation>

a multilateral exercise that is expected to involve nearly two dozen nations.⁷⁸⁶

Although traditional security partner Russia continued to dominate the \$38 billion Indian defense market (based on acquisitions from April 1 2010 to March 31 2013) with orders worth \$16 billion, the US managed to make significant inroads, thanks to the nuclear deal.⁷⁸⁷ The US-India trade relationship, already improving since India's systemic liberalization in 1991, further accelerated with the large post-nuclear deal defense acquisitions.

Trade and commerce form a crucial component of the rapidly expanding and multi-faceted relations between India and U.S. From a modest \$ 5.6 billion in 1990, the bilateral trade in merchandise goods has increased to \$ 62.9 billion in 2012 representing an impressive 1023.2% growth in a span of 22 years.⁷⁸⁸

The US and India also cooperate extensively in energy and environment, higher education, counterterrorism and global security architecture.⁷⁸⁹ However, the deepening of US-India relations in the aftermath of the nuclear deal by the global partnership frame has not proceeded at the pace anticipated by US policymakers. Lingering Cold War-era

⁷⁸⁶ "White House Facts on U.S., India as Strategic, Global Partners". (September 27, 2013),

<http://iipdigital.usembassy.gov/st/english/texttrans/2013/09/20130927283747.html>

⁷⁸⁷ Simha, Rakesh Krishnan. "Can Russia Stop Indian Drift?." *Russia and India Report*, August 24, 2013

http://indrus.in/blogs/2013/08/24/can_russia_stop_indian_drift_28799.html

⁷⁸⁸ "India - Us Bilateral Trade." *Embassy of India. Washington D.C. USA.* .

<https://www.indianembassy.org/pages.php?id=41>

⁷⁸⁹"U.S.-India Joint Statement." *The White House-Office of the Press Secretary*, September 27, 2013.

<http://www.whitehouse.gov/the-press-office/2013/09/27/us-india-joint-statement>

distrust and residual albeit firm commitment to strategic autonomy has led to India rejecting American companies for its core defense needs such as fighter aircraft.

A good example is India's decision to 'down select' Boeing's F/A-18 Superhornet and Lockheed Martin's F-16 Supercobra to award the \$10.4 billion global tender for 126 Multi-Role Combat Aircraft (MMRCA)⁷⁹⁰ to Dassault Aviation, a French company that fielded the Rafale fighter jet in April 2011.⁷⁹¹ Washington had high hopes of winning the fighter jet contract in the post-nuclear deal milieu and was furious enough to direct then US Ambassador to India Timothy Roemer to resign immediately after it became evident that the two American companies had been knocked out of the competition.⁷⁹² However, even the exiting Roemer was careful to couch his disappointment in rhetoric evincing optimism that the US would secure future big-ticket defense items in India, a sign of the increasingly cordial state of the relationship in the post-nuclear deal environment.

The US on Thursday expressed disappointment at its fighter aircraft being dropped from the India's biggest defence procurement list. Reacting to the defence ministry's decision to consider only two European fighter jets for the mega supply deal after the initial rounds of scrutiny, the US Ambassador to India, Timothy Roemer, said: "We are

⁷⁹⁰ "The Twists and Turns of India's Biggest Defence Deal". *Deccan Chronicle*, January 31, 2012
Somini Sengupta and Salman Masood, "Courting a Pair of South Asia Partners" *The New York Times*, March 27 2005.

PTI. "India to Ink \$11 Billion Mmrca Deal with Rafale by Next Month: Indian Air Force Official" *The Economic Times*, Sep 8, 2012.

⁷⁹¹Thottam, Jyoti. "Ambassador Loses Fighter-Jet Bid, Takes Marbles, Goes Home" *Time* April 28, 2011.

<http://world.time.com/2011/04/28/ambassador-loses-fighter-jet-bid-takes-marbles-goes-home/>

⁷⁹² Thottam, Jyoti. "Ambassador Loses Fighter-Jet Bid, Takes Marbles, Goes Home" *Time* April 28, 2011.

<http://world.time.com/2011/04/28/ambassador-loses-fighter-jet-bid-takes-marbles-goes-home/>

reviewing the documents received from the Government of India and are respectful of the procurement process." "We are, however, deeply disappointed by this news. We look forward to continuing to grow and develop our defense partnership with India and remain convinced that the United States offers our defense partners around the globe the world's most advanced and reliable technology," Roemer, who on Thursday also announced his decision to quit the envoy's job citing personal reasons, said.⁷⁹³

Another key front on which the global partnership juggernaut has encountered difficulties is its inability to completely snuff out the idea of the IPI pipeline and realign India's Iran policy. India has expressed an interest in joining the project as recently as May 2013.

Indian External Affairs Minister Salman Khurshid has voiced New Delhi's willingness to reenter negotiations over a project that would have transferred Iranian gas to India via Pakistan. The project, which was initially referred to as the Iran-Pakistan-India (IPI) or Peace Pipeline, was inaugurated by Tehran and Islamabad after India abandoned negotiations in 2009 despite preliminary agreements with Iran and Pakistan.⁷⁹⁴

Khurshid's expression of interest cannot be dismissed as empty rhetoric as Iran has already constructed 900 kms of the pipeline within its territory as part of the more

⁷⁹³"Iaf's Jet Deal: Us 'Disappointed' over Govt Decision". *India Today*, April 28, 2011

<http://indiatoday.intoday.in/story/iafs-jet-deal-us-disappointed-over-govt-decision/1/136566.html>

⁷⁹⁴"India Voices Willingness to Resume 'Ipi' Gas Pipeline Negotiations." *Press TV*, May 5, 2013.

<http://www.presstv.com/detail/2013/05/05/301880/india-back-on-board-ipi-gas-line-project/>

recent Iran-Pakistan pipeline project (Reeling from severe energy shortage and the accompanying political repercussions, Pakistan defied the US to conclude a pipeline deal with Iran without India. As of December 2013, Pakistan appears to be reconsidering its participation as the threat of American sanctions and the lure of inducements have grown).⁷⁹⁵ Although Pakistan has not constructed the 781 km stretch on its side citing lack of funds⁷⁹⁶, part of the pipeline has already been constructed on the Iranian side and its extension to Pakistan and ultimately India cannot be ruled out given the changing regional dynamics in the aftermath of the American withdrawal from Afghanistan in 2014 and the possibility of a US nuclear rapprochement with Iran.

At a broader strategic level, the nuclear deal and the global partnership frame have also failed to realign India's policies towards Iran as Vijay Prashad, the George and Martha Kellner Chair in South Asian History and Professor of International Studies at the Trinity College in Hartford, Connecticut (and the Edward Said Chair at the American University of Beirut, Lebanon) explained.

Pressure from the US and the desire of the Indian political and economic elites for a close link with the US befuddled India's Iran policy between 2003 and 2013. India is the second largest importer, after China, of Iranian oil. In the halls of the Non-Aligned Movement, India is a country that is greatly respected. Through a nuclear deal – as I detail in my new

⁷⁹⁵ "Pakistan Loses Ground to India in Iran Ties." *Press TV*, December 25 2013. <http://www.presstv.ir/detail/2013/12/25/341795/pakistan-loses-ground-to-india-in-iran-ties/>

⁷⁹⁶ "Delaying Tactics?: Iran-Pakistan Pipeline Project." *Dawn*, September 18 2013. <http://www.dawn.com/news/1043600/delaying-tactics-iran-pakistan-pipeline-project>
"Project in Jeopardy: Iran-Pakistan Pipeline." *Dawn*, November 1 2013
<http://www.dawn.com/news/1053303/project-in-jeopardy-iran-pakistan-pipeline>

report on India's Iran policy, the US was able to push India to vote against Iran twice at the International Atomic Energy Agency (IAEA) meetings in exchange for being brought out of the nuclear winter itself. As the sanctions regime on Iran tightened, India found it hard to buy oil from Iran and coldness between the countries set in as a result of India's seeming eagerness to toe the US line. But beneath the surface of the IAEA votes and the statements against the buying of Iranian oil, linkages deepened – on oil buying certainly but also on the trade in pharmaceuticals and wheat as well as on the Indo-Iranian construction of a port in south-eastern Iran (at Chabahar). The sanctions regime had certainly throttled Iran, but it could not sunder fully the imperatives of regional trade.⁷⁹⁷

To conclude, even as the nuclear deal and the global partnership frame has emerged as a powerful and even dominant template on the Indian foreign policy landscape, the pipeline and the regional cooperation frame fights a rearguard battle while lying in wait for an opportune moment.

⁷⁹⁷ Prashad, Vijay. "India's Iran Policy- Isolated No More absolutely nothing" *The BRICS Post*, November 30, 2013. <http://thebricspost.com/indias-iran-policy-isolated-no-more/>

Prashad, Vijay. "International Affairs-India's Iran Policy: Between Us Primacy and Regionalism." *Working Paper Series No 19*, November 2013. https://www.aub.edu.lb/ifi/international_affairs/Documents/working_paper_series/20131118_AI_WP_Indian_Iran_Policy.pdf

CHAPTER 4- THE ROLE OF INDIAN NUCLEAR SCIENTISTS IN THE DEBATE OVER THE US-INDIA NUCLEAR DEAL

Introduction

The main aim of this chapter is to trace the role played by India's retired and serving nuclear scientists associated with the Department of Atomic Energy (DAE) in the debate over the US-India nuclear deal in India from March 2006 to August 2007. The chapter is divided into five parts. The first part begins by summarizing the contours of India's separation plan to partition its hitherto intermeshed nuclear program into safeguarded civilian and unsafeguarded military components under the landmark July 18 2005 joint statement that announced the US-India nuclear deal.

The second part focuses on the debate in the US and the attempt of the US Congress to craft waiver legislation (eventually known as the Hyde Act) that would exempt India from the provisions of the Atomic Energy Act of 1954 and the Nuclear Nonproliferation Act of 1978. The exemptions would allow President Bush to negotiate a bilateral nuclear cooperation agreement (123 agreement) with India.

I use Bijker's concepts of relevant social groups and relevant social individuals to capture the meanings of the Hyde Act's provisions and the bilateral 123 agreement advanced by the retired nuclear scientists, the Prime Minister and the Chairman of the Atomic Energy Commission Anil Kakodkar.

I document the all round disappointment in India among both the retired scientists and Kakodkar regarding the restrictive provisions in the final Hyde Act released by the US Congress on a trinity of issues including fuel-supply assurances, reprocessing rights and the 'right' to conduct a future underground nuclear test.

The third part of the chapter aims to ascertain the motivations of the retirees and Kakodkar behind their insistence on concessions pertaining to the aforementioned trinity of issues in addition to the usual bureaucratic imperatives. I use Hecht's concept of a *technopolitical regime* in order to explain the key reasons behind the opposition of the retirees and Kakodkar to the Hyde Act's provisions and their insistence that India secure concessions on two issues (fuel-supply assurances and a permanent consent to reprocess US origin spent fuel) in the subsequent negotiations over the 123 agreement.

The fourth part of the chapter attempts to determine the reasons in addition to conventional bureaucratic imperatives behind the opposition of Kakodkar and the retired scientists to the Hyde Act's termination clause (a provision pertaining to the third issue in the trinity) that raised the cost to India of conducting a nuclear test by threatening an immediate post-test cessation of American cooperation under the nuclear deal. I provide a brief history of the long simmering debate over the yield and reliability of India's controversial lone thermonuclear test in 1998 and the related debate over the adequacy of India's simulation capacity in order to

highlight an important reason for the opposition of the retirees to the termination clause.

I use the concept of *experimenter's regress* developed by Harry Collins and Trevor Pinch to highlight the multiple points of contention in the debate over the lone 1998 thermonuclear test including the test site geology, efficacy of the sensors of the respective participating institutions, the thermonuclear physics of the first and second stage, the post-test crater morphology, the reliability of the scientists conducting the tests and even the manner in which the decision declaring the test a success was made by the government at the time. Such a large degree of experimenter's regress does not allow for the permanent stabilization of the Chidambaram-Kakodkar narrative that prevailed in 1998 and provides immense opportunities for resolute opponents to exploit strategic inflection points such as the nuclear deal in order to unravel the narrative.

The fifth and final part begins with a brief history of the manner in which the Bush administration gave concessions to India on the trinity of issues in the final text of the 123 agreement including the all-important one of nuclear testing thereby neutralizing the strictures in the Hyde Act. Kakodkar was satisfied with the final text and the positions of the retirees softened resulting in the splintering and disappearance of the cohort as an organized pressure group for the rest of the debate over the nuclear deal. I conclude by using the concept of *hyperconstruction* proposed by Gusterson to understand the debate over the lone 1998 thermonuclear test and its future trajectory.

Background

I begin by summarizing the grand strategic motivations that led the Bush administration to offer Non-proliferation Treaty (NPT) non-signatory India a nuclear deal recognizing its nuclear weapons and dismantling the three decade-old sanctions on nuclear fuel, reactors and dual-use technologies. I then outline the basic contours of the landmark July 18 2005 joint statement that laid out the fundamental terms of the nuclear deal.⁷⁹⁸ India's key commitment under the joint statement was a plan to separate its hitherto intermeshed nuclear program into (safeguarded) civilian and (unsafeguarded) military components. I explain how strategic considerations led the Bush administration to make crucial political concessions by accepting India's decision to retain the fast breeder reactors outside safeguards and its demand for multi-layered fuel-supply guarantees. The background section ends with a brief overview of the political milieu in India.

In Chapter 3, I focused on the motivations that led a tiny coterie headed by Secretary of State Condoleezza Rice, her "counselor" Philip Zelikow and Deputy Secretary of State Robert Zoellick to urge President Bush to fundamentally reorient the US strategic posture towards India.⁷⁹⁹ A good summary of such motivations can be found in a December 5 2006 cable by the US Embassy's Geoffrey Pyatt (Deputy Chief of Mission- New Delhi) to the State Department.

⁷⁹⁸ "Indo - US Joint Statement." (2005), Accessed on November 29 2013

<http://www.hindu.com/thehindu/indousjoint.htm>

Squassoni, S., *India's Nuclear Separation Plan: Issues and Views*. December 22 2006, Congressional Research Service (RL 33292). p. 1. Accessed on November 15 2013

<http://www.fas.org/sgp/crs/nuke/RL33292.pdf>

⁷⁹⁹ Chapter 3. Pg 40

Although the generic cable was written a year after the announcement of the nuclear deal in 2005, I suggest that the motivations for a US strategic relationship with India mentioned in it were also at play in 2005. Pyatt's core argument was that a strategic partnership with India would enable the US to enroll it as a long term member of a trilateral (US-Japan-India) or quadrilateral (US-Japan-India-Australia) security architecture in Asia. Obviously, the main objective of such a quasi-security bloc would be to 'shape' China's rise.

India brings to the table not only the world's largest democracy and a potential market of a billion people, it is also the secular home to the world's second largest muslim population, a regional naval power whose interests in maritime security closely match the United States', a growing economic giant, a nuclear power, an educational dynamo, a strategically located land and sea link for all Asia, an oasis of stability in a dysfunctional neighborhood, and a nation that is on its own actively seeking closer ties with Japan and Australia. The key question is: What if we can develop India into a close ally in the coming decades? One telling example which proved the value of a four-sided partnership was the Tsunami Core Group (established in the aftermath of the 2004 Asian tsunami), which demonstrated that we can cooperate militarily in ways that benefit the USG (US government). Erstwhile tsunami victim India was able to mobilize assets which would have taken weeks for the U.S. to bring to the region, share the burden and leverage our capabilities to provide large-scale disaster relief. Moreover, India plans to upgrade every major defense system it has over the next 15 years, and for the first

time in nearly half a century is looking at the U.S. as a defense supplier. India may never have the military might of China, however, it will have significant power projection capabilities. What the U.S. stands to gain by adding India to the U.S.-Japan-Australia mix is essentially squaring the circle in the Asia-Pacific region, bringing a geometric and geopolitical connection for democracy that spans nearly half the globe. Whereas the U.S.-Japan-Australia partnership links the U.S. to the western edge of the Pacific Rim, the addition of India penetrates all the way through to South Asia.⁸⁰⁰

The nuclear issue had been a key irritant in US-India relations and an impediment to a strategic relationship since Non-proliferation Treaty (NPT) holdout India's first nuclear test in 1974 that diverted Western nuclear assistance intended for peaceful purposes to the military side and the initially tepid but subsequently punitive American response in the years that followed (I focus in detail on the chronology of the American response later in the chapter using leaked American diplomatic cables). Tensions on the nuclear issue combined with other factors (the US tilt towards Pakistan during the Cold War, India's non-aligned foreign policy and proximity to the Soviet Union and India's quasi-socialist economic policies and the resulting difficulties faced by American capital in accessing the Indian market resulting in a narrow economic base to the

⁸⁰⁰ "Pm Singh Visit to Japan: Time for the U.S. To Seize the Day on Closer Trilateral Cooperation." (December 5 2006). Accessed on September 15 2013
<http://cablegatesearch.net/cable.php?id=06NEWDELHI8137>

US-India relationship) to ensure a lukewarm US-India relationship throughout the Cold War.

Economic ties began to grow rapidly following the end of the Cold War and the liberalization of the Indian economy but the nuclear issue threatened to derail the US-India relationship after the US slapped additional sanctions on India following its second round of nuclear tests in 1998. However, the Indian gamble that the initial US anger would subside in favor of a more pragmatic approach towards India paid off. The Clinton administration virtually discarded its pre-1998 “capping, rollback and eliminate” policy and merely demanded that India exercise nuclear restraint.⁸⁰¹ Thus, the non-proliferation oriented Clinton administration “cleared the languishing nuclear debris and created space for the next administration to reset the anomalous nuclear relationship with India”⁸⁰² thereby removing the one remaining obstacle to a wider strategic partnership.

The Bush administration utilized the opening created by the Clinton administration and blithely walked away from three decades of US nonproliferation policies in its determination to consummate a strategic partnership with India. President George W. Bush offered Prime Minister Manmohan Singh a historic nuclear deal that was the centerpiece of the July 18 2005 joint statement.⁸⁰³ The underlying nonproliferation premise of the deal was a

⁸⁰¹ Bhatia, Vandana. "Nonproliferation Policy of the Clinton Administration toward India: Shifting of Nuclear Goalposts? ." *Comparative Strategy* 32 (2013): 261. Accessed on October 15 2013.

⁸⁰² Ibid

⁸⁰³ On the Indian side, Shyam Saran, former foreign Secretary and later the Prime Minister’s Special Envoy (October 2006 to March 2010) on nuclear issues recently confirmed the Bush administration’s strategic

new paradigm developed by the Bush administration that divided countries around the world into clusters of trustworthy and unreliable nations based on the danger of their weapons falling into the hands of terrorists. India was classified as a trustworthy nation under the new paradigm.

Indeed, the US has been trying to redefine its approach toward nuclear cooperation under the Bush administration while keeping the pressure on countries such as India to sign the NPT (Nonproliferation Treaty). The new paradigm, according to experts, defines clusters of nations on the basis of a "trust factor", a definition that India fits into easily, unlike Pakistan, a fact emphasized by Rice during her visit to the sub-continent. The "trust factor" takes into consideration a country's record in peddling nuclear technology as well as indigenous paradigms that make the existence of such technology safe/dangerous in a particular country. This includes matters such as nuclear weapons falling in the hands of terrorist groups.....India feels it should be perceived as a country that can be "trusted", despite staying out of the NPT. In February this year

rationale behind offering India a radical nuclear deal. He recalled how President Bush reassured Prime Minister Singh in November 2008 (a month before the deal's final ratification by the US Congress) that he was in favor of the nuclear deal primarily to develop India into a long-term strategic partner of the US and not to access the Indian nuclear market.

"I wish to recall an exchange over dinner hosted by President George Bush for Prime Minister Manmohan Singh in November 2008 in Washington. The then Secretary of State Condoleezza Rice remarked that after the "heavy lifting" the U.S. had done to get the nuclear deal through, she hoped India would ensure that U.S. companies got a share of the orders for new reactors. Before our Prime Minister could reply, Mr. Bush stated categorically that he was not bothered if India did not buy even a single reactor from the U.S., since he regarded the agreement as confirming India as a long-term strategic partner rather than a mere customer for U.S. reactors."

Saran, Shyam. "Dealing with Pakistan's Brinkmanship"
" *The Hindu*, December 10, 2012.

<http://www.thehindu.com/opinion/lead/dealing-with-pakistans-brinkmanship/article4171664.ece>

(2005) the head of the US Nuclear Regulatory Commission, led by its commissioner, Jeffrey Merrifield, visited the Indian Atomic Energy Regulatory Board and went back quite satisfied with India's nuclear safety record.^{804 805 806 807}

The joint statement obligated the US to dismantle the three decade-old sanctions regime in order to allow India to buy nuclear reactors, uranium and

⁸⁰⁴ Siddharth Srivastava. "Us Looks Nuclear India in the Eye." *Asia Times*, May 14, 2005.

http://www.atimes.com/atimes/South_Asia/GE14Df03.html

⁸⁰⁵ Srivastava refers to Merrifield as the "head of the US Nuclear Regulatory Commission" in his article. This is erroneous. Merrifield was one of the four commissioners of the NRC but never its Chairman. Conversations with Dr. Hugh Gusterson, Professor, George Mason University, January 2014.

⁸⁰⁶ A February 17 2005 leaked American diplomatic cable recorded Merrifield assuring Joint Secretary (Americas) in the Ministry of External Affairs S. Jaishankar that India could no longer be considered as a junior partner in the civilian nuclear domain. Merrifield's positive appraisal of the Indian nuclear program and its safety record in Washington could have played a role in the US offer of a nuclear deal to India in July 2005.

"In this February 11 meeting, NRC (Nuclear Regulatory Commission) Commissioner Merrifield complimented Jaishankar about the accomplishments and maturity of the Indian nuclear power industry.....With regard to nuclear power, Merrifield said, India can no longer be treated as a junior partner. As a regulator who has seen over 200 nuclear power plants, he knows about the comparative strengths of worldwide nuclear power programs. Upon returning to the U.S., Merrifield said he could articulate what he has seen in India.....Jaishankar, expressing gratitude for NRC's attitude, said that while Commissioner Merrifield realizes the centrality of NSSP (Next Steps in Strategic Partnership), the U.S. requires some forward thinkers to address the baggage and cobwebs that continue to burden the U.S.-India nuclear relationship."

Mulford, David. "Nrc Commissioner Merrifield Meets Mea Joint Secretary, Us and Canada, Dr. S. Jaishankar." (February 17 2005). Accessed on August 14 2013.

https://www.wikileaks.org/plusd/cables/05NEWDELHI1263_a.html

⁸⁰⁷ Another rather unusual cable sent on February 17 2005 chronicled Merrifield telling Department of Atomic Energy (DAE) International Affairs Director K Raghuraman that the US Nuclear Regulatory Commission would consider availing of India's nuclear expertise in case it was asked to certify a CANDU (Canada Deuterium Uranium) reactor (all American reactors are Pressurized Water Reactors-PWR's). Clearly, Merrifield was going out of his way to identify even far-fetched possibilities of cooperation in order to lay the groundwork for the July 2005 joint statement.

"The U.S. has research facilities that allow the NRC (Nuclear Regulatory Commission) to determine that safety requirements for PWRs are met. In contrast, if the NRC were asked to certify a CANDU reactor for construction in the U.S., the U.S. does not have any CANDU reactors in its inventory, nor does the U.S. have any facilities to validate information that the reactor manufacturer would need to provide in support of the certification requirements. Thus, if questions were to arise with the certification of the new CANDU reactor, it is conceivable that the U.S. might consider requesting India's collaboration to use the facilities in Hall 7 of BARC (Bhabha Atomic Research Center)."

Mulford, David. "NRC Commissioner Merrifield Meets MEA Additional Secretary Meera Shankar." (February 17 2005). Accessed on April 15 2013.

<http://cablegatesearch.net/cable.php?id=05NEWDELHI1264&q=merrifield%20raghuram>

dual-use technologies on the international market. India agreed to come up with a plan to separate its hitherto intermeshed civilian nuclear facilities from the military ones and place the civilian facilities under International Atomic Energy Agency (IAEA) safeguards in perpetuity. After initial reservations,⁸⁰⁸ Prime Minister Singh became deeply invested in the completion of the nuclear deal and the initiative became the top foreign policy priority of his Congress party-led United Progressive Alliance (UPA) coalition government.

The separation plan was India's most important commitment under the July 18 2005 joint statement. A vigorous eight month debate (July 2005-March 2006) ensued in India over the feasibility of separation of its nuclear infrastructure⁸⁰⁹ and the civilian/military status of its nuclear facilities (including two fast breeder reactors) in the final separation plan.⁸¹⁰ India eventually came up with a separation plan that was acceptable to the Bush administration. Although the separation plan was declared by India as a unilateral document, it is clear that the US-India nuclear deal would not have progressed without the acceptance of

⁸⁰⁸ See Chapter 3 for a more detailed explanation.

⁸⁰⁹ The Indian nuclear complex at the time consisted of 3 research reactors, 23 power reactors (15 operating, 8 under construction and 3 planned), 2 breeder reactors (1 operating and the other under construction), 1 uranium enrichment plant, 3 spent fuel reprocessing plants, 6 heavy water production plants, 3 uranium processing mines, 2 copper-mine tailing extraction units, 1 uranium ore concentration mill, multiple uranium conversion facilities and 3 or 4 fuel fabrication plants. Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on March 15 2013 <http://www.fas.org/sgp/crs/nuke/RL33292.pdf>. p 8

⁸¹⁰ See chapter 2 for a more detailed history of the debate over the separation plan and the status of the fast breeder reactors

the plan by the Bush administration. The plan was announced with great fanfare during President Bush's maiden visit to India in March 2006.⁸¹¹

India had previously placed 4 out of its 22 power reactors⁸¹² under IAEA safeguards before the nuclear deal's announcement in 2005.⁸¹³ The reactors included the Tarapur Atomic Power Station (TAPS) Unit 1, 2 and the Rajasthan Atomic Power Station (RAPS) 1, 2. The Tarapur reactors were constructed with American assistance and Unit 1 of the Rajasthan reactor was completed with Canadian help. Unit 2 was partially completed before Canada terminated nuclear cooperation with India in 1974 following its first nuclear test. Unit 2 was completed by India in 1981.⁸¹⁴ Additionally, the 2 nuclear plants being constructed at Kundankulam in Tamil Nadu (KK 1, 2)⁸¹⁵ with Russian assistance were also

⁸¹¹ "U.S.-India Joint Statement ". (March 2 2006). Accessed on March 6 2013

<http://georgewbush-whitehouse.archives.gov/news/releases/2006/03/20060302-5.html>

⁸¹² Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on February 21 2013.

<http://www.fas.org/sgp/crs/nuke/RL33292.pdf>. p 17

"Pm's Suo-Motu Statement on Discussions on Civil Nuclear Energy Cooperation with the Us: Implementation of India's Separation Plan." (March 7, 2006

). Accessed on February 21 2013.

<http://pmindia.nic.in/pmsinparliament.php?nodeid=24>

⁸¹³ Chari, PR. "Parsing the Separation Plan:

The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf .p 1

⁸¹⁴ "Rajasthan Atomic Power Station (Raps)." (2013). Accessed on February 28 2013.

<http://www.nti.org/facilities/76/>

⁸¹⁵ "Implementing India's Separation Plan." *The Hindu*, March 8 2006.

<http://www.hindu.com/2006/03/08/stories/2006030808431100.htm>

scheduled to come under safeguards after completion resulting in a total of 6 safeguarded reactors (out of 22) before the separation plan.^{816 817}

The separation plan committed India to place 8 additional 220 MWe Pressurized Heavy Water Reactors (Rajasthan Atomic Power Station (RAPS) 3, 4, 5, 6; Kakrapar Atomic Power Station (KAPS) 1, 2 and Narora Atomic Power Station (NAPS) 1, 2) under permanent IAEA safeguards in phases from 2006-14.⁸¹⁸ The plan's implementation would raise the total number of Indian reactors under safeguards from 6 to 14.⁸¹⁹ The placement of 14 (out of 22) reactors under

⁸¹⁶ Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 16

⁸¹⁷ India had 6.8 tons of reactor grade plutonium in the spent fuel produced by its 6 already safeguarded reactors as of September 2006.

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 3

⁸¹⁸ "Pm's Suo-Motu Statement on Discussions on Civil Nuclear Energy Cooperation with the Us: Implementation of India's Separation Plan." (March 7, 2006). Accessed on February 21 2013. <http://pmindia.nic.in/pmsinparliament.php?nodeid=24>

"Implementing India's Separation Plan." *The Hindu*, March 8 2006. <http://www.hindu.com/2006/03/08/stories/2006030808431100.htm>

Chari, PR. "Parsing the Separation Plan: The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013. http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf .p 1

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 5, 16

⁸¹⁹Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on February 21 2013. <http://www.fas.org/sgp/crs/nuke/RL33292.pdf> .p 17

"Pm's Suo-Motu Statement on Discussions on Civil Nuclear Energy Cooperation with the Us: Implementation of India's Separation Plan." (March 7, 2006). Accessed on February 21 2013. <http://pmindia.nic.in/pmsinparliament.php?nodeid=24>

safeguards in phases would raise the total installed capacity in Megawatts (MW) under safeguards from the pre-nuclear deal 19% in 2006 to 65% by 2014.⁸²⁰

India identified some facilities in the Hyderabad-based Nuclear Fuel Complex as civilian to be offered for safeguards by 2008.⁸²¹ It also declared the two away-from-reactor spent fuel storage facilities from the already safeguarded TAPS and RAPS as civilian.⁸²² Further, nine research facilities (Tata Institute of Fundamental Research, Variable Energy Cyclotron Center, Saha Institute of Nuclear Physics, Institute for Plasma Research, Institute of Mathematics Sciences, Institute of Physics, Tata Memorial Center, Board of Radiation and Isotope Technology and Harish Chandra Research Institute) and three heavy water plants (Thal, Tuticorin and Hazira) were declared as civilian but “safeguards irrelevant.”⁸²³

⁸²⁰ "Pm's Suo-Motu Statement on Discussions on Civil Nuclear Energy Cooperation with the US: Implementation of India's Separation Plan." (March 7, 2006). Accessed on February 21 2013.

<http://pmindia.nic.in/pmsinparliament.php?nodeid=24>

"Implementing India's Separation Plan." *The Hindu*, March 8 2006.

<http://www.hindu.com/2006/03/08/stories/2006030808431100.htm>

⁸²¹ Fuel cycle facilities to be safeguarded were Uranium Oxide Plant (Block A), Ceramic Fuel Fabrication Plant (Pelletizing) (Block A), Ceramic Fuel Fabrication Plant (Assembly) (Block A), Enriched Uranium Oxide Plant, Enriched Fuel Fabrication Plant and Gadolinia Facility. Other fuel production facilities at the Nuclear Fuel Complex that will likely remain unsafeguarded include the New Uranium Oxide Fuel Plant. T.S. Subramanian, "Fuelling Power," *Frontline*, 16-29 March 2002.

<http://www.frontline.in/static/html/fl1906/19060840.htm>

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 16

⁸²² Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 16

⁸²³ Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on February 21 2013.

<http://www.fas.org/sgp/crs/nuke/RL33292.pdf>. p 17

"Implementing India's Separation Plan." *The Hindu*, March 8 2006.

<http://www.hindu.com/2006/03/08/stories/2006030808431100.htm>

India managed to keep a significant number of nuclear facilities outside safeguards to service its strategic program. It was successful in retaining eight power reactors (Kaiga Atomic Power Station (KAPS) 1, 2, 3, 4; Madras Atomic Power Station (MAPS) 1, 2 and Tarapur Atomic Power Station (TAPS) 3, 4) outside safeguards.⁸²⁴ The reactors could produce up to 1250 kg of reactor-grade plutonium annually.⁸²⁵ They could also output about 280 kg of weapons grade plutonium annually (assuming a 60 % plant load factor), enough to make 40 bombs.⁸²⁶

India chose to permanently shut down its CIRUS research reactor (the reactor was supplied by Canada and it provided the weapons grade plutonium for India's 1974 "peaceful nuclear explosion" and 1998 Pokharan II tests)⁸²⁷ ⁸²⁸ in 2010 rather than opening it to inspections. The

⁸²⁴ Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on February 21 2013.

<http://www.fas.org/sgp/crs/nuke/RL33292.pdf> . p 17

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 5, 17

⁸²⁵Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 4

⁸²⁶Chari, PR. "Parsing the Separation Plan:

The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf . p 2

⁸²⁷ Chari, PR. "Parsing the Separation Plan:

The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf . p 1

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 6

⁸²⁸ The 40 MW Cirus reactor began operations in 1964. It may have produced weapons grade plutonium for three bombs each year. The plutonium stocks remaining after the Pokharan I test in 1974 and the Pokharan II series of tests in 1998 are classified.

The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf . p3

reason advanced for CIRUS's dismemberment was that such a decision would help avoid IAEA inspections into the Bhabha Atomic Research Center (BARC) complex where the reactor was located, "a nuclear facility of high national security importance."⁸²⁹The CIRUS may have produced another 45 kg of weapons grade plutonium until its 2010 shutdown.⁸³⁰ A decision was also made to shift the fuel core of the French supplied APSARA research reactor outside the sensitive BARC complex to be safeguarded in 2010.⁸³¹

The remaining Dhruva research reactor would continue to operate outside safeguards and produce 20-25 kg of weapons grade plutonium per year.⁸³² ⁸³³ Enrichment facilities, spent fuel reprocessing facilities (except for the existing

⁸²⁹ "Indo-U.S. Nuclear Deal: Separation Plan". *Times of India*, Mar 7, 2006.

http://articles.timesofindia.indiatimes.com/2006-03-07/india/27788621_1_separation-plan-thermal-power-reactors

⁸³⁰ Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 4.

⁸³¹ Implementing India's Separation Plan." *The Hindu*, March 8 2006.

<http://www.hindu.com/2006/03/08/stories/2006030808431100.htm>

Chari, PR. "Parsing the Separation Plan:

The Indo-U.S. Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf . p1

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 16

⁸³² Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 4

⁸³³ The 100 MW Dhruva research reactor went critical in 1983 and could in theory produce a maximum of 8 bomb's worth of plutonium annually.

Chari, PR. "Parsing the Separation Plan:

The Indo-U.S. Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf .p3

safeguards on the Power Reactor Fuel Reprocessing (PREFRE) plant),⁸³⁴ three heavy water plants and various military-related installations such as the Prototype Naval Reactor (nuclear submarine propulsion program) were retained outside safeguards.⁸³⁵ The separation plan also allowed India to retain its considerable previously produced reactor-grade plutonium stockpile (approximately 11.5 tons) outside safeguards.⁸³⁶ Finally, even the multi-phase approach adopted for safeguarding the 8 additional power reactors as civilian (in addition to the preexisting 6 for a total of 14 out of 22) from 2006-2014 would add an additional 4 tons of unsafeguarded plutonium to India's stockpile due to the time lag in applying safeguards to all 8 reactors.^{837 838}

⁸³⁴ Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 17

⁸³⁵ Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on February 21 2013. <http://www.fas.org/sgp/crs/nuke/RL33292.pdf> .p 17

"Pm's Suo-Motu Statement on Discussions on Civil Nuclear Energy Cooperation with the Us: Implementation of India's Separation Plan." (March 7, 2006). Accessed on February 21 2013. <http://pmindia.nic.in/pmsinparliament.php?nodeid=24>

Implementing India's Separation Plan." *The Hindu*, March 8 2006. <http://www.hindu.com/2006/03/08/stories/2006030808431100.htm>

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p 17

⁸³⁶ Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p2.

⁸³⁷ Ibid. p 4

⁸³⁸ In Chapter 1, I quoted an article in the *Indian Express* over the number of reactors that the US and India wanted on the safeguarded civilian side of the separation plan and the final number that was agreed to. I reproduce a brief excerpt from that article for convenience. The US seems to have demanded that 18 reactors be placed on the safeguarded civilian side while India's initial offer was only 10 reactors. A compromise seems to have been reached at 14 safeguarded reactors with India retaining the remaining 8 on the unsafeguarded military side.

"The central Indian obligation under the July (18, 2005) pact was to separate the civilian and military programmes and place the former under international safeguards. The question of separation boiled down to the number of power reactors that India would put on the civilian list. India has 15 operating power

The Bush administration's determination to secure a strategic partnership with India led to some bold American political concessions in the separation plan negotiations in late February-early March 2006. One such concession was the administration's willingness to allow India to retain the Prototype Fast Breeder Reactor (PFBR) and the Fast Breeder Test Reactor (FBTR) on the unsafeguarded military side of the separation plan.⁸³⁹

But once the UPA (United Progressive Alliance) government conceded DAE's (Department of Atomic Energy's) demand (for the breeders to be retained outside safeguards), the Bush administration took a political decision to leave the Prototype Fast Breeder Reactors outside the civilian list.⁸⁴⁰

As the aforementioned excerpt suggests, the Bush administration recognized that Prime Minister Singh had limited negotiating room on the fast breeders due to sustained pressure exerted by Dr. Anil Kakodkar, Chairman of the

reactors and seven under construction. Out of this 22, what would India offer? Would it be 10, 12, 14, 16, or 18? India's initial offer was barely 10 and the US, apparently, started at 18. The two sides have reportedly settled for 14. That precisely was the figure the national security adviser of the NDA government, Brajesh Mishra, had offered to put under safeguards in 2002."

"In Each Other We Trust." *Indian Express*, March 03, 2006

⁸³⁹ Ibid. p 5-6, 17.

"In Each Other We Trust." *Indian Express*, March 03, 2006.

http://expressindia.indianexpress.com/news/columnists/full_column.php?content_id=88849

⁸⁴⁰ "In Each Other We Trust." *Indian Express*, March 03, 2006.

http://expressindia.indianexpress.com/news/columnists/full_column.php?content_id=88849

Sengupta, Elisabeth Bumiller and Somini. "Bush and India Reach Pact That Allows Nuclear Sales" *The New York Times*, March 3, 2006.

http://www.nytimes.com/2006/03/03/international/asia/03prexy.html?pagewanted=print&_r=0

Krepon, Michael. "Are the Basic Assumptions Behind the Bush Administration's Nuclear Deal with India Sound? Accessed on March 5 2013.

." (March 15, 2006), <http://www.stimson.org/essays/are-the-basic-assumptions-behind-the-bush-administrations-nuclear-deal-with-india-sound/>

Indian Atomic Energy Commission (AEC) and senior retired nuclear scientists to keep the breeders outside safeguards on the military side of the separation plan.

Singh was blindsided in particular by a February 8 2006 public interview given by Kakodkar in which the latter urged that the fast breeders should not be placed on the safeguarded civilian side of the separation plan. The reasons cited by Kakodkar were that “both, from the point of view of maintaining long-term energy security and for maintaining the ‘minimum credible deterrent’, the Fast Breeder Programme just cannot be put on the civilian list.”⁸⁴¹ He was also supported by many retired nuclear scientists,⁸⁴² desperate to overcome their perceived marginalization by the Prime Minister’s Office (PMO) and the Ministry of External Affairs (MEA) since the announcement of the July 2005 joint statement.⁸⁴³

A surprised Prime Minister was forced to issue a categorical statement in the Indian Parliament on February 27 2006 acknowledging that “we cannot accept safeguards on our indigenous Fast Breeder Programme. Our scientists are

⁸⁴¹ "The Fast Breeder Programme Just Cannot Be Put on the Civilian List." *Indian Express*, Feb 08, 2006. Accessed on March 6 2013.

⁸⁴² Laxman, Srinivas. "Indian Nuke Scientists Go Ballistic

" *The Times of India*, Feb 9, 2006.

http://articles.timesofindia.indiatimes.com/2006-02-09/india/27812204_1_nuclear-scientists-and-engineers-bar-civilian-list

⁸⁴³ Laxman, Srinivas. "Former Nuke Czars Get Role in Us Deal

" *The Times of India*, Dec 16, 2006.

http://articles.timesofindia.indiatimes.com/2006-12-16/india/27825473_1_nuke-czars-y-s-r-prasad-nuclear-czars

confident that this technology will mature and that the programme will stabilize and become more robust through the creation of additional capability.^{844 845}

Recognizing Singh's limited wriggling room in the aftermath of the clarification in Parliament, Secretary of State Condoleezza Rice informed him that the US would consider allowing India to retain the breeders on the military side of the separation plan during President Bush's maiden visit to India on March 1 2006.

Four and a half hours after his speech in Parliament, Manmohan received a call from US secretary of State Rice. She had already read the speech, and discussed it with her colleagues. She told the PM that the "deal was doable".⁸⁴⁶

Rice kept her word. India was eventually allowed to retain the two fast breeders on the military side. The magnitude of the American concession on the fast breeders can be gauged from a report by the International Panel on Fissile Materials (IPFM) estimating that the Prototype Fast Breeder Reactor (PFBR) could produce up to 130 kg of weapons grade plutonium every year following its completion in 2010. The outputted plutonium would represent a four-fold increase

⁸⁴⁴ "Pm's Statement in Parliament on Civil Nuclear Energy Cooperation with United States." (February 27, 2006

), <http://pmindia.nic.in/pmsinparliament.php?nodeid=28>

⁸⁴⁵Chari, PR. "Parsing the Separation Plan:

The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf . p 2

⁸⁴⁶ Sudarshan, V. "Fusion Material-on George Bush's First Visit Here, India Drives a Hard Civilian Nuclear Safeguards Bargain and Comes out Smiling

" *Outlook*, March 13 2006.

<http://www.outlookindia.com/printarticle.aspx?230510>

in India's current weapons grade plutonium production capacity that could result in an additional 25 nuclear weapons per year.^{847 848 849}

Another crucial American concession was Bush's decision to allow India to retain the exclusive right to determine a future (thermal or breeder) reactor as civilian or military before committing it to permanent IAEA safeguards.⁸⁵⁰ The

⁸⁴⁷ Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 4

⁸⁴⁸ Even the 15 MW Fast Breeder Test Reactor in Kalpakkam that began operating in 1986 could theoretically produce enough weapons grade plutonium for 4 bombs each year.

Chari, PR. "Parsing the Separation Plan:

The Indo-US Subsidiary Deal." (March 2006). Accessed on February 22 2013.

http://www.ipcs.org/pdf_file/issue/IB36-Chari-TheIndoUSSubsidiaryDeal.pdf . p3.

⁸⁴⁹ The documentary record does not provide evidence of any serious opposition to Rice within the Bush administration when she decided to allow India to retain the fast breeder reactors on the unsafeguarded military side of the separation plan. However, an April 3 2006 article in the *Washington Post* by Glenn Kessler based on interviews with 20 US and Indian officials described the manner in which Rice and a coterie of officials and policy wonks around her that were sympathetic to the idea of a grand nuclear bargain with India (July 2005 joint statement) in exchange for a strategic partnership sidelined powerful opponents. It is not unreasonable to speculate that the same tactics would have been used by Rice to marginalize opponents of the breeder's unsafeguarded status as well.

"Ten days after Rice's (March 2005) visit, when Bush announced the F-16 sale to Pakistan, State Department officials held a background briefing on the new India policy. One official -- identified by (Raja) Mohan as Zelikow -- said the policy's "goal is to help India become a major world power in the 21st century. We understand fully the implications, including military implications, of that statement."..... At this critical juncture, one of the leading skeptics of a nuclear deal with India -- John R. Bolton, the undersecretary of state for arms control -- was nominated U.N. ambassador. The long battle over his appointment delayed confirmation of his replacement, Robert G. Joseph, until May 26. Other key posts in the nonproliferation ranks were unfilled, leaving officials in that area thinking they had no voice in the debate. The Pentagon, meanwhile, fully backed closer relations with India..... By the time Joseph arrived at the State Department on June 1, the initiative with India was largely underway..... When the final negotiations began before Singh's visit, Joseph wasn't there. Instead, he went overseas on other business, leaving (John D.) Rood as the lone senior nonproliferation voice on a negotiating team stacked with officials eager to clinch a deal upon Singh's arrival."

Kessler, Glenn. "India Nuclear Deal May Face Hard Sell." *Washington Post* April 3, 2006.

⁸⁵⁰ "Pm's Suo-Motu Statement on Discussions on Civil Nuclear Energy Cooperation with the Us:

Implementation of India's Separation Plan." (March 7, 2006

). Accessed on February 21 2013.

<http://pmindia.nic.in/pmsinparliament.php?nodeid=24>

Squassoni, Sharon. "India's Nuclear Separation Plan: Issues and Views." Congressional Research Service, December 22 2006. Accessed on February 21 2013.

<http://www.fas.org/sgp/crs/nuke/RL33292.pdf> . p 17

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p6

concession was in direct opposition to enjoinments by the US Congress and the arms control community that the administration should secure some upper ceiling on the Indian military nuclear program in exchange for assistance to the civilian program. The right to categorize a facility as civilian or military would allow India to smoothly implement its near-term plan to construct a new unsafeguarded research reactor that would produce at least as much weapons grade plutonium as the Dhruva (and replace the dismembered CIRUS).⁸⁵¹ ⁸⁵² It would also enable India to construct additional military nuclear facilities outside safeguards in the future, further accelerating the production of fissile material for nuclear weapons.

Yet, before Bush's arrival in Delhi, two issues still remained to be resolved: one, the nature of safeguards that India could accept; two, whether these safeguards would apply to reactors which are not even on the drawing board yet.... Sources say the Indian effort was to get language into the understanding which would, without ambiguity, make it clear that India alone had the right to determine the nature of future reactors, whether military or civilian, other than those 22 (that is, 15 currently in operation plus the seven under construction) under discussions at the moment. This was considered vital as it would allow

⁸⁵¹Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p4

⁸⁵² The International Panel on Fissile Materials (IPFM) estimated that India already has about 500 kg of weapon grade plutonium from its CIRUS and Dhruva reactors, sufficient for roughly a 100 nuclear warheads.

Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal

" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> . p 3.

India to construct a military reactor should it deem it necessary for future strategic interests. In other words, India wasn't willing to accept a cap on its nuclear programme.⁸⁵³

Bush also accepted the Indian position that India would place its civilian reactors under permanent IAEA safeguards provided the US gave multi-layered fuel supply assurances for the safeguarded reactors and the additional ones that India would import following the successful conclusion of the nuclear deal.⁸⁵⁴ In fact, the US committed to provide extensive, inter-locking, lifetime fuel supply assurances in the separation plan.

(a) The United States has conveyed its commitment to the reliable supply of fuel to India. Consistent with the July 18, 2005, Joint Statement, the United States has also reaffirmed its assurance to create the necessary conditions for India to have assured and full access to fuel for its reactors. As part of its implementation of the July 18, 2005, Joint Statement the United States is committed to seeking agreement from the U.S. Congress to amend its domestic laws and to work with friends and allies to adjust the practices of the Nuclear Suppliers Group to create the necessary conditions for India to obtain full access to the international

⁸⁵³ Sudarshan, V. "Fusion Material-on George Bush's First Visit Here, India Drives a Hard Civilian Nuclear Safeguards Bargain and Comes out Smiling" *Outlook*, March 13 2006.

<http://www.outlookindia.com/printarticle.aspx?230510>

⁸⁵⁴ "In Each Other We Trust." *Indian Express*, March 03, 2006.

http://expressindia.indianexpress.com/news/columnists/full_column.php?content_id=88849

Sudarshan, V. "Fusion Material-on George Bush's First Visit Here, India Drives a Hard Civilian Nuclear Safeguards Bargain and Comes out Smiling

" *Outlook*, March 13 2006.

<http://www.outlookindia.com/printarticle.aspx?230510>

fuel market, including reliable, uninterrupted and continual access to fuel supplies from firms in several nations.

(b) To further guard against any disruption of fuel supplies, the United States is prepared to take the following additional steps:

(i) The United States is willing to incorporate assurances regarding fuel supply in the bilateral U.S.-India agreement on peaceful uses of nuclear energy under Section 123 of the U.S. Atomic Energy Act, which would be submitted to the U.S. Congress.

(ii) The United States will join India in seeking to negotiate with the IAEA an India-specific fuel supply agreement.

(iii) The United States will support an Indian effort to develop a strategic reserve of nuclear fuel to guard against any disruption of supply over the lifetime of India's reactors.

(iv) If despite these arrangements, a disruption of fuel supplies to India occurs, the United States and India would jointly convene a group of friendly supplier countries to include countries such as Russia, France and the United Kingdom to pursue such measures as would restore fuel supply to India.⁸⁵⁵

Although the fuel-supply assurances provided by the US do look impressive at first glance, their enforceability in case of a future disruptive event such as an Indian nuclear test was anything but certain. If the US decided to

⁸⁵⁵ "Information Circular Infcirc/731-Communication Dated 25 July 2008 Received from the Permanent Mission of India Concerning a Document Entitled "Implementation of the India-United States Joint Statement of July 18, 2005: India's Separation Plan" ". (July 25 2008), <http://www.iaea.org/Publications/Documents/Infcircs/2008/infirc731.pdf>

renege on its fuel-supply commitments as punishment for an Indian nuclear test, a realistic possibility given the impact of such an event on the global nuclear order, then the multiple multi-billion dollar American reactors imported by India would be in serious trouble with four available options. First, India would have to approach other suppliers to provide fuel, a course of action with no guarantee of success if the US decided to exert serious pressure on supplier countries (although Russia could conceivably be powerful enough to ignore American pressure if the former deemed its broader strategic relationship with India vital enough to supply the stranded nuclear reactors).

Second, the reactors could be fuelled by drawing from the strategic fuel reserve that the US had given India the permission to accumulate. But the dependence of multiple, large imported reactors on this single strategic fuel reserve for their lifetime fuel supply at the same time would not be a permanent solution. Third, India could reach a political settlement with the US and make concessions on the nuclear front (e.g. taking on arms control commitments) or in other areas vital to US policy (e.g. Iran) for the restoration of fuel supply.

Finally, the fourth and the most painful option would be to either run the reactors below their maximum potential capacity factors incurring substantial financial losses or shut them down altogether with adverse effects on the wider economy. However, any American decision to stop fuel-supplies to the reactors imported by India even in the aftermath of an Indian nuclear test would not be easy given the impact of such a decision on the broader strategic partnership and

the consequent lack of Indian cooperation on matters of importance to the US (e.g. China, Iran, passage of second-generation economic reforms and patent law reform). Thus, the enforceability of American fuel-supply assurances in case of a future disruptive event would not depend on the text of the separation plan as much as the context of US-India relations at the time (the utility of India in the eyes of a future American President as a counterweight to China and the consequent importance or lack thereof of cultivating good relations with India, the impact of an Indian nuclear test on the regional nuclear balance and the implications of the same for US strategic policy, the attractiveness of India as an economic market and the relative power disparity between the US and India).

The separation plan's aim was limited to erecting a firewall between the civilian and military components of India's nuclear program. Consequently, there was no reference to the thorny issue of nuclear testing. The separation plan's omission of testing, taken together with India's reiteration of its post-1998 unilateral moratorium on nuclear testing in the July 18 2005 joint statement implied that India still retained the ability to test at will in the future. The plan's limited mandate also led it to skirt the contentious issue of whether India would be allowed to reprocess the spent fuel outputted by the reactors that it would import in an indigenous reprocessing facility.

The documentary record does not suggest that pressure from non-proliferationists within and outside the Bush administration had any impact in terms of getting American negotiators to coax India to come up with a separation

plan with strictures on the issue of nuclear testing. Senior non-proliferation policy wonks like Michael Krepon seemed resigned to a separation plan on India's terms during Bush's March 2006 visit and were instead preparing to take on the nuclear deal during the next stage, the forthcoming debate in the US Congress.

Esau sold his birthright for a bowl of lentils. During the Cold War, a variation of this Biblical tale was played out whenever a president was about to engage in summitry with the Soviet Union. Back then, critics of arms control treaties warned that whoever was in the White House would sell out U.S. national security for the momentary glow of a good news story. Times have changed. The Bush administration doesn't think too kindly of treaties, and a rare presidential visit to India is fast approaching. The question at hand is not whether President Bush will undermine national security in favor of a treaty, but whether he will undermine both in order to accommodate India's bomb makers. To put the central question more precisely: How much is the Bush White House, which has gone to greater lengths than most to accentuate false positives, willing to undermine the global rules of nuclear commerce for India's benefit while seeking to tighten them for other states of proliferation concern?⁸⁵⁶

In Chapter 3, I provided a brief description of the political milieu in India around 2004-06 that served as the background to understand the attempts by the

⁸⁵⁶ Krepon, Michael. "In Pursuit of a Nuclear Deal with India" (February 21, 2006). Accessed on March 26 2014. <http://www.stimson.org/essays/in-pursuit-of-a-nuclear-deal-with-india/>

Indian leadership to consummate the long-delayed Iran-Pakistan-India (IPI) pipeline and its eventual shelving of the project in favor of a nuclear deal with the United States. A brief summary of the political landscape in India from 2004-2006 provides the broader context to situate the role of the serving and retired nuclear scientists during the debate over the US domestic waiver legislation and the bilateral 123 agreement in India.

The 2004 national elections to India's Lok Sabha (lower house of parliament-545 seats) resulted in a surprise victory for the secular, center-left Congress party led by its president Sonia Gandhi. The party emerged as the single largest political formation with 145 seats and benefited from robust performances by its numerous regional allies in the United Progressive Alliance (UPA) to win 220 seats. The Congress-led UPA unseated the incumbent Hindu nationalist Bharatiya Janata Party (BJP) and its regional allies in the National Democratic Alliance (NDA). The BJP won 138 seats and poor performances by its allies in the NDA resulted in a disappointing 185 seats. The NDA government (1998-2004) had conducted India's 1998 nuclear tests and was also responsible for a major rightward shift in Indian foreign policy away from non-alignment towards the US and Israel.

Despite its upset victory in the 2004 elections, the Congress-led UPA did not have the 272 seats required for a simple parliamentary majority to form a government, a result of India's fragmented electoral verdict. The Congress party managed to secure crucial outside issue-based support from the secular Left Front,

a four party communist alliance comprising of the Communist Party of India-Marxist (CPI-M), the Communist Party of India (CPI), the Revolutionary Socialist Party (RSP) and the Forward Block (FB).⁸⁵⁷ The Left had managed its highest ever total of 59 seats⁸⁵⁸ due to strong performances in its 'red' bastion of West Bengal and the much smaller southern state of Kerala to emerge as the third largest political formation (after the UPA and the NDA). The CPI-M was the largest and most powerful faction in the Left at the national level with 44 seats.⁸⁵⁹ The CPI (M) led-Left's support raised the Congress-led UPA's tally to 279 seats, giving it a slim majority in Parliament.

Gandhi nominated Dr. Manmohan Singh, an academic and economist credited with liberalizing India's quasi-socialist economy as finance minister in 1991 to be Prime Minister.

Theoretical Framework

In Chapter 2, I concentrated on the period from July 2005-March 2006 and used Bijker's concept of *relevant social groups* and the modified concept of

⁸⁵⁷ "West Bengal Chief Minister Buddhadeb Bhattacharjee Faces Criticism from His Party." (May 27 2006). Accessed on May 1 2013.

<http://www.cablegatesearch.net/cable.php?id=06CALCUTTA244&q=singur>

Chattopadhyay, Suhrid Sankar. "Left Landslide

" *Frontline*. Accessed on May 1 2013.

<http://www.hindu.com/thehindu/thscrip/print.pl?file=20060602003100900.htm&date=f12310/&prd=fline&>

⁸⁵⁸ Bhatt, Sheela. "Defeat Bjp, Defeat Congress: Cpi-M

" (January 28, 2009). Accessed on May 3 2013.

<http://www.rediff.com/news/2009/jan/28left-cpim-girds-up-to-defeat-bjp-and-congress.htm>

⁸⁵⁹ Ashraf, Syed Firdaus. "Meet the Left Front." (May 14, 2004). Accessed on May 15 2013.

<http://www.rediff.com/election/2004/may/14spec1.htm>

Bhatt, Sheela. "Defeat Bjp, Defeat Congress: Cpi-M

" (January 28, 2009). Accessed on May 3 2013.

<http://www.rediff.com/news/2009/jan/28left-cpim-girds-up-to-defeat-bjp-and-congress.htm>

relevant social individuals to organize actors into three coalitions based on the meanings that they attributed to the idea of separating India's nuclear program into civilian and military components. In Chapter 3, I narrowed the focus and used the concept of relevant social groups and relevant social individuals to concentrate on the role of key groups and individuals (with the focus primarily on individuals) in the origins, evolution and intersection of the debate over the Iran-Pakistan-India (IPI) pipeline and the US-India nuclear deal. I also modified Bijker's concept of a technological frame using literature from political science and developed the concept of a *technopolitical frame* to organize the pipeline and the nuclear deal into competing frames on the Indian energy and foreign policy milieu.

In Chapter 4, I continue using the concepts of relevant social groups and relevant social individuals to capture the meanings of the provisions of the Hyde Act and the 123 agreement advanced by the cohort of 8 retired nuclear scientists, the Prime Minister and the Chairman of the Atomic Energy Commission Anil Kakodkar.

I also draw from Gabrielle Hecht's magisterial *Radiance of France*, a social, political, cultural and technological history of France's first generation reactors (gas graphite reactors). Hecht probes the origins of the associations between French territory, identity, industry or diplomacy and nuclear technology during the first three decades following World War II.⁸⁶⁰

⁸⁶⁰ Hecht, Gabrielle. *The Radiance of France- Nuclear Power and National Identity after World War II*. Cambridge: MIT Press, 2009. P 342

Hecht begins by describing the post-World War II national identity crisis in France centered on anxieties about wartime losses, decolonization, reconstruction and American dominance. There was widespread agreement that France had lost its radiance (or grandeur) through wartime defeat and occupation and would continue losing influence as its colonies rebelled and its empire crumbled.

Radiance was understood as the quintessential quality of Frenchness (derives its meaning from France's history as a major military and economic power). In other words, France had lost its Frenchness and would continue fading into obsolescence if drastic measures for national rejuvenation were not taken. As a result of such concerns, there were debates over how France could regain its fading glory and reinvent itself. There was a general consensus that France would have to find ways to maintain its radiance (and Frenchness) through various political, cultural and technological acts aimed at national revitalization.

Around the same time as France was struggling to define its national identity and regain its Frenchness, the US dropped atomic bombs on Hiroshima and Nagasaki. Although the exact motivations for Japan's final surrender a few days later are more complex, the American bombing and the Japanese surrender established nuclear technology as a quintessential symbol of modernity and national power.⁸⁶¹ The end of the war and the emergence of the US and the Soviet Union as superpowers confronted the French with another troublesome question.

⁸⁶¹ Ibid. p 2, 12, 21, 52.

What meaning would France impute to the concept of “radiance” that previously symbolized military and economic power in a post- WWII bipolar world dominated by two military superpowers?

The most widely accepted answer was provided by technical and scientific experts working for the state (Hecht calls them state technologists). They argued that France should now focus on industrial, scientific and especially technological development to not only recover from the losses of the war but also regain its former status among the comity of nations by restoring its radiance. In fact, state technologists constructed explicit links between technological prowess and the restoration of France’s lost radiance. More specifically, the technologists located radiance not only within the technologies they planned to build but also in their potential ability to export such products thereby evoking the imperial connotations of the notion of radiance.

Thus, France’s new technologies would become the material manifestations of its Frenchness embodying attributes such as language, tradition and aesthetics in order to facilitate the revival of its lost radiance and the export of its Frenchness to the world.⁸⁶² To summarize, state technologists seized on the void in France’s national identity in the years following World War II and expertly connected a central trope (the radiance of France) to its technological prowess (especially nuclear expertise in the post-Hiroshima milieu of atomic euphoria) in order to secure their own place in the vanguard of postwar French

⁸⁶² Ibid. p 2, 5, 52.

society (as men of action or agents of modernization). The trope cleverly used examples from French history (from the shining monuments of the Sun King to the glorious days of the French empire) and portrayed technological prowess as a continuation of that process.⁸⁶³

Given the centrality of nuclear expertise in the new French conception of its national identity and the consistent efforts made by French technologists to embed 'Frenchness' into the nuclear program, Hecht asks the following questions:

What is French about the French nuclear program?.....How and why did the people who designed, built, worked in and wrote about, and lived near reactors forge and understand the relationship between nuclear technology and French national identity? What role did invoking Frenchness play in nuclear development? How did nuclear technology figure in the changing notions of Frenchness?⁸⁶⁴

Hecht adopts three methodological tools to answer the aforementioned questions. First, she attempts to understand how various actors concerned with the French nuclear program conceptualized the relationship between technology and politics. Second, Hecht then defines and employs the interesting concept of *technopolitics*, the strategic practice of designing or using technology to constitute, embody or enact political goals, in order to unpack the Frenchness that

⁸⁶³ Ibid. p 52

⁸⁶⁴ Ibid. p 3-4

became embodied in nuclear development. Technopolitics can also be understood as politics conducted specifically through technological means.⁸⁶⁵

As an example, Hecht argues that the reactors at Marcoule and Chinon functioned as strategies through which the distinct regimes of two competing French state nuclear institutions (Commissariat à l'Énergie Atomique's (CEA) *nationalist regime* and the Electricité de France's (EDF) *nationalized regime*) aimed to retain power over both the technological and the political dimensions of nuclear development.

Finally, Hecht develops and deploys the concept of *technopolitical regimes*. According to her, technopolitical regimes are “grounded here in institutions, consist of linked sets of people, engineering and industrial practices, technological development and pursue technopolitics.” The notion of the technopolitical regime captures not only the fundamentally hybrid nature of the goals and activities of institutions, but also accounts for the technologist's efforts to use these hybrids as instruments of power, models for state politics and expressions of French national identity.

As an example, Hecht describes the different policies for the future of the nation advanced by the CEA and the EDF even as both institutions shared the overall goal of a technologically sophisticated France with cutting-edge nuclear expertise. The efforts made by these two institutions to translate their visions into technological practices and artifacts resulted in two distinct technopolitical

⁸⁶⁵ Ibid. p 14, 90

regimes, a nationalist regime at the CEA and a nationalized regime at the EDF. The differing technopolitical regimes of the CEA and EDF manifested themselves deep in the structures, technologies and practices of each institution.⁸⁶⁶

Hecht then provides a detailed description of the CEA's regime and its manifestation in the artifacts that the regime yielded. The CEA's technopolitical regime expressed an ideology that saw national grandeur first and foremost in terms of military technological prowess. The regime valued institutional autonomy and nuclear expertise and it upheld a vision of nationalism that excluded communists. The primary goal of the CEA's nationalist technopolitical regime was to manufacture a French atomic bomb.

The material embodiments of the principles of the regime were the Marcoule reactors and the CEA's policy of champions. Engineers translated the CEA's nationalist regime into a reactor design (G2) whose primary function was to produce weapons grade plutonium for an atomic bomb. Electricity generation was only a secondary function embedded to confer legitimacy for building the G2 reactors until France's hitherto secret military nuclear ambitions came out into the open. In the CEA's regime, speed was more important than the cost of the project as the benefits to French national security and increase in its global prestige following a successful nuclear test were deemed to outweigh the financial burden incurred.⁸⁶⁷ CEA's regime also consisted of distinct design and contracting

⁸⁶⁶ Ibid. p 16, 56, 89, 90, 163, 198.

⁸⁶⁷ Ibid. p 65, 69, 71, 74.

practices evolved during the construction of the G2 reactor at Marcoule, practices that engineers insisted on implementing in subsequent projects.

However, funding constraints and the resulting compulsions faced by the CEA to jointly implement subsequent projects with the EDF, another state institution in the nuclear field brought the regime and practices of the former into conflict with the latter. Although EDF shared with CEA the overall goal of a technological and nuclear competent France, it had different ideas about the kinds of policies that would help achieve that goal. EDF's primary objective was to design reactors to produce the maximum amount of electricity at the lowest possible cost and not fissile material for nuclear weapons.

EDF's technopolitical regime also disagreed with the CEA's approach of choosing key private industries to spearhead reactor construction under the 'policy of champions.' Instead, EDF envisioned a policy in which the utility would spearhead the development of nuclear power in the best interests of the state with private industry merely following orders and playing a secondary role. EDF's nationalized technopolitical regime found form in its Chinon reactor and in its efforts to micromanage industrial contracting. Eventually, these practices became a part of EDF's institutional culture.

Thus, the construction of the EDF1 reactor, a project in which the CEA and the EDF were forced to collaborate was fraught with tension between the engineers of the two institutions. The tension centered around two issues: the role of private industry in the project and the actual design of the reactor. The CEA's

nationalist technopolitical regime demanded substantial amounts of weapons grade plutonium while EDF's nationalized technopolitical regime called for more electricity production.⁸⁶⁸ The differences continued to play out over the next three decades during the construction of other reactor projects that the two funding-constrained institutions collaborated on.

The differences between the two institutions did not end with the design of their reactors, contracting practices or political agendas. Even the ways in which the two organizations were structured provide useful insights into the visions of France and French socio-political order that the elites at the helm harbored. Marcoule's work hierarchy formalized the authority of highly trained experts and the military "vocation" of the site. Knowledge was compartmentalized and it corresponded closely to the social hierarchies in place. Depth of knowledge had more value than breadth. Each expert had his/her domain of specialization over which he/she exerted complete authority. This system left no place for non-experts (workers) to take initiative.

For the CEA, workers were mere cogs in a regime run by experts for the greater glory of France. Workers at Marcoule resented their lack of importance in the CEA's technopolitical regime. They were also angered by the need to constantly seek permission from superiors, constant oversight by personnel not involved in core operations and the inability to bring about any reform or change

⁸⁶⁸ Ibid. p 81, 82, 83.

(however incremental) on their own. Hence, rebellion against the system was an important part of the workplace identity of the workers.⁸⁶⁹

In contrast to the technocratic, top-down, command and control hierarchy of the CEA's nationalist technopolitical regime at Marcoule, EDF's Chinon was more egalitarian and accommodating as far as workers were concerned.

Individuals at most levels of hierarchy knew something about several domains of reactor operation resulting in social hierarchies that had more to do with experience and responsibility than with specialized knowledge. Breadth of knowledge had more value than depth in the EDF's nationalized technopolitical regime. Combined with institutionalized commissions that gave workers a formal place to discuss workplace issues with management, the system gave them more room to take initiative.

For the EDF, workers were powerful motors in a regime steered by nationalized institutions for the betterment of France. As a result, EDF workers understood and took pride in their own importance in the nationalized technopolitical regime. Their workplace identity was that of pioneers (discerned from their willingness to take risks with the full knowledge of their superiors).

Hecht adeptly highlights two specific technical examples: 1) the contrasts in the layout of the command rooms of the G2 and the EDF2 reactors and 2) the difference in the organization of radiation protection as material manifestations of the deep ideological differences between the CEA and EDF regimes. G2's control

⁸⁶⁹ Ibid. p 198, 199.

board was organized according to three types of functions and required people with three distinct types of knowledge to run it. EDF2's control boards integrated these functions and split them into two levels of operation, requiring people with the same kinds of knowledge to run them both.

Hecht's core argument is that the G2 and EDF1 reactors should not be viewed as apolitical, pre-ordained technical artifacts but as hybrids of technology and politics. In other words, the reactors were not the inevitable products of some progressive logic inherent in technology (technological determinism) or the infinitely malleable products of political negotiation. Rather, each reactor resulted from a seamless blend of political and technological goals and practices at several levels.⁸⁷⁰ To summarize, the reactors were the result of the distinct technopolitical goals embedded in their respective technopolitical regimes and could have been different had the goals been different.

I use Hecht's concept of a technopolitical regime to explain the underlying reasons behind the opposition of both the retired scientists and Kakodkar to the provisions in the Hyde Act in December 2006 and their insistence that India secure concessions on two key issues (fuel-supply assurances and an upfront right to reprocess US-origin spent fuel) in the upcoming negotiations over the bilateral 123 agreement.

I draw on research by Harry Collins and Trevor Pinch and use the concept of experimenter's regress in order to understand the acrimonious debate over

⁸⁷⁰ Ibid. p 88, 198, 199.

India's 1998 lone thermonuclear test that was reignited in the context of the Hyde Act's termination clause. The clause raised the cost to India of conducting a nuclear test by threatening an immediate post-test cessation of American cooperation under the nuclear deal and was resolutely opposed by both the retired nuclear scientists and Kakodkar who demanded its neutralization in the 123 agreement by excluding any reference to testing in the text.

A common theme throughout *The Golem* that is especially relevant to this chapter is the idea of 'experimenter's regress.'

The problem with experiments is that they tell you nothing unless they are competently done, but in controversial science no-one can agree on a criterion of competence. Thus, in controversies, it is invariably the case that scientists disagree not only about results, but also about the quality of each other's work. This is what stops experiments being decisive and gives rise to the regress.....The point is that, for citizens who want to take part in the democratic process of a technological society, all the science they need to know about is controversial; thus, it is all subject to the experimenter's regress.⁸⁷¹

I focus in particular on the chapter on the chemical transfer of memory that describes experiments done in the late 1950's and the mid-1970's by James McConnell and Georges Ungar on worms and rats. The experiments were based on the premise/hypothesis that if memory was stored in chemical molecules, it should be possible to transfer them from one animal to another through ingestion,

⁸⁷¹ Ibid. p 3

transfusion or injections. For example, the memories extracted from the brain of an animal could help reduce the training effort (e.g. how to get to the location of food or navigate through a maze) if transferred to a second animal thus giving it a head-start over an animal that did not receive such transfers.

The idea that memories were stored as chemical molecules first emerged out of experiments conducted by McConnell on planarian worms, a type of flatworm in the 1950s. He focused a bright light on the worms as they were swimming along the bottom of a trough followed by a mild shock that caused their bodies to arch or ‘scrunch’ in response to the stimulus. Eventually, McConnell claimed that the worms learned to associate the light with the shock and began to arch their bodies when a light was shone whether or not the shock was delivered. He called these worms as ‘trained’ worms.⁸⁷²

Thus, McConnell initially succeeded in training worms with 150 ‘pairings’ of light followed by a mild shock resulting in a 45% scrunch response rate to light alone and later managed to elicit a 90% response rate by the mid-1950s. The idea that training might be stored chemically emerged when McConnell dissected the trained worms in half and discovered that not only the regenerated front half with the putative brain retained the training but also the brain-less rear half. Encouraged, McConnell fed minced portions of trained worms to untrained ones and discovered that the ones ingesting the trained meat were one and a half times more likely to scrunch in response to light alone. Convinced that memory was

⁸⁷² Ibid. p 5-6.

being transferred chemically from trained to untrained worms, McConnell reported his results in 1962.

It is here that Collins and Pinch demonstrate the utility of the concept of experimenter's regress by exposing the inescapable ambiguities and the 'art and craft' of science in McConnell's experiments that would elicit strong opposition from the scientific community and the public. Critics pointed out that planarian worms are also known to scrunch their bodies when left alone in the absence of light and in response to stimuli other than light. They also countered McConnell's main conclusion about the chemical transfer of memories by pointing out the uniqueness of the planarian digestive system that does not break down its food into simpler chemical constituents but directly incorporates large chunks of ingested material into the body.⁸⁷³

The counter-argument being made was that naïve worms were merely receiving 'implants' (bits of brain or some distributed memory structure rather than memory substance) via the minced portions of the trained worms. Another line of attack adopted by skeptics was to speculate that planarian worms were too primitive to be trained. McConnell had merely increased the general sensitivity of his supposedly trained worms to all stimuli through the production of a sensitizing substance. It was this sensitizing substance that was being transferred between trained and naïve worms rather than a specific memory in the form of a chemical substance.

⁸⁷³ Ibid. p 6, 7, 8

The differences between McConnell and his critics peaked in 1964 with the publication of a special supplement to *Animal Behavior* that focused on the controversy but there were no clear victors. Critics continued to attack McConnell's related experiments in the years following the publication and ventured that the reason why naïve worms were following the same trail as trained worms after being fed on bits of the latter was not because of a chemical transfer of memory but because of an inbuilt predisposition to follow the slime trail of the trained worm previously inhabiting the same trough.⁸⁷⁴

Eventually, this part of the argument was resolved, at least to McConnell's satisfaction, by pre-sliming training grounds with naïve worms that were not part of the experiment. This made the troughs and alleys comfortable for the experimental subjects without reinforcing any particular behaviour.⁸⁷⁵

McConnell's detractors were still unconvinced and pointed out that his experiments had little significance for mammals.⁸⁷⁶ The overall impact of such alternative explanations advanced by critics was to reduce the significance of McConnell's experiments. The focus of Collins and Pinch on the craft of science, in particular the role of tacit knowledge in the success of McConnell's experiments is especially interesting. As critics failed to replicate McConnell's results, he

⁸⁷⁴ Ibid. p 8-9, 10.

⁸⁷⁵ Ibid. p 11

⁸⁷⁶ Ibid. p 8

often brought up the role of tacit knowledge in the success of his work along with other variables.

The intensity of the light focused on the worms had to be carefully calibrated in order for it to be bright enough for the worms in training to sense (and associate with the forthcoming mild shock) but not too bright as to elicit a standalone scrunch in the absence of the shock. Moreover, critics had also failed to factor in worm behavior that varies from time-to-time and from worm-to-worm and no two worms would necessarily respond to the focused light-shock combination in the same way.

McConnell also reminded critics that the effectiveness of shock training a worm depended crucially on the light-shock combination being delivered when it was swimming calmly and not when it was already scrunched. Thus, training a worm required a considerable amount of skill or tacit knowledge that was honed by McConnell and his assistants over a period of time. McConnell was effectively suggesting that critics would need to carry out his experiments over a period of time in order to acquire the tacit knowledge to replicate them successfully.

The experimenter's regress deepened with McConnell and his opponents eventually citing up to 70 variables for the discrepancies in their experimental results.⁸⁷⁷ The variables included the species and the size of the worms, their housing conditions, type of diet, frequency of training, the composition of the water in the trough, the strength of the light, the nature of the electric shock,

⁸⁷⁷ Ibid. p 6,7, 11, 12.

season of the year, time of day, barometric pressure and even the orientation of the moon. Worse, McConnell and his critics also disagreed on the most salient variables that would determine the success or failure of the experiment and ensure its repeatability.

Collins and Pinch adeptly point out that the controversy over McConnell's worm experiments and the chemical transfer of memory did not end with a clear victor. The controversy, a victim of infinite experimenter's regress was simply abandoned due to the apparent demonstration of memory transfer in rats and mice, mammals much more significant to the scientific community.⁸⁷⁸ The authors conclude with a very interesting observation regarding the trajectory of the aforementioned controversy over the chemical transfer of memory/learning.

In spite of the widespread demise of the credibility of the chemical transfer of memory, a determined upholder of the idea would find no published disproof that rests on decisive technical evidence. For such a person it would not be unreasonable or unscientific to start experimenting once more. Each negative result can be explained away while many of the positive ones have not been. In this, memory transfer is an exemplary case of controversial science. We no longer believe in memory transfer but this is because we tired of it, because more interesting problems came along, and because the principal experimenters lost their credibility. Memory transfer was never quite

⁸⁷⁸ Ibid. p 12, 14

disproved; it just ceased to occupy the scientific imagination. The gaze of the golem turned elsewhere.⁸⁷⁹

The concept of experimenter's regress will later help to illuminate the multiple points of contention in the debate over the lone 1998 thermonuclear test ranging from the geology of the test site to the manner in which the Indian government declared the test to be a success.

Finally, I draw from Hugh Gusterson's article on the current debate in US nuclear weapons circles over how to assure the continuing reliability of the US nuclear stockpile consisting of approximately 5350 warheads (as well as 5000 plutonium 'pits' in the strategic reserve) and whether to replace aging Cold War-era weapons.⁸⁸⁰ The primary and traditional source of confidence for the reliability of the weapons stems from the 1,054 nuclear tests but they can no longer be frequently conducted given the prevailing international norm.

Gusterson zeroed in on the controversy surrounding the American decision to proceed or refrain from approving research that would enable the construction of the Reliable Replacement Warhead (RRW), the first new US nuclear warhead in 20 years. The warhead was supported by the weapons labs, the Department of Energy (DOE) and the Department of Defense (DOD) on the one hand (although the Department of Defense was rumored to be privately more circumspect about the RRW) and opposed by a majority in the arms control

⁸⁷⁹ Ibid. p 25

⁸⁸⁰ Gusterson, Hugh. "Nuclear Futures: Anticipatory Knowledge, Expert Judgement, and the Lack That Cannot Be Filled." *Science and Public Policy* 35, no. 9 (November 2008).p 551

community on the other.^{881 882} An American decision to proceed with the construction of the RRW would be a significant shift from the computational approach of the Stockpile Stewardship Program (SSP) initiated by the Clinton administration in 1993 to ensure the reliability of the nuclear arsenal without open-ended testing.

The SSP enabled the Livermore and Los Alamos nuclear weapons labs to build new laser fusion facilities, supercomputers, hydrotest facilities and a program for underground subcritical testing at the Nevada Nuclear Test Site to test the myriad components of nuclear weapons without having to detonate the device.⁸⁸³ Gusterson's core argument was that the debate over the credibility of the warhead and the implications of its construction is

saturated with anticipatory knowledge of geopolitics, weapons engineering and environmental economics as those for and against the warhead construct forward-leaning narratives of deliverance and disaster.⁸⁸⁴

Gusterson devoted the rest of the paper to analyzing the rival framings of anticipatory knowledge in the debates over the RRW, its reliability and implications for arms control. He explained the difference in the perceptions of

⁸⁸¹ Ibid. p 551, 553

⁸⁸² The core parties to the debate were the weapons labs on the one hand and Dr. Richard Garwin, an experimental physicist and consultant for Los Alamos on the other.

⁸⁸³ Ibid. p 551-552

⁸⁸⁴ Ibid. p 553

US military planners and their arms control advocate rivals over what constituted a reliable nuclear weapon.

For arms controllers, even a standard US nuclear weapon that exploded with 10% of its certified yield was a reliable weapon as it was still far more powerful than the bomb dropped on Hiroshima and could wipe out an entire city. However, US military planners would consider a weapon exploding with a power even fractionally lower than its certified yield as unreliable because nuclear weapons in the American stockpile were calibrated to destroy underground targets under layers of reinforced concrete and steel (e.g. Iranian underground nuclear facilities) that required enormous destructive power to take out.⁸⁸⁵

Moreover, military planners usually assigned two nuclear weapons for each target in order to ensure its complete destruction, a targeting pattern that automatically doubled the nuclear arsenal. Thus, the counterforce targeting strategy of military planners was at odds with the arms controllers who insisted on a lower arsenal size assuming that the weapons would primarily be used against countervalue targets.

Gusterson also focused on the environmental debate surrounding the new proposed chemistry and metallurgy research facility to mass-produce plutonium cores for the RRW. On the one hand, proponents of the RRW framed it as a “green bomb” that would not contain beryllium thereby solving environmental

⁸⁸⁵ Ibid. p 553, 556

issues arising from a previous generation of nuclear weapons. On the other hand, opponents represented the RRW and the associated facilities required to construct it including the aforementioned chemistry and metallurgy facility as another environmental disaster in the making.

Gusterson then highlighted the profound differences even within the relatively small community of nuclear physicists and weapons designers over the RRW. The Livermore and the Los Alamos labs endorsed the RRW as a way to increase the American nuclear arsenal's long-term reliability.⁸⁸⁶ The senior weapons designers at these labs believed that constructing the RRW would "take an arsenal of nuclear Porsches" developed during the Cold War with yield-to-weight ratios at the every edge of viability (also called by designers as the "cliff," an abrupt point that separates a successful chain reaction releasing a bomb's full explosive power from a 'fizzle') and "replace it with Honda Civics" (weapons designed with more relaxed yield-to-weight ratios away from the cliff to increase their reliability and retain it as they age). The RRW would not only take care of the problem of the cliff but also its interaction with the aging effects on nuclear weapons.⁸⁸⁷ Thus, the weapons designers believed that

the USA could have greater confidence in the long-range reliability of its stockpile-and thus be in a position to agree to the deeper cuts in its arsenal that arms controllers want-if that stockpile consisted of weapons designed further away from the cliff....But here they run up against the

⁸⁸⁶ Ibid. p 553, 554, 556, 557, 558

⁸⁸⁷ Ibid. p 554, 555.

problem that a redesigned stockpile could not be tested under the current test ban regime. They have therefore concluded that such redesigned weapons should have what is called a good ‘pedigree’-that their design should hew closely to well tested designs-and that they should be designed now by experienced scientists with judgment, a feeling for the bomb, before those designers retire or die. Their new arms race is not between superpowers, but between the mortality of the designers’ human bodies and the proposed immortality of their weapons.⁸⁸⁸

However, the arguments of the weapons designers regarding the centrality of the RRW to ensure the long-term reliability of the US nuclear arsenal was contested by both independent physicists associated with the JASON Group, responsible for independent technical oversight of the US nuclear weapons program through consulting arrangements with the Department of Energy and Defense as well as arms control experts.⁸⁸⁹ The key contention of the JASONS was that the legacy stockpile of Cold War-era nuclear weapons verified through nuclear testing was aging predictably and the incremental modifications made to such weapons under the Stockpile Stewardship Program would render them more reliable than a completely new warhead (RRW) that cannot be verified by nuclear testing. Thus, the US could more confidently reduce its arsenal under arms control agreements relying on the incremental modification of its legacy weapons rather than the uncertain reliability of the untested RRW.

⁸⁸⁸ Ibid. p 555

⁸⁸⁹ Ibid. p 556

Gusterson argued that the debate over the RRW between the labs on the one hand and the JASONs and the arms controllers on the other exposed the profound difference of opinion between the contending factions over the relative importance of validation of nuclear weapons by means of experimental testing versus reliance on expert judgment, with the labs preferring the latter via the RRW and the JASONs opting for the former by supporting incremental modifications in the well-tested legacy stockpile.⁸⁹⁰ Gusterson concluded that

the contending actors in the RRW debate agree on little. The RRW is, to use a phrase introduced into science studies by Bruno Latour, Janus-faced. To its advocates, it is more reliable than existing warheads. To its opponents, it is less. To its advocates, it will facilitate arms reductions and secure the test ban treaty. To its opponents, it will excite nuclear proliferation and may, by turning out to be unreliable, force a breach of the test ban regime. To its advocates, it is as green as a nuclear weapon can be. To its opponents, it will lead to further despoliation of the environment by the nuclear weapons complex. The tiny community of weapons designers cannot even agree which of the RRW designs was better.⁸⁹¹

Gusterson noted the enormous terrain of the debate over the American nuclear arsenal characterized by the intersection of four plateaus of calculation: geographic, strategic, enviro-political and technoscientific. Yet, the four plateaus

⁸⁹⁰ Ibid. p 556, 557

⁸⁹¹ Ibid. p 558

were intimately connected in that actors supporting and opposing the RRW had to successfully understand and align the different orders of calculation in each plateau and across plateaus to construct a coherent narrative of a nuclear future with or without the RRW.

However, supporters of the RRW were faced with a structural disadvantage in that they absolutely had to align the four plateaus of calculation in order to construct a coherent metanarrative of the RRW as the solution to the nuclear arsenal-related problems. The independent physicists and arms controllers opposing the RRW had the luxury of attacking the proponents on any of the four plateaus if their metanarrative began to fail.

The most important of Gusterson's observations was the 'hyperconstruction' (enhanced contentiousness) of debates pertaining to nuclear weapons in general and the RRW in particular due to the inability of weapons designers to verify their nuclear weapons through underground tests. He suggested that this hyperconstruction was a result of a lack/void at the center of nuclear weapons science caused by the US decision to renounce nuclear testing and was similar to other scientific controversies heavily dependent on modeling and simulation.⁸⁹²

.....in the situation under discussion here, there is a sort of surplus ambiguity created by the unique features of contemporary nuclear weapons science so that in this case the available evidence is not just

⁸⁹² Ibid. p 558, 559

constructed, but *hyperconstructed*....Now that the weapons designers' core means of production of experimental evidence has been proscribed by law, there is a lack at the center of their science that excites processes of epistemic hyperconstruction-processes, I would argue, that are common to scientific debates heavily dependent on modeling and simulation.⁸⁹³

I conclude by using Gusterson's concept of *hyperconstruction* to understand the debate over India's lone 1998 thermonuclear test.

The debate over US domestic waiver legislation (Hyde Act) in India

The announcement of India's separation plan in March 2006 during

President Bush's much ballyhooed maiden visit to India was an important step in the long and convoluted process (initiated by the July 2005 joint statement) that would eventually lead to the full resumption of US-India nuclear cooperation. India had met its core commitment under the joint statement, coming up with a separation plan that would separate its civilian and military nuclear facilities and place the former under permanent IAEA safeguards. The action would now shift to the US.

Concluding a civil nuclear cooperation agreement with India posed a special set of challenges for the Bush administration. India had not signed the Non-Proliferation Treaty (NPT) and it had conducted nuclear tests in 1974 and 1998. It also refused to accept full-scope safeguards (safeguards on all its nuclear

⁸⁹³Ibid. p 559

facilities, civilian and military), violating the requirements of the US Atomic Energy Act (AEA) of 1954 and especially the Nuclear Nonproliferation Act of 1978 for nuclear cooperation with foreign nations.

Consequently, the Bush administration would require enabling legislation from Congress that would provide India three key retrospective waivers from the stipulations of the Atomic Energy Act. Congress would have to waive the requirements of Section 123(a) (2) of the Act of full scope safeguards as a condition for a recipient state to access civil nuclear cooperation.⁸⁹⁴ Section 128 (also requires full-scope safeguards) and 129 (termination of nuclear exports to a non-nuclear weapon state that the US president finds to have detonated a nuclear device) of the Act⁸⁹⁵ would also have to be waived to retroactively exempt India's 1974 and 1998 nuclear tests.

⁸⁹⁴ "Fact Sheet on the India U.S Civil Nuclear Energy Co-Operation: Conclusion of the 123 Agreement." (July 27 2007). Accessed on June 1 2013.
<http://pmindia.nic.in/Fact%20Sheet%20on%20the%20India%20US%20Civil%20Nuclear%20energy%20Co-operation.pdf>

"Nuclear Regulatory Legislation 109th Congress; 2d Session-Nureg-0980." Rev. 1, November 2006. Accessed on June 1 2013
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0980/rev1/vol-1-sec-1.pdf>. p 61
Ghoshroy, S., *U.S. S.- India Nuclear Deal: why disarmament needs to be on the agenda?*, in *Think Outside the Bomb Summer Conference*. August 14 2008. Accessed on June 2 2013.
<http://web.mit.edu/stgs/pdfs/TOTB%202008%20Summer%20Conference.pdf> . p. 6.

"Title I—United States and India Nuclear Cooperation." (2006). Accessed on June 4 2013.

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:h5682enr.txt.pdf (p 1)

⁸⁹⁵ Parillo, Sharon Squassoni and Jill Marie. "U.S.-India Nuclear Cooperation: A Side-by Side Comparison of Current Legislation (Order Code R133561) ", September 5, 2006. Accessed on June 4 2013.
http://csis.org/files/media/csis/pubs/poni/060905_cooperation_india_comparison.pdf p 1.

Fred McGoldrick, Harold Bengelsdorf, and Lawrence Scheinman. "The U.S.-India Nuclear Deal: Taking Stock" *Arms Control Today* October 2005. Accessed on June 4 2013.

http://www.armscontrol.org/act/2005_10/OCT-Cover

Senior Fellow the Brookings Institution before the United States House of Representatives Committee on International Relations ". May 11, 2006. Accessed on June 4 2013.

The enabling legislation (eventually known as the Hyde Act after Henry J. Hyde, the Chairman of the House International Relations Committee) would not only create a “unique exception to US nuclear export law to allow nuclear cooperation with India for the first time in over 30 years” but also “set the legal boundaries governing any such cooperation.”⁸⁹⁶ Towards this end, the Bush administration introduced draft waiver-authority bills in the House (H.R. 4974) and Senate (S. 2429) in March 2006, immediately after accepting India’s separation plan.⁸⁹⁷

Although there was bipartisan support in the US Congress,⁸⁹⁸ barring some exceptions,⁸⁹⁹ for the nuclear deal and the strategic partnership it would help construct, senators and congressmen were angered by the administration’s decision to ignore them before it announced the joint statement in 2005. They

<http://www.brookings.edu/~media/research/files/testimony/2006/5/11india%20falkenrath/20060511.pdf>. p8

⁸⁹⁶ PTI. *N-deal: Violating Hyde Act will put Congressional approval at risk*. July 20 2007. Accessed on June 4 2013. <http://www.rediff.com/news/2007/jul/20nddeal2.htm>

⁸⁹⁷ "109th Congress 2d Session H. R. 4974." March 16 2006. Accessed on June 5 2013

<http://www.gpo.gov/fdsys/pkg/BILLS-109hr4974ih/pdf/BILLS-109hr4974ih.pdf>

"109th Congress 2d Session S. 2429 ". March 16 2006. Accessed on June 5 2013

<http://www.gpo.gov/fdsys/pkg/BILLS-109s2429is/pdf/BILLS-109s2429is.pdf>

Parillo, Sharon Squassoni and Jill Marie. "U.S.-India Nuclear Cooperation: A Side-by Side Comparison of Current Legislation (Order Code RI33561) ", September 5, 2006. Accessed on June 4 2013.

http://csis.org/files/media/csis/pubs/poni/060905_cooperation_india_comparison.pdf. p 1.

⁸⁹⁸"Senate Committee on Foreign Relations Chairman Richard G. Lugar Opening Statement for Hearing on U.S.-India Civilian Nuclear Agreement ". April 5, 2006. Accessed on June 5 2013.

<http://www.foreign.senate.gov/imo/media/doc/LugarStatement060405.pdf>

"Opening Statement of Senator Joseph R. Biden, Jr. Hearing of April 5, 2006: U.S.-India Atomic Energy Cooperation." April 5 2006.

<http://www.foreign.senate.gov/imo/media/doc/BidenStatement0604051.pdf>

⁸⁹⁹Krishnaswami, Sridhar. "India's Efforts to Drum up Support for N-Deal Hit Glitch

" (April 01, 2006). Accessed on June 6 2013. <http://www.rediff.com/news/2006/apr/01nddeal2.htm>

"N-Deal: Hurdles before Congressional Approval". (April 03, 2006). Accessed on June 6 2013.

<http://www.rediff.com/news/2006/apr/03nddeal.htm>

were also miffed at the administration's refusal to extensively consult Congress during negotiations over the separation plan. The Bush administration's determination to conclude a nuclear deal with India and its decision to minimize/avoid consultations with Congress appeared as yet another transgression to Congressmen and women increasingly skeptical of the administration's policies amidst the floundering Iraq War. Even Bush administration officials feared incisive questioning by Congress. An unnamed Bush administration official involved in the negotiations over the July 2005 joint statement told *Washington Post* reporter Glenn Kessler on the condition of anonymity that

"The way they (a coterie in the State Department led by Condoleezza Rice) jammed it (joint statement) through is going to haunt us."⁹⁰⁰

Secretary of State Condoleezza Rice testified before the Senate Foreign Relations Committee (SFRC-hereafter referred to as the "Senate Committee") and the House International Relations Committee (HIRC-hereafter referred to as the "House Committee") on April 5 2006 to advocate for congressional legislative exemption that would allow the President to negotiate a bilateral nuclear agreement (also known as a 123 agreement) with India.⁹⁰¹ The back-to-back

⁹⁰⁰ Kessler, Glenn. "India Nuclear Deal May Face Hard Sell." *Washington Post*, April 3, 2006

⁹⁰¹ K.Alan.Kronstadt. "India-U.S Relations." U.S Congressional Research Service, January 30 2009. Accessed on June 20 2013 http://assets.opencrs.com/rpts/RL33529_20090130.pdf. p 36

"The U.S.-India Civilian Nuclear Cooperation Agreement Secretary Condoleezza Rice Opening Remarks before the Senate Foreign Relations Committee Washington, Dc". (April 5, 2006). Accessed on June 15 2013. <http://2001-2009.state.gov/secretary/rm/2006/64136.htm>
Weisman, S.R., Rice Seeks Backing for Nuclear Deal for India, in *New York Times*. April 6 2006.
Kessler, Glenn. "Rice Appeals for Nuclear Deal for India" *Washington Post*. April 6, 2006.

testimonies were her first public explanation of the American rationale for offering India a nuclear deal before the two high-powered Congressional Committees (previous testimonies in 2005 were given by undersecretaries).

Rice began by highlighting India's democratic credentials and indicated that it would be a key actor in the emerging Asian balance of power. She also blithely acknowledged that the three-decade-old US non-proliferation policies had failed to deter India from testing and were not successful in getting it to give up nuclear weapons.⁹⁰² Rice then argued that her new approach, a grand nuclear bargain with India would enhance international security by cementing the US-India strategic partnership, provide India with a nuclear alternative to meet its energy needs thereby reducing its dependence on Iran, improve climate security by reducing India's greenhouse gas emissions, strengthen the international non-proliferation system by bringing a significant proportion of Indian reactors under IAEA safeguards and benefit the US economy by adding at least 3000-5000 direct jobs as well as 10,000-15,000 indirect ones.⁹⁰³

That Rice's arguments were accepted without any serious challenge by the House and Senate Committees indicated the level of support that her outreach to India enjoyed. Apart from a few non-proliferationists, the only major concern of most congressmen and senators was that the administration be more transparent

⁹⁰² "The U.S.-India Civilian Nuclear Cooperation Agreement Secretary Condoleezza Rice Opening Remarks before the Senate Foreign Relations Committee Washington, Dc". (April 5, 2006). Accessed on June 15 2013. <http://2001-2009.state.gov/secretary/rm/2006/64136.htm>
K.Alan.Kronstadt. "India-U.S Relations." U.S Congressional Research Service, January 30 2009. Accessed on June 20 2013. http://assets.opencrs.com/rpts/RL33529_20090130.pdf. p 36

⁹⁰³ Ibid

about its intentions henceforth and not provide India a nuclear carte blanche in the form of too many concessions to enhance the nuclear arsenal. The public motivations provided by congressmen and women for their supporting the nuclear deal were strategic, non-proliferation related and economic. Senator John McCain's (R-AZ) press release from a later period during the 2008 presidential campaign suggests that he supported the deal for energy security and more importantly strategic reasons as a key initiative with the potential to deepen relations between two large democracies.

The agreement will also allow the U.S. and India to cooperate in taking maximum advantage of new technologies that can provide energy without relying on greenhouse gas-emitting fossil fuels."Our friendship with India is rooted in the norms and values we hold in common with the great democracies of Asia.....During the Senate's previous consideration of this important legislation, Senator Obama supported efforts that would have killed this accord. His own running mate, Senator Joe Biden, described one of the provisions Senator Obama voted for as a 'deal breaker.' We (McCain campaign) took a different approach.⁹⁰⁴

Senator Richard Lugar (R-IN) also supported the deal for non-proliferation, national security and economic reasons.

⁹⁰⁴McCain, John. "Statement by John McCain on the U.S.-India Civil-Nuclear Agreement" (October 2, 2008). Accessed on March 21 2014. <http://www.presidency.ucsb.edu/ws/?pid=90796>

Republican Sen. Richard Lugar said the pact protects U.S. national security and nonproliferation efforts while building "a strategic partnership with a nation that shares our democratic values and will exert increasing influence on the world stage."..."With a well-educated middle class that is larger than the entire U.S. population, India can be an anchor of stability in Asia and an engine of global economic growth," Lugar said.⁹⁰⁵

The strategic rationale for the nuclear deal advanced by Rice was also shared by substantial sections of the Democratic Party⁹⁰⁶ although support was slightly less enthusiastic than the Republicans.

But while Obama voted for the so-called 123 Agreement (after the section of the Atomic Energy Act it would amend), he also voted in favor of amendments that would require India to end its military cooperation with Iran and require the president to certify that the agreement will not enable India to manufacture more nuclear weapons. Still, both Obama and his vice presidential running mate Joe Biden (Democrat of Delaware) continue to speak in support of the agreement.⁹⁰⁷

There was also the concerted effort made by concentrated capital to get congresspersons to support the nuclear deal. Big Business had immediately

⁹⁰⁵ "Senate Oks U.S.-India Nuclear Deal." *USA Today*, October 1 2008.

⁹⁰⁶ "Rice Hails Approval of India Nuclear Deal." (October 2 2008). CNNPolitics.com. Accessed on March 21 2014.

<http://www.cnn.com/2008/POLITICS/10/02/us.india.nuclear/index.html?eref=yahoo>

⁹⁰⁷ Schwartz, Stephen I. "Barack Obama and John McCain on Nuclear Security Issues." (October 6, 2008). James Martin Center for Nonproliferation Studies. Accessed on March 21 2014.

http://cns.miis.edu/stories/080925_obamamacain.htm

recognized the significance of the nuclear deal in alleviating the Cold War-era US-India trust deficit and was well aware of the initiative's potential to pave the way for corporations to access the vast Indian market. Lobbyists believed that defense contracts worth billions of dollars would be up for grabs in a post-nuclear deal scenario due to the increased willingness of a more receptive Indian leadership to buy American weapons.⁹⁰⁸ Recall that Condoleezza Rice had brought up the prospect of thousands of jobs being created in the US out of the export of nuclear reactors to India. Obviously, the export of multiple reactors to the large Indian nuclear market would open up an important new market for the stagnant US nuclear industry resulting in large profits.⁹⁰⁹ Towards this end, a well-organized lobbying campaign was underway in Washington.⁹¹⁰ As Mira Kamdar noted in the *Washington Post*,

the nuclear pact brought together an Indian government that is savvier than ever about playing the Washington game, an Indian American community that is just coming into its own and powerful business interests that see India as perhaps the single biggest money-making opportunity of the 21st century..... The U.S.-India Business Council has

⁹⁰⁸ The Soviet Union and later Russia dominated the Indian defense market for decades with its willingness to provide both weaponry and share technology of a strategic nature.

Harsh V. Pant. "India, Russia Revive a Time-Tested Partnership" *World Politics Review*, October 15 2010. Accessed June 21 2013.

<http://www.worldpoliticsreview.com/articles/6720/india-russia-revive-a-time-tested-partnership>

⁹⁰⁹ More recently, the US Chamber of Commerce estimated that the Indian nuclear market had a total business potential of \$150 billion and the capacity to create 250,000 high-tech American jobs "U.S. Chamber's Mission to India Highlights Opportunities to Increase Exports, Create Jobs." (April 7, 2010). Accessed on March 21 2014. <https://www.uschamber.com/press-release/us-chambers-mission-india-highlights-opportunities-increase-exports-create-jobs>

⁹¹⁰ "Global Regional Practices." (2013). Accessed on June 21 2013.

<http://www.pattonboggs.com/practice/global-regional-practices>.

lavished big money on lobbyists, too. With India slated to spend perhaps \$60 billion over the next few years to boost its military capabilities, major U.S. corporations are hoping that the nuclear agreement will open the door to some extremely lucrative opportunities, including military contracts and deals to help build nuclear power plants. According to a recent MIT study, Lockheed Martin is pushing to land a \$4 billion to \$9 billion contract for more than 120 fighter planes that India plans to buy. "The bounty is enormous," gushed Somers, the business council's president.⁹¹¹

The potent alliance of an Indian American community still retaining links to its country of origin and Big Business determined to clinch the nuclear deal resulted in a willingness among even senior congressmen and senators to appear friendly to USINPAC (US-India Political Action Committee), the front organization for both cohorts.

There are now some 2.2 million Americans of Indian origin -- a number that's growing rapidly..... First-generation immigrants keenly recall the humiliating days when India was dismissed as an overpopulated, socialist haven of poverty and disease. They are thrilled by the new respect India is getting. Meanwhile, a second, American-born generation of Indian Americans who feel comfortable with activism and publicity is just beginning to hit its political stride.....One standout member of the first generation is Sanjay Puri, who founded the U.S. India Political Action

⁹¹¹ Kamdar, Mira. "Forget the Israel Lobby. The Hill's Next Big Player Is Made in India." *Washington Post*, September 30, 2007.

Committee in 2002. (Its acronym, USINPAC, even sounds a bit like AIPAC.).... In just five years, USINPAC has become the most visible face of Indian American lobbying. Its Web site boasts photos of its leaders with President Bush, Senate Majority Leader Harry Reid, and presidential candidates from Fred Thompson to Barack Obama..... "We model ourselves on the Jewish people in the United States," explains Mital Gandhi of USINPAC's new offshoot, the U.S.-India Business Alliance. "We're not quite there yet. But we're getting there."⁹¹²

Fifteen independent analysts weighed in on the potential benefits and/or problems that might result from the nuclear deal in testimonies before the House and the Senate Committees.⁹¹³ Rice's arguments were reinforced by supporters of the deal including Ashley Tellis (Senior Research Associate at the Carnegie Endowment for International Peace),⁹¹⁴ Stephen Cohen (Senior Fellow at Brookings),⁹¹⁵ Richard A. Falkenrath (Stephen and Barbara Friedman Fellow at

⁹¹² Kamdar, Mira. "Forget the Israel Lobby. The Hill's Next Big Player Is Made in India." *Washington Post*, September 30, 2007.

⁹¹³ K. Alan Kronstadt. "India-U.S Relations."

U.S Congressional Research Service, January 30 2009. Accessed on June 20 2013 http://assets.opencrs.com/rpts/RL33529_20090130.pdf p 36

⁹¹⁴ "Prepared Testimony by Ashley J. Tellis Senior Associate Carnegie Endowment for International Peace to the Senate Foreign Relations Committee. U.S.-India Atomic Energy Cooperation: Strategic and Nonproliferation Implications". (April 26 2006). Accessed on June 22 2013. <http://www.foreign.senate.gov/imo/media/doc/TellisTestimony060426.pdf> p 3-7

⁹¹⁵ "Remarks of Dr. Stephen P. Cohen at the Senate Foreign Relations Committee Panel Discussion on the U.S.-India Nuclear Cooperative Initiative". (April 26, 2006). Accessed on June 22 2013. <http://www.foreign.senate.gov/imo/media/doc/CohenTestimony060426.pdf> .p 1

Brookings),⁹¹⁶ William J. Perry (Senior Fellow at the Hoover Institution)⁹¹⁷ and Ronald F. Lehman II (Director, Center for Global Security Research, Lawrence Livermore Laboratory).⁹¹⁸ More reluctant and qualified support was offered by Ashton B. Carter (Co-Director, Preventive Defense Project-John F. Kennedy School of Government).⁹¹⁹

On the other hand, the nuclear deal was resolutely opposed by other experts including Robert J. Einhorn (Senior Adviser, Center for Strategic and International Studies),⁹²⁰ Gary Milhollin (Director, Wisconsin Project on Nuclear Arms Control and Professor Emeritus, University of Wisconsin Law School)⁹²¹ and Robert L. Gallucci (Dean of the Edmund A. Walsh School of Foreign Service at Georgetown University).⁹²² They argued that the hastily conceived initiative

⁹¹⁶ Falkenrath, Richard A. " U.S.-India Global Partnership and the U.S.-Indian Civilian Nuclear Cooperation Initiative" (May 11, 2006). Accessed on June 22 2013.

<http://www.brookings.edu/research/testimony/2006/05/11india-falkenrath> . p 2, 5, 6.

⁹¹⁷ " U.S.-India Atomic Energy Cooperation: Strategic and Nonproliferation Implications a Compilation of Statements by Witnesses before the Committee on Foreign Relations United States Senate One Hundred Ninth Congress Second Session". (April 26, 2006). Accessed on June 23 2013.

<http://www.gpo.gov/fdsys/pkg/CPRT-109SPRT27347/html/CPRT-109SPRT27347.htm>

⁹¹⁸ Ibid

⁹¹⁹ "Hearing on Assessing the India Deal-Testimony before the Committee on Foreign Relations-Ashton B. Carter Co-Director, Preventive Defense Project John F. Kennedy School of Government Harvard University ". (April 26, 2006). Accessed on June 24 2013. <http://www.hks.harvard.edu/news-events/news/testimonies/ashton-carter-testifies-before-the-u.s.-senate-foreign-relations-committee-on-the-recent-nuclear-agreement-between-the-united-states-and-india>

⁹²⁰ "Statement by Robert J. Einhorn Senior Adviser, Center for Strategic and International Studies before the Senate Foreign Relations Committee-the U.S.-India Civil Nuclear Deal." (April 26, 2006). Accessed on June 24 2013. <http://www.foreign.senate.gov/imo/media/doc/EinhornTestimony060426.pdf> .p6

⁹²¹ "Testimony of Gary Milhollin Director, Wisconsin Project on Nuclear Arms Control and Professor Emeritus, University of Wisconsin Law School before the Committee on Foreign Relations United States Senate". (April 26, 2006). Accessed on June 24 2013.

<http://www.foreign.senate.gov/imo/media/doc/MilhollinTestimony060426.pdf> . p2

⁹²² "Testimony of Robert L. Gallucci Dean of the Edmund A. Walsh School of Foreign Service Georgetown University before the Senate Foreign Relations Committee-the Proposed Us - India Nuclear

was offered by the Bush administration to India without thorough consultations with Congress and the substantial number of nuclear reactors on the military side of India's separation plan (including fast breeder reactors) would allow it to produce more fissile material, leading to a possible South Asian arms race.⁹²³

The core argument of the cohort was that the July 2005 joint statement (and the March 2006 separation plan) was a dangerous dilution of NPT norms.⁹²⁴ In particular, Michael Krepon of the Stimson Center argued that the multi-layered fuel-supply assurances given by the Bush administration in the separation plan would lower the threshold for India to conduct a nuclear test and ride out the resulting sanctions by relying on the accumulated fuel inventory.

The key provision that makes another round of Indian testing more likely is a promise of assured fuel supplies to guard against disruption. If implemented, this promise eviscerates the administration's insistence that the deal could collapse if New Delhi were to resume testing, because assured fuel supplies constitutes India's best insurance policy against disruption.⁹²⁵

Deal." (April 26 2006). Accessed on June 24 2013.

<http://www.foreign.senate.gov/imo/media/doc/GullucciTestimony060426.pdf>

⁹²³ "Statement by Robert J. Einhorn Senior Adviser, Center for Strategic and International Studies before the Senate Foreign Relations Committee-the U.S.-India Civil Nuclear Deal." (April 26, 2006). Accessed on June 24 2013. <http://www.foreign.senate.gov/imo/media/doc/EinhornTestimony060426.pdf> .p 1, 4-6.

⁹²⁴ "Testimony of Robert L. Gallucci Dean of the Edmund A. Walsh School of Foreign Service Georgetown University before the Senate Foreign Relations Committee-the Proposed Us - India Nuclear Deal." (April 26 2006). Accessed on June 24 2013.

<http://www.foreign.senate.gov/imo/media/doc/GullucciTestimony060426.pdf> . p 3-4

⁹²⁵ Krepon, Michael. "Betting the Ranch on the Us-India Nuclear Deal " (June 05, 2005). Accessed on March 21 2014. <http://www.stimson.org/essays/betting-the-ranch-on-the-us-india-nuclear-deal/>

The experts differed on the course of action that the US Congress should adopt. One camp suggested that Congress should reject the deal in its current form⁹²⁶ while another urged Congress to balance a lop-sided deal by adding conditions⁹²⁷ that would claw back some of the administration's concessions thereby ensuring the integrity of the non-proliferation regime.⁹²⁸

The House and Senate Committees came up with their versions of the enabling legislation (H.R. 5682 and S. 3709 respectively) in late June.⁹²⁹ The bills approved the administration's request for retroactive waivers for India from the aforementioned provisions of the Atomic Energy Act.⁹³⁰ The approval would allow the Bush administration to negotiate a bilateral nuclear cooperation agreement (123 agreement) with India. However, both versions rejected provisions in the administration's waiver authority bills that sought to minimize the role of Congress by asking it to pre-approve the still-to-be-negotiated nuclear cooperation agreement.⁹³¹ They were clear that any final agreement with India

⁹²⁶"U.S.-India Nuclear Deal Fails Nonproliferation Test." (March 2 2006). Arms Control Association. Accessed on March 21 2014. http://www.armscontrol.org/pressroom/2006/20060302_India_Deal

⁹²⁷"Statement by Robert J. Einhorn Senior Adviser, Center for Strategic and International Studies before the Senate Foreign Relations Committee-the U.S.-India Civil Nuclear Deal." (April 26, 2006). Accessed on June 24 2013. <http://www.foreign.senate.gov/imo/media/doc/EinhornTestimony060426.pdf>

.p 6
⁹²⁸Ibid

⁹²⁹ Parillo, Sharon Squassoni and Jill Marie. "U.S.-India Nuclear Cooperation: A Side-by Side Comparison of Current Legislation (Order Code RL33561) ", September 5, 2006. Accessed on June 4 2013. http://csis.org/files/media/isis/pubs/poni/060905_cooperation_india_comparison.pdf p 1.

⁹³⁰ Ibid

⁹³¹ Oelrich, Ivan. "House Overwhelmingly Approves Path to Nuclear Cooperation with India." (July 28, 2006). Accessed on June 25 2013. http://blogs.fas.org/security/2006/07/house_overwhelmingly_approves/

would have to be brought back by the administration for ratification through a joint resolution of Congress.⁹³²

On June 26, 2006, the House Committee passed its version of the bill (United States and India Nuclear Cooperation Promotion Act of 2006) after some hiccups⁹³³ by an overwhelming 37-5 margin.⁹³⁴ The legislation was authored by Committee Chairman Henry Hyde and Ranking Member Tom Lantos.⁹³⁵ A day later, the Senate Committee approved its version of the enabling legislation (United States-India Peaceful Atomic Energy Cooperation and US Additional Protocol Implementation Act) by a thumping 16-2 margin.⁹³⁶ The bill was

⁹³² Parillo, Sharon Squassoni and Jill Marie. "U.S.-India Nuclear Cooperation: A Side-by Side Comparison of Current Legislation (Order Code RI33561)", September 5, 2006. Accessed on June 4 2013. http://csis.org/files/media/isis/pubs/poni/060905_cooperation_india_comparison.pdf. p 1.
Oelrich, Ivan. "House Overwhelmingly Approves Path to Nuclear Cooperation with India." (July 28, 2006). Accessed on June 25 2013. http://blogs.fas.org/security/2006/07/house_overwhelmingly_approves/

⁹³³ Haniffa, Aziz. "Lantos Suggests Compromise Legislation on N-Deal" (May 12, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/may/12ndeal.htm>

"Onus of Congress Nod to Indo-US Nuke Deal on Bush Admin: India". (May 13, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/may/13ndeal.htm>

Haniffa, Aziz. "Burns Clearing N-Deal Hurdles Ahead of Saran Meet" (May 24, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/may/24ndeal1.htm>

Haniffa, Aziz. "Us Congressman Introduces Bill That May Scuttle N-Deal" (June 21, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/jun/21ndeal.htm>

⁹³⁴ Boese, Wade. "Senate Vote on U.S.-Indian Deal Delayed" *Arms Control Today* October 2006. Accessed on June 26 2013.

http://www.armscontrol.org/act/2006_10/USIndia

Haniffa, Aziz. "Us House Panel Approves N-Deal Bill" (June 28, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/jun/28ndeal1.htm>

"Nuclear Bill Is a Serious Mistake, Warn Critics" (June 28, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/jun/28ndeal2.htm>

⁹³⁵ "India Confident of N-Deal's Successful Passage in US Congress" (June 24, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/jun/24ndeal.htm>

⁹³⁶ Haniffa, Aziz. "US Senate Committee Passes N-Deal Bill" (June 29, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/jun/29ndeal5.htm>

Krishnaswami, Sridhar. "Democrats Willing to Take up N-Deal in Senate" (November 09, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/nov/09ndeal1.htm>

authored by Committee Chairman Richard Lugar and Ranking Democrat (and current Vice-President) Joseph Biden.⁹³⁷

As stated earlier, an important actor lobbying the House and Senate Committees was Big Business including the US Chamber of Commerce, the US-India Business Council and top CEO's. Indian American community leaders and Patton Boggs, a high power lobbying firm hired by the Indian government were also key players.⁹³⁸

.....'unprecedented lobbying efforts' went into the smooth sailing of the legislation through the two panels of the House and Senate.....Those who did their part in lobbying efforts included top executives of JP Morgan Chase & Co, General Electric Co and Boeing Co, testifying to India's political clout.....Senator Barack Obama, a member of the Senate Foreign Relations Committee, said there appears to be a very coordinated effort to have every Indian-American that I know, to contact me before the vote by the Senate panel. Obama, a Democrat from Illinois, said (a) 'prominent investment banker'⁹³⁹ called as well.⁹⁴⁰

However, the concerted lobbying efforts of business groups (and the separate but related arguments advanced by strategic analysts) did not go entirely unopposed. Countervailing pressure was also exerted on Congress by non-

⁹³⁷ "India Confident of N-Deal's Successful Passage in US Congress

". (June 24, 2006). Accessed on June 26 2013. <http://www.rediff.com/news/2006/jun/24ndeal.htm>

⁹³⁸ "Global Regional Practices." (2013), <http://www.pattonboggs.com/practice/global-regional-practices>

⁹³⁹ likely Vikram Pandit, the Indian American CEO of Citibank (2007-2012)

⁹⁴⁰ "N-Deal: What's on Behind the Scenes". (July 25, 2006). Accessed on June 28 2013.

<http://www.rediff.com/news/2006/jul/25ndeal1.htm>

proliferation groups such as the Arms Control Association, determined to ensure that India would not be able to produce more fissile material by using imported nuclear fuel for its civilian program and diverting domestic uranium stocks to the military side.⁹⁴¹ Their concerns were shared by some in Congress.⁹⁴² Some members of Congress were also concerned about perceived military ties between India and Iran and India's lukewarm attitude towards the American position that Iran's perceived attempt to acquire nuclear weapons was an imminent threat. They were determined to bring India's foreign policy on Iran in line with that of the US by linking it to civil nuclear cooperation.

The aforementioned factors resulted in the addition of several conditions to the Committee bills. Clause D of Section 2 (Sense of Congress) of the House Committee bill (H.R. 5682) passed on June 27 2006 by the HIRC with a thumping 37-5 margin conditioned nuclear cooperation with India on its willingness to give greater

political and material support to the achievement of United States global and regional nonproliferation objectives, especially with respect to dissuading, isolating, and, if necessary, sanctioning and containing states

⁹⁴¹ "The U.S-India Nuclear Deal: A Critical Assessment Prepared Remarks of Daryl G. Kimball." (February 15, 2006). Accessed on June 28 2013.

http://www.armscontrol.org/events/20060215_Kimball_Prepared_Remarks

⁹⁴² Lobe, Jim. "US Critics Question Nuclear Pact with India" (March 4, 2006). Accessed on June 28 2013.

<http://www.antiwar.com/lobe/?articleid=8660>

Shankar Thom. "Nuclear Deal with India Wins Senate Backing " *New York Times*, November 17, 2006.

http://www.nytimes.com/2006/11/17/washington/17nuke.html?_r=0

Leaver, Shehzad Nadeem. Edited by Erik. "The Regional Implications of the U.S.-India Nuclear Agreement" *Foreign Policy in Focus* April 28, 2006. Accessed on June 28 2013.

http://www.fpif.org/articles/the_regional_implications_of_the_us-india_nuclear_agreement

that sponsor terrorism and terrorist groups, that are seeking to acquire a nuclear weapons capability or other weapons of mass destruction capability and the means to deliver such weapons.....⁹⁴³

Although Section 2 was the “non-binding” part of the bill, it was clear that India was being expected to realign its foreign policy on Iran in exchange for nuclear cooperation.⁹⁴⁴ Clause 4 of Section 3b (Statements of Policy) left no room for doubt by reiterating the American objective to

secure India’s full and active participation in United States efforts to dissuade, isolate, and, if necessary, sanction and contain Iran for its efforts to acquire weapons of mass destruction.⁹⁴⁵

Further, Clause 1 of Section 3b reiterated the long-standing US non-proliferation policy goal towards South Asia, an achievement of a moratorium on the production of fissile material by India, Pakistan and China at the earliest possible date.⁹⁴⁶ Section 3b (2) asked India to help the US expeditiously negotiate a Fissile Material Cut-off Treaty (FMCT).

Clause 3 demanded India’s full participation in the Proliferation Security Initiative (PSI).⁹⁴⁷ Clause 1 of Section 4(o) (Waiver Authority and Congressional

⁹⁴³ "Union Calendar No. 341-109th Congress 2d Session H. R. 5682

[Report No. 109–590, Part I]." (JUNE 26, 2006). Accessed on June 28 2013.

<http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682rh/pdf/BILLS-109hr5682rh.pdf> .p4

⁹⁴⁴Boese, Wade. "U.S.-Indian Nuclear Deal Advances." *Arms Control Today*, September 2007. Accessed on June 29 2013.

http://www.armscontrol.org/act/2007_09/USIndia

⁹⁴⁵"Union Calendar No. 341-109th Congress 2d Session H. R. 5682

[Report No. 109–590, Part I]." (JUNE 26, 2006). Accessed on June 28 2013.

<http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682rh/pdf/BILLS-109hr5682rh.pdf> .p 7

⁹⁴⁶ Ibid. p 6

⁹⁴⁷ Ibid. p 6

Approval) enjoined the US President to annually certify whether India was meeting the policy prescriptions specified by Congress in Section 3(b) and made continued US nuclear cooperation with India contingent on a positive certification. Section 102 (6) of the Senate Committee bill (S.3709) passed by the SFRC on June 29 2006 with a comprehensive 16-2 margin was clear that the

United States should not seek to facilitate or encourage the continuation of nuclear exports to India by any other party if such exports are terminated under United States law.⁹⁴⁸

The message to India was that it should not expect to test a nuclear weapon and attempt to work around US abrogation of the nuclear deal by holding American allies like the UK, France and Japan to their fuel supply commitments under other nuclear cooperation agreements bound to follow the US-India nuclear deal.

Further, Section 103 (1) (Declaration of Policy) of the Senate Committee bill explained the US non-proliferation policy towards South Asia that sought to quickly achieve the cessation of fissile material production by India and Pakistan.⁹⁴⁹ Clause 7 reinforced the US policy of working with members of the Nuclear Supplier's Group (NSG) to further restrict the transfers of enrichment and reprocessing technologies to India.⁹⁵⁰ Section 108(b)(4) enjoined the US President

⁹⁴⁸ "Calendar No. 527 109th Congress 2d Session S. 3709 [Report No. 109-288] ". (JULY 20, 2006). Accessed on June 28 2013. <http://www.gpo.gov/fdsys/pkg/BILLS-109s3709pcs/pdf/BILLS-109s3709pcs.pdf> . p 3

⁹⁴⁹ "Calendar No. 527 109th Congress 2d Session S. 3709 [Report No. 109-288] ". (JULY 20, 2006). Accessed on June 28 2013. <http://www.gpo.gov/fdsys/pkg/BILLS-109s3709pcs/pdf/BILLS-109s3709pcs.pdf> . p 3

⁹⁵⁰ Ibid. p 5

to annually certify that India was in compliance with the conditions stipulated in the Senate Committee bill.⁹⁵¹ Finally, Section 110 was categorical that

any waiver under section 104 shall cease to be effective if the President determines that India has detonated a nuclear explosive device after the date of the enactment of this Act.⁹⁵²

Simply put, an Indian nuclear test in the future would result in an immediate termination of the US-India nuclear deal, including the American fuel supply to the reactors that India would import.

Reactions of retired nuclear scientists in India to the evolving US domestic legislation

The conditions in the Committee bills immediately elicited strong protests from three retired nuclear scientists in India. The trio was particularly upset by the restrictions on the Indian nuclear weapons program (especially Clause 1 of Section 3b and Section 3b (2) of the House Committee bill and Section 103 (1) and Section 102 (6) of the Senate Committee bill).

I begin by summarizing the positions adopted by the trio on the joint statement and then describe their initial positions and final stance on the separation plan in order to provide the background to understand their reactions to the House and Senate Committee bills. I will deal with the reactions of the two top serving scientists (Dr. Anil Kakodkar- Chairman of the Atomic Energy

⁹⁵¹ Ibid. p 18

⁹⁵² Ibid. p 21

Commission and Dr. R Chidambaram-Principal Scientific Adviser to the Government of India) to the evolving US domestic legislation later in the chapter.

Former Chairman of the Atomic Energy Commission (AEC)- Dr. P. K. Iyengar

A key retired scientist opposed to the aforementioned provisions in the evolving US domestic legislation was Dr. P. K. Iyengar (hereafter referred to as “Iyengar”), a veteran with forty years of experience in the Indian nuclear program and “one of the main scientists behind the actual manufacture of the atomic device which put India on the nuclear map with Pokhran I on May 18, 1974.”⁹⁵³ Iyengar served as the Director of the Bhabha Atomic Research Center (BARC) in 1984 and was appointed as the Chairman of the Atomic Energy Commission in 1990.⁹⁵⁴

Iyengar’s first response to the July 2005 joint statement was lukewarm and he expressed skepticism regarding the ability of the Bush administration to implement its promise of restoring nuclear cooperation with India.

Former AEC (Atomic Energy Commission) chairman P K Iyengar said there was nothing "concrete" in the Bush-Singh joint statement that calls for immediate celebration."All that President (George W) Bush has said is that he will try to get the domestic laws changed to allow sale of fuel and materials for India's civil nuclear programme and that he will talk to

⁹⁵³"Honorary Fellows-Dr. P.K. Iyengar." (October 20 2012). Accessed on June 29 2013.
<http://keralaacademyofsciences.net/Iyengar.php>

⁹⁵⁴"Honorary Fellows-Dr. P.K. Iyengar." (October 20 2012). Accessed on June 29 2013.
<http://keralaacademyofsciences.net/Iyengar.php>

his friends and allies in the NSG (Nuclear Suppliers Group) about relaxing the guidelines," Iyengar said, adding "this is all good but one has to wait and see if and when these promises are implemented."⁹⁵⁵

He was also concerned about India's key commitment under the nascent nuclear deal, a pledge to come up with a separation plan that would erect a firewall between its civilian and military facilities and place the former under permanent IAEA safeguards. Iyengar worried that

the demarcation between civilian and military facilities is no easy task, and is fraught with serious consequences. "We have to consider whether the agreement adversely impacts on the cost-effectiveness of our programme, our ability to do r&d (research and development) in the weapons' field and the production facilities which are needed for our nuclear arsenal."⁹⁵⁶

Former Director of the Bhabha Atomic Research Center (BARC)-Dr. A. N. Prasad

Dr. A. N. Prasad (hereafter referred to as "Prasad"), former Director of the Bhabha Atomic Research Center (1993-1996) also took aim at the provisions in the US domestic legislation. Prasad earned his Master's degree in nuclear power engineering from the Indian Institute of Science at Bangalore. He later went on to

⁹⁵⁵ "Nuclear Experts Give Guarded Response to Indo-U.S. Pact". *Outlook*, July 20, 2005. <http://news.outlookindia.com/items.aspx?artid=311619>

⁹⁵⁶ Sudarshan, V. "It Can Lead to a Lot of Fission" *Outlook*, August 1 2005. <http://www.outlookindia.com/printarticle.aspx?228079>

study nuclear chemical engineering at the Oak Ridge School of Reactor Technology in the US.⁹⁵⁷

Prasad joined the Department of Atomic Energy's (DAE) reprocessing group in 1959⁹⁵⁸ and played a key role in commissioning India's first fuel reprocessing plant at Trombay in 1964 giving India the capability to separate plutonium from the spent fuel outputted by reactors (a capability it would later use to explode its first nuclear bomb in 1974 by extracting plutonium from the spent fuel produced by the CIRUS research reactor). He specialized in the back-end of the nuclear fuel cycle during his years in the nuclear establishment and also served as the expert member of the Standing Advisory Group on Safeguards Implementation at the IAEA from 1988 to 1996. Prasad who had a reputation as an expert on the issue of safeguards, retired in 1996 and settled in Bangalore after another stint at the IAEA.⁹⁵⁹ He spoke to the press on the eve of the Prime Minister's visit to Washington in July 2005 to negotiate the joint statement and cautioned that

given the "small scale of the military activities involved," dedicating reactors for a single purpose "is not only impractical but also not cost effective." Any change in U.S. policy on the nuclear supplies front should be "carefully assessed to see if there are any unacceptable

⁹⁵⁷ Prasad, Dr A N. "National Interest Is at Stake" (December 26, 2005). Accessed on June 30 2013. <http://www.rediff.com/news/2005/dec/26inter.htm>

⁹⁵⁸Varadarajan, Siddharth. "Dr. A.N. Prasad on the Indo-U.S. Nuclear Deal." (July 18 2007). Accessed on July 1 2013. <http://svaradarajan.blogspot.com/2007/07/dr-prasad-on-indo-us-nuclear-deal.html>

⁹⁵⁹ Prasad, Dr A N. "National Interest Is at Stake" (December 26, 2005). Accessed on June 30 2013. <http://www.rediff.com/news/2005/dec/26inter.htm>

conditions." At no point should India "compromise the basic inherent strength so relentlessly built over the years under heavy odds."⁹⁶⁰

He also warned the UPA government in the days following the joint statement that the separation of India's nuclear program would not be possible and economical due to its inter-linked nature and the use of certain nuclear facilities for both civilian and military purposes.⁹⁶¹

Both Iyengar and Prasad played an important role (along with other retired scientists working anonymously behind the scenes) in pressuring and supporting Kakodkar in his attempts to keep the breeder reactors outside safeguards in early February of 2006.

Top nuclear scientists and experts have come out in full support of Atomic Energy Commission(AEC) chief Anil Kakodkar's stand that putting the fast breeder reactor programme under IAEA safeguards will jeopardise the country's strategic interests. Backing Kakodkar, P K Iyengar, former AEC Chairman, asked "why this government is backing on its words? We are a nuclear weapon country and it is for us to decide (on which reactors to put under IAEA safeguards)..... As a weapon state, and a non-signatory to NPT, "we should be able to decide as to what we want to emphasise as our priorities and a collective wisdom will help the

⁹⁶⁰ Varadarajan, Siddharth. "Nuclear Cooperation with U.S.: Experts Urge Caution" *The Hindu*, July 18, 2005.

<http://www.hindu.com/2005/07/18/stories/2005071805001100.htm>

⁹⁶¹Varadarajan, Siddharth. "Nuclear Cooperation with U.S.: Experts Urge Caution" *The Hindu*, July 18, 2005.

<http://www.hindu.com/2005/07/18/stories/2005071805001100.htm>

Sudarshan, V. "It Can Lead to a Lot of Fission" *Outlook*, August 1 2005.

<http://www.outlookindia.com/printarticle.aspx?228079>

government also," former Director of Bhabha Atomic Research Centre A
N Prasad said.⁹⁶²

Former Chairman of the Atomic Energy Regulatory Board (AERB)- Dr. A. Gopalakrishnan

A third retired scientist who also came out against the clauses in the nascent US domestic legislation was Dr. A. Gopalakrishnan. He held a doctorate in Nuclear Engineering from the University of California, Berkeley. Gopalakrishnan had served in senior research and managerial positions for twenty years at the Argonne National Laboratory, the Electric Power Research Institute and the University of California, Berkeley. He also held senior managerial positions at the Bharat Heavy Electricals Limited (BHEL), a major Indian power sector manufacturing corporation, and served as the Director of the Central Mechanical Engineering Research Institute (CMERI). Gopalakrishnan is known for his tenure as Chairman of the Atomic Energy Regulatory Board (AERB) (1993-1996), a watchdog bureaucracy ostensibly set up to monitor the safety of India's nuclear installations but beholden to the entity (Department of Atomic Energy-DAE) that it was supposed to regulate due to structural reasons.⁹⁶³ ⁹⁶⁴ He

⁹⁶² "US Wants to Block India's Indigenous Nuclear-Programme". *The Times of India*, Feb 9, 2006. http://articles.timesofindia.indiatimes.com/2006-02-09/india/27827273_1_anil-kakodkar-safeguards-breeder-reactor-programme

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Rao, V.S. "Who We Are the Editorial Advisory Committee. Accessed on June 30 2013", <http://energy-dialogue.org/about-who-we-are.php>

⁹⁶⁴ "In November 1983, the AERB (Atomic Energy Regulatory Board) of the Government of India was set up through an executive order of the secretary of DAE (Department of Atomic Energy). The AERB's original charter was to oversee and enforce safety in all nuclear operations, including those within the DAE and also those among the national industrial and medical users of radiation. This was modified in April 2000 to exclude all Bhabha Atomic Research Center (BARC) facilities from AERB's oversight which followed the declaration of BARC as a nuclear weapons laboratory. The AERB chairman reports to the

also served as a Visiting Senior Research Fellow in the Kennedy School of Government at Harvard University (2000-2003) dealing with Energy Policy and Non-proliferation issues.⁹⁶⁵

Gopalakrishnan also joined Iyengar and Prasad in expressing reservations about the prospect of India going in for full scale nuclear cooperation with the US ahead of the Prime Minister's visit to the US to sign the joint statement. He acknowledged that India was short of uranium⁹⁶⁶ but demanded that the UPA government restrict itself to asking the US to carve out a onetime exception on India's behalf by lobbying the Nuclear Supplier's Group (NSG) to resume the sale of natural uranium for India's indigenous reactors.⁹⁶⁷ India would initially buy

Atomic Energy Commission (AEC), which is also headed by the secretary of DAE who has ultimate responsibility for the DAE installations. The chairman of the NPCIL (Nuclear Power Corporation of India Limited) is also a member of the AEC thereby indirectly exercising administrative powers over the AERB, which is supposed to independently enforce safety in the NPCIL plants. In addition, the AERB has very few qualified staff of its own, and about 95% of the technical personnel in AERB safety committees are officials of the DAE whose services are made available on a case-to-case basis for conducting the reviews of their own installations. The perception is that such dependency could be easily exploited by the DAE management to influence the AERB's evaluations and decisions."

Gopalakrishnan., A. "Evolution of the Indian Nuclear Power Program. ." *Annual Review of Energy and the Environment* 27 (November 2002.): p 385.

⁹⁶⁵Rao, V.S. "Who We Are the Editorial Advisory Committee. Accessed on June 30 2013", <http://energy-dialogue.org/about-who-we-are.php>

⁹⁶⁶ India had meager natural uranium deposits since the inception of its nuclear program and the fuel-constraint was exacerbated due to the international fuel embargo following the 1974 nuclear test and the Department of Atomic Energy's (DAE) inability to mine in certain regions due to tribal and environmental opposition. As of 2006, India was extracting its modest uranium reserves from mines near Jaduguda (2500t/day), Turamdih (3000t/day, expanding to 4500t/day) and Tummalapalle. The Jaduguda ore is of poor quality with a grade of just 0.05-0.6%U.

"Nuclear Power in India

". (March 19 2014). World Nuclear Association. Accessed on March 21 2014. <http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/India/>

⁹⁶⁷ Varadarajan, Siddharth. "Nuclear Cooperation with U.S.: Experts Urge Caution" *The Hindu*, July 18, 2005.

<http://www.hindu.com/2005/07/18/stories/2005071805001100.htm>

natural uranium fuel for 5000 MWe of Pressurized Heavy Water Reactors (PHWR's) for the duration of their lifetime.⁹⁶⁸

Thus, the scope envisioned by Gopalakrishnan for US-India nuclear cooperation before the July 2005 joint statement was rather narrow. The US would allow India to procure natural uranium for its fuel-constrained indigenous reactors thereby enabling the latter to proceed with the three-stage program. Gopalakrishnan was against a broader nuclear deal that would require India to import American Light Water Reactors (LWR's) to augment the Indian nuclear program based primarily on Pressurized Heavy Water Reactors (PHWR's).

Gopalakrishnan was of the opinion that the US was not in a position to offer India anything technologically significant.⁹⁶⁹ He was also miffed at the Prime Minister's Office (PMO) and the Ministry of External Affairs (MEA) for not consulting the retired scientists on the nuclear deal before and after the announcement of the joint statement.

Laments former chairman of the Atomic Energy Regulatory Board A. Gopalakrishnan, "The way we are going about it, having no consultations with the scientific community, is a problem. What efforts have the PMO (Prime Minister's Office) or the MEA (Ministry of External Affairs)

⁹⁶⁸ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 4

⁹⁶⁹ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 3

undertaken, even like having a two-day workshop to discuss the topic?"⁹⁷⁰

Further, Gopalakrishnan was the only scientist among the trio who supported the feasibility of separating India's nuclear program right from the outset, bringing to the fore the long simmering difference of opinion between civilian scientists such as himself and weapons scientists including Iyengar and Prasad on the core mission of the nuclear program.

The weapons scientists claim that the military and civilian nuclear facilities cannot be delineated separately. This is blatantly wrong, based on what was already done during the Vajpayee government's tenure. The DAE (Department of Atomic Energy) themselves have done it in 2000, when they wanted to avoid any independent safety regulation of the AERB (Atomic Energy Regulatory Board) on the weapons activities, and there was a Gazette Notification issued in this regard in July 2000. If the DAE could do it then under the previous government, what is the problem in merely updating that exercise in 2005? Every scientist in the DAE system must remain conscious that India's nuclear program and the DAE itself were not created for conducting nuclear weapons development.....The primary purpose of a nuclear program in this developing country, run at an enormous expenditure to the taxpayer, is to provide nuclear electricity and other civilian benefits to all of us. Somewhere along the road, in mid-1960's, the nuclear weapon scientists

⁹⁷⁰ Sudarshan, V. "It Can Lead to a Lot of Fission" *Outlook*, August 1 2005.
<http://www.outlookindia.com/printarticle.aspx?228079>

succeeded in relegating this main objective to a lower priority and instead elevated weapon development as DAE's prestigious, but unspoken, first task.⁹⁷¹

The concessions made by the US in the separation plan and its limited mandate that avoided key issues such as nuclear testing, right to reprocess US-origin spent fuel in an indigenous reprocessing facility, fissile material production and the Fissile Material Cut-off Treaty, the Proliferation Security Initiative (PSI) and access to American enrichment and reprocessing technologies resulted in the trio's support for the final plan despite initial reservations in the case of Iyengar and Prasad.⁹⁷² Iyengar even echoed Atomic Energy Commission Chairman Anil Kakodkar's sentiments⁹⁷³ that the separation plan would not affect India's civilian or military nuclear program.

The Indo-American nuclear deal will not have any adverse impact either on indigenous atomic research or the country's weapons programme, Chairman of the Atomic Energy Commission Anil Kakodkar assured Friday. Kakodkar's optimism on the deal announced Thursday has been shared by almost the entire nuclear establishment, including former AEC chairman P K Iyengar who had been worried about the possible adverse

⁹⁷¹ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 21

⁹⁷² "Indian Nuclear Scientists Welcome Nuke Deal". (March 03, 2006). Accessed on July 1 2013.
<http://www.rediff.com/news/2006/mar/03bush29.htm>

P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 70, 71

⁹⁷³ Sudarshan, V. "Fusion Material " (March 2006).
<http://m.outlookindia.com/story.aspx/?sid=4&aid=230510>

fallout on indigenous research and development in atomic energy..... "I have no objection to this deal as we are not losing anything," Iyengar told PTI (Press Trust of India).⁹⁷⁴

It was in this context that the House and the Senate Committee bills with their respective conditions on the aforementioned sensitive issues skirted by the separation plan made their way out of the US Congress. Although Iyengar, Prasad and Gopalakrishnan were not unaware of the prospect of the US Congress attaching conditions to its waiver bills that would streamline the concessions in the separation plan, they still expected that Congress would adhere to the spirit of “full” civil nuclear cooperation enshrined in the joint statement and codified in the separation plan. They were not prepared for the residual compulsions among congressmen and senators to further US non-proliferation interests despite being in favor of a geopolitically significant and politically lucrative US-India nuclear deal.

Former Chairman of the Atomic Energy Commission- Dr. P. K. Iyengar

Iyengar had supported the separation plan in March 2006 but now fumed at the conditions on the Indian nuclear weapons program in Section 3 (the non-binding Statements of Policy section) of the House Committee bill released on June 26 2006. In particular, Section 3b stipulated that

⁹⁷⁴ "Indian Nuclear Scientists Welcome Nuke Deal". (March 03, 2006). Accessed on July 1 2013. <http://www.rediff.com/news/2006/mar/03bush29.htm>

the following shall be the policies of the United States with respect to South Asia: (1) Achieve a moratorium on the production of fissile material for nuclear explosive purposes by India, Pakistan, and the People's Republic of China at the earliest possible date. (2) Achieve, at the earliest possible date, the conclusion and implementation of a treaty banning the production of fissile material for nuclear weapons to which both the United States and India become parties and....(5) Seek to halt the increase of nuclear weapon arsenals in South Asia, and to promote their reduction and eventual elimination.⁹⁷⁵

Iyengar reckoned that Section 3 of the House Committee bill would cripple the civilian and military components of the Indian nuclear program by destroying its ability to conduct indigenous research and capping the number of nuclear weapons that India could build.

One gets the feeling that these additions to the agreement of 18 July 2005, will, in effect have the following fall-outs (a) Cap our strategic programme for a credible minimum deterrent; (b) Information on almost all activities on nuclear science and technology, related to basic research or technical development, will be available to the US (c) India will essentially forgo its sovereign right to develop modern science and cutting-edge technology in areas of nuclear science, strategic devices like nuclear explosives and missiles, and innovations that can have

⁹⁷⁵"H. R. 5682 ". (June 26 2006), 109th Congress, 2nd session. Accessed on March 21 2014. <http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682ih/pdf/BILLS-109hr5682ih.pdf> .p4-7

implications on the use of thorium, and in space technology, etc.....⁹⁷⁶

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Former Director of the Bhabha Atomic Research Center (BARC)-Dr. A. N. Prasad

Section 3(b) of the House Committee bill also led Prasad to move away from his reluctant support for the nuclear deal previously based on an accommodative separation plan.

It calls for India, Pakistan and China declaring a moratorium on the production of fissile material for nuclear explosive purposes. If India were to agree to this it will be at a disadvantage *vis-a-vis* China in terms of stockpile and not serve national strategic interests. Similarly, the bill talks about implementation of a treaty with the US as a partner banning the production of fissile material for nuclear weapons. This is a big joke. While the US suffers from indigestion with excess fissile material, not knowing what to do with it, it wants India to prematurely shut shop.

⁹⁷⁶ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. p 111

⁹⁷⁷ Iyengar continued his diatribe against the US waiver legislation in a telephone interview with me. He was particularly incensed by the continuation of technology denial regimes on India in areas such as enrichment and reprocessing. Iyengar pointed out that such restriction went against the spirit of the July 18 2005 joint statement that promised “full” civil nuclear cooperation. The veteran scientist also expressed unease at the Iran-related provisions in the House Committee bill.

“And even though, it (House Committee bill) can authorize the President to treat India in a different style, by allowing trade, it put restrictions on transfer of technology, as well as co-operation in areas such as reprocessing and heavy water production..... the United States was using this deal in order to strengthen the non-proliferation objectives as demanded by the hawks....rather than an openness to co-operate in increasing nuclear power in India..... You say this isn’t concerned with foreign affairs...But at the same time Iran enters there...it is clear that the United States would like India, its foreign policy to be tailored and be following the trail of what the Americans want.”

Personal interview with Dr. P. K. Iyengar. January 25 2010.

What a nice way to cap India's nuclear programme before it has even properly taken off!⁹⁷⁸

Former Chairman of the Atomic Energy Regulatory Board-Dr. A. Gopalakrishnan

The clauses in the Committee bills also significantly diluted Gopalakrishnan's post-separation plan enthusiasm for the nuclear deal. He was particularly worried about Section 110 of the Senate Committee bill that called for US termination of a nuclear agreement with India in case the President determined that India had exploded a nuclear device. Gopalakrishnan warned that Section 110 would convert India's post-1998 unilateral moratorium on nuclear testing into a bilateral binding commitment. The most interesting aspect of Gopalakrishnan's critique was his highlighting of the narrow quantitative definition of a nuclear explosive device specified in the bill. Clause 10 of Section 110 defined a nuclear explosive device as

any device designed to produce an instantaneous release of an amount of nuclear energy from special nuclear material that is greater than the amount of energy that would be released from the detonation of one pound of trinitrotoluene (TNT).⁹⁷⁹

⁹⁷⁸ Prasad, Dr A N. "Why Indian Scientists Are Upset About the Nuclear Deal" (June 29, 2006). Accessed on July 6 2013. <http://www.rediff.com/news/2006/jun/29anp.htm>
P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 102-103

⁹⁷⁹ "Henry J. Hyde United States-India Peaceful Atomic Energy Cooperation Act of 2006." (June 2006). 109th Congress. Accessed on March 21 2014. <http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682enr/pdf/BILLS-109hr5682enr.pdf> .p 15

The outspoken scientist worried that such a constricting definition would prevent India from conducting low yield hydronuclear tests to verify the reliability and safety of its arsenal. Overall, Gopalakrishnan's position was that the US was not only trying to make it impossible for India to conduct further underground tests by predicating continued nuclear cooperation on India refraining from testing, but was also preventing India from conducting much smaller hydronuclear tests.

As expected, the US Congress has ignored India's voluntary moratorium on nuclear weapon testing, and asserts in Section 110 of the Senate Bill that nuclear cooperation will cease if the President determines at any time that India has detonated a "nuclear explosive device." Interestingly, the Senate Bill is explicit in quantitatively defining a nuclear explosive device as any device designed to produce the instantaneous release of an amount of nuclear energy that is greater than the amount of energy that would be released from the detonation of one pound of trinitrotoluene (TNT)..... In the absence of full-scale explosive tests, countries will have the alternative of conducting one or both of two classes of lower-yield tests. In the so-called "sub-critical" tests, no critical mass is formed during implosion and no self-sustaining chain reaction occurs. The nuclear energy release will be negligibly low and, according to US interpretation, the Comprehensive Test Ban Treaty (CTBT) will not be violated if such tests are done. In a "hydronuclear" test, however, the implosion causes a supercritical mass to be formed for an

extremely small time interval, but not maintained long enough to permit the device to deliver full explosive nuclear yield. During the CTBT discussions, both the US and UK governments had insisted on retaining the flexibility to conduct hydronuclear tests with nuclear yields up to four pounds of TNT equivalent, but under the current deal, the US wants to restrict India to a one-pound TNT limit, just one-quarter of the level which they themselves considered as essential minimum. This would make it extremely difficult, almost impossible, for India to conduct meaningful hydronuclear tests for verifying the safety and reliability of our existing nuclear arsenal or for modifying or compacting the present warheads.⁹⁸⁰

Three retired nuclear scientists in India were consistently critiquing the House and the Senate Committee bills as of June 2006 even as a convoluted process awaited the bills in the US Congress. Both versions would have to secure majorities in their respective chambers of Congress, the House of Representatives and the Senate. They would then be reconciled by a Conference Committee. The reconciled bill would have to be approved by the House and Senate again, this time with an up or down vote without the ability to offer amendments. The final product would end up on the President's desk for signature into law.

The House took up its Committee bill and passed the Henry J. Hyde United States and India Nuclear Cooperation Promotion Act of 2006 (H.R. 5682)

⁹⁸⁰ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 123-124

by an overwhelming 359-68 margin on July 26, 2006.⁹⁸¹ ⁹⁸² The Act retained many of the provisions in the House Committee bill (the stipulation that India cooperate with the US to dissuade Iran from building nuclear weapons, clauses enjoining India to stop fissile material production, calls for India to help expeditiously negotiate the Fissile Material Cut-off Treaty (FMCT) and join various non-proliferation groupings including the Proliferation Security Initiative (PSI), the Australia Group (which aims to achieve export controls harmonization to prevent chemical or biological weapons proliferation) and the Wassenaar Arrangement (export controls for conventional arms and dual use goods and technologies)).⁹⁸³

As stated earlier, the perceived restrictions on the Indian nuclear program in the Committee bills had already created a furor in India with three prominent retired scientists coming out against the conditions. That the views espoused by Iyengar, Prasad and Gopalakrishnan were widely shared by other retired nuclear scientists became clear from their concerted response to the bill passed by the House.⁹⁸⁴

⁹⁸¹ Haniffa, Aziz. "House of Representatives Passes Nuclear Bill 359-68" (July 27, 2006). Accessed on July 6 2013. <http://www.rediff.com/news/2006/jul/27ndeal5.htm>

⁹⁸² The bill stipulated "that Washington will cooperate with New Delhi on nuclear issues and exempt it from signing the Nuclear Nonproliferation Treaty." 219 Republicans voted in favor of the bill and only 9 opposed it while 58 Democrats supported the initiative and 140 opposed it. Chronology of the Indo-US nuclear deal, in *Times of India* October 9 2008. <http://timesofindia.indiatimes.com/World/US/Chronology-of-the-Indo-US-nuclear-deal/articleshow/3575350.cms>

Haniffa, Aziz. "House of Representatives Passes Nuclear Bill 359-68" (July 27, 2006). Accessed on July 6 2013. <http://www.rediff.com/news/2006/jul/27ndeal5.htm>

Haniffa, Aziz. "How the Vote Went " (July 27, 2006). Accessed on July 6 2013. <http://www.rediff.com/news/2006/jul/27ndeal7.htm>

⁹⁸³ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 131

⁹⁸⁴ M. R. Srinivasan, one of the retired scientists was the member of the National Security Advisory Board (2006-2008)

Retired nuclear scientists- The 8 horsemen.

On August 14 2006, 8 retired nuclear scientists signed an open letter to the Indian Parliament. The retirees began by reaffirming their support for the fundamental bargain underlying the nuclear deal in the July 18 2005 joint statement. They warned that the House bill and the Senate Committee bill (the Senate passed the House bill-H.R. 5682 substituting the text of its own bill-S. 3709 as an engrossed amendment) had significantly deviated from the joint statement's promise of "full" civil nuclear cooperation on equal terms. The retirees were also categorical that the final legislation likely to emerge out of the US Congress would be unacceptable to India unless the Indian Parliament intervened at the earliest and sent a strong message that the retention of the 'problem' provisions would be a 'deal-breaker.' The signatories to the open letter included Dr. H. N. Sethna (former Chairman, Atomic Energy Commission), Dr. M. R. Srinivasan (former Chairman Atomic Energy Commission), Iyengar, Gopalakrishnan, Prasad, Dr. S. L. Kati (former Managing Director, Nuclear Power Corporation), Dr. Y. S. R. Prasad (former Chairman and Managing Director, Nuclear Power Corporation) and Dr. Placid Rodriguez, (former Director, Indira Gandhi Center for Atomic Research (IGCAR). The octogenarian Sethna was the most senior member of the cohort.

It is significant that the most advanced country in nuclear science and technology has come forward to accept us into the international nuclear

"Indian National Academy of Engineering- Lifetime Contribution Award in Engineering 2010- Dr. M. R. Srinivasan." Accessed on July 6 2013. <http://www.inae.in/contents/awards/M.R.%20Srinivasan.pdf>

community, by the historic document signed by our prime minister with president Bush on July 18, 2005...However, the lawmakers of the US Congress have modified, both in letter and spirit, the implementation of such an agreement....it is essential that we insist on the following four central themes:

- a. India should continue to be able to hold on to her nuclear option as a strategic requirement in the real world that we live in, and in the ever-changing complexity of the international political system. This means that we cannot accede to any restraint in perpetuity on our freedom of action.
- b. After 1974, when the major powers discontinued cooperation with us, we have built up our capability in many sensitive technological areas, which need not and should not now be subjected to external control. Safeguards are understandable where external assistance for nuclear materials or technologies are involved.
- c. We find that the Indo-US deal, in the form approved by the US House of Representatives, infringes on our independence for carrying out indigenous research and development (R&D) in nuclear science and technology. Our R&D should not be hampered by external supervision or control, or by the need to satisfy any international body.... While the sequence of actions to implement the cooperation could be left for discussion between the two governments, the basic principles on which such actions will rest is the right of Parliament and the people to decide.

The prime minister has already taken up with President George Bush the issue of the new clauses recommended by the US House of Representatives. If the US Congress, in its wisdom, passes the bill in its present form, the 'product' will become unacceptable to India, and, diplomatically, it will be very difficult to change it later. Hence it is important for our Parliament to work out, and insist on, the ground rules for the nuclear deal, at this stage itself.

- d.We therefore request you, the parliamentarians, to discuss this deal and arrive at a unanimous decision....⁹⁸⁵

⁹⁸⁵ "Nuclear Scientists' Appeal to Parliamentarians." *People's Democracy* Vol. XXX no. No. 34 (August 20, 2006). Accessed on July 9 2013
http://pd.cpim.org/2006/0820/08202006_nuclear%20scientists.htm

"Indo-US Nuclear Deal Infringes on Our Independence". (August 14, 2006). Accessed on July 9 2013
<http://www.rediff.com/news/2006/aug/14ndeal.htm>

"Indian Nuclear Scientists Unhappy with N-Bill Passage". (July 27, 2006). Accessed on July 9 2013. <http://www.rediff.com/news/2006/jul/27ndeal11.htm>



Figure 15:The retired scientists (from the left: Dr. H. N. Sethna, Dr. P. K. Iyengar, Dr. A Gopalakrishnan, Dr. Placid Rodriguez, Dr. M. R. Srinivasan, Dr. A. N. Prasad, Dr. Y. S. R. Prasad and Dr. S. L. Kati)

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Mathew, Roy. "Dr. P. K. Iyengar — Probing Atoms with a Nobel Laureate" *The Hindu*, December 22, 2011.

<http://www.thehindu.com/sci-tech/science/dr-p-k-iyengar-probing-atoms-with-a-nobel-laureate/article2737795.ece>

Reporter, Staff. "Homi Sethna Passes Away" *The Hindu*, September 7, 2010.

<http://www.thehindu.com/news/national/homi-sethna-passes-away/article617648.ece>
Laxman, Srinivas. "Dr. A.N.Prasad Discusses Clean Waiver U-Turn by Nuclear Suppliers Group" (July 25, 2011). Accessed on July 9 2013. <http://www.asianscientist.com/topnews/barc-director-aec-a-n-prasad-discusses-clean-waiver-u-turn-nuclear-suppliers-group/>
Ramachandran, R. "Nuclear Scientist Fails to Get U.S. Visa" *The Hindu*, February 17, 2006. <http://www.hindu.com/2006/02/17/stories/2006021702941600.htm>
Laxman, Srinivas. "Dr. M. R. Srinivasan, Former Indian Atomic Chief, Discusses India's Nuclear Future", August 29, 2011. Accessed on July 9 2013
<http://www.asianscientist.com/features/m-r-srinivasan-former-chairman-indian-atomic-energy-comission-nehru-centre/>
Seema Sirohi, V. Sudarshan. "N-Tangled." *Outlook*. Accessed on July 9 2013
<http://m.outlookindia.com/story.aspx?sid=4&aid=225630>
"Barc Newsletter." (November 2002). Accessed on July 10 2013.
<http://www.barc.gov.in/publications/nl/2002/200211.pdf>

Five additional retired scientists had now explicitly joined Iyengar, Prasad and Gopalakrishnan in their complaints against the constraints imposed by US domestic waiver legislation on the Indian nuclear program. A 'heavyweight' like Sethna, associated with the Indian nuclear program since its inception and a key player in the 1974 nuclear test was one among them.

The primary demand made by the retirees in the letter (as evidenced by its placement right at the beginning) was that India should not accept any restrictions on its nuclear weapons program. Clearly, the retirees were taking aim at clauses in the House bill and Senate Committee bill that sought to restrict India's fissile material production capacity. More importantly, they were asking the Prime Minister via Parliament to oppose Section 110 (hereafter referred to as the "termination clause") in the Senate Committee bill that called for an instant termination of American cooperation in case of a future Indian nuclear test, effectively converting India's unilateral moratorium on nuclear testing into a defacto binding bilateral commitment by raising the cost to India (several fuel

deprived multibillion dollar imported reactors and the associated economic consequences) of testing a nuclear weapon (as stated earlier, India could in theory buy fuel from alternative suppliers including Britain, France and Russia under the guaranteed fuel supply assurances provided by the US in the separation plan but the enforceability of the assurances could not be taken for granted).

The concerted exhortation of the retired scientists immediately opened up the political space in India for a comprehensive debate over the implications of the nuclear deal and the evolving US waiver legislation. The Left initially called for a discussion in Parliament followed by a binding “Sense of Parliament” resolution read out by the Speaker or Prime Minister⁹⁸⁶ that would hold the Indian government to certain key negotiating positions. One such position would be that India must not accept any conditions in US domestic waiver legislation that would constrain the nuclear weapons program. Simply put, the UPA government would be required by the resolution to walk away from the nuclear deal if the final version of US domestic legislation retained the restrictive provisions in the House bill and the Senate Committee bill, especially the termination clause on India’s ability to test a nuclear weapon.

⁹⁸⁶ "Left Parties Seek N-Deal Discussion". (July 28, 2006). Accessed on July 10 2013
<http://www.rediff.com/news/2006/jul/28ndea2.htm>

"Left on Indo-US Nuclear Deal

". (Friday, July 28, 2006), Accessed on July 10 2013. <http://cpim.org/content/left-indo-us-nuclear-deal>

"Sense of Parliament Should Be Reflected on N-Deal: Karat". (July 30, 2006). Accessed on July 10 2013.
<http://www.rediff.com/news/2006/jul/30ndea.htm>

The binding parliamentary resolution demanded by the Left would provide an explicit role for the legislature in finalizing India's policy towards the nuclear deal and US domestic waiver legislation. The intervention by the Indian Parliament in the foreign policy domain would be unprecedented as the Executive branch has enjoyed an exclusive right to formulate foreign policy since independence in India's Westminster political system. It would be tantamount to tying the hands of the Prime Minister on the nuclear deal. The Left's call for a binding parliamentary resolution was immediately supported by the main opposition BJP (and its allies in the NDA), ever ready to collapse the government by driving a wedge between the UPA and the Left.⁹⁸⁷ However, the Left's bark turned out to be worse than its bite. The communists jettisoned their demand for a binding parliamentary resolution and settled for the non-binding offer made by Sonia Gandhi and the Prime Minister.

A suo motu statement on the issue by Prime Minister or a "short duration" discussion to which the PM would reply.⁹⁸⁸

⁹⁸⁷ "Govt Won't Budge on Indo-US Nuclear Pact". (August 03, 2006). Accessed on July 10 2013.
<http://www.rediff.com/news/2006/aug/03ndeal2.htm>

⁹⁸⁸ Chatterjee, Manini. "Backing Pm, Sonia Snubs Cpm: Any Resolution on Nuclear Deal Unacceptable, Will Threaten Upa Govt." *Indian Express* Aug 04 2006.

<http://www.indianexpress.com/news/backing-pm-sonia-snubs-cpm-any-resolution-on-nuclear-deal-unacceptable-will-threaten-upa-govt/9912/0>

"Govt Won't Budge on Indo-US Nuclear Pact". (August 03, 2006). Accessed on July 10 2013.
<http://www.rediff.com/news/2006/aug/03ndeal2.htm>

The Left's retraction was the result of strong pushback from the Congress party, Gandhi⁹⁸⁹ and the Prime Minister⁹⁹⁰ combined with repeated assurances that its concerns would be taken into account in the reply to the short duration discussion. Besides, the Left also seemed unwilling to take on the UPA government at this still early stage in US-India consultations.

Thus, the communists eventually settled for the Prime Minister's offer, much to the consternation of a sullen BJP.⁹⁹¹ The short discussion in the Rajya Sabha (Upper House of the Indian Parliament) began on August 17 2006. The discussion turned out to be the most comprehensive parliamentary debate over the nuclear deal and the implications of the House bill and Senate Committee bill.

The Prime Minister was faced with an unrelenting barrage from both the

⁹⁸⁹ Gandhi warned the CPI (M) (Communist Party of India-Marxist), the largest faction in the Left that its demand for a binding parliamentary resolution in coordination with the main opposition BJP led NDA would result in the unraveling of the UPA government.

Chatterjee, Manini. "Backing Pm, Sonia Snubs Cpm: Any Resolution on Nuclear Deal Unacceptable, Will Threaten Upa Govt." *Indian Express* Aug 04 2006.

<http://www.indianexpress.com/news/backing-pm-sonia-snubs-cpm-any-resolution-on-nuclear-deal-unacceptable-will-threaten-upa-govt/9912/0>

⁹⁹⁰ For his part, the Prime Minister also told a delegation of CPI (Communist Party of India-the second largest Left faction) members that the Left's siding with the BJP on the issue of the parliamentary resolution would be interpreted as an expression of no confidence in the Prime Ministership resulting in the government's collapse.

Chatterjee, Manini. "Backing Pm, Sonia Snubs Cpm: Any Resolution on Nuclear Deal Unacceptable, Will Threaten Upa Govt." *Indian Express* Aug 04 2006.

<http://www.indianexpress.com/news/backing-pm-sonia-snubs-cpm-any-resolution-on-nuclear-deal-unacceptable-will-threaten-upa-govt/9912/0>

"N-Deal: Left Mounts Pressure on Govt". (August 04, 2006). Accessed on July 10 2013.

<http://www.rediff.com/news/2006/aug/04ndeal.htm>

⁹⁹¹"N-Deal: Left Mounts Pressure on Govt". (August 04, 2006). Accessed on July 10 2013.

<http://www.rediff.com/news/2006/aug/04ndeal.htm>

Correspondent, Special. "Bjp Criticises Left for "Backing out" of Resolution " *The Hindu*, Jul 29, 2006.

<http://www.hindu.com/2006/07/29/stories/2006072906861200.htm>

Bhattacharya, Santwana. "Short Discussion on N-Deal and Pm's 'Wrap-up' Reply." *Indian Express*, Aug 04 2006,.

<http://www.indianexpress.com/news/short-discussion-on-ndeal-and-pms-wrapup-reply/9884/>

irreconcilable Right⁹⁹² and a conciliatory but still vocal Left.⁹⁹³ However, the most important opponent that Singh had to answer to was the coterie of 8 retired

⁹⁹² Yashwant Sinha, a senior BJP leader and former finance and foreign minister in the previous NDA government initiated the discussion. He began by questioning the energy security rationale advanced by the Prime Minister in support of the nuclear agreement. Sinha then took aim at the controversial clauses and amendments in the final House bill and the Senate Committee bill.

“..... this basic reason for this deal that our Government would like us to believe, namely, that it would provide India with nuclear energy and energy security, is fundamentally flawed.....How can India have energy security on the strength of imported reactor and imported fuel?Coal-based thermal power plants costs Rs.4.5 crores per MW; combined cycle gas turbine running on gas or naphtha cost Rs. 3 crores per MW; indigenously built nuclear reactor costs about Rs.7-8 crores per MW; and imported nuclear reactor costs Rs.10 crores per MW. This is the most expensive form of energy for which we are bargaining.So, at this rate, Sir, 20,000 MWs of additional power by 2020 (the target announced by the Department of Atomic Energy before the nuclear deal) would need an investment of 2 lakh crores of rupees by this country. Two lakh crores in the next fourteen years!....What about uranium which we propose to import? Uranium prices, Sir, have gone up by 70 per cent in the last one year from US\$ 21 to US\$ 36 per pound.....We are required to identify and declare a date by which we will be willing to stop production of fissile material for nuclear weapons, even unilateral, forget about the FMCT (Fissile Material Cut-off Treaty). And, one of the determinations, which the US President required to make, in writing, before the US Congress is this.....(1) An estimate of the previous year of the amount of uranium mined in India; (2) The amount of such uranium that has likely been used or allocated for the production of nuclear explosive devices; (3) The rate of production of (i) fissile material for nuclear explosive devices; and (ii) nuclear explosive devices; and, (4) An analysis as to whether imported uranium has affected such rate of production of nuclear devices.' This is the kind of intrusive, detailed requirement of the US Congress. Not once, but, every year, before the 31st of July, or, by the 31st of July.”

Sinha clarified that his party and its regional allies in the NDA were not against a US-India strategic partnership but were against a “patron client relationship” not based on “sovereignty, equality, reciprocity and mutual respect.” He argued that the patron-client nature of the US-India relationship was evident in the provisions of the House bill and Senate Committee bill requiring India to cooperate in preventing Iran from acquiring nuclear weapons in exchange for continued US nuclear cooperation. Sinha’s critique was reinforced by fellow BJP leader Arun Shourie, former editor of the *Indian Express*, *Times of India* and Minister of Disinvestment, Communication and Information Technology in the previous NDA government. "Short Duration Discussion on Indo-U.S. Nuclear Deal ". (August 17 2006), Accessed on July 17 2013.

http://164.100.47.5/newdebate/deb_ndx/208/17082006/12to1.htm

"Short Duration Discussion on Indo-U.S. Nuclear Deal ". (August 17 2006), Accessed on July 17 2013.

http://164.100.47.5/newdebate/deb_ndx/208/17082006/5to6.htm

⁹⁹³ Sitaram Yechury of the Communist Party of India-Marxist (CPI-M, the largest faction in the Left) repeated the consistent Left position since 2005 that the nuclear deal, regardless of its individual merits must be understood in the context of the burgeoning US-India strategic partnership. He also attacked the energy security premise of the deal.

“.....I would actually like to know whether any study has been done on the basis of which you are moving towards this option of augmenting India's nuclear energy....In 2005, of the installed capacity that you had of electricity generation, the nuclear electricity generation was a mere 2.5 per cent, and that was, actually, 3310 MW. Now if this were to increase to 10,000 MW, which is what is being planned, by the year 2015, this would still be only 5 per cent of India's projected capacity generation then. So, for this 5 per cent of the projected capacity generation, are we going to tie down our country's strategic interests in such a manner? And, if you look at it in another way, that is, cost-wise, -- Shri (honorable) Yashwant Sinha also referred to the question of the cost of nuclear production, it is the most expensive one.....”

scientists and the concerns expressed (especially on the termination clause) in their open letter to Parliament. In fact, a closer look at the structure of his speech reveals an almost point-by-point answer to the concerns expressed in the open letter by the retirees.⁹⁹⁴

Prime Minister Manmohan Singh

Prime Minister Singh assured the Rajya Sabha that the civilian nuclear deal had not led to any fundamental change in the orientation of India's foreign policy.⁹⁹⁵ He also pointed out that the House bill and the Senate Committee bill were not the final enabling legislation. The Prime Minister promised that India would not accept the termination clause either in the final US domestic waiver legislation or the subsequent bilateral 123 agreement that would convert its unilateral moratorium on testing into a binding bilateral commitment.

The draft Senate Bill requires the US President to make an annual report to the Congress that includes certification that India is in full compliance of its non-proliferation and other commitments. We have made it clear to the United States our opposition to these provisions, even if they are projected as non-binding on India, as being contrary to the letter and spirit of the July (2005) Statement. An important assurance (in the

"Short Duration Discussion on Indo-U.S. Nuclear Deal ". (August 17 2006), Accessed on July 17 2013.
http://164.100.47.5/newdebate/deb_ndx/208/17082006/2to3.htm

⁹⁹⁴ "Short Duration Discussion on Indo-U.S. Nuclear Deal ". (August 17 2006), Accessed on July 17 2013.
http://164.100.47.5/newdebate/deb_ndx/208/17082006/7to8.htm

⁹⁹⁵ "No One Can Influence Policy as Long as I Am Pm". (August 18, 2006), Accessed on July 17 2013.
<http://www.rediff.com/news/2006/aug/18ndeal-text.htm>

"Short Duration Discussion on Indo-U.S. Nuclear Deal ". (August 17 2006), Accessed on July 17 2013.
http://164.100.47.5/newdebate/deb_ndx/208/17082006/7to8.htm

March 2006 separation plan) is the commitment of support for India's right to build up strategic reserves of nuclear fuel over the lifetime of India's reactors.....The integrity of our 3-Stage nuclear programme will not be affected.....We are not willing to accept a moratorium on the production of fissile material. We are only committed to negotiate a Fissile Material Cut-off Treaty in the Conference on Disarmament in GenevaThere is provision in the proposed US law that were India to detonate a nuclear explosive device, the US will have the right to cease further cooperation. Our position on this is unambiguous. The US has been intimated (informed) that reference to nuclear detonation in the India-US Bilateral Nuclear Cooperation Agreement as a condition for future cooperation is not acceptable to us. We are not prepared to go beyond a unilateral voluntary moratorium on nuclear testing as indicated in the July Statement.⁹⁹⁶

Clearly, the open letter by the retirees had forced the cornered Prime Minister to come out with a set of categorical assurances regarding India's approach towards the provisions embedded in the House bill and the Senate Committee bill. The Prime Minister also met the retired scientists on August 26 2006.⁹⁹⁷ I reproduce Gopalakrishnan's recollections of the meeting (he was one of the participants) in a September 22 2006 article in the *Asian Age*.

⁹⁹⁶ Ibid

⁹⁹⁷ Sharma, Rajeev. "Scientists Voice Fears over Nuclear Deal" *The Tribune*, August 27, 2006. <http://www.tribuneindia.com/2006/20060827/main1.htm>

On August 26, 2006, Prime Minister Manmohan Singh met with seven senior nuclear scientists for a discussion on the Indo-US nuclear cooperation deal.....Along with the PM (Prime Minister), the national security adviser, the principal secretary to the PM, the chairman of the AEC (Atomic Energy Commission- Anil Kakodkar), the principal scientific adviser to the PM (Dr. R. Chidambaram), the minister of state in the PMO (Prime Minister's Office), and a few other senior officials were also present. The meeting involved a very cordial and useful exchange among all present, and it lasted for about 90 minutes.....The government, as I understand, is firmly opposed to any direct or indirect attempt by the United States to limit or slow down the fissile material production in the country....It is clear than any clauses in the final US legislation which may directly or indirectly contradict these stands will become "deal breakers." Another crucial issue is that of India retaining the flexibility to conduct further nuclear weapon tests, in case the future strategic environment necessitates such tests in the interest of our national security. The government appears to concede that such a future need cannot be ruled out, and this is the reason for its repeated emphasis on a "voluntary" moratorium on testing."⁹⁹⁸

⁹⁹⁸ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. p 159-160.

The retirees welcomed the Prime Minister's statement in Parliament as a step in the right direction.⁹⁹⁹The Left was also positive in its initial reaction.¹⁰⁰⁰

¹⁰⁰¹ Predictably, the BJP led NDA remained unconvinced.¹⁰⁰²

Chairman of the Atomic Energy Commission (AEC) - Dr. Anil Kakodkar

Chairman of the Atomic Energy Commission Dr. Anil Kakodkar was also the Secretary to the Department of Atomic Energy (DAE), a bureaucracy with 65,000 employees and a \$1.2 billion budget.¹⁰⁰³ He was appointed to the post in December 2000, the culmination of his four and half decade career in the nuclear establishment. Kakodkar played an important role in India's 1998 nuclear tests as the Director of the Bhabha Atomic Research Center (BARC), a post he assumed in 1996. He was also involved in India's 1974 test.¹⁰⁰⁴

Although Kakodkar initially opposed a preliminary draft of the July 2005 joint statement faxed by the American side to the Prime Minister's plane en route to Washington because it was "full of nonproliferationism,"¹⁰⁰⁵ he eventually acquiesced to a subsequent draft finalized by the American and Indian

⁹⁹⁹"Pm Wins Left, Scientists over, Bjp Unhappy". (August 18, 2006). Accessed on July 17 2013.

<http://www.rediff.com/news/2006/aug/18nddeal.htm>

¹⁰⁰⁰ Ibid

¹⁰⁰¹ In fact, Communist Party of India-Marxist (CPI-M) leader Sitaram Yechury told the US embassy's Political Counselor Ted Osius on November 13 2006 that the nuclear deal was a "done deal."

Mulford, David. "An Introductory Meeting with Communist Leader Sitaram Yechury" (November 13 2006). Accessed on July 23 2013

<http://cablegatesearch.net/cable.php?id=06NEWDELHI7762>

¹⁰⁰² "Pm Wins Left, Scientists over, Bjp Unhappy". (August 18, 2006). Accessed on July 17 2013.

<http://www.rediff.com/news/2006/aug/18nddeal.htm>

¹⁰⁰³ Bagla, Pallava. "Breaking up (a Nuclear Program) Is Hard to Do." *Science* 311, no. 5762 (February 10 2006): 765-66

¹⁰⁰⁴ "Asset Bulletin." (August 2011), Accessed on July 23 2013

<http://www.asset.org.in/Archtechts%20of%20Indian%20Nuclear%20Programme.pdf> .p 38-39

¹⁰⁰⁵ Varadarajan, Siddharth. "The American Dilemma at the NSG" *The Hindu*, August 28, 2008.

delegations. Kakodkar then became the primary nuclear establishment proponent of the nuclear deal in India and argued in multiple newspaper interviews that the separation of India's hitherto intermeshed nuclear program was indeed possible.¹⁰⁰⁶

Although he was in favor of partitioning India's nuclear infrastructure, Kakodkar also ensured through his defiant February 8 2006 public interview that the two fast breeder reactors would not be placed by a Prime Minister eager to consummate the separation plan on the safeguarded civilian side. As stated earlier, Kakodkar effectively foreclosed the Prime Minister's options on the breeders by publicly articulating that the fast breeder reactors should not be placed on the safeguarded civilian side for energy security and national security reasons.¹⁰⁰⁷ Despite the kerfuffle on the breeders, Kakodkar came out in support of the Prime Minister on the final separation plan.¹⁰⁰⁸

¹⁰⁰⁶Subramanian, T.S. ""Identifying a Civilian Nuclear Facility Is India's Decision" " *The Hindu*, Aug 12, 2005

¹⁰⁰⁷ "The Fast Breeder Programme Just Cannot Be Put on the Civilian List." *Indian Express*, Feb 08, 2006.

¹⁰⁰⁸ Sudarshan, V. "Fusion Material " (March 2006). *Outlook*.
<http://m.outlookindia.com/story.aspx/?sid=4&aid=230510>



Figure 16: Chairman of the Atomic Energy Commission Dr. Anil Kakodkar

Source: "India's 50 Most Powerful People 2009." Accessed on July 23 2013

http://images.businessweek.com/ss/09/04/0415_india_most_powerful/15.htm

Kakodkar had not given a public interview on the provisions in the evolving US domestic legislation although he played an important behind-the-scenes role in coaching the Prime Minister for the August 2006 speech to Parliament and the subsequent meeting with the retirees. The documentary record indicates that Kakodkar's first detailed public comment on the waiver legislation was in a September 8, 2006 interview to T.S. Subramaniam of *The Hindu*. Kakodkar reinforced the Prime Minister's position on testing and fuel-supply articulated by the latter in his statement to Parliament.

Subramaniam: Under the U.S. Public Law and the Atomic Energy Act of 1954, if India conducts a nuclear test, fuel supply will be stopped and imported reactors' construction will come to a halt midway. The draft Senate bill also sets its face against a nuclear test by India. The Prime

Minister has said India would take corrective steps if the fuel supply were to be stopped. What are these corrective steps?

Kakodkar: The Prime Minister's reply is quite clear. We are a sovereign country. Our moratorium on tests is our own unilateral one. These are all multi-layered assurances built-in into the Separation Plan. If in spite of all that there is a discontinuance of fuel supply, then India will have to take corrective steps as has been specified. We will decide what to do at that time.

Subramaniam: Can you spell out these corrective steps?

Kakodkar: There is no need to spell them out.¹⁰⁰⁹

I rely on an article from a later period (August 2007) by Gopalakrishnan to ascertain the nature of the corrective measures left deliberately unspecified by Kakodkar. Gopalakrishnan reckoned that there were no corrective measures that India could possibly take to ensure the uninterrupted operation of its reactors in case the fuel was cutoff following an Indian nuclear test. He accused Kakodkar of deliberately misrepresenting facts by repeating the purely political 'unspecified corrective measures' talking points of the Prime Minister's Office (PMO).

¹⁰⁰⁹ Subramaniam, T.S. ""Safeguards Can Kick in Only after Cooperation Starts"" *The Hindu*, September 8 2006.

<http://www.hindu.com/2006/09/08/stories/2006090810441100.htm>

Dr Kakodkar also keeps parroting the PMO position that the 123 Agreement provides for "corrective measures that India may take to ensure uninterrupted operation of its civilian nuclear reactors." What are these magical measures which the Indian establishment has in mind, and why are they kept in such high secrecy? The answer is that there are no such measures possible, and it is purely a bluff to mislead Indian Parliament and the public. A retaliatory measure could have been to withdraw the reactors from IAEA safeguards, if fuel supply is denied. But after signing a safeguards agreement to keep these reactors under perpetual safeguards, such a step will attract serious international action against India, including a Chapter 7 resolution at the UN Security Council, leading to severe sanctions on the country. Or do these measures we are thinking of include clandestine purchases of fuel from illegal sources? India will never do that, since we have always maintained an impeccable record on nuclear imports and will not stoop to that level under any circumstance. So, in spite of layers of consultations built into this 123 Agreement and the overwhelming mutual confidence and bonhomie between the PM and US President George W. Bush, the imported reactors in India, and all the downstream industries which depend on them, will remain on stand-still when fuel supply is interrupted.¹⁰¹⁰

¹⁰¹⁰ Gopalakrishnan, Dr A. "Kakodkar, Chidambaram Are Misrepresenting Facts (Deccan Chronicle Article Reprint)" (August 14, 2007). Accessed on March 23 2014.
<http://www.socialcause.org/getarticlefromdb.php?id=1030>

Kakodkar was also worried about the silence of the House and Senate Committee bills on a key issue. He demanded that the waiver legislation provide India with an upfront and permanent right to reprocess the spent fuel outputted by the reactors that it would import in an indigenous reprocessing facility. The demand was a bold one for two reasons. First, India had placed all four of its reprocessing facilities on the unsafeguarded military side of the separation plan (raising the risk in the American mind of India diverting the plutonium separated from the imported reactor spent fuel to the weapons side of the program, overcoming any verification measures).

Second, the US had a consistent decades-old policy of not allowing its nuclear partners (except very close allies such as Japan and the European Atomic Energy Community-EURATOM nations) to reprocess spent fuel in indigenous facilities due to proliferation concerns. The US itself had moved away from reprocessing spent fuel due to high cost and proliferation concerns as a mere 6 kilograms of plutonium separated from the spent fuel could be used to produce a nuclear weapon. It had adopted the 'once-through' cycle in which the spent fuel produced by the reactor is considered as waste to be permanently entombed in an underground repository. Kakodkar seemed particularly conscious of American concerns about possible proliferation by India via reprocessing and spent a significant amount of time expounding on the centrality of reprocessing for the

Indian nuclear program.¹⁰¹¹ He also explained the Indian preference for a closed fuel cycle (in which spent fuel from the reactor is reprocessed to separate the plutonium from the rest of the high level waste. The plutonium can be used as fuel in second stage fast breeder reactors).

Subramaniam: The July 18, 2005, Joint Statement by Prime Minister Manmohan Singh and U.S. President George W. Bush promises full civil nuclear cooperation with India, covering the entire nuclear fuel cycle. But the U.S. House of Representatives Bill 5682 passed in July says the U.S. President "should seek to prevent the transfer to India of nuclear equipment, materials or technology from other participating Governments in the Nuclear Suppliers Group or any other source.".....

Kakodkar:..... We have been adopting the principle or philosophy of closed nuclear fuel cycle, which means that the spent fuel, after its use in the reactor, must be reprocessed, and uranium and plutonium recycled.

¹⁰¹¹ The Indian nuclear program's grand vision is a sequential three-stage endeavor proposed by its founder Dr. Homi Bhabha. The first stage involves the use of natural uranium as fuel in small to medium Pressurized Heavy Water Reactors (PHWRs). The irradiated spent fuel is reprocessed in reprocessing plants that extract plutonium. The plutonium is then used to "provide startup cores of fast breeder reactors (FBRs)" that are expected to be the mainstay of the nuclear program and provide a quarter of all electricity by 2050. These cores would be surrounded by "blankets" of either depleted or natural uranium, to produce more plutonium to fuel more breeders until the desired capacity is achieved. After the targeted numbers of breeders become operational, the abundant thorium reserves would be substituted for uranium in the blankets to produce fissile uranium-233, the startup fuel for the third stage. The third and final stage would consist of Advanced Heavy Water Reactors burning U-233 in their cores and thorium in their blankets beyond 2050. Thus, reprocessing is a key step that is perceived by the Indian nuclear establishment as a crucial step to transition from the first to the third stage.

Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 54.

Ashwin Kumar, M. V. Ramana "The Safety Inadequacies of India's Fast Breeder Reactor." *Bulletin of Atomic Scientists* July 21 2009.

Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55.

Chandra, R. B. Grover and Subash. "Scenario for Growth of Electricity in India." *Energy Policy* 34, no. 17 (2006): p. 2845.

Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 55

This way, we not only have an environmentally benign radioactive waste management arrangement but also considerably enlarged energy that you can extract from the given quantity of uranium. In the absence of closed nuclear fuel cycle, one ends up having to deal with the spent fuel as waste which, according to us, is not an acceptable solution even from a long-term credible waste management point of view, leave alone the issue of energy availability in a sustainable manner. The spent fuel, if deposited in repositories for long-term disposal, would over a period of time become a virtual plutonium mine once most of the radioactive components decay out. This can thus become a serious security issue over a long term. In fact, the logic of closed nuclear fuel cycle is getting to be recognised the world over and I am certain it will become universal fairly soon. It is in this context that we consider reprocessing an extremely important part of full civil nuclear cooperation. Since India has already developed its own enrichment, reprocessing, and heavy water technologies, there need be no apprehensions with cooperation in these areas.

Subramaniam: If full civil nuclear cooperation is not offered, will it be a deal breaker?

Kakodkar: A situation where the spent fuel (from the imported reactors) simply accumulates without any proper disposal option being available is not acceptable.

Subramaniam: How do you rate the chances of this nuclear agreement going through?

Kakodkar: Let us wait and see. What does it matter? Our programme is going on. If we succeed in developing cooperation, well and good.¹⁰¹²

Thus, Kakodkar not only outlined India's concerns regarding the House and the Senate Committee bills but also set the Indian agenda for the forthcoming negotiations over the 123 agreement. India would oppose any restrictions diluting its unilateral moratorium on nuclear testing, fight to preserve the lifetime fuel-supply guarantees first given by the US in the separation plan and secure an upfront and permanent right to reprocess the spent fuel outputted by imported reactors.

Meanwhile, the Senate Committee bill was up for a vote before the Senate. On November 16, 2006, the Senate passed its version of the waiver legislation (US-India Peaceful Atomic Energy and US-IAEA Additional Protocol Implementation Act of 2006)¹⁰¹³ by a massive 85-12 margin¹⁰¹⁴ after some delays. 53 Republicans voted for the bill as against 32 Democrats.¹⁰¹⁵

Multiple "killer amendments" identified by New Delhi as roadblocks to a future nuclear cooperation agreement were defeated by the Senate. An important amendment that bit the dust was proposed by California Democrat Barbara Boxer

¹⁰¹²Subramaniam, T.S. "'Safeguards Can Kick in Only after Cooperation Starts'" *The Hindu*, September 8 2006.

<http://www.hindu.com/2006/09/08/stories/2006090810441100.htm>

¹⁰¹³ "Amendments Will Kill the N-Deal: Lugar to Senate". (November 16, 2006). Accessed on July 27 2013. <http://www.rediff.com/news/2006/nov/16ndeal5.htm>

¹⁰¹⁴ Haniffa, Aziz. "Us Senate Votes 85-12 in Favour of India's Nuclear Bill" (November 17, 2006). Accessed on July 27 2013. <http://www.rediff.com/news/2006/nov/17ndeal8.htm>

¹⁰¹⁵ Bureau, rediff International Affairs. "Republicans Outvote Democrats on Nuke Bill" (November 17, 2006), Accessed on July 27 2013. <http://www.rediff.com/news/2006/nov/17ndeal11.htm>

(amendment 5187). It conditioned nuclear cooperation with India on the US President certifying that India had agreed to suspend military-to-military cooperation with Iran until the latter was no longer designated as a state sponsor of terrorism.¹⁰¹⁶ 29 Democrats (including then senator Barack Obama and Hillary Clinton) voted in favor of the amendment as compared to 9 Republicans.¹⁰¹⁷ Senator Jeff Bingaman's (Democrat-New Mexico) amendment calling for the US to deny nuclear fuel to India unless the latter committed to completely halt fissile material production was also rejected.¹⁰¹⁸

However, the Senate bill was not without restrictions. Several provisions in the Senate Committee bill perceived by India as restrictive were retained in the Senate bill. Further, an important amendment proposed by Senator Barack Obama (Section 114-hereafter referred to as the "Obama amendment") was also adopted. The amendment restricted the size of the strategic fuel reserve that India could stockpile for the reactors it would import to "reasonable operating requirements" thereby undercutting the lifetime fuel-supply guarantees provided by the Bush administration in the separation plan.

It is the policy of the US that any nuclear power reactor fuel reserve provided to the Government of India for use in safeguarded civilian

¹⁰¹⁶ Ibid.

¹⁰¹⁷ Ibid

¹⁰¹⁸ Haniffa, Aziz. "N-Bill at Senate: First Killer Amendment Defeated" (November 17, 2006). Accessed on July 30 2013. <http://www.rediff.com/news/2006/nov/17ndeal2.htm>

nuclear facilities should be commensurate with reasonable reactor operating requirements.¹⁰¹⁹

The amendment was intended to ensure that India would not be able to adopt a strategy of testing a nuclear weapon at some future date and riding out the international sanctions by utilizing an open-ended fuel stockpile allowed by the separation plan until a favorable political settlement. The “reasonable operating requirements” language would ensure that the administration would not be able to release more than a year’s worth of fuel to India’s imported reactors at a time. Additionally, the Senate bill also retained the committee bill’s termination clause in the event of an Indian nuclear test.

The Senate bill already carries another clause stipulating a halt to all fuel supply and nuclear cooperation in the event India tested a nuclear device.¹⁰²⁰

Both the House and the Senate had passed their versions of the waiver legislation. The only remaining steps were the reconciliation of the House and the Senate bills by the Conference Committee, the repassage of the reconciled product through the House and Senate by an up or down vote and the President’s signature of the final bill into law.

¹⁰¹⁹ "Senate Passes Amendment to Nuke Bill". (November 17, 2006). Accessed on July 30 2013. <http://www.rediff.com/news/2006/nov/17ndeal1.htm>

¹⁰²⁰ "Nuclearbharat- Campaign to Uphold/Preserve India's Nuclear Autonomy, National Security and Sovereignty." Accessed on August 3 2013. <http://www.nuclearbharat.com/nuclear-bharat-data/other-issues-2006/231106.htm>

On December 9 2006, the Conference Committee approved compromise legislation reconciling the House and the Senate bills. The House passed the compromise legislation by a massive majority of 330-59.¹⁰²¹ The Senate approved the bill through a unanimous consent agreement.¹⁰²² President Bush signed the "Henry Hyde United States-India Peaceful Atomic Energy Cooperation Act" (hereafter referred to as the "Hyde Act") into law on December 18 2006.¹⁰²³

The magnitude of the waivers provided by the Hyde Act was remarkable. After all, the Act was an embodiment of a key US acknowledgement, that the three-decade policy of trying to 'cap, roll-back and eliminate' the Indian nuclear program had not worked. The provisions of the US Atomic Energy Act of 1954 and the Nuclear Non-proliferation Act of 1978 were retroactively modified to enable nuclear cooperation with India. The Act also acquiesced to the legitimization of India's nuclear weapons in the July 2005 joint statement, a longstanding demand of a country that detested being equated with Pakistan and preferred comparison with China, an official nuclear weapons state.

Further, the Act created an explicit double standard in the non-proliferation regime by recognizing the nuclear weapons of NPT holdout India and resuming nuclear cooperation without requiring India to safeguard all its

¹⁰²¹ Haniffa, Aziz. "House of Representatives Votes out Hurdle in N-Deal" (December 09, 2006).

Accessed on August 3 2013. <http://www.rediff.com/news/2006/dec/09nddeal.htm>

¹⁰²²Krishnaswami, Sridhar. "Us Congress Approves Legislation on Nuclear Deal" (December 09, 2006).

Accessed on August 3 2013. <http://www.rediff.com/news/2006/dec/09nddeal1.htm>

¹⁰²³ "President Signs U.S.-India Peaceful Atomic Energy Cooperation Act ". (December 18, 2006).

Accessed on August 3 2013. <http://georgewbush-whitehouse.archives.gov/news/releases/2006/12/20061218-1.html>

nuclear facilities. An NPT non-signatory was arbitrarily elevated over and above its other two companions (Pakistan and Israel) into the global mainstream while Iran, an NPT signatory was being told that it should not even countenance a nuclear weapon capability, much less fancy the future acquisition and recognition of a nuclear arsenal.

The premise of the double standard was that India was a ‘good guy’ in the international system: a vibrant democracy and a responsible custodian of its nuclear weapons despite not signing the NPT. On the other hand, Iran was the ‘bad guy,’ a country that had tried to acquire nuclear weapons on the sly, a state sponsor of terror and resolute opponent of US strategic policies in the Middle East and beyond. It also helped that India was a rising power and a key actor in the Asian balance of power, a nuclear weapons power strategically located between a troubled Pakistan and an increasingly ascendant China and a huge market for American corporations.

No clause in the Hyde Act prohibited India from adding new facilities on the unsafeguarded military side of its separation plan, a key concession that reinforced the Bush administration’s giveaway in March 2006. There were some restrictions on India’s fissile material production capacity but they were either in the non-binding section of the Act or merely cosmetic statements made to demonstrate that the US was still committed to its non-proliferation goals in South Asia. Moreover, the enjoinder in the Act seeking India’s cooperation to expeditiously negotiate a multilateral Fissile Material Cutoff Treaty (FMCT) was

a virtual non-starter given Pakistan's success in blocking any such initiative at the Conference on Disarmament (and the possibility of continued opposition).¹⁰²⁴

The annual presidential certification requirement regarding India's continued compliance with the terms of the Hyde Act in the Senate bill was reduced to a mild reporting requirement in the final Act, an internal matter between President and Congress with no document demanded from India.¹⁰²⁵ Finally, the Act's dismantling of US imposed technology sanctions was bound to increase India's access to non-nuclear cutting-edge technologies with the potential to fastrack the already maturing US-India Science and Technology (S&T) relationship.¹⁰²⁶

Despite the numerous aforementioned concessions, the Hyde Act was greeted with a sense of disappointment in India as it failed to satisfactorily address the concerns of the retirees on testing expressed in their open letter and grant concessions on the trinity of issues (testing, fuel-supply and reprocessing) highlighted by Kakodkar. The Act retained the termination clause in the Senate bill perceived in India as an American attempt to prevent India from conducting further nuclear tests by entangling it in a bilateral version of the multilateral Comprehensive Test Ban Treaty (CTBT).

¹⁰²⁴ "Short Duration Discussion on Indo-U.S. Nuclear Deal ". (August 17 2006), Accessed on July 17 2013. http://164.100.47.5/newdebate/deb_ndx/208/17082006/3to4.htm

¹⁰²⁵ Ibid

¹⁰²⁶ Ibid

A determination and any waiver under section 104 shall cease to be effective if the President determines that India has detonated a nuclear explosive device after the date of the enactment of this title.¹⁰²⁷

Further, the Hyde Act was also clear that if India tested a nuclear weapon, the US would not only terminate nuclear cooperation but also seek to prevent the transfer to a country of nuclear equipment, materials, or technology from other participating governments in the NSG (Nuclear Suppliers Group) or from any other source if nuclear transfers to that country are suspended or terminated pursuant to this title, the Atomic Energy Act of 1954 (42 U.S.C. 2011et seq.), or any other United States law.¹⁰²⁸

Simply put, the US would also lobby/coerce India's other nuclear partners including the UK, France, Australia and Japan to cease nuclear cooperation in the aftermath of an Indian test. The Act also retained the Obama amendment that undercut the lifetime fuel supply guarantees in the separation plan by reducing the fuel available to India to "reasonable operating requirements" (a year's worth of fuel at a time).^{1029 1030}

¹⁰²⁷ "H. R. 5682-One Hundred Ninth Congress of the United States of America at the Second Session". (2006). Accessed on August 5 2013.

<http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682enr/pdf/BILLS-109hr5682enr.pdf> .p 13

¹⁰²⁸ Ibid. p 3

¹⁰²⁹ Ibid. p 4

¹⁰³⁰ The Obama amendment was retained in the final Hyde Act despite Kakodkar's fervent attempts to get it excised at the Conference Committee stage. Kakodkar warned a visiting US business delegation led by Under Secretary for International Trade Franklin L. Lavin that India would not procure reactors from the US unless the amendment was excised. Clearly, Kakodkar was using India's buyer power to cajole key congressmen and women into deleting the Obama amendment.

"N-Business with US Difficult until Concerns Are Addressed". (December 04, 2006), Accessed on August 5 2013.

<http://www.rediff.com/news/2006/dec/04ndeal1.htm>

The Act was silent on the issue of whether India could reprocess the spent fuel from imported reactors in an indigenous reprocessing facility. Instead, it offered upfront reprocessing rights provided India built a multinational reprocessing facility under permanent IAEA safeguards as part of a US led global effort to develop a proliferation resistant fuel cycle (Global Nuclear Energy Partnership-GNEP).¹⁰³¹ Such a conditional American offer was a non-starter as India was clear that it would not host a multinational reprocessing facility under the GNEP.

Paradoxically, India's success in retaining a large number of facilities on the unsafeguarded military side of the March 2006 separation plan including its entire reprocessing infrastructure was now combining with US reservations regarding reprocessing to constrain India's ability to obtain consent to reprocess the spent fuel from imported reactors. On the foreign policy front, the Hyde Act also retained provisions from the House and Senate bills urging India to align its Iran policy with the US.¹⁰³²

A presidential signing statement issued by Bush after initialing the Hyde Act tried to alleviate India's concerns by diluting several provisions (mainly

¹⁰³¹ "H. R. 5682-One Hundred Ninth Congress of the United States of America at the Second Session". (2006). Accessed on August 5 2013.
<http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682enr/pdf/BILLS-109hr5682enr.pdf> . p8

¹⁰³² "H. R. 5682-One Hundred Ninth Congress of the United States of America at the Second Session". (2006). Accessed on August 5 2013.
<http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682enr/pdf/BILLS-109hr5682enr.pdf> . p 2, 4, 6, 11

certification requirements) in the Act¹⁰³³ but did not address the aforementioned trinity of issues.

Retired nuclear scientists

As stated earlier, the retired scientists had come out against the evolving Hyde Act in August 2006 and were mainly worried about restrictions on the nuclear weapons program, especially India's ability to conduct future nuclear tests. They were temporarily pacified by the assurances of the Prime Minister in Parliament and in person that India's position would only be determined by the final Hyde Act and any restrictions on India's ability to test such as the termination clause would not be tolerated in the final Act.

The retirees had given the Prime Minister an opportunity to use his personal relationship with President Bush to get the termination clause excised from the Hyde Act through administrative pressure on Congress. However, the Prime Minister had failed and the clause was now an integral part of the Hyde Act. It was time for the retirees to mobilize again. Six of the eight authors of the

¹⁰³³ The statement reiterated the advisory nature of the 'non-binding' Section 103 and significantly diluted other sections.

"Section 103 of the Act purports to establish U.S. policy with respect to various international affairs matters. My approval of the Act does not constitute my adoption of the statements of policy as U.S. foreign policy. Given the Constitution's commitment to the presidency of the authority to conduct the Nation's foreign affairs, the executive branch shall construe such policy statements as advisory..... The executive branch shall construe provisions of the Act that mandate, regulate, or prohibit submission of information to the Congress, an international organization, or the public, such as sections 104, 109, 261, 271, 272, 273, 274, and 275, in a manner consistent with the President's constitutional authority to protect and control information that could impair foreign relations."

"Statement by President Bush on Signing the Henry J. Hyde United States-India Peaceful Atomic Energy Cooperation Act of 2006". (December 18, 2006), Accessed on August 5 2013. <http://2001-2009.state.gov/p/sca/rls/2006/77960.htm>

August 2006 open letter (Homi Sethna, M.R. Srinivasan, Y.S. R. Prasad, Iyengar, Prasad and Gopalakrishnan) met Kakodkar on December 16. The cohort reiterated its concerns over the Hyde Act's retention of the termination clause that converted India's unilateral moratorium into a binding commitment.¹⁰³⁴

Seven out of the eight authors of the August 2006 open letter (except Dr. S. L. Kati- former Managing Director- Nuclear Power Corporation) published a second joint letter in *The Hindu* following their meeting with Kakodkar. The letter pointed out the refusal of the Hyde Act to satisfactorily address the trinity of issues (testing, fuel supply and reprocessing) including the all important one of India's 'right' to conduct future tests. Despite their misgivings regarding the Hyde Act, the retirees did not recommend that India walk away from the nuclear deal. Clearly, the aforementioned waivers provided by the Hyde Act were so significant that even the insistent retirees were forced to weigh the enormous potential benefits offered by the Act over any problematic strictures on the trinity of issues.

Moreover, there was also the tantalizing possibility of an accommodative Bush administration resolving the trinity of issues to India's satisfaction during the upcoming 123 agreement negotiations, thereby undercutting the associated strictures in the Hyde Act. Recall that the Bush administration went out of its way to conclude a separation plan on India's terms in March 2006 in order to clear the deck for a strategic partnership. Consequently, the retirees recommended that

¹⁰³⁴ "India's Nuclear Czars Wary of Us Deal". *The Times of India*, Dec 16, 2006.
http://articles.timesofindia.indiatimes.com/2006-12-16/india/27821249_1_anil-kakodkar-nuke-deal-civilian-nuclear-energy

India negotiate an ironclad bilateral 123 agreement that would negate the conditions imposed by the Act.¹⁰³⁵

Henry J. Hyde U.S.-India Peaceful Atomic Energy Cooperation Act of 2006.

In view of the uncertain strategic situation around the globe, we are of the view that India must not directly or indirectly concede our right to conduct future nuclear weapon tests, if these are found necessary to strengthen our minimum deterrence. In this regard, the Act makes it explicit that if India conducts such tests, the nuclear cooperation will be terminated and we will be required to return all equipment and materials we might have received under this deal. To avoid any abrupt stoppage of nuclear fuel for reactors which we may import, India and the U.S. had mutually agreed to certain alternative fuel supply options which this Act has totally eliminated out of consideration. Thus, any future nuclear test will automatically result in a heavy economic loss to the country because of the inability to continue the operation of all such imported reactors. In summary, it is obvious that the Hyde Act still retains many of the objectionable clauses in the earlier House and Senate bills....Once this Act is signed into law, all further bilateral agreements with the U.S. will be required to be consistent with this law.As such, the Government of

¹⁰³⁵ "Hyde Act and Nuclear Scientists' Note." *The Hindu*, Dec 16, 2006.
<http://www.hindu.com/2006/12/16/stories/2006121616171500.htm>

India may convey these views formally to the U.S. Administration and they should be reflected in the 123 Agreement.¹⁰³⁶

Chairman of the Atomic Energy Commission- Dr. Anil Kakodkar

The concerns raised by the retirees were shared by Kakodkar. He echoed the concerns of the retirees regarding the Hyde Act's failure to resolve the trinity of issues to India's satisfaction in a January 17 2007 interview with Pallava Bagla published in *The Hindu*. Kakodkar also identified the trinity as key deliverables in the forthcoming 123 agreement negotiations.¹⁰³⁷

Bagla: If we accept the Hyde Act now, is it clear that we will never be able to conduct a nuclear explosion?

Kakodkar: The Act says that if India conducts a nuclear test, cooperation would cease. In fact, it goes beyond to say that all the equipment and reactor vessels and materials have to be returned. I don't understand how that's possible. India has declared a kind of unilateral moratorium. It cannot be converted into any kind of bilateral or multilateral legality.

Bagla: Weren't the tests of 1974 and 1998 enough?

Kakodkar: That's not the point. We are talking not just of near term. We are talking about how things are likely to unfold. Should there be

¹⁰³⁶ "Hyde Act and Nuclear Scientists' Note." *The Hindu*, December 16, 2006.
<http://www.hindu.com/2006/12/16/stories/2006121616171500.htm>

¹⁰³⁷ Bagla, Pallava. ""Implementation of Hyde Act Would Mean Shifting of Goalposts" *The Hindu*, January 17, 2007.
<http://www.hindu.com/2007/01/17/stories/2007011702641100.htm>

situations which evolve, where, say, some other countries start doing tests, or there are changes in technology, the question would arise that at that time what should India do.

Bagla: In the process of legislation, we seem to have lost this assurance of lifetime fuel supply. How big a concern is that?

Kakodkar: That's a crucial matter. The separation plan clearly states there would be multi-layered assurances for fuel supplies and that includes the ability to build a stockpile to meet the lifetime requirements of the reactors.

Bagla: India was also supposed to get full nuclear cooperation.

Kakodkar:..... It is important because even in the civil domain, reprocessing and enrichment, heavy water are all very important areas and if the two countries have agreed that there will be full civil nuclear cooperation then it stands to reason that that determination has to be translated into reality.

Bagla: What happens if we don't get the 123 Agreement?

Kakodkar: Well, the domestic programme is there, we will carry on.¹⁰³⁸

¹⁰³⁸ Bagla, Pallava. ""Implementation of Hyde Act Would Mean Shifting of Goalposts" *The Hindu*, January 17, 2007.

<http://www.hindu.com/2007/01/17/stories/2007011702641100.htm>

Prime Minister Manmohan Singh

The Prime Minister recognized the dissatisfaction among Kakodkar and the retirees with the Hyde Act. Determined to prevent any surprise moves (recall Kakodkar's rebellious February 2006 interview and the joint letter of the retirees in August 2006) that would further increase the difficulty of clinching a nuclear deal central to his legacy, the Prime Minister sought to reassure Kakodkar and the retirees that they would not be marginalized in the 123 agreement negotiations.

Prime Minister Manmohan Singh on Tuesday assured the Atomic Energy Commission (AEC) that "nothing would be done behind your back" insofar as the India-U.S. nuclear deal was concerned. AEC Chairman Anil Kakodkar had a discussion with Dr. Singh and senior aides in the Prime Minister's Office on the nuclear deal. According to informed sources, Dr. Kakodkar was told that he and his AEC colleagues would be kept in the picture during the next stage when the 123 Agreement gets negotiated. As far as Dr. Singh was concerned, the proof of the pudding is in the eating — in the bilateral agreement to be hammered out between the two administrations, irrespective of the exertions of the U.S. Congress. According to the sources, Dr. Singh told his senior aides that the nuclear deal was a "legacy issue" for him, and that he would not like to go down as someone whom history can accuse of having compromised India's national interests. "Once the 123 Agreement is

finalised, and if on balance the final deal does not meet the test of national interests, we can walk away from it," Dr. Singh said.¹⁰³⁹

Singh also courted the retirees by agreeing to consult them extensively during the forthcoming negotiations over the 123 agreement. The Prime Minister's overture gave the retirees a formal voice in the policymaking process for the first time since the nuclear deal's announcement in the July 2005 joint statement.

Quietly but surely, the former nuclear czars-the top scientists associated with India's nuclear establishment are being drafted into playing an advisory role in Chapter II of the Indo-US nuke deal saga, the upcoming negotiations on the 123 Agreement. Friday's meeting between the ex-czars and Atomic Energy Commission (AEC) chairman Anil Kakodkar is considered significant by the science establishment as, for the first time, these informed critics of the deal are being included in the country's nuclear diplomacy.¹⁰⁴⁰

The formal inclusion of the retirees as advisers in the upcoming negotiations over the 123 agreement can be understood as the culmination of their effort since August 2006 to acquire a voice in the policymaking process. They had used a clever combination of individual media attacks and an open letter to

¹⁰³⁹Correspondent, Special. "Manmohan's Assurance to Kakodkar" *The Hindu*, December 13 2006. Accessed on August 9 2013.
<http://hindu.com/thehindu/thscrip/print.pl?file=2006121306210100.htm&date=2006/12/13/&prd=th&>

¹⁰⁴⁰Srinivas Laxman. "Former Nuke Czars Get Role in US Deal" *The Times of India*, December 16, 2006. Accessed on August 9 2013.
http://articles.timesofindia.indiatimes.com/2006-12-16/india/27825473_1_nuke-czars-y-s-r-prasad-nuclear-czars

Parliament in August 2006 to carve out the space for a comprehensive political debate in India over the nuclear deal. The retirees had collectively cashed in their credibility acquired over decades of service to loudly elbow their way into the policy-making circle from the margins.

The Prime Minister set about trying to forge a political consensus to confidently move forward with the 123 agreement negotiations after mollifying the scientists. Although concerns were expressed by senior leaders from the socialist wing within his own Congress Party, Singh managed to overcome the dissent by persuading the Congress Working Committee and Sonia Gandhi to support his decision to proceed with the 123 agreement negotiations.¹⁰⁴¹ The Congress party's allies in the UPA were also supportive of India entering into consultations over a 123 agreement.

However, any expectation that the Prime Minister might have nurtured about securing support from the opposition BJP led-NDA was quickly squashed as the latter cornered the former in a heated parliamentary debate on December 18 2006.¹⁰⁴² The termination clause in particular was a major sore point for the BJP,

¹⁰⁴¹George, Varghese K. "With You on Deal, Go Ahead, Cwc Tells Pm." *The Indian Express*, Dec 13 2006.

<http://www.indianexpress.com/news/with-you-on-deal-go-ahead-cwc-tells-pm/18454/>

¹⁰⁴² The BJP's position was articulated in Parliament by veteran Leader of the Opposition L. K. Advani who attacked Section 106 (termination clause) and Section 103 (E) (10) (Obama amendment) of the Hyde Act.

"Section 106 of the Hyde Act decrees that civil nuclear energy co-operation with India shall cease to be effective if the President determines that India has detonated a nuclear explosive device after the date of the enactment of this law. In its explanatory notes, the Hyde Act leaves no scope for uncertainty.....Has India accepted such a deal earlier for the sake of getting nuclear fuel from America? Otherwise, neither the Congress Government would have been able to conduct Pokhran – I nor the NDA Government would have been able to conduct Pokhran – II. This is my question to the hon. Prime Minister. Would you like to mortgage away India's sovereign right to conduct Pokhran – III and Pokhran – IV in the future?The

the self-proclaimed custodian of India's nuclear weapons program (a BJP led NDA coalition government conducted India's second round of tests in 1998) and a proud proponent of a more muscular foreign policy wrapped around it.

The BJP's politically expedient opposition was pretty much expected and was not likely to matter as long as the Prime Minister had the support of the Left, the main coalition ally of his UPA government. The Left's initial reaction to the Hyde Act was to join the BJP in criticizing the Prime Minister during the parliamentary debate.¹⁰⁴³ The communists were angered in particular by the Iran-related strictures in the Act and excoriated Singh for tolerating them. The Left also demanded that India refrain from entering into negotiations over a 123 agreement with the US¹⁰⁴⁴ given that the Bush administration would henceforth be constrained by the Hyde Act despite its pro-India leanings.

However, the Prime Minister succeeded in bringing around the Left by asking it to reserve final judgement until the final text of the 123 agreement was released, an argument he had successfully used to win over the scientists.¹⁰⁴⁵ Clearly, the Left was not ready to confront Singh yet and was waiting for a

Hyde Act (Obama amendment) neither guarantees, uninterrupted supply of fuel nor allows India to accumulate fuel to cover and safeguard the reactors lifespan. In fact, it explicitly bans this kind of cooperation.....When I go through the explanatory memorandum attached to the Hyde Act I find Iran was mentioned at least fifteen times.”

"Discussion under Rule 193". Accessed on August 9 2013.

<http://164.100.47.132/LssNew/Debates/textofdebatedetail.aspx?sdate=12/18/2006>

¹⁰⁴³

"Discussion under Rule 193". Accessed on August 9 2013.

<http://164.100.47.132/LssNew/Debates/textofdebatedetail.aspx?sdate=12/18/2006>

¹⁰⁴⁴ George, Varghese K. "N-Deal: Cong Braces to Woo Left." *The Indian Express*, December 14 2006.

<http://www.indianexpress.com/news/ndeal-cong-braces-to-woo-left/18529/>

¹⁰⁴⁵ Ibid

politically opportune moment. That opportunity would come in August 2007 following the release of the final text of the 123 agreement.

The reader may question as to why the retirees and Kakodkar were so obsessed with the provisions of the Hyde Act, especially pertaining to the trinity of issues? After all, the Act was a domestic law and an internal matter of the US. Its main aim was to provide the requisite retroactive waivers to allow President Bush to negotiate a bilateral 123 agreement with India. The retirees and Kakodkar should ideally be concerned only with the text of the forthcoming 123 agreement, an international treaty constraining India's actions that would supersede the Hyde Act's provisions as per the Vienna Convention on the Law of Treaties.¹⁰⁴⁶ In other words, why were Kakodkar and the retirees so focused on the Hyde Act when the forthcoming 123 agreement should be the only document of interest to them?

A review of the documentary record during the debate over the Hyde Act suggests four reasons advanced or implied by the retirees and Kakodkar. First, the Hyde Act's mandate did not just include the provision of retroactive waivers to India to allow the Bush administration to negotiate a bilateral 123 agreement. The Act would also end up defining the terms for a future nuclear cooperation agreement between the US and India thereby at least theoretically constraining the Bush administration's ability to deviate from the Act's strictures during

¹⁰⁴⁶ Article 27-(Internal law and observance of treaties) of the Vienna Convention on the Law of Treaties requires that "A party may not invoke the provisions of its internal law as justification for its failure to perform a treaty."

"Vienna Convention on the Law of Treaties." Accessed on August 9 2013
<http://www1.umn.edu/humanrts/instree/viennaconvention.html>

negotiations over the 123 agreement (we shall see later how the Bush administration violated the Act's strictures to make concessions in favor of India on the trinity of issues).

Thus, the Hyde Act's assumed constraining impact on the negotiating behavior of the Bush administration during the 123 agreement negotiations was a major reason for the relentless focus of Kakodkar and the retirees on the Act, especially after their failure to get the US Congress to excise the problematic provisions from the Act by indirectly exerting pressure and constraining the Prime Minister's maneuvering room in India.

Second, the Act was the domestic law of the United States, the preeminent power in the international system with a vast power advantage over India. Although a future disruptive event such as an Indian nuclear test would be a high-risk policy choice given the economic repercussions, it was not inconceivable due to the intense controversy surrounding the reliability of the lone 1998 thermonuclear test among weapon scientists that I describe in more detail later in the chapter.

An Indian decision to qualitatively upgrade its nuclear arsenal through another nuclear test, likely a thermonuclear one to verify and validate the 1998 design, would pit the fury of the US Congress miffed at the violation of the Hyde Act and backed by sheer American power against the text of the 123 agreement (assuming India managed to persuade the Bush administration to exclude a reference to nuclear testing in the agreement) and the norms of the Vienna

Convention. There was a distinct possibility that the Hyde Act's termination clause would trump the 123 agreement resulting in the termination of US nuclear cooperation and the imposition of sanctions. Thus, the Hyde Act was viewed by the nuclear scientists as a document on par with the 123 agreement as evidenced in their attempts (especially preemptive ones such as the August 2006 open letter) to secure a clean Act with concessions on the trinity of issues (of course, the scientists were forced to ultimately focus on the 123 agreement as their attempt to secure a clean Hyde Act failed).

Third, given the Hyde Act's importance to the scientists as a major operative document on par with the forthcoming 123 agreement, the strictures in the Act on the Indian nuclear program had implications for the Indian Department of Atomic Energy's (DAE) bureaucratic rationale to expand its turf and maintain a monopoly over the nuclear program. In particular, the ability to explode a nuclear bomb was an important source of prestige, funding¹⁰⁴⁷ and personal acclaim for weapon scientists¹⁰⁴⁸ including Kakodkar. The termination clause in the Hyde Act threatened to permanently foreclose this option by raising the cost to India of a future nuclear test.

¹⁰⁴⁷ The budget of the Department of Atomic Energy went up by 30% following the 1998 tests
Jayaraman, K. S. "India Boosts Budget for Atomic Research in Wake of Bomb Tests"
Nature 393 (June 11 1998): 507.

¹⁰⁴⁸ Dr. R. Chidambaram, the Chairman of the Atomic Energy Commission at the time of the 1998 tests was awarded the Padma Vibhushan, India's second highest civilian honor by the government for his role in the tests. Kakodkar was honored with the Padma Bhushan, India's third highest civilian honor.
"Dr. R. Chidambaram Principal Scientific Advisor Government of India, India." Accessed on August 11 2013. <http://www.indiarnd.com/html/speakers/Chidambaram.pdf>
"Padma Vibhushan for Dr Anil Kakodkar." Accessed on August 11 2013.
http://www.iitb.ac.in/news/PadmaVibhushan_AK.html

Further, the Act's streamlining of the lifetime fuel-supply assurances in the separation plan through the Obama amendment raised the threshold against India conducting a nuclear test by reducing its margin of comfort through a reduction of the size of the strategic reserve of fuel. The Hyde Act's silence on whether India could reprocess the spent fuel from imported reactors in an indigenous reprocessing facility threatened the DAE's ability to use the spent fuel to produce the plutonium necessary to power the second stage of the indigenous three stage nuclear program. The net effect of India's inability to reprocess the spent fuel outputted by imported reactors would be to restrict the size of the second stage of the three stage nuclear program as India would be unable to use the plutonium in the spent fuel to power the fast breeders.

I suggest that the fourth and final reason is perhaps the most important one and merits sustained examination. The Hyde Act was perceived by the scientists in India as a reincarnation of a previous stringent US domestic law, the Nuclear Non-proliferation Act of 1978 (NNPA). The US had unilaterally invoked the provisions of the NNPA to terminate its fuel-supply obligations under the 1963 Tarapur nuclear cooperation agreement, a previous US-India bilateral nuclear cooperation agreement, following India's first nuclear test in 1974.

The American exit from the Tarapur agreement temporarily stranded the two reactors constructed by US based General Electric (GE) Corporation at Tarapur near Mumbai, causing difficulties for the DAE and power shortages in Western India (American fuel-supply obligations were subsequently taken over

by France, Russia and China). I rely on the documentary record and leaked American diplomatic cables (Kissinger cables) to reconstruct the history of the Tarapur agreement and its functional unraveling in the years following India's 1974 test. An understanding of the agreement provides an important historical reason for the attitudes of the retirees and Kakodkar towards the Hyde Act, their insistence on iron-clad fuel supply assurances and an upfront consent to reprocess (two of three issues that comprised the trinity).

The Tarapur agreement

The Tarapur agreement was an outgrowth of the Atoms for Peace Program¹⁰⁴⁹ proposed by President Eisenhower on December 8 1953.¹⁰⁵⁰ Dr. Homi Bhabha, the founder of India's nuclear program managed to secure cooperation from the West under the Atoms for Peace initiative by raising the possibility of nuclear cooperation with the Soviet Union.¹⁰⁵¹ He received steadfast support from India's first Prime Minister and close friend Jawaharlal Nehru.

¹⁰⁴⁹ The program was designed to encourage third world countries to become US allies through nuclear technology cooperation. The strategic necessity to contain Chinese and Soviet influence in South Asia led the US to de-prioritize non-proliferation concerns. The giddy optimism surrounding the potential of nuclear energy in the 1950's also led the Eisenhower Administration and the US Atomic Energy Commission (USAEC) to perceive civilian nuclear energy cooperation with developing nations like India primarily as a high-technology initiative providing access to export markets that posed few risks of nuclear proliferation. Leonard Weiss, "Atoms for Peace," *Bulletin of the Atomic Scientists*, November/December 2003. Zia Mian, A.H. Nayyar, R. Rajaraman, and M.V. Ramana. "Fissile Materials in South Asia: The Implications of the U.S.-India Nuclear Deal" (September 2006). Accessed on February 26 2013. <http://fissilematerials.org/library/rr01.pdf> .p7 Power, Paul F. "The Indo-American Nuclear Controversy." *Asian Survey* 19,, no. 6 (June 1979): 576-77.

¹⁰⁵⁰ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 25

¹⁰⁵¹ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 21

Western nuclear assistance began to reach the Indian nuclear establishment in earnest in the mid-1950's.^{1052 1053}

Britain provided technical assistance to build a low-power research reactor (APSARA)¹⁰⁵⁴ that attained criticality in August 1956¹⁰⁵⁵ and supplied enriched uranium fuel.¹⁰⁵⁶ Bhabha also succeeded in securing Canadian assistance under the Colombo plan to set up CIRUS (Canadian-Indian Research Utility Services), a 40 MW heavy water moderated, light water cooled, natural uranium fuelled reactor.¹⁰⁵⁷

Canada was not unaware of the possibility of India repurposing the spent fuel outputted by the civilian CIRUS to produce weapons grade plutonium for nuclear weapons. However, Canadian diplomats went along with the Indian insistence that IAEA safeguards on the CIRUS would impinge on India's

¹⁰⁵² Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 30

¹⁰⁵³ US-India nuclear cooperation got underway with the US Atomic Energy Commission and its Indian counterpart finalizing an agreement on March 16, 1956 for the sale of 21 short tons of heavy water to be used as a moderator in the natural uranium fuelled Canadian Indian Research Utility Services (CIRUS) reactor, a research reactor set up in Mumbai with Canadian assistance under the Colombo Plan
Ramana, M. V. "The Indian Nuclear Industry: Status and Prospects-Nuclear Energy Futures Paper No. 9." (December 2009), Accessed on August 11 2013

http://www.cigionline.org/sites/default/files/Nuclear%20Energy%20Futures_9.pdf. p 3

¹⁰⁵⁴ Sir John Cockroft, Bhabha's former colleague and a prominent scientist in the British atomic program provided the latter with the technical blueprints for the reactor.

Ramana, M. V. "Nuclear Power in India: Failed Past, Dubious Future." Accessed on August 11 2013

[http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_\(PAPER\).pdf](http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_(PAPER).pdf).

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¹⁰⁵⁵ Ramana, M. V. "Nuclear Power in India: Failed Past, Dubious Future." Accessed on August 11 2013

[http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_\(PAPER\).pdf](http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_(PAPER).pdf).

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¹⁰⁵⁶ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 27

¹⁰⁵⁷ Ramana, M. V. "Nuclear Power in India: Failed Past, Dubious Future." Accessed on August 11 2013.

[http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_\(PAPER\).pdf](http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_(PAPER).pdf).

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sovereignty¹⁰⁵⁸ (although they did obtain a commitment from India in a secret annex to the treaty that the CIRUS and its spent fuel would not be repurposed for military uses).¹⁰⁵⁹ The US supplied the heavy water required for the CIRUS reactor.^{1060 1061}

However, the British aided APSARA and the Canadian supplied CIRUS were research reactors that did not produce electricity and pressure began to mount on the Indian Department of Atomic Energy (DAE) to justify its funding by providing a visible public service.¹⁰⁶² In August 1960, the DAE announced that Tarapur, a small fishing village inhabited by a few hundred people about a 100 kilometers north of its headquarters in Mumbai would be the site of the first power reactor in India.¹⁰⁶³ Subsequently, Prime Minister Nehru announced the decision in the Lok Sabha (lower house of the Indian Parliament).¹⁰⁶⁴

¹⁰⁵⁸ Ibid. p 5

¹⁰⁵⁹ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 27

¹⁰⁶⁰ Ramana, M. V. "Nuclear Power in India: Failed Past, Dubious Future." Accessed on August 11 2013. [http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_\(PAPER\).pdf](http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_(PAPER).pdf) p 6

¹⁰⁶¹ US cooperation with India also included such sensitive areas as reprocessing. Vitro International, an American firm prepared the blueprints for India's first reprocessing plant at Trombay that was later used to separate plutonium from the irradiated CIRUS spent fuel rods to be used in India's 1974 "peaceful nuclear explosion." Indian scientists were also trained at scientific institutions in the US.

Ramana, M. V. "Nuclear Power in India: Failed Past, Dubious Future." Accessed on August 11 2013. [http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_\(PAPER\).pdf](http://www.npolicy.org/article_file/Nuclear_Power_in_India-Failed_Past_Dubious_Future_(PAPER).pdf)

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(Wohlstetter, 1977: 3-61). Cited in

Ramana, M. V. "The Indian Nuclear Industry: Status and Prospects-Nuclear Energy Futures Paper No. 9." (December 2009), Accessed on August 11 2013

http://www.cigionline.org/sites/default/files/Nuclear%20Energy%20Futures_9.pdf p 3

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 30.

¹⁰⁶² Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. p 23

¹⁰⁶³ Ibid. p 46-47

¹⁰⁶⁴ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 37

The DAE was initially inclined to only go in for the British gas-graphite reactor and issued a tender requesting bids for natural uranium fuelled reactors.¹⁰⁶⁵ The United Kingdom Atomic Energy Agency (UKAEA) had promised India that it would supply a natural uranium fuelled gas graphite reactor for approximately 600 million rupees.¹⁰⁶⁶ However, the tender was altered to allow bids for enriched uranium fuelled reactors at the request of US nuclear corporations.¹⁰⁶⁷

Although the British were considered the frontrunners to secure the contract, the final bids came as a surprise to the DAE as the US based General Electric Company (GE) quoted the lowest price. It promised two enriched uranium fuelled 190-MW Boiling Water Reactors (BWR's) on a turnkey basis for just 480 million rupees.¹⁰⁶⁸ The financing terms were very attractive and included \$80 million in credit at a mere 0.75% interest over 40 years.¹⁰⁶⁹ The US bid was

¹⁰⁶⁵ Ramana, M. V. "The Indian Nuclear Industry: Status and Prospects-Nuclear Energy Futures Paper No. 9." (December 2009), Accessed on August 11 2013

http://www.cigionline.org/sites/default/files/Nuclear%20Energy%20Futures_9.pdf .p3

Sundaram, C.V., L. V. Krishnan, and T.S. Iyengar. "Atomic Energy in India: 50 Years. ." . Mumbai: Department of Atomic Energy, Government of India, 1998. P 104

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 47-48

¹⁰⁶⁶ Ashok.Parthasarathi. *Technology at the Core. Science and Technology with Indira Gandhi*. New Delhi: Pearson Longman. , 2007. P 12-13

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 23-24.

¹⁰⁶⁷ Sundaram, C.V., L. V. Krishnan, and T.S. Iyengar. "Atomic Energy in India: 50 Years. ." . Mumbai: Department of Atomic Energy, Government of India, 1998. P 104

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 47-48

¹⁰⁶⁸ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 24, 48.

¹⁰⁶⁹ Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 19

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56

much lower¹⁰⁷⁰ than the one turned in by the UK (950 million rupees)¹⁰⁷¹ and France (870 million rupees).¹⁰⁷²

The US further sweetened an already favorable offer by not requiring any payment from India for the first ten years.¹⁰⁷³ An additional \$14.4 million was allocated to pay for the import of the first fuel shipment for the Tarapur reactors.¹⁰⁷⁴ The low US bid, attractive financing firms and deferred payment plan led India to award GE the contract to construct the two Tarapur reactors¹⁰⁷⁵ despite enriched uranium fuelled reactors not being a part of India's three stage nuclear program that was supposed to rely exclusively on natural uranium fuelled Pressurized Heavy Water Reactors (PHWR's) in the first stage.¹⁰⁷⁶

¹⁰⁷⁰ The provision of cheap capital by the US was intended to bridge the disparity in the capital costs between the Tarapur reactors and conventional coal-fired power plants located away from the pithead. Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 52

¹⁰⁷¹ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 24

¹⁰⁷² Ibid

¹⁰⁷³ Ibid.p 48-49

¹⁰⁷⁴ Ibid

¹⁰⁷⁵ Ibid.p 24

Ramana, M. V. "The Indian Nuclear Industry: Status and Prospects-Nuclear Energy Futures Paper No. 9." (December 2009), Accessed on August 11 2013

http://www.cigionline.org/sites/default/files/Nuclear%20Energy%20Futures_9.pdf .p3

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 55-57

Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 19

¹⁰⁷⁶ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 24

Ramana, M. V. "The Indian Nuclear Industry: Status and Prospects-Nuclear Energy Futures Paper No. 9." (December 2009), Accessed on August 11 2013

http://www.cigionline.org/sites/default/files/Nuclear%20Energy%20Futures_9.pdf .p3.

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 55-57

Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 19

Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 52

American and Indian diplomats undertook negotiations in 1961.¹⁰⁷⁷ India's insistence that any IAEA safeguards on the Tarapur reactors would infringe on its sovereignty was not acceptable to the US which wanted India to accept safeguards.¹⁰⁷⁸ A compromise was reached. The US gave assurances under Article II of the agreement that it would provide an adequate supply of uranium fuel to the Tarapur reactors for the duration of their lifetime in exchange for India placing them under safeguards.¹⁰⁷⁹

The overall ceiling of the fuel that India could purchase over the timeframe of the agreement was set at 14,500 kilograms of uranium 235 contained in uranium enriched up to 20 percent.¹⁰⁸⁰ For its part, India agreed to sign a safeguards agreement with the IAEA that would allow inspections. Indian negotiators also agreed to only use American enriched uranium fuel for the Tarapur reactors.¹⁰⁸¹ The American guarantee of fuel supply for the lifetime of the Tarapur reactors in exchange for the Indian commitment to accept safeguards and

¹⁰⁷⁷Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 55.

¹⁰⁷⁸Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56

¹⁰⁷⁹"United States: Agreements for Cooperation Concerning the Civil Uses of Atomic Energy, with India and Certain Other Countries". *International Legal Materials*, 2, no. 5 (September 1963): 893.

Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy " *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 58-59.

¹⁰⁸⁰"United States: Agreements for Cooperation Concerning the Civil Uses of Atomic Energy, with India and Certain Other Countries". *International Legal Materials*, 2, no. 5 (September 1963): 893.

¹⁰⁸¹Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56

Power, Paul F. "The Indo-American Nuclear Controversy" *Asian Survey* Vol. 19, no. No. 6 (Jun., 1979): p 576-77.

only use American fuel made the Tarapur agreement unique among other bilateral nuclear agreements signed by the US in the 1960s.

A bilateral umbrella US-India civil nuclear cooperation agreement was finalized on August 8, 1963.¹⁰⁸² It included a contract for the design, construction and commissioning of two 200 MWe Boiling Water Reactors at Tarapur by GE on a turnkey basis.¹⁰⁸³ The agreement came into effect on October 25 1963¹⁰⁸⁴ and would be valid for thirty years.¹⁰⁸⁵ The Tarapur reactors would use light water as moderator and operate for 25 years.

Article II of the agreement also required India to seek American approval for reprocessing the safeguarded spent fuel discharged by the Tarapur reactors in order to separate the plutonium.¹⁰⁸⁶ Interestingly, the Tarapur agreement did not explicitly prohibit peaceful nuclear explosions (PNEs) similar to the ones conducted by the US and the Soviet Union¹⁰⁸⁷ but was clear that American fuel or

¹⁰⁸² Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 55

¹⁰⁸³ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 52, 55

"Nuclear Power in India". (20 November 2013). Accessed on November 25 2013. <http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/India/>

¹⁰⁸⁴ Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy " *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 58

¹⁰⁸⁵ Power, Paul F. "The Indo-American Nuclear Controversy" *Asian Survey* Vol. 19, no. No. 6 (Jun., 1979): p 576-577

¹⁰⁸⁶ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56

"United States: Agreements for Cooperation Concerning the Civil Uses of Atomic Energy, with India and Certain Other Countries". *International Legal Materials*, 2, no. 5 (September 1963): p 893

¹⁰⁸⁷ Power, Paul F. "The Indo-American Nuclear Controversy" *Asian Survey* Vol. 19, no. No. 6 (Jun., 1979): p 577

technology should not be diverted by India for military purposes.¹⁰⁸⁸ Funds for the Tarapur project would be dispensed through the US Agency for International Aid (USAID) under the December 7 1963 Loan Agreement.¹⁰⁸⁹

Both sides appeared satisfied with the agreement although concerns were expressed by American¹⁰⁹⁰ and Indian¹⁰⁹¹ skeptics. The main gain for the American side was India's decision to accept safeguards on the reactors and the prospect of securing a foothold in a large nuclear market. At the broader strategic level, the agreement was also a key enabling initiative that would help the US to move towards enlisting India as its ally in South Asia.¹⁰⁹² The Indian side emphasized that it had succeeded in restricting the application of safeguards to the

¹⁰⁸⁸ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56.

¹⁰⁸⁹ Brahma., Chellaney. *Nuclear Proliferation: The Us-India Conflict*. . Hyderabad.: Orient Longman. , 1993. P 26

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 48-49

¹⁰⁹⁰ On the American side, objections to the agreement in the US Congress focused on India's reluctance in cooperating with the US on foreign policy issues of importance to the latter. However, Congressmen and women did not question the generous terms of credit extended by the US to India under the agreement and the initiative's possible proliferation implications.

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 57

¹⁰⁹¹ The domestic debate over the Tarapur agreement in India focused on the country's decision to opt for American Light Water Reactors (LWR's) instead of the Canadian Pressurized Heavy Water Reactors (PHWR's), the mainstay of the first stage of the Indian nuclear program under the three-stage Bhabha plan. Critics also worried that the agreement would make India dependent on the US and would deplete its already meager foreign exchange reserves. The DAE justified the Tarapur agreement by citing the favorable financing terms offered by the US, the proven track record of Light Water Reactor technology that would demonstrate the feasibility of nuclear power in India and the operational experience that would accrue following the commissioning of American reactors.

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 55-57

¹⁰⁹² Ibid. P 55-56, 58

Tarapur reactors and that too in exchange for concrete American fuel-supply guarantees.¹⁰⁹³

Construction of the Tarapur I and II units began in 1964 with the US based Bechtel Corporation responsible for the architecture and engineering portions of the project.¹⁰⁹⁴ There were delays due to multiple problems including labor unrest, the vanishing of steam generators for the Tarapur reactors on a ship bound for India stuck at the Karachi port during the 1965 India-Pakistan war and cracks in the inner lining of the reactor vessel that required a 9 month long repair.¹⁰⁹⁵ A contract containing American fuel-supply assurances was signed on May 17, 1966.¹⁰⁹⁶ Two fuel shipments from the US had already arrived by 1967.¹⁰⁹⁷ The project was completed in 1969¹⁰⁹⁸ and Prime Minister Indira Gandhi inaugurated the reactors on January 19 1970.¹⁰⁹⁹ The Tarapur units supplied nuclear electricity for the first time in India although the cost of the project had doubled.¹¹⁰⁰

The first ever trilateral IAEA safeguards agreement was signed between the US, India and the IAEA in Vienna on January 27, 1971 (although safeguards

¹⁰⁹³ Ibid. p 56

¹⁰⁹⁴ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 24, p 49

¹⁰⁹⁵ Ibid. p49

¹⁰⁹⁶ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56
Power, Paul F. "The Indo-American Nuclear Controversy " *Asian Survey* Vol. 19, no. No. 6 (Jun., 1979): p 576-577.

¹⁰⁹⁷ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 46

¹⁰⁹⁸ Ibid. p 24, 48

¹⁰⁹⁹ Ibid. p 50

¹¹⁰⁰ Ibid. p 24, 48

were applied earlier from October 25, 1963 for a period of thirty years).¹¹⁰¹ IAEA inspections permitted by the agreement would ensure that American origin fuel was being used only for peaceful purposes at Tarapur.¹¹⁰² The inspections were also supposed to verify that the spent fuel produced by the Tarapur reactors would not be diverted for military purposes.¹¹⁰³

On May 18 1974, India conducted its first “peaceful nuclear explosion” by diverting plutonium outputted by the Canadian supplied CIRUS research reactor. The test was a significant event in India-world and US-India relations. Canada completely terminated its nuclear cooperation with India on May 18, 1976¹¹⁰⁴ and a declaration released by the Canadian cabinet in December of that year was clear that nuclear cooperation would henceforth be restricted to signatories of the Nonproliferation Treaty (NPT).^{1105 1106} Despite Prime Minister Indira Gandhi’s

¹¹⁰¹ Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy" *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 58

¹¹⁰² Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56

¹¹⁰³ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999.p 56

¹¹⁰⁴ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 186-187, 197.

"Fonmin Chavan Statement on Indo-Canadian Nuclear Discussions

". (May 20, 1976). Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1976NEWDE07494_b.html

¹¹⁰⁵(The Power of Promise- Examining Nuclear energy in India- M V. Ramana) p 31

¹¹⁰⁶ Indo-Canadian nuclear cooperation was already fraying in 1973 due to increasing Canadian reluctance to transfer assistance to an India that was refusing to sign the NPT and accept more intrusive IAEA safeguards. Canadian reservations turned into outrage following the 1974 test. A moratorium on the transfer of nuclear fuel and technology to India was announced within four days of the test. Canada also came up with a new policy in December 1974 that explicitly required a recipient country to not divert Canadian assistance for a “peaceful nuclear explosion.” Henceforth, nuclear cooperation with India would be contingent on the latter’s acceptance of full-scope safeguards (i.e. safeguards on all its nuclear installations).Tempers cooled briefly and Canadian diplomats negotiated a new agreement with their Indian counterparts in the two years following the 1974 test. The agreement would ensure a return to pre-1974 levels of cooperation. A leaked American diplomatic cable written on May 25 1976 revealed that India had agreed to an 18 month temporary moratorium on nuclear testing in the new agreement with Canada.The

defiant rhetoric of self-reliance,¹¹⁰⁷ Canada's initial moratorium and subsequent termination of nuclear cooperation adversely affected the under-construction Rajasthan II reactor and the Kota heavy-water plant.

moratorium and other Indian concessions (short of an acceptance of full-scope safeguards on all nuclear facilities and complete renouncing of nuclear testing) indicated that India was eager to access Canadian assistance. But the Canadian government backtracked and announced that no further nuclear cooperation with India would be possible without its acceptance of the December 1974 policy on testing and full-scope safeguards on all nuclear facilities.

"Reported Canadian Curb on Nuclear Cooperation with India

". (June 25 1973). Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1973NEWDE07417_b.html

"India's Nuclear Position

". (June 22 1973). Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1973NEWDE07334_b.html

"Indian Nuclear Program

". (August 3 1973). Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1973NEWDE09014_b.html

Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 30, 31

Chari, PR. "Pokharan-I-Personal Recollections." In *IPCS Special*

Report No 80. Institute for Peace and Conflict Studies August 2009. Accessed on September 1 2013.

http://www.ipcs.org/pdf_file/issue/SR80-Chari-Final.pdf. p 1

Noble, Lance 2006. 'Canadian Nuclear Cooperation with India in Historical Perspective.' In *Nuclear Cooperation with India: New Challenges, New Opportunities*, edited by Karthika Sasikumar and Wade L. Huntley. Vancouver: Simons Centre for Disarmament and Non-Proliferation Research. P 80

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012.p 31

Ramana, M. V. "The Indian Nuclear Industry: Status and Prospects-Nuclear Energy Futures Paper No. 9." (December 2009), Accessed on August 11 2013

http://www.cigionline.org/sites/default/files/Nuclear%20Energy%20Futures_9.pdf. .p4

"Canadian Reaction to Indian Test ". (May 24,1974). Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1974NEWDE06901_b.html

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 186-187

" Indian- Canadian Talks on Nuclear Problems

". (July 19 1974).Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1974NEWDE09682_b.html

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 186-187

"Indian Nuclear Policy and the Canadians and the Americans

". (May 25 1976). Accessed on September 1 2013.

https://www.wikileaks.org/plusd/cables/1976NEWDE07733_b.html

¹¹⁰⁷"Prime Minister Gandhi on Nuclear Relations with the United States and Canada

". (August 12, 1976). Accessed on September 1 2013

https://www.wikileaks.org/plusd/cables/1976NEWDE11840_b.html

The broader international reaction to the Indian test was varied. Japan adopted a punitive approach and cut-off economic assistance.¹¹⁰⁸ The Soviet Union ‘objectively’ reported the test and the official Indian explanation that the explosion had been conducted for peaceful purposes.¹¹⁰⁹ The Non-aligned bloc of nations and France welcomed the test.¹¹¹⁰

The American response to the 1974 test was complicated but would eventually have adverse implications for the Tarapur agreement and US-India relations. The initial reaction of the Nixon administration to the test was muted.¹¹¹¹

¹¹⁰⁸ Power, Paul F. "The Indo-American Nuclear Controversy" *Asian Survey* Vol. 19, no. No. 6 (Jun., 1979): p 576

Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 30

¹¹⁰⁹ Mehrotra, Santosh. K. 1990. *India and the Soviet Union: Trade and Technology Transfer*. Cambridge, UK: Cambridge University Press. P 21

Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 30

¹¹¹⁰ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 183

¹¹¹¹ An important reason for the muted and even complacent reaction of the Nixon administration in the immediate aftermath of India's 1974 test was then Secretary of State Henry Kissinger's brand of 'hard-headed' realism that recognized strong criticism of India as counterproductive and instead emphasized ways to coopt it to advance US strategic interests. Another significant reason for the tepid US reaction was that the State Department was not entirely unaware of the theoretical possibility of an Indian nuclear test in the months leading up to May 1974. Infact, US Ambassador to India Daniel Patrick Moynihan advised Washington in an April 2 1973 cable that although India had the capability to explode a nuclear bomb, it was also aware of the high economic cost of developing a full fledged arsenal. He surmised that India had decided to not go in for nuclear weapons due to its fragile economic situation, relying instead on Soviet deterrence against China. However, he concluded by pointing out that India could reverse its policy. Moynihan approved another dispatch two days later based on the observations made by the United States Atomic Energy Commission (USAEC) representative in Bombay (Mumbai) Dr. Pinajain responsible for liasing with the Bhabha Atomic Research Center (BARC) and the Tata Institute of Fundamental Research (TIFR). Pinjain had told Moynihan that India was doing extensive research on plutonium. Moynihan warned that the embattled Prime Minister Indira Gandhi's Congress party government might go in for a nuclear test in order to divert public attention away from a faltering economy and to compensate for the diminishing political returns from India's victory in the 1971 Bangladesh War. However, Moniyan made a crucial error by reversing his prior assessment in a November 23 1973 cable. He now advised Washington that India was not in a position to conduct a nuclear test due to the adverse economic situation in the country. The erroneous judgement was repeated in a January 19 1974 cable that even went to the extent of explicitly modifying Pinajain's assessment. A detailed analysis of the tranche of cables (Kissinger

An already mild critique prepared by the State Department was killed by then Secretary of State Henry Kissinger in favor of an anodyne admonition by the department spokesperson.^{1112 1113 1114}

A month after India's test, the US demonstrated its "low-key" posture by allowing a consignment of previously approved Light Enriched Uranium (LEU)

cables) leaked by *Wikileaks*, indicates that the aforementioned cable represented the final (and erroneous) US position on India's capacity to carry out a nuclear test.

"Nea Chiefs of Mission Conference- Country Summary for India". (April 2 1973).Accessed on September 4 2013. https://www.wikileaks.org/plusd/cables/1973NEWDE03743_b.html

"India's Nuclear Position". (April 4 1973).Accessed on September 4 2013.

https://www.wikileaks.org/plusd/cables/1973BOMBAY00705_b.html

"Indian Attitude toward the Npt

". (November 23 1973). Accessed on September 4 2013

https://www.wikileaks.org/plusd/cables/1973NEWDE13654_b.html

"India's Nuclear Intentions

". (January 19, 1974). Accessed on September 4 2013

https://www.wikileaks.org/plusd/cables/1974NEWDE00943_b.html

¹¹¹² Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 183-184

¹¹¹³ A revealing May 23 1974 cable from the US embassy in New Delhi expressed satisfaction over Kissinger's intervention.

"Thanks to the Secretary, the United States reaction so far has been less costly than it probably was going to be. The statement first proposed by the Department of State, while mild, was not mild enough. Within moments, however, the Secretary (Kissinger) weighed in from Damascus to say there was not to be any department statement and that, if queried, the department spokesman was to make a "low-key repeat low-key response". It is well that we have chosen this posture...the Government of India has made it known, albeit very quietly, that they have taken note of the fact that our reaction was moderate....What to do? This seems obvious enough with respect to India. We should respond to this development as we did to the advent of n minus one (probably a reference to the US response following the Soviet Union's first nuclear test)....Which is to take the country seriously, giving a good dose of thought to how its interests and ours may be accommodated, and taking emphatic steps to bring about such accommodation....the various devices installed to pick up traces of Chinese nuclear activity were able to detect the Indian explosion as well."

"Indian Nuclear Test ". (May 23 1974).Accessed on September 7 2013.

https://www.wikileaks.org/plusd/cables/1974NEWDE06847_b.html

¹¹¹⁴ The US Embassy also advised the State Department not to undertake actions that would rupture ties with Indian Atomic Energy Commission Chairman Homi Sethna as he had successfully resisted pressures from Egypt, Libya and Argentina to transfer nuclear weapons related technology in the aftermath of the 1974 test.

"Tarapur". (August 20 1974). Accessed on September 7 2013.

https://www.wikileaks.org/plusd/cables/1974NEWDE11007_b.html

fuel to be shipped to the Tarapur reactors.¹¹¹⁵ The decision was justified on the grounds that the nuclear test did not technically violate the 1963 Tarapur agreement or the 1966 fuel-supply contract.¹¹¹⁶ The shipment would sustain the reactors from June 15, 1974 to April 1, 1975. The US Atomic Energy Commission (USAEC) and its Indian counterpart also reached an agreement in September 1974 over the assurances that India would have to provide for the US to approve additional fuel shipments.¹¹¹⁷ The assurances required the Indian government to “respect understandings that preclude use of US uranium in any explosive device and that utilize IAEA safeguards verification.”¹¹¹⁸

Broader nuclear cooperation also continued with the USAEC proceeding with the transfer of a “microtron” owned by the Lawrence Radiation Laboratory in Berkeley, California to Poona (Pune) University. The transfer had originally been approved in principle by the USAEC in November 1972.¹¹¹⁹ Kissinger struck a conciliatory tone in a speech at the Indian Council of World Affairs in October 1974 and insinuated that India would be included in a multi-lateral

¹¹¹⁵ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 184

¹¹¹⁶ Ibid

¹¹¹⁷ Ibid

¹¹¹⁸ "Dr. Omenn's Trip to India: Personal Views on Us Approach to Goi Atomic Energy Program ". (July 15 1974). Accessed on September 7 2013.

https://www.wikileaks.org/plusd/cables/1974NEWDE09423_b.html

¹¹¹⁹ " 'Microton' Gift to Poona University

". (June 21 1974).Accessed on September 7 2013.

https://www.wikileaks.org/plusd/cables/1974NEWDE08293_b.html

mechanism (that would later become the Nuclear Supplier's Group) to regulate nuclear commerce.¹¹²⁰

He even congratulated Indian Prime Minister Indira Gandhi for the nuclear test in a meeting and suggested that discussions begin to prevent further proliferation of nuclear weapons.¹¹²¹ However, Kissinger's measured response, whether out of genuine conviction or intended as a delaying tactic to stall further Indian tests/technology transfer to other states before the formation of a multilateral export control mechanism was not shared by the US Congress. The US Nuclear Regulatory Commission (USNRC) held up a subsequent shipment of nuclear fuel to the Tarapur reactors under congressional pressure.

A March 4 1976 cable by US Ambassador to India William Bart "Bill" Saxbe warned Washington that prolonged delays in the US fuel shipment for Tarapur would not only result in adverse power shortages in the states of Maharashtra and Gujarat further complicating an already difficult US-India political relationship, but would also provide a convenient excuse for Indian scientists to persuade the political establishment to pursue a more radical nuclear policy.

A working level source in the Indian AEC (Atomic Energy Commission) gave me a copy of a draft paper he has prepared on the consequences of the continued US refusal to honor the Indian requests for export licenses

¹¹²⁰ "Text of the Secretary's Speech to Indian Council on World Affairs, October 28, in New Delhi " (October 28 1974), https://www.wikileaks.org/plusd/cables/1974NEWDE14462_b.html

¹¹²¹Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 185

for nuclear fuel for the twin Tarapur reactors. The paper reads as follows and is dated March 3, 1976: quote: Tarapur Atomic Power Station has an installed capacity of 420 MWe. Tarapur station meets the needs of the states of Maharashtra and Gujarat and comprises about 12 percent of their total installed capacity excluding Tarapur. The station is estimated to require around 130-150 fuel bundles on an average per annum. Our annual fabrication capacity corresponds to this. The time required for the fabrication of a fuel bundle from the time raw material is made available is estimated around 9 months. To reduce fuel inventory costs, the en.u (enriched uranium) is scheduled for withdrawals to meet the fabrication programme and timely availability for the station refuelling needs. Any delays, therefore, adversely affect the fabrication programme and could result into running the station at reduced outputs or completely stopping it (unquote). It is unlikely that the leak of this document was an inspired one. I believe that my source is genuinely concerned that some people in the IAEC (Indian Atomic Energy Commission) may wish to use this difficulty over the fuel to turn India's atomic policy away from cooperation with the US and possibly toward a more radical and independent line.¹¹²²

The warning issued in the cable, subsequent meetings between Ambassador Saxbe and several members of Congress and the intervention of the State Department resulted in the Nuclear Regulatory Commission clearing a six

¹¹²² "Consequences of Withholding Nuclear Fuel from Tarapur". (March 4 1976). Accessed on September 12 2013.
https://www.wikileaks.org/plusd/cables/1976NEWDE03279_b.html

month supply of fuel for Tarapur (half the regular amount) on May 21 1976.¹¹²³

Prime Minister Indira Gandhi subsequently informed the Indian Parliament on August 12 1976 that

approximately half the quantity of enriched uranium for which license has been applied for was cleared for export and the same has already been received in India on July 23, 1976. There is consequently, no immediate difficulty in this regard.¹¹²⁴

If Indian leaders and the nuclear establishment assumed that the Nuclear Regulatory Commission's release of a temporary shipment indicated a decrease in congressional pressure, they were mistaken. The US Congress pushed the administration to rectify the Atoms-for-Peace program by tightening domestic and international non-proliferation laws. Recipient countries would henceforth be required to accept IAEA safeguards on all nuclear facilities (full scope safeguards) to prevent the diversion of civilian assistance towards military ends.¹¹²⁵ Congress also approved the Symington Amendment to the Foreign Assistance Act in June 1976 that prohibited the administration from offering American economic or military assistance to any country seeking to import

¹¹²³ "Tarapur: Press on Delay in US Uranium Shipments". (July 2 1976). Accessed on September 12 2013
https://www.wikileaks.org/plusd/cables/1976NEWDE09812_b.html

¹¹²⁴"Prime Minister Gandhi on Nuclear Relations with the United States and Canada". (August 12 1976). Accessed on September 12 2013
https://www.wikileaks.org/plusd/cables/1976NEWDE11840_b.html

¹¹²⁵ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 183-185, 191

enrichment and reprocessing technologies unless it accepted full-scope safeguards.¹¹²⁶

The steady pressure from Congress and the adoption of non-proliferation as a major US foreign policy priority by presidential candidate Jimmy Carter in the 1976 campaign significantly narrowed the maneuvering room for President Gerald Ford (he had by now succeeded Nixon after the latter's resignation in the wake of the Watergate scandal). The Ford administration issued a major statement on October 28, 1976 that committed the US to the once-through cycle and called for a halt to spent fuel reprocessing. US foreign policy would henceforth focus on strengthening the safeguards system and export controls in order to minimize the risks of horizontal proliferation.¹¹²⁷ The US would also retroactively renegotiate international nuclear cooperation agreements in order to reduce the incentives to the recipient country for reprocessing.¹¹²⁸ The policy climate in the US was becoming hostile to the Tarapur agreement.

Recall that Kissinger had adopted a conciliatory tone following the Indian nuclear test. He now quickly fell in line with the Ford administration's directive and chaired a secret meeting in London that discussed the formation of a multilateral export control grouping.¹¹²⁹ The mechanism would enable the advanced industrial countries to coordinate their export control policies towards

¹¹²⁶ Ibid. p 198

¹¹²⁷ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 199

¹¹²⁸ Ibid. p 205

¹¹²⁹ Ibid. p 191

the developing world, subject a list of materials and items required for nuclear weapons to export controls and enact stringent conditions designed to close loopholes in the safeguards system that allowed India to divert civilian technology for military purposes.^{1130 1131}

The multilateral grouping became the Nuclear Supplier's Group (NSG)¹¹³² that agreed on a set of guidelines for the export of nuclear materials, equipment and technologies.¹¹³³ NSG members also demanded additional assurances (IAEA safeguards) from recipient states on the transferred materials and items.¹¹³⁴ To summarize, the US not only began adopting a more muscular approach towards non-proliferation in 1976 but also threw its weight at the international level to construct a multilateral institution for the achievement of that goal. Carter's victory in the 1977 US presidential election resulted in the coming into office of an administration that gave a higher priority to non-proliferation.¹¹³⁵

However, the biggest blow to the Tarapur agreement came on March 10, 1978 with the US Congress passing the stringent Nuclear Non-Proliferation Act (NNPA).¹¹³⁶ The Act required every recipient country except the five nuclear

¹¹³⁰Ibid. p 191

¹¹³¹ The approach would build on the efforts of the Zangger committee, a group of 20 states that decided to not export a "trigger list" of nuclear materials and items that could be used by a recipient country to produce nuclear weapons. Trigger list items would only be exported if the recipient state accepted IAEA safeguards on the facilities receiving the items.

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 187

¹¹³² Ibid. p 191

¹¹³³ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. p 30

¹¹³⁴ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 191

¹¹³⁵Ibid. p 194, 205

¹¹³⁶ Ibid. p 206

weapon states and NPT signatories to accept full-scope safeguards as a precondition for nuclear cooperation.¹¹³⁷ Further, it explicitly prohibited the explosion of peaceful nuclear devices by diverting American assistance.¹¹³⁸ The Act also prohibited the reprocessing of US origin spent fuel without American approval and required the administration to terminate nuclear cooperation with any state that detonated a nuclear explosive device.¹¹³⁹

Congress set an 18 month deadline for the administration to renegotiate all prior nuclear agreements and bring them in line with the requirements of the Act failing which a complete termination of US assistance would occur.¹¹⁴⁰ The implications of the Act for the Tarapur agreement were ominous. US fuel shipments to the Tarapur reactors would cease by March 10 1980 unless India accepted full-scope safeguards.¹¹⁴¹

Furious Indian diplomats argued that the Nuclear Non-proliferation Act's requirement to renegotiate the Tarapur agreement was a violation of article 27 of the Vienna Convention on the Law of Treaties, an international law that forbade a party to a treaty from invoking its domestic laws as an excuse for failure to

Squassoni, Sharon. " Looking Back: The 1978 Nuclear Nonproliferation Act" *Arms Control Today*, December 2008. Accessed on September 12 2013.

http://www.armscontrol.org/act/2008_12/lookingback_NPT

¹¹³⁷ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 31
Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 206

¹¹³⁸ Ibid

¹¹³⁹ Ibid

¹¹⁴⁰ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 206, 220

¹¹⁴¹ Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy
" *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 58-59

perform obligations.¹¹⁴² They warned that the American violation of its fuel supply and technology assistance obligations would in turn free India from the obligations of Article II of the Tarapur agreement that required the latter to seek the former's approval for reprocessing the safeguarded spent fuel outputted by the Tarapur reactors to separate the plutonium.¹¹⁴³ In other words, India would be free to unilaterally reprocess the safeguarded spent fuel at Tarapur¹¹⁴⁴ in retaliation for the US violation of the Tarapur agreement through the unilateral and retroactive modification of its terms by passing the Nuclear Non-proliferation Act.

The Carter administration had anticipated such a scenario and came close to clinching an agreement with India that would allow it to buy the excess spent fuel and bring the shipment to the US as provided for in the Tarapur agreement. However, that possibility was foreclosed by logistical challenges, opposition from the environmental movement in the US and the reluctance of the administration to adhere to the principle of reciprocity enshrined in the agreement. Operationalising the principle would have resulted in Indian inspectors acquiring the right to inspect American facilities housing the Tarapur spent fuel.¹¹⁴⁵

¹¹⁴²Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy" *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 59

Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 23

¹¹⁴³ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 56.

"United States: Agreements for Cooperation Concerning the Civil Uses of Atomic Energy, with India and Certain Other Countries". *International Legal Materials*, 2, no. 5 (September 1963): p 893

¹¹⁴⁴ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 209

¹¹⁴⁵ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 208

Indian interlocutors also contended that the Nuclear Nonproliferation Act's retroactive overriding of the Tarapur agreement would raise serious questions over the title to the accumulated plutonium in the spent fuel of the Tarapur reactors.¹¹⁴⁶ To summarize, the Indian position was that the additional commitments (e.g. full scope safeguards) demanded by the US under the Nuclear Nonproliferation Act over and above the Tarapur agreement under the threat of fuel-supply and technology transfer termination was legally indefensible.¹¹⁴⁷

The intractability of the American and Indian positions and the resulting inability to resolve differences before the 18 month deadline specified by Congress led to the termination of US fuel-supply in 1979.¹¹⁴⁸ Although the Indian AEC did not have the capacity to produce low enriched uranium fuel,¹¹⁴⁹ it defiantly proposed developing mixed oxide (MOX) fuel (contains plutonium and uranium)¹¹⁵⁰ as a substitute for enriched uranium from the US within three years to run the stranded Tarapur reactors.¹¹⁵¹

Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 21

¹¹⁴⁶ Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy" *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 59

¹¹⁴⁷ Ibid.

¹¹⁴⁸ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 234

Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 53

¹¹⁴⁹ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012.p 52

¹¹⁵⁰ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 234

¹¹⁵¹ " 'India Works on Uranium Substitute.' ". *GAM (The Globe and Mail)*, May 18 1979.

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. p 53

The proposal to use an unproven fuel without adequate validation was opposed within the AEC as risky and cumbersome.¹¹⁵² MOX fuel technology would not only decrease the safety margin and increase the risk of accidents but was also a temporary solution in that it would only reduce (and not eliminate) the requirement for enriched uranium.¹¹⁵³ Prime Minister Indira Gandhi eventually rejected the proposal as she did not have confidence in the nuclear establishment's claims¹¹⁵⁴ and had decided to resolve the Tarapur dispute by improving the broader bilateral relationship with the US.¹¹⁵⁵

Her good personal relationship with Carter's successor Ronald Reagan resulted in a successful state visit to the US in 1982. The Reagan administration was also coming around to the view that the Nuclear Nonproliferation Act's across the board strictures on tighter export controls and plutonium reprocessing would have to be circumvented in order to resolve the Tarapur dispute, a necessary concession to elicit greater Indian cooperation in the American effort to contain the Soviet Union.¹¹⁵⁶ The administration was also egged on by the power equipment lobby.¹¹⁵⁷ After several rounds of negotiations, US lead negotiator

¹¹⁵² Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 25

¹¹⁵³ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 53

¹¹⁵⁴ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p 234

¹¹⁵⁵ Ibid

¹¹⁵⁶ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 233

¹¹⁵⁷ Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 25

James Malone and his Indian counterpart Eric Gonsalves eventually agreed to the transfer of American fuel-supply obligations to a third party.¹¹⁵⁸

The US completed its disengagement from the Tarapur agreement in late 1982 by agreeing to let France take over American fuel supply obligations. The transition was accomplished through an amendment to the agreement.¹¹⁵⁹

Secretary of State George Schultz (former Vice Chairman of the Betchel Group and former Secretary of Labor in the Nixon administration) also resolved a dispute over the supply of spare parts for the Tarapur reactors.¹¹⁶⁰

The first enriched uranium fuel shipment from France arrived in India in May 1983.¹¹⁶¹ France was not the only replacement supplier for the Tarapur reactors and subsequent fuel shipments were delivered by China and Russia.¹¹⁶²

However, the two sides could not reach an agreement on whether India should obtain American consent to reprocess the spent fuel¹¹⁶³ produced by the Tarapur

¹¹⁵⁸ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 234

¹¹⁵⁹ Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 25

¹¹⁶⁰ Taubman, Philip. 1 July, 1983. 'Schultz Tells India That US Will Drop Reactor Parts Ban.' *The New York Times*, A.4.

<http://www.nytimes.com/1983/07/01/world/shultz-tells-india-that-us-will-drop-reactor-parts-ban.html>

Kux, Dennis. 1994. *Estranged Democracies: India and the United States, 1941-1991*. New Delhi: Sage. Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 50.

¹¹⁶¹ DAE (Department of Atomic Energy). 1984. 'Annual Report 1983-1984.' Bombay. Department of Atomic Energy

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 53

¹¹⁶² Chari, P. R., ed. *Indo-U.S Nuclear Deal- Seeking Synergy in Bilateralism*. New Delhi: Routledge, 2009. P 21

Srinivasan, M.R. "Remember Lessons from Tarapur" *The Hindu*, December 27, 2006.

<http://www.hindu.com/2006/12/27/stories/2006122704441000.htm>

Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 31, 52

¹¹⁶³ Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 235, 239

reactors although India agreed to continue safeguards. Although the US led international embargo on nuclear cooperation with India was not a watertight one, it adversely affected the Tarapur reactors as they were frequently shutdown due to various technical problems that were no longer easy to redress given the difficulty in securing foreign cooperation.¹¹⁶⁴

The Tarapur complex

Department of Atomic Energy (DAE) planners originally expected the Tarapur reactors to operate at a high capacity factor of 80% before 1974 and supply a substantial portion of the electricity demand for Maharashtra and Gujarat states.¹¹⁶⁵ The repeated shutdowns of the reactors in the aftermath of US sanctions frequently collapsed the Western electricity grid that left the entire region without power.¹¹⁶⁶ The DAE came under enormous political pressure after American termination of assistance to continue operating the Tarapur reactors at high capacity factors¹¹⁶⁷ leading it to cut corners on safety.¹¹⁶⁸ The power level of the reactors had to be downgraded to 160 MW in 1985.¹¹⁶⁹ Still, the reactors achieved a load factor of only around 62 per cent.¹¹⁷⁰

¹¹⁶⁴ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 50-51

¹¹⁶⁵ "Falling Apart

". *Economic and Political Weekly*, Vol. 9, no. No. 20 ((May 18, 1974)): p 774.

¹¹⁶⁶ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. p 50-51

¹¹⁶⁷ "Falling Apart

". *Economic and Political Weekly*, Vol. 9, no. No. 20 ((May 18, 1974)): p 774.

¹¹⁶⁸ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. p 50-51

¹¹⁶⁹ Katiyar, S.C., and S.S. Bajaj. 2006. 'Tarapur Atomic Power Station Units-1 and 2: Design Features, Operating Experience and License Removal.' *Nuclear Engineering and Design* 236: 881-93

Cited in Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. p 51-52

¹¹⁷⁰ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 52

The post-1978 US led international embargo on nuclear cooperation adversely affected the broader Indian nuclear program resulting in construction delays at multiple nuclear power stations including the RAPS II (8 years), FBTR (11 years), MAPS I (9 years), MAPS II (10 years), NAPS I (14 years) and NAPS II (14 years).¹¹⁷¹ On a broader level, the Tarapur fiasco and the delays suffered by the Indian nuclear program combined with other issues (India's non-NPT status, US support for Pakistan, India's tilt towards the Soviet Union and the narrow economic base of the US-India relationship) to sour US-India relations.¹¹⁷² The difficulty in operating the Tarapur reactors following the American fuel-supply cutoff in the aftermath of the Nuclear Non-proliferation Act of 1978 and the challenges in obtaining replacement fuel suppliers and safety related spare parts from the US created intense resentment among some of the aforementioned retired nuclear scientists who were at the helm of various nuclear bureaucracies at the time.

A key lesson that the retirees learned from the Tarapur fiasco was that the US was capable of breaching with impunity its lifetime fuel-supply commitments in an international treaty such as the Tarapur agreement by blithely citing the constraints of its domestic legislation, the Nuclear Non-proliferation Act of 1978 enacted later. Consider this statement by Dr. M. R. Srinivasan, former Chairman

¹¹⁷¹ Ibid. p 33

¹¹⁷² Chari, P. R. "An Indian Reaction to U.S. Nonproliferation Policy

" *International Security* Vol. 3, no. No. 2 (Autumn, 1978): p 58

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. P 209

of the Atomic Energy Commission and a signatory to the August and December 2006 open letters.

The Tarapur agreement concluded in 1963 was unique in that it guaranteed supplies of enriched uranium fuel from the U.S. for running the Tarapur reactors for their entire life. However, after 1978 the U.S. did not supply fuel saying its domestic legislation (the Nuclear Non-Proliferation Act of 1978) prevented it from doing so.....The lesson from the Tarapur episode is that the U.S. breached with impunity even a cast-iron guarantee it had furnished.^{1173 1174}

Given the perceived unreliability of the US as a fuel supplier post-Tarapur, the challenge for the retirees was to ensure the maximum possible safeguards in the current nuclear deal insulating India from another fuel-supply cut-off caused by a disruptive event such as a future Indian nuclear test.

The determination of the retirees to prevent another Tarapur style fuel cut-off to the reactors imported by India under the nuclear deal was also shared by a serving veteran like Kakodkar, himself affected by the Tarapur experience.

¹¹⁷³ Srinivasan, M.R. "Remember Lessons from Tarapur" *The Hindu*, December 27, 2006. <http://www.hindu.com/2006/12/27/stories/2006122704441000.htm>

¹¹⁷⁴ Similarly, Dr. A. Gopalakrishnan, former Chairman of the Atomic Energy Regulatory Board (AERB) and a joint author of the open letter raked up the Tarapur issue to excoriate the proponents of the nuclear deal for moving India away from the indigenous three-stage nuclear program to large reactor imports with uncertain fuel supply.

"The glaring indictment against the advisability of importing nuclear reactors from the US is the predicament in which we find ourselves today in the case of Tarapur reactors. The US having reneged their contractual obligation to supply life-time fuel to these reactors, India finds itself going from country to country to get enriched uranium to keep these reactors running."

P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 9

Kakodkar brought up the Tarapur experience in a January 17 2007 interview with *The Hindu* to argue in favor of a tough Indian negotiating strategy in the upcoming 123 agreement negotiations that would undercut the Obama amendment.

.....there are serious concerns (if the multi-layered fuel supply assurances in the separation plan are not reiterated in the forthcoming 123 agreement to counteract the Obama amendment) because we have this Tarapur example glaring at us. So we can't have problems similar to Tarapur, but of a much larger magnitude.^{1175 1176}

It would be reasonable to assume that he would have held similar Tarapur influenced views on the issue of fuel-supply in mid-2006 during the separation plan negotiations. The documentary record indicates that the pressure exerted by the retirees and Kakodkar on the Prime Minister regarding the issue of fuel-supply was conveyed by Singh to Secretary of State Condoleezza Rice before the final negotiations over the separation plan in March 2006.

¹¹⁷⁵ Bagla, Pallava. ""Implementation of Hyde Act Would Mean Shifting of Goalposts"" *The Hindu*, January 17, 2007.

<http://www.hindu.com/2007/01/17/stories/2007011702641100.htm>

¹¹⁷⁶ Kakodkar also told visiting Nuclear Regulatory Commission (NRC) Chairman Dale Klein much later on November 24 2008 (as the nuclear cooperation agreement was on the verge of being ratified into law by the US Congress) that, although he was interested in nuclear cooperation with the US, the Tarapur incident still rankled. It would be reasonable to assume that the Tarapur experience was still a factor in Kakodkar's decision-making calculus in late 2006.

"Kakodkar pointedly observed that the Indian nuclear program originated through cooperation with the U.S. at Tarapur and that while he was "extremely keen to build cooperation with the United States," he stressed repeatedly that this new era of cooperation must be built on a "firm foundation.".....Kakodkar confessed that although he favored renewed cooperation with U.S. firms, he was haunted by images "not only of Tarapur, but also of Enron."

"Atomic Energy Chairman Kakodkar Shares Candid Overview with NRC Chairman Klein ". (November 24 2008). Accessed on September 18 2013.

http://www.wikileaks.org/plusd/cables/08NEWDELHI2985_a.html

Sources say that in an earlier discussion with Rice, he (Prime Minister) had told her, "You have to win over the trust of our scientific establishment. Two generations of scientists have grown up under US sanctions. They have seen the US cooperate more with a country like China, while the Indians have been subjected to a variety of denials, from visas to technology."¹¹⁷⁷

To summarize, the combined Tarapur influenced pressure exerted by the retirees and Kakodkar on the Prime Minister for comprehensive American fuel-supply guarantees and the Prime Minister's relaying of that pressure to Secretary Rice were important secondary factors that reinforced the primary proclivity of the Bush administration to make nuclear concessions in return for a strategic partnership and resulted in its acquiescence to the multilayered fuel-supply assurances in the separation plan.

However, the inclusion of the Obama amendment in the Hyde Act streamlining the size of the strategic fuel reserve that India could build up rekindled the worst fears of the retirees that the US was yet again using its domestic legislation to renege on the promises made in international agreements such as the March 2006 separation plan. Consider this excerpt from a critique of the Hyde Act by Prasad. Notice how he equated the Hyde Act with the Nuclear Non-proliferation Act of 1978 that overrode the Tarapur agreement thus

¹¹⁷⁷ Sudarshan, V. "Fusion Material " *Outlook*, March 13 2006.
<http://www.outlookindia.com/printarticle.aspx?230510>

insinuating that the Hyde Act's Obama amendment would similarly override the fuel-supply assurances in the separation plan and even the forthcoming 123 agreement.

As scientists, of course, we go by our experience. There was a 123 agreement for Tarapur, which was signed in 1963. It said the U.S. would supply fuel for the lifetime of the reactor, defined as 25 years. But in 1974, we conducted a nuclear explosion, and in 1978 came the Nuclear Non-Proliferation Act (NNPA). They said our 123 agreement had to comply with the Act which had come much later! So we were abruptly denied fuelSo my point is that the (still to be completed) 123 agreement is not a very safe document. The (Hyde) Act is what counts. And here, we have to worry not about another Act which may come in the future. The Hyde Act is already there to see.¹¹⁷⁸

This explains the loud protestations of the retirees against the dilution of fuel-supply assurances right at the beginning of the December 2006 open letter¹¹⁷⁹ and their directive to the government to negotiate the reiteration in toto of the separation plan's fuel supply guarantees in the forthcoming 123 agreement text, thereby undercutting the Obama amendment (the second best option available to the retirees after their failure to prevent the Obama amendment from being

¹¹⁷⁸ Varadarajan, Siddharth. "Dr. A.N. Prasad on the Indo-U.S. Nuclear Deal." (July 18 2007). Accessed on September 17 2013. <http://svaradarajan.blogspot.com/2007/07/dr-prasad-on-indo-us-nuclear-deal.html>

¹¹⁷⁹ "Hyde Act and Nuclear Scientists' Note." *The Hindu*, Dec 16, 2006. <http://www.hindu.com/2006/12/16/stories/2006121616171500.htm>

retained in the final Hyde Act and their reluctance to walk away from the whole nuclear deal).

The other major lesson that the retirees and Kakodkar learned from the Tarapur experience stemmed from the refusal of the US to allow India to reprocess the spent fuel produced by the Tarapur reactors and the subsequent accumulation of that spent fuel in safeguarded pools near the reactor site. Henceforth, any future nuclear cooperation agreement with the US would have to include an upfront and permanent right for India in all key documents to reprocess the spent fuel outputted by the imported reactors in order to allow India to use the plutonium therein to power the second stage indigenous breeder reactors.

Although the experience with the US at Tarapur was an important reason behind the adamant insistence of the retirees and Kakodkar on fuel-supply assurances and the right to reprocess US-origin spent fuel in the 123 agreement text, it is only a partial explanation. I attempt to provide the ‘other half’ of the explanation by delving into the impact of Tarapur on the Indian nuclear psyche, the mindset that emerged from the sanctions, the artifacts created by the interaction of the mindset and the sanctions-constrained nuclear environment and reinforcing impact of the artifacts on the mindset.

The resentment due to the American termination of fuel-supply to the Tarapur reactors and broader sanctions on the Indian nuclear program gave rise to an institutional narrative of grievance in the DAE. The narrative held the US solely responsible for the abrupt fuel-supply termination to the Tarapur reactors in

violation of contractual obligations and the broader slowdown of the Indian civilian nuclear program due to delays in the construction of multiple reactors, a result of the denial of international cooperation and technical consultants.

The DAE's institutional narrative of grievance in turn resulted in a mindset of distrust that was suffused with memories of the unilateral US termination of fuel-supply, denial of reprocessing rights to India in order to reprocess the spent fuel outputted by the Tarapur reactors, the broader embargo hampering the Indian nuclear program and the difficulties arising from each. For the retirees, the US was no longer a reliable partner but a rule-obsessed adversary with a massive superiority-complex that was out to gut the Indian civilian and military nuclear programs.

The resentment and the mindset of distrust spawned by Tarapur played an important role in shaping the attitudes of the retirees towards US-India nuclear cooperation in general and the Hyde Act in particular. Dr. K. S. Parthasarathy, former secretary of the Atomic Energy Regulatory Board explained to the *Deccan Herald* newspaper that the strident reactions of the retirees to the provisions in the Hyde Act were a result of the trust deficit towards the US arising from the Tarapur fiasco.

....many of my senior colleagues apprehensions result from their bitter experience with the USA in Tarapur.¹¹⁸⁰

¹¹⁸⁰ "Nuclear Scientists Say Aye to 123 Agreement". *Deccan Herald* August 4 2007.
<http://archive.deccanherald.com/Content/Aug42007/national2007080417101.asp>

Ronen Sen, India's ambassador to the US (2004-2009) and secretary to the Atomic Energy Commission during the 1974 test also provided a brief summary of the Tarapur dispute and its impact on the retired scientists.

The biggest legacy of the US-India civilian nuclear deal was not just civil nuclear cooperation that it would entail, but the restoration of trust between the two countries that was terribly eroded after Washington cut off nuclear fuel to India's Tarapur reactor following India first nuclear explosion in 1974.....The envoy said that he had seen "how much it affected our relationship".....because he was privy to all of the goings on since at the time he was with the Department of Atomic Energy and also the Secretary to the Atomic Energy Commission."It was a huge burden we were carrying of a symbol of a lack of trust," and recalled that particularly when the US slapped sanctions on India after the 1974 test, "you had a low point in our relationship....."¹¹⁸¹

Stephen P. Cohen, veteran India watcher and a senior fellow with the India Project in the Foreign Policy Program at Brookings described the broad undercurrent of resentment towards the US among India's civilian and weapons scientists due to the post-Tarapur sanctions in a generic February 28, 2006 research note.

Indian opposition to the nuclear agreement has flowed partly from traditional anti-Americanism, but the more serious opposition has stemmed from India's small but influential nuclear weapons

¹¹⁸¹ Haniffa, Aziz. "The Missing Trust between India & US Was Restored" (March 09, 2009). Accessed on September 15 2013. <http://www.rediff.com/news/2009/mar/09nddeal-envoy-ronen-sen-talks.htm>

establishment, the core of what Itty Abraham and others have referred to as India's "strategic enclave.".....Key elements of the strategic enclave remain bitterly opposed to concessions to a country that they have regarded with deep suspicion. As many American non-proliferationists tried to undercut, weaken, and terminate India's military nuclear program, those who worked in that program viewed themselves as secret national heroes, sacrificing their normal lives at very little pay in the service of the nation. Many were barred from America, their laboratories were forced to scrape and scrimp in secret, but they succeeded in producing a nuclear weapon despite the Americans. These American-led restrictions on the Indian nuclear program also crippled its civilian side, and its defenders argue that it was only due to the courage and brilliance of India's nuclear scientists that the present modest nuclear energy program exists today....The scientists and technicians, who labored for decades under the handicap of American sanctions are especially distrustful, and some even deny that the Indian civilian nuclear program needs outside assistance. This group is the force behind India's long-standing insistence that "technology transfer" should be the touchstone of US-Indian relations, and they recount, with bitterness, the sanctions imposed upon various Indian entities, and even individuals, for what were claimed to be benign activities.¹¹⁸²

¹¹⁸² Cohen, Stephen Philip. "A Deal Too Far? ." (February 28, 2006). Accessed on March 26 2014. <http://www.brookings.edu/views/papers/cohens/20060228.pdf>

Despite the complex American reaction in the years following the 1974 test (before the passage of the Nuclear Non-proliferation Act of 1978) and the eventual transfer of US fuel-supply obligations to France, the mindset of distrust that arose out of the insular post-1978 nuclear environment among the retirees simplified the complex US response into a single abrupt act of betrayal. An important reason for the emergence of such a mindset could also be the passage of time that erased the nuances of US actions from the memories of the scientists and only left key events such as the US fuel-supply cut-off in their recall. The post-Tarapur American response also got severed from the Indian action (“peaceful nuclear explosion” of 1974) that caused it.

In fact, a November 13 2006 leaked American diplomatic cable recorded a conversation between Ministry of External Affairs Joint Secretary (Americas) S. Jaishankar and US Assistant Secretary of State for South and Central Asia Richard Boucher in which an exasperated Jaishankar told Boucher about the distorted perspective of the nuclear scientists (i.e. linearization of the complex American response) regarding what transpired at Tarapur.

The details touched on much conceptual, emotional, psychological sensitivity for the Indians, especially due to the raw nerves that still lingered because of fuel supplies to Tarapur back in the 1970s. "You don't know what it's like to be pressured by you," smiled Jaishankar. The

Myth of Tarapur had taken on a life of its own, such that even the atomic scientists had a distorted view of what had actually happened....¹¹⁸³

Further, the DAE's partial recovery from the post-1974 sanctions in the early 1990s and the stabilization and modest expansion of the Indian nuclear program accomplished through the addition of several indigenously constructed reactors gave rise to a feeling of intense organizational pride at having 'defeated' the sanctions. Consider this excerpt from my personal interview with Dr. A. D. Damodaran, former Director, Special Materials Plant, Nuclear Fuel Complex and a colleague of Iyengar, one of the authors of the open letter. Although Damodaran was not among the cohort of retirees that authored the joint letters, he would later team up with Gopalakrishnan, Prasad, diplomats, judges and journalists to form the Committee for an Independent Foreign Policy and protest against the 123 agreement text in mid-2007. The Committee would work in close coordination with the Left during the final stage of the debate over the US-India nuclear deal (August 2007-July 2008).¹¹⁸⁴ Damodaran fondly reminisced about India's indigenous efforts that led to a recovery from the US and international sanctions.

¹¹⁸³ Mulford, David. "Boucher Discusses Nuclear Talks, Bilateral Relations, China, and Sri Lanka with Jaishankar." (November 13 2006). Accessed on September 23 2013
<http://cablegatesearch.net/cable.php?id=06NEWDELHI7759>

¹¹⁸⁴ The Committee website provided a summary of a speech against the nuclear deal given by Damodaran during a September 10, 2007 convention on "Indo-US Nuclear Deal and India's Sovereignty" organized in New Delhi. The excerpt below is a good summary of Damodaran's position on the nuclear deal. (Damodaran is the son-in-law of E.M.S Nambudiripad; the Chief Minister of the first democratically elected communist government in the southern state of Kerala and has a long association with left politics). "Dr A D Damodaran, formerly of Nuclear Fuels Complex, stressed on the point that nuclear technology in India has been developed with great pain and effort, and the independent development of science and technology in India has been a counterpart of our Non-Aligned foreign policy. The Indo-US nuclear deal jeopardizes our independent research as well as our commitment to the NAM (Non-Aligned Movement), he said."

...that (post-1974) embargo, something which was impossible, any country would have surrendered. Any country I can tell you would have surrendered. I'm saying a developing country, would have surrendered. And we didn't surrender. In fact, we struggled through and the first time it took almost.....this Rajasthan reactor, it came up in late sixties. It was starting work and by seventy three seventy four, it should have been commissioned. That could never be commissioned without very major changes and in fact only by eighty six or eighty seven, we commissioned the first Madras atomic power plant with all the nuclear this embargo. Never getting any help from any country in the West. Denying (Denied) even laboratory visits. Okay? And we came out of it in eighty nine.....then the world knew, India is a different kettle of fish. They can't be controlled just like that....some of these reactors got World Association of Nuclear Operators (WANO) award.....So that is the (organizational) culture... It is true. We are short of uranium.....We have assured supply of about sixty thousand tons of uranium in our country. It is low grade, but we have developed the technology. I don't know whether any other country extracts uranium, from such a low quality uranium ores as India has done.....Again nobody has helped us.....¹¹⁸⁵

Kohli Vineet and Subhanil Chowdhury. "Nuclear Deal Compromises Our Sovereignty, Say Indian Activists" *Political Affairs*, September 19 2007. Accessed on September 23 2013.

<http://www.politicalaffairs.net/nuclear-deal-compromises-our-sovereignty-say-indian-activists/>

¹¹⁸⁵ Interview with Dr. A. D. Damodaran. March 1 2010.

However, the technical fixes developed by the DAE in partnership with private industry to keep the Tarapur reactors functioning and to construct new reactors based on the designs of the initial PHWR reactors supplied by Canada (the 220 MWe Rajasthan Atomic Power Station- RAPS 1 completed in December 1973 and the RAPS 2 completed by India in 1981 after Canada withdrew assistance to the under construction project following the 1974 test) were not just engineering solutions adopted in the sanctions-constrained environment. The fixes can also be understood as efforts to *Indianize* and *indeginize* a foreign technology in order to acquire mastery over the technologies necessary to revive and even accelerate the sanctions-hit Indian civilian nuclear program.

As an example, consider excerpts from a research paper published in *Nuclear Engineering and Design* by S.S. Bajaj and A. R. Gore of the Nuclear Power Corporation of India Limited (NPCIL), a DAE subsidiary tasked with the construction of reactors. The paper cited numerous specific examples of design modifications made during the construction of the Narora Atomic Power Station (NAPS 1 and NAPS 2) located in the remote town of Narora (Uttar Pradesh) as compared to its Canadian predecessor.

The Narora reactors were originally supposed to come online from 1975 to 1978 but only began operations 14 years later in July 1991 and July 1992 respectively due to the post-1974 sanctions. Bajaj and Gore have identified the Narora reactors as the project that resulted in a “major indigenization and

standardization of PHWR designs”¹¹⁸⁶ in a paper tellingly titled “The Indian PHWR.” In particular, the authors highlight the adoption of an integral calandria (reactor vessel) and end shields assembly, two independent fast acting reactor shutdown systems, a high pressure Emergency Cooling System, a double containment with suppression pool and a shift from analog to computerized instrumentation as changes in Narora’s design that were improvements over its Canadian predecessor (RAPS 1).¹¹⁸⁷

The authors describe in detail a new integral assembly of the Calandria and end shield and refer the reader to a cut-away diagram of the design modification.

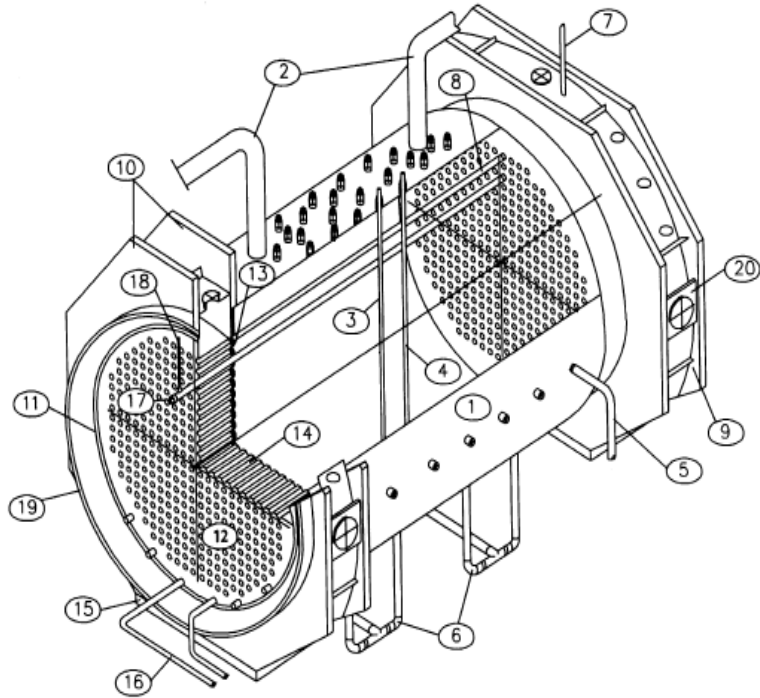
In the original design adopted in (the Candian supplied) Rajasthan Atomic Power Station and Madras Atomic Power Station, there was a dump tank located underneath the reactor vessel or ‘calandria’. Reactor shutdown was achieved by fast dumping of moderator from the calandria into the dump tank through a system of S shaped dump ports located at bottom of the calandria. From Narora Atomic Power Station onwards, a new scheme of reactor shutdown systems was adopted allowing dump tank to be eliminated, and considerable simplification of the calandria design. The design of the two end shields located at two ends of the reactor was also modified. The end shields limit the radiation dose in the vaults (fuelling machine vaults) adjoining the reactor vault.In the

¹¹⁸⁶ Bajaj. S.S.& A.R. Gore "The Indian PHWR " *Nuclear Engineering and Design* 236 (2006).p 701

¹¹⁸⁷ Ibid. p 702

original design, the end shield (about a meter thick) consisted of 30mm thick slabs of steel shrunk fitted into a steel shell, with water passages in between. These were modified from Narora Atomic Power Station onwards where the slabs were replaced by steel balls which were filled into the end shield at site. The weight of the fabricated end shield to be transported came down to almost half (at 60 t).....In current design (Narora Atomic Power Station onwards) the calandria and two end shields constitute an integral assembly, supported from the reactor vault walls, unlike earlier designs wherein the calandria and end shields were separately suspended by support rods. This design allows common tube sheet between calandria and end shield, simplifies alignment requirement between calandria tubes and end shield lattice tubes, and is more suited to conditions at seismic site.¹¹⁸⁸

¹¹⁸⁸ Ibid. p 705



- | | |
|------------------------------|--|
| 1. CALANDRIA SHELL | 2. OVER PRESSURE RELIEF DEVICE |
| 3. SHUT DOWN SYSTEM #1 | 4. SHUT DOWN SYSTEM #1 |
| 5. MODERATOR INLET | 6. MODERATOR OUTLET |
| 7. VENT PIPE | 8. COOLANT CHANNEL ASSEMBLY |
| 9. END SHIELD | 10. END SHIELD SUPPORT STRUCTURE ASS'Y |
| 11. MAIN SHELL ASS'Y | 12. TUBE SHEET F/M SIDE |
| 13. TUBE SHEET CAL SIDE | 14. LATTICE TUBE |
| 15. END SHIELD SUPPORT PLATE | 16. END SHIELD COOLING INLET PIPES |
| 17. END FITTING ASS'Y | 18. FEEDER PIPES |
| 19. OUTER SHELL | 20. SUPPORT LUG |

Fig. 2. Integral assembly of calandria and end shield (cut-away view of reactor).

Figure 17: Integral assembly of calandria and end-shield (cut-away view of reactor).

Source: Bajaj, S.S.& A.R. Gore "The Indian PHWR " *Nuclear Engineering and Design* 236

(2006). P 706

The other example that the authors provided suggests their satisfaction over the Narora Atomic Power Station keeping abreast with international technological developments in a sanctions-constrained environment through the

shift from older hydraulic and pneumatic systems to computerized instrumentation and monitoring systems.

Reactor control and protection system of Rajasthan Atomic Power Station #1 and 2 and Madras Atomic Power Station #1 and 2 was made using conventional discrete analog circuits. The process instrumentation was more or less still pneumatic. With Narora Atomic Power Station the scene started changing rapidly. Many pneumatic transmitters were replaced by electronic transmitters. The magnetic amplifiers were replaced by solid state amplifiers, large number of discrete components were replaced by just one or two integrated circuits. The computerization of control systems was attempted for systems having sequential logic and large data acquisition. The fuelling machine control and channel temperature monitoring were the systems where initiation of computerization was carried out. Intel 8085- based microprocessor boards were used for triple redundant reactor regulating system of Narora Atomic Power Station.....The introduction of digital systems (computers) did away with the problems of analog circuit design like drift, poor noise, etc.¹¹⁸⁹

In fact, the authors even tried to reframe the near nuclear meltdown caused by the Narora fire as an “incident” and a trigger event for additional modifications to the Narora reactors and to the wider reactor fleet.

¹¹⁸⁹ Ibid.p 715

The detailed investigation and reviews following this incident, both by the regulatory body and by the utility, resulted in several modifications and improvements in various areas covering design, operation and administrative and surveillance practices. One study was with regard to the susceptibility of the existing design and layout of Narora Atomic Power Station to common cause failure, mainly due to fire as an initiating event. Consideration was given to preventive measures for avoiding common cause failures, as well as the need for additional mitigative measures for assured core cooling, etc., in situations such as station blackout.¹¹⁹⁰

Experts have pointed out that the Indian civilian reactor fleet has continued to suffer from accidents of varying degrees even after the Narora incident.¹¹⁹¹ My intention here is not to support the views of the authors of “The Indian PHWR” that the design modifications made during the construction of the Narora reactors improved their performance or safety. Rather, my contention here is that, for better or worse, the Narora reactors and the reactors built after them became Indianized and indigenized in a sanctions-constrained environment. The Indian nuclear establishment finally began to believe that it had standardized an improved design that was better than the Canadian-supplied reactors, mastered the complex logistics required for their construction and established the requisite supply networks with private industry to manufacture specific components.

¹¹⁹⁰ Ibid.p 719

¹¹⁹¹ Ramana, M. V. *The Power of Promise- Examining Nuclear Energy in India*: Penguin, 2012. P 206

Thus, the Narora reactors in particular and the ones that came after them not only became sources of organizational pride for a DAE determined to not give in to the sanctions but also the material embodiment of the principle of self-reliance rhetorically proclaimed (but not always followed in practice) by the three-stage Bhabha plan's proponents.¹¹⁹²

¹¹⁹² The description of the three-stage program that follows is a reiteration of the more detailed narrative provided in Chapter 2. India was the first country in Asia to establish an Atomic Energy Commission (AEC) in 1948, primarily due to the efforts of Dr. Homi Bhabha, the first Chairman of the AEC and his proximity to India's first Prime Minister Jawaharlal Nehru. The duo was convinced that India was colonized due to its failure to develop modern science and technology. They also wanted India to emerge as a great power and believed that the goal was possible only if the country was successful in creating an economy based on modern science and technology. The duo resolved that India should be in the vanguard of the atomic revolution, considered to be the state of the art in science and technology following World War II. George Perkovich has suggested in his magisterial *India's Nuclear Bomb* that Nehru was aware of the military uses of nuclear technology right from the outset and sought to develop the technological capability to manufacture nuclear weapons despite lofty public declarations to the contrary. Bhabha was aware of the poor quality and low quantity of India's uranium reserves that could only support 10,000 MW of nuclear power for 40 years at high extraction cost. He also knew that the country possessed 25% of the world's thorium reserves. Bhabha came up with a sequential, inter-linked, three-stage nuclear program that would optimally utilize India's modest uranium reserves and eventually transition to thorium producing large amounts of electricity. The first stage of the program would involve using natural uranium as fuel in Pressurized Heavy Water Reactors (PHWRs). The irradiated spent fuel outputted by the reactors would be reprocessed in reprocessing plants to separate the plutonium. The plutonium would then be used as fuel to provide startup cores of the second-stage fast breeder reactors (FBR's)," the mainstay of the nuclear program expected to provide a quarter of India's electricity by 2050. The startup cores would be surrounded by "blankets" of either depleted or natural uranium to produce more plutonium for more breeders until the desired capacity was achieved. After a sufficiently large number of breeders became operational, India's abundant thorium reserves would be substituted for the natural/depleted uranium in the blankets to produce fissile uranium 233, the startup fuel for the third stage. The U-233 would then be used in Advanced Heavy Water Reactors, the third and final stage with thorium in their blankets beyond 2050. The main motive claimed by Bhabha for coming up with the three-stage program was to ensure India's self-reliance in a key domain suffused with strategic implications. Self-reliance would be ensured through the principle of a "closed fuel cycle" underlying the three stage program wherein the "spent fuel of one stage is reprocessed to produce fuel for the next stage and multiplies manifold the energy potential of the fuel." Despite his proclamations about the centrality of the principle of self-reliance to the Indian nuclear enterprise, Bhabha did accept assistance from the West. The assistance was justified on the grounds that imports would provide a quick take-off for the Indian nuclear program with indigenous technology taking over in the long-term. As stated earlier, the real reason for accepting the American bid to build the Tarapur reactors was to justify the funding for the Indian nuclear program by providing a visible public service and the very generous terms of the US offer.

Gadekar, Surendra. "India's Nuclear Fuel Shortage." *Bulletin of Atomic Scientists*, August 6 2008.

Perkovich, George. *India's Nuclear Bomb: The Impact on Global Proliferation*. London: University of California Press, 1999. p-14

Ashwin Kumar, M. V. Ramana "The Safety Inadequacies of India's Fast Breeder Reactor." *Bulletin of Atomic Scientists* July 21 2009.

However, the Indian PHWR was not just a product of the DAE's desperate self-help measures in a sanctions-constrained environment. The successful construction of multiple reactors in the 1990's, the corresponding increase in the generation of power (from a low base) and the sharp (albeit short-lived) rise in the capacity factors of those reactors also turned them into symbols that could be framed by the nuclear establishment as evidence of Indian ingenuity and the feasibility of the ambitious Bhabha plan even in an environment characterized by the sanctions straitjacket.

Simply put, the Indian PHWR was not only socially shaped by the sanctions, the DAE's self-help measures and its success however tenuous in constructing an industrial base but also played an important role in shaping Indian nuclear discourse by becoming the symbol of Indian tenacity and determination to proceed with the three-stage Bhabha plan.

I deploy Hecht's concept of a *technopolitical regime* and organize the tight ensemble of the aforementioned institutional narrative of grievance that arose in the DAE, its mindset of distrust towards the US, fierce organizational pride over the complete indigenization of foreign (Canadian) PHWR technology

Gadekar, Surendra. "India's Nuclear Fuel Shortage." *Bulletin of Atomic Scientists*, August 6 2008.

S.K.Jain, Dr. "Nuclear Power –an Alternative." <http://www.npcil.nic.in/pdf/nuclear%20power-%20an%20alternative.pdf> p 3

Ramana, M. V. "India and Fast Breeder Reactors." *Science and Global Security*, 17 (2009): 54,55

Chandra, R. B. Grover and Subash. "Scenario for Growth of Electricity in India." *Energy Policy* 34, no. 17 (2006): p. 2845.

Abraham, Itty. *The Making of the Indian Atomic Bomb: Science, Secrecy and the Postcolonial State*:Orient Longman, 1998. p 77-78

and the Indian PHWR's status as both the material embodiment of the three-stage Bhabha plan and its symbolic representative in a sanctions-limited environment into a *nationalistic technopolitical regime*. Both the retirees and Kakodkar were products of this regime and were deeply socialized in it.

It is this combination of the Tarapur fiasco and scientists (both retired and a serving one like Kakodkar) steeped in the nationalistic technopolitical regime during the sanctions-limited decades that played an important role in impelling them to insist on two out of the three aforementioned trinity of issues; 1) A 'cut and paste' of the separation plan's lifetime fuel-supply guarantees and 2) A permanent right to reprocess the spent fuel from imported reactors in an indigenous safeguarded reprocessing facility in the 123 agreement text.

The issue of nuclear testing

As stated earlier, the Tarapur experience and the nationalistic technopolitical regime provide important historical reasons (in addition to bureaucratic considerations) for the demands made by the retirees and Kakodkar for multilayered lifetime fuel-supply assurances and an upfront right to reprocess. However, the two factors do not adequately explain the dogged pre-Hyde Act insistence of the retirees (and Kakodkar as we shall see later) that no restrictions (such as the termination clause) be placed on India's right to test and their post-Hyde Act demand for the exclusion of any reference to testing in the still to be negotiated 123 agreement.

Earlier in the chapter, I briefly described the possible bureaucratic motivations that could have impelled Kakodkar and the retirees to oppose the termination clause and call for its neutralization in the 123 agreement text. The documentary record also indicates an additional powerful motivation for the position of the retirees and Kakodkar on the issue of nuclear testing that complements the bureaucratic rationale.

Principal Scientific Adviser to the government- Dr. R. Chidambaram

So far, I have focused on one key serving scientist (Kakodkar) in order to understand the debate over the Hyde Act and the 123 agreement. Although Kakodkar was the main public champion of the nuclear deal for the nuclear establishment in his capacity as the Chairman of the Atomic Energy Commission and DAE Secretary, he was intermittently accompanied by another veteran scientist who was careful to maintain a low public profile throughout the debate. That scientist was Dr. Rajagopala Chidambaram (hereafter referred to as “Chidambaram”), a veteran of the nuclear establishment and the Principal Scientific Adviser to the Government of India since 2001.¹¹⁹³

Chidambaram was born on November 12 1936.¹¹⁹⁴ He topped his B.Sc (Hons.) exams at Madras University (Presidency College) in 1956 and was subsequently admitted into the Ph.D program at the Indian Institute of Science.

¹¹⁹³“Dr. R. Chidambaram- Principal Scientific Adviser to the Government of India.” Accessed on October 1 2013. <http://www.terina.org/usindiasummit/2012/pdf/chidambaram.pdf>

¹¹⁹⁴ Roychoudhury, Rajkumar. "Rajagopala Chidambaram ", Accessed on October 1 2013 <http://library.isical.ac.in/jspui/bitstream/10263/5574/2/r%20chidambaram%20biography.pdf> . p 1

Chidambaram constructed the first magnetic resonance instrument in India for his Ph.D. He obtained a doctorate in 1962 and was awarded the Martin Froster medal for his thesis.¹¹⁹⁵ Chidambaram joined the Bhabha Atomic Research Center (BARC) in 1962 and initiated research on neutron diffraction and crystallography.¹¹⁹⁶ He played a key role in introducing crystallographic computing in India.¹¹⁹⁷ Chidambaram set up the High Pressure Physics group at the Bhabha Atomic Research Center (BARC) in 1967 and initiated research on nuclear weapons after being asked to do so.¹¹⁹⁸ He was the first scientist in India to work out the equation of state for plutonium, a key step necessary to design a successful nuclear weapon still withheld by the nuclear weapon states.¹¹⁹⁹ He also worked on the implosion device that India exploded in 1974.¹²⁰⁰

Chidambaram initiated “open research” in the field of high pressure physics following the 1974 test.¹²⁰¹ He was elected Vice-President of the

¹¹⁹⁵"Asset Bulletin." (August 2011), Accessed on October 1 2013
<http://www.asset.org.in/Archtechts%20of%20Indian%20Nuclear%20Programme.pdf> .p 34-35

¹¹⁹⁶ Ibid
"Dr. R. Chidambaram, Former Director-Barc During (1990-1993)." Accessed on October 1 2013.
<http://www.barc.gov.in/leaders/rc.html>

¹¹⁹⁷ Ibid
¹¹⁹⁸ Roychoudhury, Rajkumar. "Rajagopala Chidambaram ", Accessed on October 1 2013
<http://library.isical.ac.in/jspui/bitstream/10263/5574/2/r%20chidambaram%20biography.pdf> . p 1
"Dr. R. Chidambaram, Former Director-Barc During (1990-1993)." Accessed on October 1 2013.
<http://www.barc.gov.in/leaders/rc.html>

¹¹⁹⁹ "Dr. R. Chidambaram, Former Director-Barc During (1990-1993)." Accessed on October 1 2013.
<http://www.barc.gov.in/leaders/rc.html>

"Asset Bulletin." (August 2011), Accessed on October 1 2013
<http://www.asset.org.in/Archtechts%20of%20Indian%20Nuclear%20Programme.pdf> .p34

¹²⁰⁰ "Dr. R. Chidambaram, Former Director-Barc During (1990-1993)." Accessed on October 1 2013.
<http://www.barc.gov.in/leaders/rc.html>

¹²⁰¹ "Asset Bulletin." (August 2011), Accessed on October 1 2013
<http://www.asset.org.in/Archtechts%20of%20Indian%20Nuclear%20Programme.pdf> p 34

International Union of Crystallography from 1986-2000.¹²⁰² He was also responsible for initiating the development of supercomputers in India as Director of BARC in 1990.¹²⁰³ Chidambaram assumed the chairmanship of the Atomic Energy Commission in 1993 and led the scientific team that conducted India's 1998 tests.¹²⁰⁴ He was responsible for developing a more compact implosion system for the devices used in the tests that could be weaponized.¹²⁰⁵

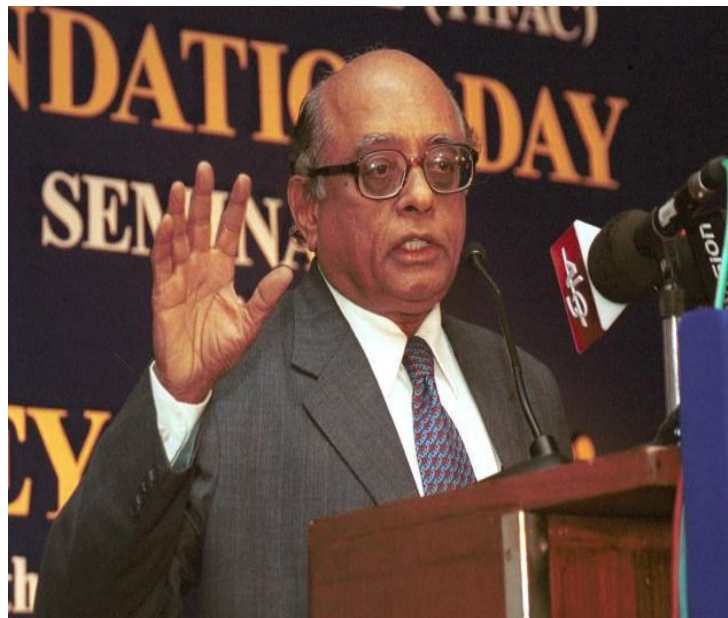


Figure 18: Principal Scientific Adviser to the government of India- Dr. R. Chidambaram

Source: Varadarajan, Siddharth. "Fizzles' Claim for Thermonuclear Test Refuted

¹²⁰²Ibid. p 34-35

¹²⁰³ "Dr. R. Chidambaram, Former Director-Barc During (1990-1993)." Accessed on October 1 2013.

<http://www.barc.gov.in/leaders/rc.html>

"Asset Bulletin." (August 2011), Accessed on October 1 2013

<http://www.asset.org.in/Archtechts%20of%20Indian%20Nuclear%20Programme.pdf> .p34

¹²⁰⁴ "Chairman Atomic Energy Commission since 1948. Accessed on October 1 2013"

http://dae.nic.in/writereaddata/chmnaec_0.pdf . p2

"Dr. R. Chidambaram- Principal Scientific Adviser to the Government of India." Accessed on October 1 2013

<http://www.terina.org/usindiasummit/2012/pdf/chidambaram.pdf>

¹²⁰⁵ "Asset Bulletin." (August 2011), Accessed on October 1 2013

<http://www.asset.org.in/Archtechts%20of%20Indian%20Nuclear%20Programme.pdf> p 34

" *The Hindu*, August 27, 2009. <http://www.thehindu.com/opinion/columns/siddharth-varadarajan/fizzle-claim-for-thermonuclear-test-refuted/article10457.ece>

Chidambaram explained the types of tests conducted and their yields in an interview to *Frontline* magazine (May-June 1998 edition).

Interviewer: What is the story behind the latest achievement?

Chidambaram: The 1974 device was a fission explosive. At that time, we were talking about the peaceful applications of nuclear explosions. What we have done now is to test a whole series of explosive devices - one can say almost all possible types - which includes a fission device of advanced design, a thermonuclear device and low-yield devices whose yields are in the sub-kiloton range, that is, less than one kiloton each. That is the significance of the explosions. On the first day (May 11), three - a fission device, a low yield device and a thermonuclear device - were detonated simultaneously, and two sub-kiloton devices were detonated simultaneously on the second day. Simultaneous detonation is an advanced technique and this is a new example in the history of nuclear explosions. Five explosions in less than 48 hours is some kind of a world record, I think. It becomes even more significant when one notes that all these devices were of different types.

Interviewer: How do you feel about this achievement?

Chidambaram: This was my ambition for many years. It has been achieved.¹²⁰⁶

To summarize, India's 1998 tests broke a 24 year interregnum following its first test in 1974. The first three tests on May 11, a fission weapon, a low yield device and a thermonuclear bomb had claimed yields of 15kt (kiloton), 0.2kt and 45 kt (claimed potential maximum yield 200 kt)¹²⁰⁷ respectively.¹²⁰⁸ The two subkiloton tests conducted on May 13 were claimed to have yields of 0.5 kt and 0.3 kt respectively.¹²⁰⁹

However, Chidambaram's claimed yield of the thermonuclear test and the other four tests was contested in the following months and years by western scientists who reckoned that they were significantly lower. Western experts tried to determine the combined yield of the three tests by using seismological techniques as the devices were fired simultaneously. The yield of the thermonuclear test was especially important as it would determine whether India was 'just' a 'fission power' with proven Hiroshima yield fission weapons in a league with Pakistan and North Korea or a 'fusion power' with much more powerful thermonuclear weapons in a league with the five official nuclear powers (US, China, Russia, France, and the UK) and probably Israel (believed to have

¹²⁰⁶ Subramanian, T.S. "India Must Become Strong!" *Frontline*, May 23 - June 05, 1998.

<http://www.frontline.in/navigation/?type=static&page=flonnet&rdurl=fl1511/15110110.htm>

¹²⁰⁷ "India's Nuclear Weapons Program-Operation Shakti: 1998." (March 30 2001). Accessed on October 4 2013. <http://nuclearweaponarchive.org/India/IndiaShakti.html>

¹²⁰⁸ "Shakti Nuclear Weapons Tests May 11-13, 1998." (July 04, 2000). Accessed on October 4 2013.

<http://www.fas.org/nuke/guide/india/nuke/shakti-pix.htm>

¹²⁰⁹ Ibid

thermonuclear weapons/capability).¹²¹⁰ Chidambaram vigorously defended his claimed yield for the five nuclear tests including the all important thermonuclear test in a 1999 interview with *Frontline*.

Interviewer: There is a controversy about the total yield of the five nuclear tests conducted at Pokhran in May 1998. Roger Clarke, a British seismologist, has agreed with the assessment of the Department of Atomic Energy that the total yield of the three tests conducted on May 11 was around 60 kilotonnes. But another group of seismologists disputes this. For example, University of Arizona geophysicist Terry C. Wallace wrote in the journal *Seismological Research Papers* that the yield was 10 to 15 kilotonnes on May 11, and 100 to 150 tonnes on May 13. Bhabha Atomic Research Centre (BARC) scientists S.K. Sikka, Falguni Roy and G.J. Nair wrote in the September 10 issue of *Current Science* (published from Bangalore) that the interference between the seismic waves from the two main explosions on May 11 would have led to a lowered estimate of the seismic signal strength at stations situated in the eastern and western directions. They have argued that only the data from the stations situated in the northern and southern directions should be taken into account. Can you put the record straight?

Chidambaram: It is always difficult to correlate the seismic magnitudes with yields unless it is a well-calibrated testing site like Nevada in the United States or eastern Kazakhstan in the erstwhile Soviet Union. It is

¹²¹⁰Tillawi, Hesham. "Vanunu Confirms Israel's Global Thermonuclear Blackmail." (2004), Accessed on March 27 2014. <http://www.rense.com/general88/vanu.htm>

also susceptible to deliberate manipulation, as happened between the Soviet Union and the United States. In our case, for the tests on May 11, there is the further complication caused by separated but simultaneous explosions, when the seismic signals interfere, as you mentioned, and their unfamiliarity with the Pokhran geology. The latter is important because the strength of the seismic signal is determined by the way the explosive energy couples into the geological medium, and there are strong regional differences. In fact, each seismic station has to be calibrated, and this is obvious from the range of seismic magnitudes reported by various global seismic stations. A small difference in body wave magnitude of a little over 0.2 corresponds to a halving of the yield estimate. And for any underground nuclear explosion, seismic body wave magnitudes are known to range over 1.0 or even more, which indicates the pitfalls in yield estimates from seismic signals, unless they are done carefully and correctly. This has been done by BARC scientists, using four different methods, and the details have been published in the November 1998 issue of BARC Newsletter..... That is, the total yield of the tests done on May 11, 1998 is 4.5 times the yield of the test done in May 1974.....The International Data Centre (IDC), Arlington, U.S., gives the yield of our May 1974 test as between 10 and 15 kilotonnes. We have evaluated it more accurately as between 12 and 13 kilotonnes. This is accepted by leading seismologists in the world. If you multiply

these numbers by 4.5, you again get a yield of about 50 to 60 kilotonnes.^{1211 1212}

Chidambaram was also at pains to point out that western seismologists had under-estimated the yields because they

also failed to appreciate that India's weapons designers purposely went for lower yields because the shots had to be fired in existing shafts which could not be dug any deeper for fear of detection. Higher yields, then, would have caused damage to nearby villages and also led to the possible venting of radioactivity.¹²¹³

Chidambaram's claims were not only challenged by western seismologists but were also disputed within the Indian nuclear establishment by K. Santhanam, Director of Test Site Preparations and a senior scientist at the Defense Research and Development Organization (DRDO). However, Chidambaram managed to win that debate.

¹²¹¹ "We Have an Adequate Scientific Database for Designing ... A Credible Nuclear Deterrent'." *Frontline*, January 02 - 15, 1999.

<http://www.frontline.in/static/html/fl1601/16010840.htm>

¹²¹² For more recent analysis of the yield estimates of Indian nuclear tests see The yields of the Indian nuclear tests of 1998 and their relevance to Test Ban verification A. Douglas*, P. D. Marshall, D. Bowers, J. B. Young, , and D. Porter and N. J. Wallis. "The Yields of the Indian Nuclear Tests of 1998 and Their Relevance to Test Ban Verification " *Current Science* VOL. 81, , no. No. 1, (July 10 2001): P 72.

See also

Zhao Lian-Feng, Wang Wei-Min, Li Juan and Yao Zhen-Xing "Yield Estimation of the 11 May 1998 Indian Nuclear Test Using Relative Static Source Strength

" *Chinese Journal of Geophysics* Vol.48 no. No.5 (2005): 1164.

¹²¹³ Varadarajan, Siddharth. "'Fizzle' Claim for Thermonuclear Test Refuted " *The Hindu*, August 27, 2009.

<http://www.thehindu.com/opinion/columns/siddharth-varadarajan/fizzle-claim-for-thermonuclear-test-refuted/article10457.ece>

A former senior official of the erstwhile Vajpayee (BJP led NDA) government confirmed to *The Hindu* (newspaper) that there had been differences of opinion between BARC (the Bhabha Atomic Research Center whose data Chidambaram based his claim on) and DRDO (Defense Research Development Organization) scientists after the May 1998 tests, with the latter asserting that some of the weapons tests had not been successful. The internal debate was complicated by the fact that the DRDO experts, including Mr. Santhanam, were not privy to the actual weapon designs, which are highly classified. But the issue was resolved after a high-level meeting chaired by Brajesh Mishra, who was National Security Advisor at the time, in which the BARC experts established that DRDO had underestimated the true yields due to faulty seismic instrumentation. And the radioactivity analysis provided the clincher. Since 1998, whatever his private reservations might have been, Mr. Santhanam appears to have stuck closely to the official line in his public pronouncements.^{1214 1215}

Chidambaram also claimed in a January 1999 interview with *Frontline* magazine that India had confirmed the adequacy of its supercomputer capability following the lone 1998 thermonuclear test as the device was designed on supercomputers and performance of its individual components simulated. The

¹²¹⁴Varadarajan, Siddharth. "'Fizzle' Claim for Thermonuclear Test Refuted" *The Hindu*, August 27, 2009.

<http://www.thehindu.com/opinion/columns/siddharth-varadarajan/fizzle-claim-for-thermonuclear-test-refuted/article10457.ece>

¹²¹⁵ Santhanam recently revealed that the thermonuclear test had fizzled in 2009 for the first time in public triggering a fresh controversy.

parameters of the device obtained through the underground test were in close agreement with the results obtained by simulating the various sub-assemblies of the weapon before the test. Thus, India was now in a position to produce reliable nuclear weapons designs pre-tested in the virtual world of supercomputers without the need for underground testing. In other words, Chidambaram was making the rather astonishing claim that future nuclear weapon designs could be directly converted into weapons without the intermediary step of underground testing. Such a view was well outside the mainstream opinion among the community of weapons scientists and designers at the Los Alamos and Livermore labs in the US that was predicated on verifying a new weapons design through several underground tests before contemplating simulation and subsequent deployment of the weapon.¹²¹⁶

Interviewer: What about India's capability to go in for computer simulation?

Chidambaram: This again has to be related to the fact that there was a perfect match between the calculated and the measured yields in all our tests. In the early days, when they carried out a computer design calculation for a device, the actual yield would be far away from the calculated yield, often being off by a factor of two or more. And then they will adjust some parameter in the calculation to get a match between

¹²¹⁶ Conversations with Dr. Hugh Gusterson, Professor of Sociology and Anthropology at George Mason University. January 2014.

the calculated and the measured yields. If they did several tests, they would have several parameters to play with and thus have a computer simulation package. The errors were even more in the case of a thermonuclear device. But today, since we have got experts in practically every branch of physics which goes into the design of the various types of nuclear devices, we did not have to do any empirical parameter fitting but could go ahead with first principle calculation. That is why I am confident that we have the so-called computer simulation capability in this field.¹²¹⁷

Bharat Karnad, a leading Indian conservative nuclear strategist explained Chidambaram's rationale behind the computer simulations approach based on notes from a more recent talk (Karnad himself opposed this line of thinking and I cover his critique later in the chapter).

R Chidambaram held the view prior to the underground explosions that the high level of computational skills and simulation capabilities the BARC (Bhabha Atomic Research Center) had developed had made testing redundant, that designs could be converted into reliable weapons without their having to pass through the stage of physical testing. He contended that because a lot of the staged bomb was designed on the computer and a lot of the computer simulations were verified against the available data even before the test, and because each of the subsystems,

¹²¹⁷"Nuclear Issues-Interview with Dr. R. Chidambaram." *Frontline*, January 02 - 15, 1999
<http://www.frontline.in/static/html/fl1601/16010840.htm>

subassemblies, and components in each of the designs was tested thoroughly, when put together these various parts would work perfectly. “We did not develop designs by tests,” he said in a talk at the Indian Institute of Science in Bangalore in December 2002, “but confirmed the design validity by testing.”¹²¹⁸

Chidambaram’s technical judgement enabled the Vajpayee government to declare a unilateral moratorium on nuclear testing after the 1998 tests. The government even indicated an initial willingness (later retracted) to sign the Comprehensive Test Ban Treaty (CTBT) that would foreclose any prospect of an underground nuclear test in the future by India. Subsequently, a no first use policy and a nuclear doctrine organized around the concept of credible minimum deterrence was announced by India.¹²¹⁹

¹²¹⁸Karnad, Bharat. *India's Nuclear Policy*: Praeger Security International 2008. P 66

¹²¹⁹ Bharat Karnad, an influential conservative nuclear strategist provided a detailed description of the concept of credible minimum deterrence in a recent book.

“The CMD (credible minimum deterrence) concept is more an organizing theme than specific guidelines, and, in that sense, the Indian nuclear force is still evolving. There is consensus, however, on a staged buildup initially to some 200 warheads and weapons. In consolidating the country’s strategic nuclear assets, the upsizing of the force or qualitative improvements in the nuclear weaponry will be dictated by the changing nature of threats, technology trends, and regional and international security developments. The strategic triad, conceived by the nuclear doctrine in 1999, and medium and intermediate range ballistic missiles deployed on rail and road mobile platforms and embarked on warships and nuclear powered submarines able to fire nuclear tipped ballistic and cruise missiles (SSBN’s), and still longer range missiles based in tunnels excavated in the mountains-is detailed. The nuclear powered submarines are set to assume the principal role in tackling the primary threat, China....The credible minimum deterrence idea provides a flexible policy instrument enabling many diverse views about strategies and tactics, force structures, and nuclear-weapons use and targeting schemes to compete and coexist under one conceptual umbrella. Such differences have not turned into institutional barriers to development of the deterrent....Politically, the government has found the credible minimum deterrence concept useful as it reflects the key attributes of moderation, economical use of scarce resources, low key efficacy, and the “responsible” state behavior that it swears by.”

Karnad, Bharat. *India's Nuclear Policy*: Praeger Security International 2008. P 2

Given the centrality of Chidambaram's technical judgement to the Vajpayee government's announcement of the unilateral moratorium on nuclear testing and the location of that judgement well outside the mainstream of international weapons designer opinion regarding the verification of a nuclear weapon, Chidambaram's judgement was bound to come under fire from opponents in India. They could potentially deride Chidambaram's technical judgement as an expedient technical opinion conjured up to legitimize the pre-decided political choice of the Vajpayee government to declare a moratorium on nuclear testing in order to minimize the economic costs from sanctions and to ensure a period of post-test good behavior to create the conditions for a nuclear rapprochement with the US. That is precisely what happened.

Former Chairman of the Atomic Energy Commission- Dr. P. K. Iyengar

The challenge to Chidambaram's claims was not restricted to Western seismologists and nuclear establishment insiders like Santhanam. His claimed yield for the thermonuclear test and his contention that India did not need to conduct further underground tests was challenged by Iyengar. As stated earlier, Iyengar played a key role in India's 1974 "peaceful nuclear explosion."¹²²⁰ Iyengar argued in August 2000 that the secondary fusion core of the thermonuclear bomb only burnt partially, resulting in a failed ('fizzle') test. The detailed technical explanation provided by Iyengar suggests that although he was

¹²²⁰ Subramanian, T. S. "He Played a Key Role in India's First Peaceful Nuclear Explosion in 1974" *The Hindu*, December 21, 2011.
<http://www.thehindu.com/news/he-played-a-key-role-in-indias-first-peaceful-nuclear-explosion-in-1974/article2735812.ece>

not a part of the 1998 tests, the veteran was giving voice to the views of nuclear establishment insiders who were involved in the tests but wary of speaking out.

If one goes by the numbers for the total nuclear yield put out by the Department of Atomic Energy, which I see no reason to dispute, the yield of the thermonuclear device detonated on May 11, 1998 was around 40 kilotons. This is a rather low yield. If the yield was deliberately kept low to restrict damage to the nearby villages, then surely it would have been more sensible to test the thermonuclear device separately, and not along with the 15 kt fission device. Now, the thermonuclear device itself consisted of two parts: the fission trigger and the fusion core. The crucial question is not what the total yield of the device was, but what was the ratio of fission energy to fusion energy? Clearly, for a given total yield, the greater the fraction of the fusion energy, the more efficient is your thermonuclear device. In my opinion, that ratio must have been around 1:1, and no one has so far, to my knowledge either publicly or privately, disputed that number. Therefore, by my estimate, the fusion yield could not have been more than 20 kt. Further, it seems likely that a fission 'spark-plug' was used at the centre of the fusion core, in which case the actual fusion yield would have been even less. Sticking to the larger number of a 20 kt fusion yield, one can easily calculate that the amount of LiD (lithium deuteride-fusion fuel used in thermonuclear weapons) fusion material needed would be only around 400 grams or around 500 cc. This is a very small size for the fusion core, and the actual core used must certainly have been much

larger. This suggests that the fusion core burnt only partially, perhaps less than 10 per cent. This can easily be checked; if the burn was only partial, there should have been a lot of tritium produced, which should have been detected after the explosions.¹²²¹

After challenging Chidambaram's claims regarding the yield of the thermonuclear test, Iyengar took aim at the former for announcing that data from the test was enough to design nuclear weapons through computer simulation without the need to conduct further underground tests.

In such a complex system as a two-stage thermonuclear device, getting any burn at all is a credit to the abilities of the scientists and engineers of the Bhabha Atomic Research Centre (BARC). However, a thermonuclear device that only burns partially is certainly inefficient. Logically and scientifically, the next step would be to improve the design of the device to achieve greater efficiency. This is particularly important from the point of view of a weaponisation programme. Some people argue that we have benchmarked our computer simulations using the data from the Pokhran tests, and, therefore, further weapons can be designed based on those computer simulations. We should note that we have conducted only one thermonuclear test, and that too of low yield. It is, as mentioned before, likely that this device burnt only partially. Devices that are more

¹²²¹ Iyengar, P. K. "Nuclear Nuances-Credible Deterrent through Testing" *Times of India*, August 2000.
Retrieved from Jeffrey.L. "India's H Bomb Revisited" (August 27 2009).
<http://lewis.armscontrolwonk.com/archive/2445/indias-h-bomb-revisited>
For a more recent critique by Iyengar, see
Iyengar, P. K. "Non-Fissile Doubts" *Outlook*, October 26 2009
<http://www.outlookindia.com/article.aspx?262331>

efficient will have to be built. In order to weaponise, we will need missile-mountable devices, which will have a different geometry. They will also have to be of higher yield. Then these will have to be made compact, and integrated with delivery as well as command and control systems. Can our nuclear deterrent be credible if we go through this long process of weaponisation without a single additional test? The bottom line is that we just cannot hand over to the army, or deter potential aggressors with, weapons based on computer simulations.¹²²²

Iyengar also tried in vain to confront Chidambaram in person over the yield of the thermonuclear test and even sought to use veteran nuclear establishment insider Raja Ramanna and Chief of Army Staff V. Malik as intermediaries.

He (Iyengar) once told me (V. Sudarshan, a reporter) how he was so beset by doubts over the efficiency of the thermonuclear device tested on May 11, 1998, that he dashed off a paper with his arguments — on why he thought the device under-performed — to the then national security adviser, Brajesh Mishra, who promised to take it up with the then AEC chairman, R Chidambaram. Mishra also promised to arrange a meeting between the two to sort the matter out. Weeks passed and Iyengar got no

¹²²² Iyengar, P K. "Nuclear Nuances-Credible Deterrent through Testing" *Times of India*, August 2000.
Retrieved from Jeffrey L. "India's H Bomb Revisited" (August 27 2009).
<http://lewis.armscontrolwonk.com/archive/2445/indias-h-bomb-revisited>
Iyengar, P K. "‘I Was Misquoted on Pokhran-II Success’"
The New Indian Express, September 26 2009.
<http://newindianexpress.com/nation/article156995.ece>

response. They ran into each other at some function where Iyengar came directly to the point and asked what the delay was about. Mishra told him succinctly: “He (Chidambaram) doesn’t want to meet you. The chemistry (between you two) seems to be wrong.” “What’s chemistry got to do with it?” asked Iyengar, the physicist. “These are technical issues and personal chemistry does not come into it.” The interaction ended when the national security adviser reiterated, “He (Chidambaram) doesn’t want to meet you.” There rested the matter. Efforts to involve Raja Ramanna (former Chairman of the Atomic Energy Commission 1983-1987) as intermediary also did not work.....He (Iyengar) spoke to V Malik, the chief of army staff during the Pokhran 1998 tests, about his fears. He told this reporter that all the doubts could have been laid to rest if data had been provided to him in camera, for him to satisfy himself that the test had indeed been successful. He was no national security risk, after all, having helped father the Pokhran-I bomb.¹²²³

Principal Scientific Adviser to the government- Dr. R. Chidambaram

Chidambaram preferred to rebut from a distance Iyengar’s accusations of a failed secondary fusion core performing below expectations.

Dr. Chidambaram wrote that the thermonuclear device tested was “a two-stage device of advanced design, which had a fusion-boosted fission trigger as the first stage and a fusion secondary stage which was compressed by radiation implosion and ignited.” He said the argument

¹²²³ Sudarshan, V. "The Unforgettable Dr P K Iyengar" *The New Indian Express*, Dec 25, 2011. <http://newindianexpress.com/opinion/article311301.ece?service=print>

that the secondary stage failed to perform is belied by post-shot radioactivity measurements on samples extracted from the test site which showed significant activity of sodium-22 and manganese-54, both by-products of a fusion reaction rather than pure fission. "From a study of this radioactivity and an estimate of the cavity radius, confirmed by drilling operations at positions away from ground zero, the total yield as well as the break-up of the fission and fusion yields could be calculated." Based on this, he said, BARC (Bhabha Atomic Research Center) scientists worked out a total yield of 50 +/- 10 kt for the thermonuclear device, which was consistent with both the design yield and seismic estimates.¹²²⁴

Chairman of the Atomic Energy Commission- Dr. Anil Kakodkar

Chidambaram's claims regarding the yield of the thermonuclear test and

his support for computer simulations have been periodically reinforced by Kakodkar who played a major role in the 1998 tests (along with Dr. A. P. J. Abdul Kalam, Scientific Adviser to the Defense Minister, Secretary of the Defense Research and Development Organization and subsequently the President of India (2002-2007)). Kakodkar dismissed the concerns raised by Santhanam and Iyengar by pointing out that the former was not privy to the weapon designs while the latter was not involved in the 1998 tests.

¹²²⁴Varadarajan, Siddharth. "'Fizzle' Claim for Thermonuclear Test Refuted" *The Hindu*, August 27, 2009.
<http://www.thehindu.com/opinion/columns/siddharth-varadarajan/fizzle-claim-for-thermonuclear-test-refuted/article10457.ece>

“It (allegations of the retirees) is a totally erroneous conclusion. The yield of thermonuclear test was verified, not by one method but by several methods and by different groups, and this has been reviewed in detail,” he said. “I had described the tests as perfect in 1998 and I stand by that,” added Mr. Kakodkar, who played key roles in the nuclear tests of 1974 and 1998. He also said the instruments used by the DRDO (Defense Research and Development Organization) to measure the yield of the tests did not work. “I myself had reviewed this immediately after the test and we concluded that these instruments did not work... If the instruments did not work, where is the question of going by the assertions based on them and what is the basis of those assertions?” he said. On former AEC chief P.K. Iyengar’s support to Mr. Santhanam’s claims, Mr. Kakodkar said: “Iyengar was not in the picture as far as 1998 tests were concerned. He knows only as much as has been published. Nothing more.”¹²²⁵

To summarize, the debate over the yield of the lone 1998 thermonuclear test consisted of a “sizzle” side claiming that the test was a success and a “fizzle” side alleging that the test was a failure.¹²²⁶ The sizzle side was led by Chidambaram and included Dr. Raja Ramanna,¹²²⁷ Kakodkar, Dr. S. K. Sikka

¹²²⁵ "1998 Nuclear Tests Were Perfect, Says Kakodkar." *The Hindu*, December 13, 2009.

<http://www.thehindu.com/news/national/1998-nuclear-tests-were-perfect-says-kakodkar/article64687.ece>

¹²²⁶ Sastry, Shiv. "Sizzle or Fizzle: The Indian Nuclear Test Soap Opera" *Security Research Review* Vol. 4, no. No. 1 (October 26 2009): p1.

<http://www.adl.gatech.edu/research/brmsr/2009/SRRP04010901.pdf>.

¹²²⁷ "Atomic Energy Commission Press Statement on Thermo-Nuclear Tests." (September 15, 2009). Accessed on March 27 2014. <http://pibmumbai.gov.in/scripts/detail.asp?releaseId=E2009PR993> "No Reason to Doubt the Yield of 1998 Nuclear Test: Aec." *The Hindu*, September 16 2009.

(Director of Atomic and Condensed Matter Physics Group at BARC and Scientific Secretary to Chidambaram since 2002)¹²²⁸ and Dr. A. P. J. Abdul Kalam.¹²²⁹ The fizzle team included K. Santhanam, Iyengar and Dr. B. K. Subbarao.^{1230 1231} Meanwhile, Chidambaram was appointed as the Principal Scientific Adviser to the Government of India following the end of his tenure as the Chairman of the Atomic Energy Commission.¹²³² He was retained for another term by the incoming UPA government in 2004.

The initial American attitude towards Chidambaram in the aftermath of the 1998 tests was hostile. He was denied a visa by an angry Clinton administration to visit the US for an International Crystallography seminar.¹²³³ However, the Bush administration realized the importance of enlisting Chidambaram's support for the nascent US-India nuclear deal that it was

<http://www.thehindu.com/todays-paper/tp-national/no-reason-to-doubt-the-yield-of-1998-nuclear-test-aec/article184410.ece>

¹²²⁸ "Indian National Science Academy-Indian Fellow." Accessed on October 15 2013

<http://insaindia.org/detail.php?id=N88-1008>

¹²²⁹ Sastry, Shiv. "Sizzle or Fizzle: The Indian Nuclear Test Soap Opera" *Security Research Review* Vol. 4, no. No. 1 (October 26 2009): p2

<http://www.adl.gatech.edu/research/brmsrr/2009/SRRP04010901.pdf>.

¹²³⁰ Subbarao did not in anyway coordinate with Iyengar or Santhanam and is merely grouped with them based on his skeptical attitude towards the 1998 thermonuclear test.

¹²³¹ Sastry, Shiv. "Sizzle or Fizzle: The Indian Nuclear Test Soap Opera" *Security Research Review* Vol. 4, no. No. 1 (October 26 2009): p2

<http://www.adl.gatech.edu/research/brmsrr/2009/SRRP04010901.pdf>.

¹²³² "Chidambaram Appointed as Principal Scientific Advisor". *The Times of India*, Nov 11, 2001.

http://articles.timesofindia.indiatimes.com/2001-11-11/mumbai/27245777_1_chidambaram-bhabha-atomic-energy

¹²³³ "Uncle Sam's Petulance". *India Today* July 27 1998.

<http://indiatoday.intoday.in/story/by-denying-chidambaram-a-visa-the-us-has-effectively-politicised-science/1/264646.html>

contemplating in early 2005. After all, his role as the Principal Scientific Adviser to the Government of India, location within the Prime Minister's Office (PMO) and track record for providing technical judgements gave Chidambaram an important voice as a key technical arbiter of the incipient nuclear deal. Consequently, Secretary of State Condoleezza Rice attempted to woo Chidambaram by inviting him to Washington for preparatory talks on the contours of a nuclear deal that was eventually announced during Prime Minister Singh's visit to Washington in July 2005.

The United States will soon play host to an honored guest from India, a person who has been one of the architects of India's nuclear program...Chidambaram's clearance follows US Secretary of State Condoleezza Rice's landmark visit to India earlier this year (March 2005), during which Rice discussed US willingness to end the more than three-decades-long nuclear energy blockade of India.....In a top-level exchange that is also a reflection of changing paradigms, Chidambaram is scheduled to visit the US on May 19 to discuss issues related to proposed cooperation between the two sides on nuclear energy, relevant technologies and the jettisoning of roadblocks. Ironically, Chidambaram had been invited to witness a US nuclear test in Nevada in the late 1960s and played a leading role in the design and execution of the peaceful nuclear experiment by India in 1974.¹²³⁴

¹²³⁴ Srivastava, Siddharth. "Us Looks Nuclear India in the Eye" *Asia Times*, May 14, 2005. http://www.atimes.com/atimes/South_Asia/GE14Df03.html

The documentary record suggests that Chidambaram played a lead role in the negotiations over the contours of the nuclear deal from March-June 2005¹²³⁵ and Kakodkar was brought in later in early-July (although there is no way to verify whether the two coordinated their efforts in the interim and sequenced their participation accordingly).¹²³⁶ ¹²³⁷ Chidambaram's stout defense of the controversial yield of the thermonuclear test since 1998, his steadfast support for computer simulations instead of future underground tests, lead role in the initial consultations over the nuclear deal and silence over the termination clause in the Hyde Act caused alarm among the retirees.

The fear was that the 'perennial careerist' Chidambaram with his support for computer simulations would foreclose India's right to conduct future underground tests by accepting an explicit reference to testing in the forthcoming 123 agreement text. Put another way, the retirees worried that India's post-1998 unilateral moratorium on nuclear testing would be converted by Chidambaram into a bilateral binding commitment that would freeze the Indian nuclear arsenal

¹²³⁵ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 157

¹²³⁶ An August 28, 2008 article in *The Hindu* recounted Kakodkar's dissatisfaction with the first draft of the July 18 2005 joint statement faxed by the US to the Prime Minister's aircraft heading for Washington on July 16. "When the first draft of J18 (the July 18 2005 joint statement that outlined the basic terms of the nuclear deal) was faxed to the Prime Minister's plane at Frankfurt en route to Washington, it was so full of nonproliferationism that Anil Kakodkar, the Chairman of the Atomic Energy Commission, saw red. A message was immediately sent to the (advance team of) Indian negotiators to stand down and not agree to anything until the PM arrived. What ensued was a bitter fight, first within the Indian camp, and then between the Indians and the Americans. In the end, Dr. Rice and President Bush had to intervene." Varadarajan, Siddharth. "The American Dilemma at the NSG " *The Hindu*, Aug 28, 2008.

<http://www.hindu.com/2008/08/28/stories/2008082855911100.htm>

¹²³⁷ I approached Kakodkar for a personal interview in early 2010 through his friend Professor S. Rajagopal, a former employee at the Department of Atomic Energy. Rajagopal told me that Kakodkar was rule bound to not talk about the nuclear deal for two years following its conclusion (2008-2010).

at a 'primitive level'-Hiroshima yield fission weapons, a thermonuclear weapon of questionable reliability and the inability to validate it with future underground tests.

Former Chairman of the Atomic Energy Regulatory Board- Dr. A. Gopalakrishnan

Consider this excerpt from an August 14 2007 article in the *Asian Age* by Gopalakrishnan, a signatory of the August and December 2006 open letters. The article was written following the release of the text of the 123 agreement (covered later in the chapter) in August 2007. It provides a good idea of the worst fears of a key retired scientist vis a vis Chidambaram on the issue of testing.

Gopalakrishnan charged that Chidambaram had accepted binding constraints on India's ability to conduct future underground tests in exchange for nuclear cooperation. I suggest that Gopalakrishnan also held the aforementioned views 8 months earlier during the period under consideration (December 2006-January 2007). Notice how Gopalakrishnan brings up Chidambaram's conduct following the 1998 tests to cast aspersions over his motives during the negotiations over the nuclear deal, a line of attack that indicates the former's acute lack of trust in the latter.

We should not forget that his (Chidambaram's) assertion in 1998 that the country had successfully conducted one thermonuclear weapon test, and therefore need not test again, was strongly repudiated at that time by both national and international nuclear weapon experts. That with one failed test you can design and build reliable thermonuclear weapons in future is

a myth which only Dr Chidambaram continues to believe. In 1998, it was based on his "scientific advice" that the then Prime Minister, Atal Behari Vajpayee, declared a unilateral moratorium on nuclear testing and almost got to the brink of signing the CTBT (Comprehensive Test Ban Treaty). The very same scientist is now advising the current PM (Prime Minister) that there is no need to conduct any more weapon tests and, therefore, the Hyde Act stipulations.....in this regard can be accepted.¹²³⁸

Former Chairman of the Atomic Energy Commission- Dr. P. K. Iyengar

A November 2007 article by Iyengar in the *New Energy Times*, released in

the months following the announcement of the 123 agreement text in August, also expressed deep concern that Chidambaram had signed away India's ability to conduct future underground nuclear tests. Again, I suggest that Iyengar held the aforementioned views 9 months earlier during the period under consideration (December 2006-January 2007).

The costs of the deal, on the other hand, are substantial. The most important one is that it will seriously impact national security. Further testing is essential for us to develop and maintain a credible nuclear deterrent....It is sometimes argued that it is not essential to test. This position is contradicted by the actions of the US itself. Even after sixty years of weapons development and over 2000 tests after the end of the

¹²³⁸ Gopalakrishnan, Dr A. "Kakodkar, Chidambaram Are Misrepresenting Facts (Deccan Chronicle Article Reprint)" (August 14, 2007). Accessed on October 19 2013
<http://www.socialcause.org/getarticlefromdb.php?id=1030>

Cold War and the emergence of a ‘unipolar’ world, the US wants to start (the) Reliable Replacement Warhead project, to invent new nuclear weapons and maintain their stockpiles in operating readiness.¹²³⁹

Nuclear strategist Bharat Karnad, known for his proximity to the retired scientists¹²⁴⁰ even alleged that the Bush administration’s decision to go in for the July 18 2005 joint statement was motivated by Chidambaram’s assurances about India’s willingness to convert its unilateral moratorium on nuclear testing into a bilateral binding commitment in the 123 agreement.

The breakthrough in the nuclear deal with the US-it is not widely known-was, in fact, made by Dr. Chidambaram. Accompanying foreign secretary Shyam Saran to Washington in March 2005, Dr. Chidambaram, who had opposed nuclear testing in 1995 and after the 1998 tests supported the test moratorium-because he imprudently believes that nuclear simulation, rather than actual physical testing, is enough reportedly assured senior American officials not only about New Delhi’s readiness to extend its voluntary test ban into a permanent bilateral commitment but, more crucially, to bring the bulk of India’s nuclear programme and the country’s extensive scientific research facilities that feed it under international safeguards. These assurances suddenly enthused the George W. Bush administration, eventuating in the July 18

¹²³⁹ P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009. P 267-268.

¹²⁴⁰ Karnad teamed up with three other retired scientists including Iyengar to author “Strategic Sellout”, a comprehensive compendium of numerous newspaper articles critical of the nuclear deal from 2005-2008. P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-US Nuclear Deal*: Pentagon Press, 2009.

Joint Statement three months later and the controversial “separation plan” announced by New Delhi on March 2, 2006.¹²⁴¹

Iyengar’s deep suspicion of Chidambaram’s motives behind the nuclear deal arising from the latter’s stout defense of the simulations approach was not the only reason behind the insistence of the former on an exclusion of any reference whatsoever to testing in the 123 agreement text. He was also equally uneasy about the motivations of Chidambaram’s political boss, Prime Minister Singh. As Chairman of the Atomic Energy Commission, Iyengar had repeatedly clashed with then finance minister Singh during the cash strapped 1990’s over the funding of India’s nuclear program. He came to view Singh as an academic economist more interested in fostering economic growth and with a limited understanding of nuclear policy, especially pertaining to nuclear weapons. Iyengar now feared that the strategically myopic Singh would make concessions on the Indian nuclear weapons program including signing away India’s ‘right’ to test in exchange for a robust US-India economic relationship.

When Dr Iyengar was chairman AEC (Atomic Energy Commission), he feuded constantly with Prime Minister Narasimha Rao and (then finance minister) Dr Manmohan Singh over allocation of funds for nuclear power. At one meeting, Dr Singh felt obliged to point to the problems for the economy consequent to the 1974 nuclear test at Pokhran. Iyengar retorted:

¹²⁴¹ Ibid.p 157

“The 1974 decision was a Congress policy and your party should then be held responsible.” (Weapons of Peace by Raj Chengappa, p 381).¹²⁴²

An analysis of the debate over India’s 1998 thermonuclear test and the statements made by two key retirees (Iyengar and Gopalakrishnan) during the debate over the nuclear deal indicates a deep suspicion that the ‘careerist’ Chidambaram and ‘economist’ Prime Minister would together sign away India’s right to conduct further underground tests in exchange for an enhanced relationship with the US. I suggest that the sentiments espoused by the two aforementioned retirees were shared by the other six authors of the August and December 2006 open letters as well.

Thus, the pre-Hyde Act insistence of the retirees that no restrictions be placed on India’s nuclear weapons program (including on the right to test), their post-Hyde Act opposition to the termination clause and demand for a 123 agreement sans any reference to testing can be attributed to a lack of trust in the Chidambaram-Prime Minister duo and a fear that they would permanently foreclose India’s ability to conduct further underground tests, thereby saddling the country with a ‘primitive’ arsenal. The aforementioned reason complements the traditional bureaucratic motivations that could be advanced to explain the opposition of the retirees to any provisions in the Hyde Act that would constrain

¹²⁴² Sudarshan, V. "The Unforgettable Dr P K Iyengar" *The New Indian Express*, Dec 25, 2011. <http://newindianexpress.com/opinion/article311301.ece?service=print>

India's ability to test a nuclear weapon and their insistence on a 123 agreement without any reference to nuclear testing.

Despite their support for the claimed yield of the 1998 test and the simulations approach, Kakodkar and Chidambaram could still avoid a debate on the issue of testing and go along with the maximalist position advanced by the retirees ahead of the 123 agreement negotiations banking on the Bush administration's consistent proclivity to make deep nuclear concessions including possibly on the issue of testing in exchange for the strategic partnership. After all, the Bush administration had tossed aside most of the strictures issued by Congress over the principles that should guide the separation of India's nuclear infrastructure during preliminary hearings over the newly announced nuclear deal in late 2005. As a result, the March 2006 separation plan had no injunctions constraining India's fissile material production capacity and no mention whatsoever of testing. There was little reason to believe that the Bush administration would deviate significantly from that negotiating strategy during the 123 agreement negotiations.

The concept of *experimenter's regress* developed by Harry Collins and Trevor Pinch provides a useful theoretical lens to refract the debate over the reliability of the lone 1998 thermonuclear test between the retirees and Kakodkar and to understand its structure. Notice the sheer number of contention points in the debate including test site geology, access to the highly classified weapons designs, efficacy of the instrumentation of the DRDO and the DAE (BARC), the

thermonuclear physics of the primary and secondary, the post-test crater morphology and the technical capabilities of the scientists conducting the tests. The structure of the debate over the thermonuclear test is not very different from the debate over the chemical transfer of memory in planarian worms between McConnell and his critics with the two parties disagreeing over upto 70 experimental variables.

In fact, the controversy over the chemical transfer of memory was simpler in that McConnell's opponents could atleast attempt to replicate (if unsuccessfully) his experiments given their simplicity and the benign nature of the subject that lacked strategic/national security implications. Despite this, McConnell and his rivals socially constructed very different reasons for the chemical transfer/non-transfer of memory in planarian worms and the controversy was only resolved through forgetting (i.e. the arrival of the debate on the chemical transfer of memory in mammals).

The controversy over the lone 1998 thermonuclear test is much more complex in that it revolves around a single test (experiment) conducted simultaneously with other fission weapons (thereby making indistinguishable the thermonuclear weapon's yield from the yield of the fission devices and forcing both international and domestic skeptics to first take into account the total yield and then deduce the thermonuclear yield). The immense international pressure immediately following the test foreclosed any possibility of India testing another thermonuclear weapon in the near term making it impossible to reconduct the

disputed experiment. The entire argument in favor of the claimed yield of the weapon rests squarely on the shoulders of Chidambaram and Kakodkar, members of a small coterie of scientists that had access to the highly classified weapons design.

Although the Chidambaram-Kakodkar version of events has managed to become the mainstream Indian position, it is far from accepted by formidable (Santhanam, Iyengar) opponents that make up for their inability to access the weapons design with the credibility derived from several decades of service at the helm of key bureaucracies. The public debate between these two authoritative sources is constrained by the amount of detail about the weapon that can be revealed by Kakodkar and Chidambaram due to national security reasons. The private debate is stunted by at least one documented instance of personal animosity (Chidambaram Vs Iyengar).

Crucially, the ambiguity over the reliability of the weapon derives from the ambiguity over the dependability of the two sets of sensors used to monitor the test with the different data collection methods underlying the operating principles of each set of sensors again being contested.

The stakes in the debate are very high. If the thermonuclear test did indeed achieve its claimed yield, then India gains a spot among the 'elite' thermonuclear weapons powers with the resulting implications for international relations (and the attendant credibility benefits for Chidambaram and Kakodkar). On the other hand, if the thermonuclear test was a "dud" or a "fizzle," then India finds itself in the

company of fission weapon powers including Pakistan and North Korea and the aging (recently deceased) Iyengar and Santhanam go down in history as the nuclear Snowdens who blew the whistle on Chidambaram's careerist perfidy.

Finally, the controversy over the thermonuclear test is not as easily circumventable (and hence resolvable) as the bypassed controversy over the chemical transfer of memory. Any new nuclear disarmament initiative or nuclear cooperation agreement such as the nuclear deal only serves to throw fresh fuel on the simmering embers of the thermonuclear controversy. Thus, the structure of the thermonuclear debate is based on a very low experimental base (of one disputed test), formidable sources of rival authority, a large number of variables, constraints imposed by national security imperatives, a very visible personality clash, high strategic stakes, high personal stakes and a huge void (or hole) created by the inability to test again in the near future due to the adverse consequences.

Such a large degree of experimenter's regress allows only for the temporary stabilization of the Chidambaram-Kakodkar narrative and not its permanent institutionalization as determined opponents periodically turn the temperature up, especially during strategic inflection points such as the nuclear deal, seeking to unravel the official narrative and push India's nuclear policy towards a more radical direction (open-ended thermonuclear testing). I deploy Gusterson's concept of hyperconstruction to understand another facet of the thermonuclear debate in the conclusion section.

The 123 agreement negotiations

As stated earlier, the final Hyde Act came as a disappointment to both Kakodkar and the retirees in India and led to their demands on the trinity of issues. The clear and ambitious Indian expectations from the Bush administration ahead of negotiations over the 123 agreement and the equally categorical stipulations by the US Congress in the Hyde Act constraining the administration was bound to make consultations over the agreement difficult. American and Indian diplomats were conscious of the difficult consultations ahead but also aware of the tremendous momentum for a successful agreement from the top political eschelons on both sides. They began extensive negotiations in February 2007 and consultations continued until July.^{1243 1244}

¹²⁴³ *Fact Sheet on the India US Civil Nuclear energy Co-operation: Conclusion of the '123' Agreement.* July 27 2007. Accessed on March 27 2014. <http://www.mea.gov.in/pressrelease/2007/07/27pr01.htm>

¹²⁴⁴ Bush administration officials and their Indian counterparts had already undertaken exploratory discussions on a bilateral 123 agreement as early as March 2006, immediately after the announcement of the separation plan even as the Hyde Act was making its way through the US Congress. The first draft of the agreement handed over by the US to India in March 2006 contained an explicit provision (similar to the one in the December 2006 Hyde Act) that would terminate nuclear cooperation in the event of an Indian nuclear test. New Delhi found the provision so egregious that the draft was promptly leaked to the press. The Indian Ministry of External Affairs categorically clarified that India would not accept such a provision in the agreement and would be bound only by its post-1998 unilateral moratorium on nuclear testing. US Assistant Secretary of State for South and Central Asian Affairs Richard Boucher also publicly asked India to “further define” its minimum credible deterrent (i.e. specify the maximum number of nuclear weapons that it would possess) only to quickly retract his statement following India’s refusal to do so. He had to be content with declaring that India’s unilateral moratorium on nuclear testing would be the “lynchpin” of a future 123 agreement. Foreign Secretary Shyam Saran handed over India’s response to the American draft nuclear cooperation agreement to Undersecretary of State Nicholas Burns in late May 2006. Negotiations continued through June between the Indian side led by S. Jaishankar (Joint Secretary- Americas) in the Ministry of External Affairs (and officials from the Department of Atomic Energy) and the American side led by Richard Stratfor, Director of the Department of Energy (and officials from the State Department’s Bureau of Security and Nonproliferation). The US came up with a second draft in August 2006. India did not respond to the draft as it was getting concerned about various provisions in the Hyde Act. India requested the US side to temporarily suspend consultations over the 123 agreement till the passage of the final Hyde Act. Subsequently, a broader discussion focusing on concepts rather than clauses was held at the insistence of the American side in November 2006. Wade Boese has claimed in *Arms Control Today* that American negotiators gave India a second draft of the 123 agreement in November 2006

The objective of the negotiations was to “incorporate into a legal agreement the political understandings and commitments of July 2005 and March 2006.”¹²⁴⁵ The resulting nuclear cooperation agreement would amend section 123 of the US Atomic Energy Act of 1954 permitting the US to initiate nuclear co-operation with a “non-NPT state without full scope safeguards.”¹²⁴⁶

The two parties reached an understanding on July 27, 2007 after five rounds of tough negotiations¹²⁴⁷ and a brief impasse that was resolved following

Varadarajan, Siddharth. "Draft 123 Text to Be Given to U.S.." *The Hindu*, February 17, 2007.

<http://www.hindu.com/2007/02/17/stories/2007021714260100.htm>

Boese, Wade. "Slow Start in 2007 for U.S.-Indian Nuclear Deal" *Arms Control Today* March 2007.

Accessed on October 23 2013

http://www.armscontrol.org/act/2007_03/SlowStart

"India Rejects Us Proposal on N-Testing". (April 17, 2006). Accessed on October 23 2013.

<http://www.rediff.com/news/2006/apr/17ndeal1.htm>

Haniffa, Aziz. "Moratorium on Nuclear Testing Vital to N-Deal: Us

" (April 21, 2006). Accessed on October 23 2013 <http://www.rediff.com/news/2006/apr/21ndeal.htm>

"Us Asks India to Define Minimum Deterrent". (April 07, 2006). Accessed on October 23 2013.

<http://www.rediff.com/news/2006/apr/07ndeal2.htm>

"India Won't Define Minimum N-Deterrent: Saran". (April 08, 2006). Accessed on October 23 2013.

<http://www.rediff.com/news/2006/apr/08ndeal2.htm>

Haniffa, Aziz. "Boucher Clarifies Remarks on Minimum Nuclear Deterrent" (April 21, 2006). Accessed on

October 23 2013 <http://www.rediff.com/news/2006/apr/21ndeal1.htm>

Krishnaswami, Sridhar. "No New Conditions on N-Deal: US" (May 26, 2006). Accessed on October 23

2013. <http://www.rediff.com/news/2006/may/26ndeal3.htm>

"India, US Begin Talks on Bilateral Nuclear Agreement". (June 12, 2006). Accessed on October 23 2013.

<http://www.rediff.com/news/2006/jun/12ndeal.htm>

"N-Agreement: India, US Continue Deliberations". (June 13, 2006). Accessed on October 23 2013.

<http://www.rediff.com/news/2006/jun/13ndeal3.htm>

"N-Talks: India, Us Narrow Differences". (June 14, 2006). Accessed on October 25 2013.

<http://www.rediff.com/news/2006/jun/14ndeal1.htm>

¹²⁴⁵Ibid

¹²⁴⁶ K.Alan.Kronstadt, *India-U.S Relations*. January 30 2009, U.S Congressional Research Service (RL 33529). p. 42.

<http://fas.org/sgp/crs/row/RL33529.pdf>

Ghoshroy, S., *U.S. S.- India Nuclear Deal: why disarmament needs to be on the agenda?*, in *Think Outside the Bomb Summer Conference*. August 14 2008. Accessed on October 25 2013. p. 6.

<http://web.mit.edu/stgs/pdfs/TOTB%202008%20Summer%20Conference.pdf>

¹²⁴⁷*Chronology of the Indo-US nuclear deal*. Times of India. October 9 2008.

<http://timesofindia.indiatimes.com/World/US/Chronology-of-the-Indo-US-nuclear-deal/articleshow/3575350.cms>

intervention from the highest levels including President Bush, National Security Adviser Stephen Hadey and Vice President Dick Cheney. The text of the “Agreement for Cooperation between the Government of the United States of America and the Government of India concerning peaceful uses of nuclear energy”¹²⁴⁸ (123 Agreement) was simultaneously released by both sides on August 3, 2007.¹²⁴⁹ The agreement would remain in force for a period of 40 years and could be renewed beyond that period for 10 years at a time.¹²⁵⁰

Even a cursory glance at the contents of the agreement indicates yet again the extent to which President Bush was prepared to go in order to clinch the initiative and pave the way for a strategic partnership with India. Each of the three issues (testing, fuel-supply assurances and reprocessing) raised by the Indian side in the aftermath of the Hyde Act in December 2006 was resolved on terms favorable to India. In doing so, the Bush administration significantly diluted and altogether undercut the strictures imposed by the Hyde Act on the trinity of issues. An exasperated statement on the website of the American Federation of Scientists aptly summarized the Bush administration’s accommodative negotiating posture.

In summary, there isn’t much of a deal here at all, India gets what it wants.¹²⁵¹

¹²⁴⁸ Ibid

¹²⁴⁹ Ibid

"The Full Text of the 123 Agreement". (August 03, 2007). October 25 2013. <http://www.rediff.com/news/2007/aug/03nddeal3.htm>

¹²⁵⁰ "U.S. And India Release Text of 123 Agreement." (August 3, 2007). Accessed on October 25 2013. <http://2001-2009.state.gov/r/pa/prs/ps/2007/aug/90050.htm>

¹²⁵¹ Oelrich, Ivan. "India Gets a Deal." (August 7, 2007). Accessed on November 1 2013 http://blogs.fas.org/security/2007/08/india_gets_a_deal/

The most important concession made by the Bush administration was its decision to accept the Indian demand to leave out the word “testing”¹²⁵² in the termination clause of the agreement. Instead, the issue of testing was incorporated in an indirect, roundabout manner and was qualified with a key escape clause.

ARTICLE 14 - TERMINATION AND CESSATION OF COOPERATION

1. Either Party shall have the right to terminate this Agreement prior to its expiration on one year's written notice to the other Party. A Party giving notice of termination shall provide the reasons for seeking such termination.....2. Before this Agreement is terminated pursuant to paragraph 1 of this Article, the Parties shall consider the relevant circumstances and promptly hold consultations, as provided in Article 13, to address the reasons cited by the Party seeking termination.....The Parties agree to consider carefully the circumstances that may lead to termination or cessation of cooperation. They further agree to take into account whether the circumstances that may lead to termination or cessation resulted from a Party's serious concern about a changed security environment or as

¹²⁵² "U.S. And India Release Text of 123 Agreement." (August 3, 2007. Accessed on November 3 2013.), <http://2001-2009.state.gov/r/pa/prs/ps/2007/aug/90050.htm>
Bhatt, Sheela. "India Has Got Same Rights as Nuclear-Weapon States" (July 26, 2007). Accessed on November 3 2013. <http://www.rediff.com/news/2007/jul/26nddeal3.htm>

a response to similar actions by other States which could impact national security.....¹²⁵³

Notice the accommodating tone of Article 14 and the absence of the word “testing” as against the direct tone of the termination clause (now Section 106) in the final Hyde Act that explicitly conditioned continued American nuclear cooperation on India not testing a nuclear weapon.

Sec. 106. INOPERABILITY OF DETERMINATION AND WAIVERS

A determination and any waiver under section 104 shall cease to be effective if the President determines that India has detonated a nuclear explosive device after the date of the enactment of this title.¹²⁵⁴

The second major concession made by the Bush administration was on the issue of fuel supply. It agreed to reiterate in toto the separation plan’s lifetime fuel-supply guarantees in the 123 agreement text thereby undermining the Obama amendment in the Hyde Act that called for streamlining the strategic fuel reserve available to India to a year’s worth of fuel (“reasonable operating requirements”) at a time.¹²⁵⁵ Clause 2(e) of Article 2 committed the US to the

¹²⁵³U.S. And India Release Text of 123 Agreement." (August 3, 2007. Accessed on November 3 2013.), <http://2001-2009.state.gov/r/pa/prs/ps/2007/aug/90050.htm>

¹²⁵⁴ “Henry J. Hyde United States-India Peaceful Atomic Energy Cooperation Act of 2006”. U.S Congress, December 2006. Accessed on March 25 2014

<http://www.gpo.gov/fdsys/pkg/BILLS-109hr5682enr/pdf/BILLS-109hr5682enr.pdf> .p 13

P. K. Iyengar, A.N. Prasad, A. Gopalakrishnan and Bharat Karnad. *Strategic Sellout: Indian-Us Nuclear Deal*: Pentagon Press, 2009. P 428

¹²⁵⁵ Samanta, Pranab Dhal. "With Gap Narrowing, Indian Team Extends Stay to Seal Nuclear Deal." *The Indian Express*, July 21 2007.

<http://www.indianexpress.com/news/with-gap-narrowing-indian-team-extends-stay-to-seal-nuclear-deal/206022/0>

Varadarajan, Siddharth. "123 Fulfills Prime Minister’s Assurances" *The Hindu*, July 24, 2007.

development of a strategic reserve of nuclear fuel to guard against any disruption of supply over the lifetime of India's reactors....¹²⁵⁶

Article 6 (a) of the agreement reinforced Article 2 by repeating verbatim the multi-layered fuel supply assurances in the separation plan.¹²⁵⁷ Article 6 (c) allowed India to take unspecified “corrective measures” in a future safeguards agreement with the IAEA if American fuel supply to the reactors safeguarded by India under the separation plan was interrupted.

(c) In light of the above understandings with the United States, an India specific safeguards agreement will be negotiated between India and the IAEA providing for safeguards to guard against withdrawal of safeguarded nuclear material from civilian use at any time as well as providing for corrective measures that India may take to ensure uninterrupted operation of its civilian nuclear reactors in the event of disruption of foreign fuel supplies.¹²⁵⁸

Even Article 14 of the agreement, dealing indirectly with nuclear testing and the termination of the treaty reiterated the US commitment to fuel Indian reactors for the duration of their lifetime.

<http://www.hindu.com/2007/07/24/stories/2007072457750100.htm>

¹²⁵⁶U.S. And India Release Text of 123 Agreement." (August 3, 2007. Accessed on November 3 2013.), <http://2001-2009.state.gov/r/pa/prs/ps/2007/aug/90050.htm>

¹²⁵⁷ Ibid

¹²⁵⁸ "U.S and India Release Text of 123 Agreement ". (August 3 2007). Accessed on November 3 2013 http://responsiblenucleartrade.com/keydocuments/india_123_agreement_text.pdf .p 8

.... Such (1 year post-nuclear test) consultations shall give special consideration to the importance of uninterrupted operation of nuclear reactors of the Party concerned with respect to the availability of nuclear energy for peaceful purposes as a means of achieving energy security.....¹²⁵⁹

Finally, the US also gave in to the Indian demand for an upfront and permanent right to reprocess the spent fuel outputted by the reactors that India would import in an indigenous reprocessing facility. Article 6(iii) of the final 123 agreement allowed India to reprocess the spent fuel in a dedicated national reprocessing facility under permanent IAEA safeguards. The new facility would be on the safeguarded civilian side of the separation plan unlike India's four existing reprocessing facilities that were retained on the unsafeguarded military side. Article 6(iii) also set a definite timeline for the operationalization of the consent to reprocess, acceding yet again to the Indian demand for an early time-bound implementation of the consent.

iii) With a view to implementing full civil nuclear cooperation as envisioned in the Joint Statement of the Parties of July 18, 2005, the Parties grant each other consent to reprocess or otherwise alter in form or content nuclear material transferred pursuant to this Agreement and nuclear material and by-product material used in or produced through the

¹²⁵⁹"U.S. And India Release Text of 123 Agreement." (August 3, 2007. Accessed on November 3 2013.), <http://2001-2009.state.gov/r/pa/prs/ps/2007/aug/90050.htm>

use of nuclear material, non-nuclear material, or equipment so transferred. To bring these rights into effect, India will establish a new national reprocessing facility dedicated to reprocessing safeguarded nuclear material under IAEA safeguards and the Parties will agree on arrangements and procedures under which such reprocessing or other alteration in form or content will take place in this new facility.

Consultations on arrangements and procedures will begin within six months of a request by either Party and will be concluded within one year.....¹²⁶⁰

India's success in persuading the US to grant it upfront and permanent rights to reprocess the spent fuel outputted by the imported reactors shattered the silence of the Hyde Act over the issue of reprocessing.

The Eight Horsemen part ways

Recall that eight prominent retired scientists had authored an open letter in August 2006 that opened the space for a comprehensive political debate on the Hyde Act and the nuclear deal. The open letter and the post-Hyde Act joint critique of the retirees had helped them to acquire a greater voice in the policymaking process in the days before negotiations over the 123 agreement began in earnest. The attitude of some of the retirees changed noticeably following the release of the 123 agreement text. The magnitude of the concessions made by the US on testing, fuel-supply assurances and reprocessing were so significant

¹²⁶⁰ "U.S. And India Release Text of 123 Agreement." (August 3, 2007. Accessed on November 3 2013.), <http://2001-2009.state.gov/r/pa/prs/ps/2007/aug/90050.htm>

that they now elicited support even from members of a cohort hardened by the Tarapur experience and determined to safeguard the option of conducting future underground thermonuclear tests.

Though there are some bitter memories about India's previous brush with the US nuclear administration more than three decades ago, nuclear scientists now point out that the present 123 agreement is the "best that could have happened under the present circumstances". "This is the best what could have happened under the present circumstances," Dr Placid Rodrigues, the president of Indian Nuclear Society told Deccan Herald. Dr Rodrigues – one of those who criticised the deal earlier, arguing that it would hamper the Indian strategic programme – said the new India-friendly deal could face more opposition in the USA, because of the strong anti-proliferation lobby. When contacted, two other critics – Dr A N Prasad and Dr A Gopalakrishnan – said they required more time to read the text before making comments. Dr P K Iyengar was not available due to his ill health. Another opposing scientist and former chairman of the atomic energy commission Dr M R Srinivasan said, "most of the concerns are addressed in the agreement. A few points were not upto our expectations, but I think we have to live with it".

Interestingly, in 1960-61, a young Dr Srinivasan was the principal project engineer at the Tarapur atomic power station, where two reactors were supplied by the US firm General Electric.¹²⁶¹

¹²⁶¹ "Nuclear Scientists Say Aye to 123 Agreement". *Deccan Herald* August 4 2007. <http://archive.deccanherald.com/Content/Aug42007/national2007080417101.asp>

The group cohesiveness of the retired scientists, their major asset since 2006 was gone. There would be no more open letters to Parliament from the retirees due to the splintering within the group. Simply put, the retirees ceased being a potent force in the debate over the nuclear deal beyond August 2007 (following the release of the 123 agreement text) as compared to a year earlier in August 2006.

Chairman of the Atomic Energy Commission-Dr. Anil Kakodkar

The newfound enthusiasm/reluctant acquiescence of the retirees for the 123 agreement was shared by Kakodkar. He had already endorsed the agreement in a joint press conference with National Security Adviser Narayanan and Foreign Secretary Menon on July 27. Obviously, the US concessions on the trinity of issues played an important role in his positive attitude towards the agreement.

Question (Jyoti Malhotra, The Telegraph): Dr. Kakodkar, you were quite unhappy and you made it very clear in the public eye, in the media that you were very unhappy in the past by the way negotiations were going. So, specifically on the issues that you have discussed in the last week in Washington, - whether to do with reprocessing fuel, supply assurances, testing - are you satisfied with the deal that you have got with the Americans today?

Chairman, Atomic Energy Commission: The point is simple. Whatever I had said earlier was a part of the national position; whatever I am saying now is also a part of the national position; and whatever this agreement

has achieved is also consistent with the national position. So, I have no reason to be unhappy.¹²⁶²

Principal Scientific Adviser to the government- Dr. R. Chidambaram

Finally, Kakodkar's satisfaction with the agreement was also echoed by

Chidambaram in an interview with *The Hindu*. Interestingly, Chidambaram pointed to the absence of any explicit reference to testing in the 123 agreement as a major concession despite his supposed belief that future underground tests were unnecessary and computer simulations were sufficient.

Interviewers (Harish Khare and Siddharth Varadarajan): There's a view that India's ability to test will be severely constrained as a result of the agreement with the U.S., that testing will become more difficult in the future.

Chidambaram: See, whenever you test, there will be consequences.

When we tested in 1974 and 1998, the leadership then knew there would be consequences. So that is something which is built into the system. But as far as the 123 agreement goes, there is nothing in the agreement which prevents us from testing, if the government decides to test for whatever reason. That is what we should look at.¹²⁶³

¹²⁶²"Joint Press Conference by National Security Advisor, Chairman, Atomic Energy Commission and Foreign Secretary". (

July 27, 2007). Accessed on November 13 2013

https://www.indianembassy.org/archives_details.php?nid=868

Varadarajan, Siddharth. "Nuclear Deal Is Satisfactory, Says Kakodkar" *The Hindu*, July 28, 2007.

<http://www.hindu.com/2007/07/28/stories/2007072859660100.htm>

¹²⁶³ Varadarajan, Harish Khare and Siddharth. "For Nuclear Renaissance, the World Needs India" *The Hindu*, August 10, 2007.

<http://www.hindu.com/2007/08/10/stories/2007081056171100.htm>

Conclusion

I used the concept of experimenter's regress earlier and pointed out the numerous contention points in the debate over the reliability of the lone 1998 thermonuclear test that prevented its permanent resolution (through the permanent stabilization of the Chidambaram-Kakodkar narrative and the end of continued challenges posed by skeptics like Iyengar and Santhanam). I also referred briefly to a void at the center of the Indian thermonuclear debate, the inability to conduct another test in the near future due to the high economic costs and the resulting interim dependence on supercomputer simulations as another variable retarding the resolution of the debate.

In comparison to the debate over the RRW, the void at the center of the Indian thermonuclear debate seems to be much larger. After all, the US nuclear weapons designs including its megaton-yield thermonuclear warheads have been validated through thousands of nuclear tests and yet there exists a strong body of scientific opinion that opposes the RRW's induction without prior validation through testing. In the Indian case, the experimental base is so small (one test), the available evidence for the yield so murky and the stakes so high that it encourages all kinds of hyperconstruction and exploitation of inevitable ambiguities by skeptics. To use Gusterson's language, there is a lot of surplus ambiguity in the thermonuclear debate that is exploited by skeptics with their own agendas (e.g. nuclear strategist Bharat Karnad has long favored open-ended testing to perfect India's thermonuclear weapons designs and bring them on par with Chinese megaton yield warheads).

An interesting question is whether the thermonuclear hyperconstruction over the 1998 test witnessed during the debate over the nuclear deal could return at a future date and actually lower the threshold for India to conduct another thermonuclear test. Notice that most of the participants in the debate over thermonuclear reliability are veterans (Chidambaram is 77, Kakodkar-70, Iyengar is deceased, Santhanam- 76, Gopalakrishnan-77).

It is reasonable to speculate that a younger generation of weapons designers would have occupied mid-level positions at key nuclear bureaucracies and would be eager to prove to its intellectual mettle both to the international community and to the skeptics within India, fully aware of the tremendous implications of a successful test for the overseer's career trajectory as well the nuclear establishment's economic interests.¹²⁶⁴ Conservative nuclear strategist Bharat Karnad has confirmed the presence of over twelve untested designs 'on the shelf.' Some of the untested designs include thermonuclear weapons.

There are over 12 untested weapons designs, encompassing nuclear and thermonuclear gravity and glide bomb and warheads optimized for delivery by aircraft, land-based cruise and ballistic missiles, on the shelf.¹²⁶⁵

Although this younger cohort of weapons designers has been quite content to allow its seniors to carry on with the thermonuclear debate, there are external

¹²⁶⁴ Conversations with Dr. M. V. Ramana, Associate Research Scholar, Program on Science and Global Security, Princeton University. March 2014.

¹²⁶⁵ Karnad, Bharat. *India's Nuclear Policy*: Praeger Security International 2008. P 70

and internal factors that could lead it to push for another nuclear weapons test.

The new norm taking shape in the West of underground testing as the preserve of primitive countries and supercomputer modeling as the path of the future¹²⁶⁶ does not seem to be shared by a significant section within the community of Indian nuclear weapons scientists.

Thus, an external event such as a nuclear test by Pakistan, China and indeed even the US or other members of the P-5 could result in the aforementioned younger cohort of weapons designers (or “strategic enclave” to use South Asia scholar Itty Abraham’s phraseology) advancing new hyperconstructions of the 1998 test and pushing for further underground testing. Siddharth Varadarajan, former editor of the *The Hindu* newspaper explained the profound influence of a decision by another country (except a nuclear outlier like North Korea) to test a nuclear weapon on the Indian decision to test in a personal interview with me.

If the U.S tests, because the U.S is one country most likely to test,..it’s also the one most likely to ratify the CTBT (Comprehensive Test Ban Treaty), but it’s also one most likely to test. If they do test, the probability of the Indian test is close to 100%....If they don’t test and they sign the CTBT and China signs the CTBT, the probability of the Indian test is close to zero.¹²⁶⁷

¹²⁶⁶ Conversations with Dr. Hugh Gusterson, Professor of Sociology and Anthropology at George Mason University. January 2014.

¹²⁶⁷ Interview with Siddharth Varadarajan, former Editor of the *The Hindu* newspaper. April 2010.

The key internal factor that could throw fresh fuel on the simmering 1998 thermonuclear debate prompting a new phase of hyperconstructions could be the scientific, personal and institutional ambitions of the younger weapons designers. After all, they would be fully aware of the tremendous benefits of a successful thermonuclear test hid successfully from US intelligence agencies for their own careers, place in India's nuclear history, prospects of funding for their respective bureaucracies and 'recognition' from the international nuclear weapons community. Further, a successful test would also comprehensively hoist India into the ranks of the thermonuclear club, its rightful place according to the younger generation of weapons designers comprising the strategic enclave.

Although the thermonuclear debate in India has returned to the 'simmer' mode as of 2014, the void at its center caused by the reliance on a single test is so large that such a blackhole could combine with a future aforementioned external or internal event to give rise to a new round of hyperconstructions, resulting in renewed pressure on political leaders to approve a thermonuclear test. The decision of the political leadership at the time would be predicated on its ideology (Hindu nationalist Vs left of center or leftist), vision of India's place in the world (great power Vs leader of the non-aligned bloc), the state of the Indian economy and its capacity to absorb any punitive measures, the electoral gains from such a test-especially amongst India's nationalistic middle class and US power.

CHAPTER 5: CONCLUSION

The full significance of the US-India nuclear deal and the strategic partnership wrapped around it for Asian and world geopolitics becomes evident when viewed against the most recent projections regarding the composition of the global order by 2030. Particularly instructive in this regard is the *Global Trends* series of reports published every four years by the National Intelligence Council (NIC), a subdivision of the US intelligence community. The reports include projections about the future distribution of power in the international system and the resulting opportunities/challenges for the US.¹²⁶⁸ *Global Trends 2030: Alternative Worlds* is the fifth and most recent installment in the series that was published in December 2012. The mandate of the report is to stimulate thinking about the rapid and vast geopolitical changes characterizing the world today and possible global trajectories during the next 15-20 years. As with the NIC's previous Global trends reports, we do not seek to predict the future—which would be an impossible feat—but instead provide a framework for thinking about possible futures and their implications.¹²⁶⁹

The analyses and projections in the report are based on public, private and academic sources. A key conclusion of the report is that Asia will reemerge as the primary

¹²⁶⁸ Fisher, Max. "The Coming Realignment of World Powers, Foretold in Charts." *The Washington Post*, December 11, 2012
<http://www.washingtonpost.com/blogs/worldviews/wp/2012/12/11/the-coming-rise-and-decline-of-world-powers-foretold-in-charts/>

¹²⁶⁹ "Global Trends 2030: Alternative Worlds." (December 2012). National Intelligence Council. Accessed on May 25 2014. http://www.dni.gov/files/documents/GlobalTrends_2030.pdf .p i

economic and military pole of the world order by 2030, effectively ending the period of Western ascendancy and primacy in world affairs since 1750 and “the era of unrivalled American ascendancy in international politics that began in 1945.”¹²⁷⁰ The rapid economic growth rates of China and India is identified as the main driver of the shift of power from the West to the East.

As the graph below shows, it took Britain 155 years to double GDP per capita, with about 9 million people in 1870 . . . The US and Germany took between 30 and 60 years with a few tens of million people . . . but India and China are doing this at a scale and pace not seen before: 100 times the people than Britain and in one tenth the time. By 2030 Asia will be well on its way to returning to being the world’s powerhouse, just as it was before 1500.^{1271 1272}

¹²⁷⁰ Ibid. p 98

¹²⁷¹ Ibid. p 2

¹²⁷² The report neglects to mention that the near decadal doubling of GDP of both China and India since 1979 and 1991 respectively is due in major part to their starting off from a very low economic base.

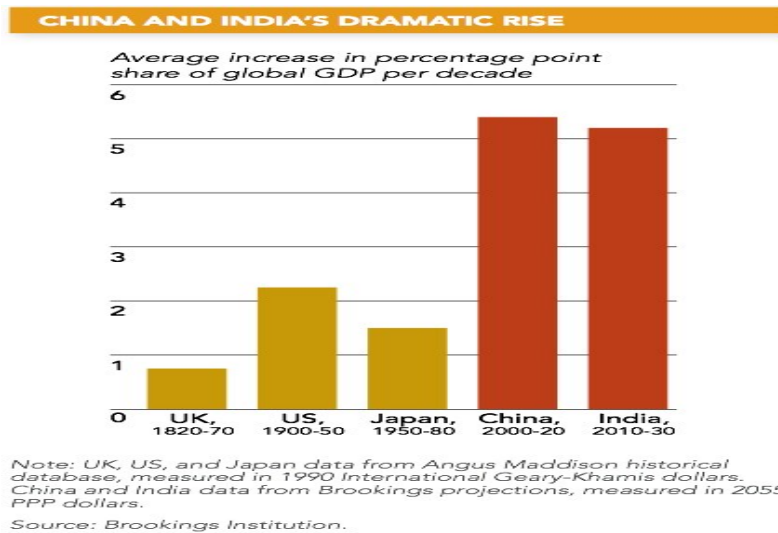


Figure 19: Average increase in percentage point share of global GDP per decade for China and India

Source: "Global Trends 2030: Alternative Worlds." (December 2012). National Intelligence Council.

Accessed on May 25 2014. http://www.dni.gov/files/documents/GlobalTrends_2030.pdf . p 2

China is anticipated to equal the US share of world power around 2030 using the conventional metrics to measure power (Gross Domestic Product-GDP, population size, military spending and technology).¹²⁷³ A second power calculation approach based on a broader array of elements (Internet/Communication Technologies, research and development, government revenue, human capital, international assistance, foreign direct investments, trade, nuclear weapons, GDP- PPP, military spending and energy) considered by the NIC to more accurately represent 21st century power results in China equaling the US share of world power shortly after 2040. Both projections are reproduced below.

¹²⁷³Fisher, Max. "The Coming Realignment of World Powers, Foretold in Charts." *The Washington Post*, December 11, 2012
<http://www.washingtonpost.com/blogs/worldviews/wp/2012/12/11/the-coming-rise-and-decline-of-world-powers-foretold-in-charts/>

AGGREGATE POWER OF DEVELOPING STATES SET TO SURPASS US POWER BY 2030

The main discussion refers to a global power index, based upon GDP, population size, military spending, and technology, which we have used in previous *Global Trends* works. Recently, we have contributed to the development of a new global power index, which incorporates a broader array of elements relevant to 21st-century power, including health, education, and governance. Using the new index, China's and India's shares of global power increase, but at a slower pace than projected by the other index. Using the earlier, four-pronged power index, China's share of national power equals the US share in 2030; using the new index, China's share is 4-5 percentage points below the US share. Using the new, broader power index, Europe (EU-27) ranks much closer to the US than in the previous index. Using either index, the aggregate power of developing states overtakes that of all developed states, including the US, by 2030. The share of global power held by the EU, Japan, and less so Russia decreases under both indices.

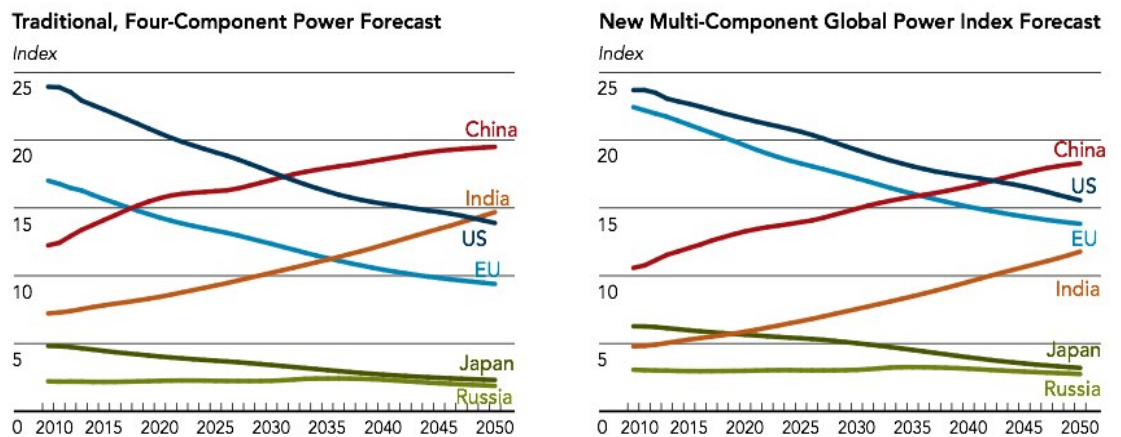


Figure 20: Power comparison of countries/blocs using traditional four-component and new multi-component power index.

Source: "Global Trends 2030: Alternative Worlds." (December 2012). National Intelligence Council. Accessed on May 25 2014. http://www.dni.gov/files/documents/GlobalTrends_2030.pdf .p 16

Finally, a revealing bar graph uses the second power calculation approach to depict the comprehensive national power of key countries by 2030. The US is still projected to remain the 'first among equals' but the post-1991 unipolar world order is anticipated to shift to a bipolar one with China emerging as the rival pole. India is projected to become the third most powerful country in this bipolar world order with a

large economy, massive military spending, continued albeit incremental addition to its nuclear weapons stockpile and enormous human capital.

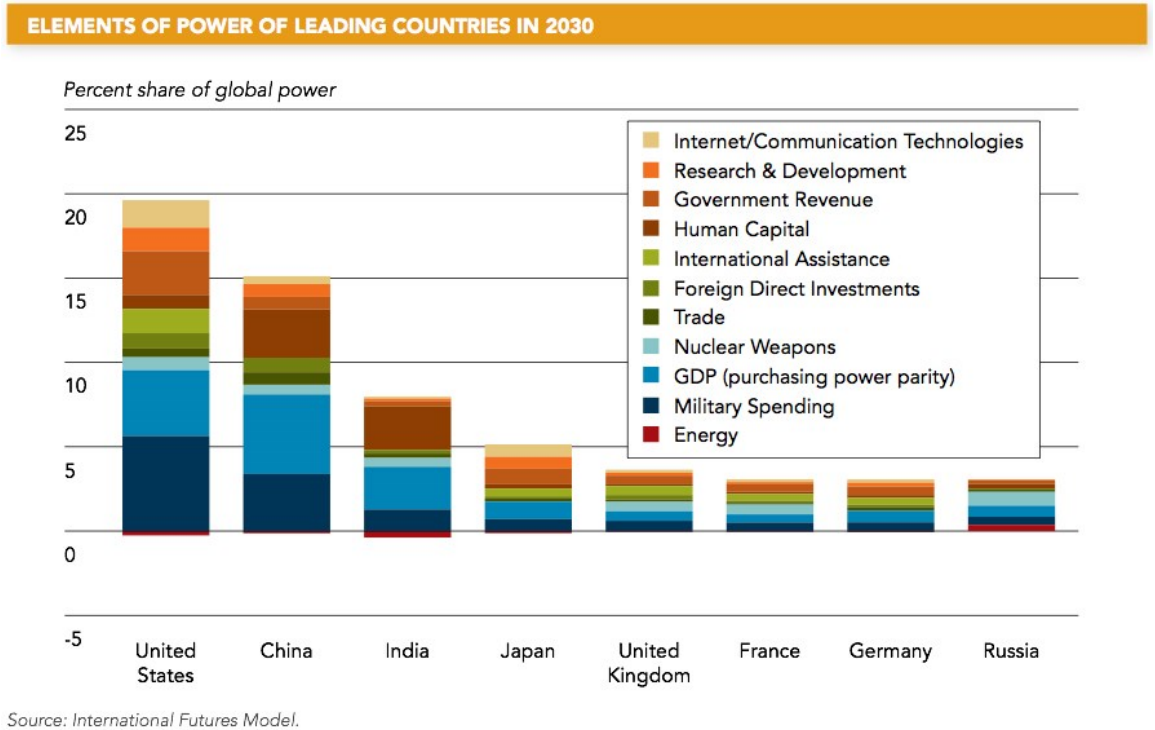


Figure 21: Percentage share of global power of leading countries in 2030

Source: "Global Trends 2030: Alternative Worlds." (December 2012). National Intelligence Council. Accessed on May 25 2014. http://www.dni.gov/files/documents/GlobalTrends_2030.pdf .p 101

I do not intend to suggest that the reader construe my reproduction of the aforementioned description and figures as my whole-hearted endorsement of their certainty. After all, large majorities in the strategic community have repeatedly failed to anticipate seismic events that fundamentally affected global affairs such as the collapse of the Soviet Union that laid waste to the assumption that the world would forever be bipolar, the attacks on 9/11 and the subsequent Global War on Terror, the 2008 financial crisis, the Arab Spring and Russia’s reemergence under Putin.

Rather, my contention is that the aforementioned projections about the emerging world order and hitherto non-aligned India's place in it as a "global swing state" with the potential to affect the Asian and global balance of power would have been available to/anticipated by the American progenitors of the nuclear deal (Rice, Zelikow and Zoellick- see Chapter 3) as of 2005, especially given their access to highly classified information even more detailed than the public *Global Trends* reports. Infact, even the language used in a prior *Global Trends* report (*Mapping the Global Future* released by the NIC in December 2004) regarding the international system being in a "state of flux" due to the rise of China, India and other regional powers¹²⁷⁴ is almost identical to Zelikow's contention in his secret memo (see Chapter 3) on the necessity for a nuclear deal with India that eventuated in the July 2005 joint statement. I have reproduced the relevant excerpt below. Notice how Zelikow identifies the nuclear deal as the key enabling initiative that would deal with the ongoing flux in the international system by co-opting a rising India and harnessing its growing weight to advance American interests in Asia. The thinly veiled objective of the American nuclear outreach was to obviously harness India's growing weight to balance Chinese power in Asia.

You'll see actually the memo lays out the whole idea in detail. It lays out the geopolitical rationale for it (the nuclear deal) in detail. And actually it forecasts the role of India in the 21st century and then basically makes a strategic argument about, now is kind of a key moment of flux, how do

¹²⁷⁴ "Mapping the Global Future-." (December 2004). National Intelligence Council. Accessed on May 25 2014.
http://www.dni.gov/files/documents/Global%20Trends_Mapping%20the%20Global%20Future%202020%20Project.pdf . p 9

we want to position ourselves in relation to this moment? It even analogized the strategic decisions we made about building up Western Europe in the early nineteen fifties, building up Japan in early nineteen fifties.....not in the security sense, but in the political economic sense as building them up as healthy centers of democratic power.¹²⁷⁵

Thus, Siddharth Varadarajan, former editor of *The Hindu* newspaper was prescient in his analysis in a July 29 2005 article published a few days after the announcement of the July 18 joint statement that the nuclear deal was an attempt by the prevailing hegemon (the US) to reduce the chances of a challenge to its world order from a strategic competitor (China) by entangling a potential balancer and great power (India) into its alliance system and norms. Changing the structure of the global nuclear order in one stroke by conferring *de facto* (though not *de jure*) recognition on India's nuclear weapons and creating an entirely arbitrary category of a 'state with advanced nuclear technology' between the Nuclear Weapons States and Non-nuclear Weapons States categories was perceived by the deal's American proponents to be a reasonable price to pay in exchange for long-term Indian strategic cooperation.

In the fullness of time, last week's nuclear agreement between India and the United States will be seen as one of those decisive moments in international politics when two powers who have been courting each other for some time decide finally to cross the point of no return. The U.S. and India have 'come out', so to speak, and the world will never be the same again. Every world order needs rules in order to sustain itself

¹²⁷⁵ Interview with Philip Zelikow, Counselor to Secretary of State Condoleezza Rice. November 24 2010.

but sometimes the rules can become a hindrance to the hegemonic strength of the power that underpins that order. Following India's nuclear tests in 1998, the U.S. had two options: continuing to believe the Indian nuclear genie could be put back, or harnessing India's evident strategic weight for its own geopolitical aims before that power grows too immense or is harnessed by others like Europe or China. The U.S. has chosen the latter option, and the joint statement released by President George W. Bush and Prime Minister Manmohan Singh on July 18 is the most dramatic textual manifestation of what Washington is attempting to do.¹²⁷⁶

At the domestic level, the nuclear deal was a major shift in India's foreign policy from the non-aligned approach it adopted since independence that positioned it between the two Cold War superpowers (with more of a tilt towards the Soviet Union) to a posture more supportive (though not completely subordinate) of the US-dominated world order increasingly confronted by an emerging China but also by a reinvigorated Russia, an assertive Iran and unstable Pakistan.

The initiative had major implications for the structure of the Indian civilian nuclear program, both in terms of the availability of long denied foreign fuel to bail out the fuel-starved, sanctions-constrained civilian reactors and the possible addition of a large import component consisting of a fleet of multibillion dollar Light Water Reactors (LWRs) from the US and others. Further, the nuclear deal and the increase in nuclear

¹²⁷⁶ Varadarajan, Siddharth. "The Truth Behind the Indo-U.S. Nuclear Deal." *The Hindu*, July 29, 2005. <http://www.hindu.com/2005/07/29/stories/2005072903221000.htm>

power generation that seemed plausible during the 2005-2008 period (courtesy the optimistic expansion scenarios laid out by the nuclear establishment) was also anticipated to impact India's energy choices, a prediction that has not materialized as of July 2014.

Predictably, such a significant initiative suffused with politico-military-strategic implications generated a wide-ranging debate in India that involved its political, scientific, strategic and media communities. Independent researchers and anti-nuclear activists also advanced well-reasoned critiques of the deal that were ignored by the mainstream media. The main objective of the dissertation was to gain a detailed understanding of the complex, multifaceted debate over the nuclear deal in India.

Chapter 2 used STS concepts to focus on the debate over the feasibility of separating India's nuclear infrastructure, its core commitment under the nuclear deal and the status of the fast-breeder reactors in the separation plan. A key insight from the chapter was the heterogeneity within the Indian bureaucratic system over the contours of the separation plan with the MEA and the DAE supporting different plans that were products of their institutional agendas. The chapter also brought out the strategies used by the nuclear establishment (public interviews at key junctures combined with organized pressure in private) to win the debate over the separation plan's contours and the status of the fast breeder reactors.

Chapter 3 used concepts from STS and Political Science to focus in particular on the role of key individuals in the origins, evolution and emergence of the Iran-Pakistan-India (IPI) pipeline and the paradigm of regional cooperation wrapped around it with a robust Iran-India relationship at the core. I then described the emergence of the idea of a

bold nuclear outreach to India amongst a small coterie in the State Department led by Condoleezza Rice and her success in winning the inter-agency debate over the nuclear deal in the Bush administration by enlisting the support of the Pentagon and marginalizing key non-proliferation minded bureaucrats in the State Department.

The crux of the chapter was the collision of the two aforementioned paradigms; regional cooperation with the IPI pipeline at its core and the US-India global partnership with the nuclear deal as its centerpiece in the Indian domestic milieu. The temporary impairment of the IPI pipeline, the derailment of the regional cooperation paradigm and the transient chill in Iran-India relations were significant achievements of the nuclear deal and the paradigm of bilateral strategic cooperation that it was a spearhead of.

Finally, Chapter 4 zeroed in on the important role played by India's nuclear scientists in the debate over the Hyde Act's implications for India's ability to continually access foreign fuel, reprocess US-origin spent fuel in a reprocessing facility and conduct a nuclear test in the future. The chapter focused in particular on a previous episode of botched US-India nuclear cooperation, the impact of that failure on the mindset of the scientists and the emergence of particular set of axioms, practices and artifacts as a result. A key argument made in the chapter was that the aforementioned complex of axioms, practices and artifacts combined with bureaucratic considerations resulting in the demands made by the scientists for the inclusion of guaranteed fuel-supply assurances and the right to reprocess in the 123 agreement text.

Another key section in the chapter was the reconstruction of the hitherto simmering debate over the yield of India's lone 1998 thermonuclear test that was

reignited by the Hyde Act's termination clause. An important insight from that debate was the level of dissension within the Indian nuclear establishment and suspicions among the retirees regarding the motivations of a top serving scientist and an economist Prime Minister. An understanding of the debate over the lone 1998 thermonuclear test in India and the DAE's bureaucratic imperatives helps to grasp the insistence of the scientists on the text of the 123 agreement excluding any reference to testing.

I now contrast the current state of US-India relations as of June 2014 against the claims made by the nuclear deal's proponents from 2005-2008. As stated earlier in Chapter 2, the nuclear deal did succeed in raising US-India relations to a new normal during and after its passage. However, the more optimistic claims by its American proponents that the initiative would eliminate 40 years of Cold War-era distrust and convert India into a camp follower of the US strategy in Asia have fallen short.

Four recent developments demonstrate the profound differences that still characterize the US-India relationship despite the increased cooperation in the post-nuclear deal milieu. First, India broke ranks with other major powers by explicitly supporting Russia's military intervention in the Ukraine and its annexation of Crimea. Although India is not a permanent member of the Security Council, its muted but clearly discernible support for Russia's violation of an issue as fundamental as the international norm on the sanctity of territorial sovereignty despite US diplomatic efforts has led to deep concerns in the US.

Andrew J. Stravers, researcher at the Department of Defense's Minerva Initiative's project on natural resource and armed conflict and Peter Harris, doctoral

candidate in Government at the University of Texas, Austin warned the US foreign policy establishment that the returns from the nuclear deal had significantly depreciated and urged immediate steps to reinvigorate the increasingly fragile US-India relationship, characterized by President Obama in 2010 as “one of the defining and indispensable partnerships of the 21st century.”¹²⁷⁷

In the wake of Vladimir Putin’s incursion into Crimea, almost every member of the international community voiced concern over Russia’s actions. . . . Yet there is one unusual suspect among those lining up behind Putin that requires further investigation: India. On its face, New Delhi’s enunciation of respect for Russia’s “legitimate interests” in Crimea is a surprising blow to the prevailing U.S. policy of reaching out to India. As the largest democracy in the world, a burgeoning capitalist economy and an increasingly important military power, India has been viewed as a counterweight to China’s rise and an anchor of the U.S.-led international order. India’s support for Russia’s revisionism in Crimea, then, is something that should trouble U.S. policymakers. In the long run, India’s response to the Crimean crisis might even be remembered as one of the more important implications of the whole episode. For how India aligns in the coming multipolar world will have enormous ramifications. After the Bush administration left office, India was heralded as one of the foreign policy success stories of his presidency.

¹²⁷⁷ "Remarks by the President to U.S.-India Business Council and Entrepreneurship Summit." (November 08, 2010). Accessed on April 2 2014. <http://www.whitehouse.gov/the-press-office/2010/11/08/remarks-president-us-india-business-council-and-entrepreneurship-summit>

Economic relations had been deepened, diplomatic ties strengthened, a nuclear agreement signed. It should greatly concern the American foreign policy establishment that, at a moment when international norms are under assault by Moscow, India has chosen to (at least partially) throw its lot in with Russia. How strong can a norm of territorial integrity be without the world's largest nation and the world's largest democracy? How stable can the American-led global order be with such a prominent repudiation of American foreign policy preferences? The answer to both of these questions is, unfortunately, "not very."¹²⁷⁸

If one of the primary motives of the nuclear deal was to bring Indian foreign policy on issues of concern to the US in line with American thinking, clearly that motive has not been achieved. The Indian foreign policy establishment continues to insist on 'strategic autonomy' and the right to stake out complex positions that are often at variance with the US. The recent publication of *NonAlignment 2.0- A Foreign and Strategic Policy for India in the Twenty First Century*, a grand strategy document by several eminent Indian intellectuals that was blessed by the establishment demonstrates the continued extent to which the Indian elite remains wedded to Prime Minister Nehru's foreign policy blueprint (although this may change if a government led by the Hindu nationalist Bharatiya Janata Party were to remain in power long enough to remove the

¹²⁷⁸Harris, Andrew J. Stravers and Peter. "Indian Foreign Policy: The Cold War Lingers." *The Diplomat* (March 24 2014). Accessed on April 2 2014. <http://thediplomat.com/2014/03/indian-foreign-policy-the-cold-war-lingers/>

moorings of non-alignment put in place since independence by the center left Congress Party).¹²⁷⁹

Second, the arrest and strip-search of Devyani Khobragade, India's Deputy Consul General at its New York mission by US Marshals on December 11 2013 for allegedly lying on a US visa form to secure the entry of her maid (Sangeetha Richards) and subsequently underpaying her had a chilling effect on US-India relations.¹²⁸⁰ An Indian Foreign Service (IFS) outraged at the alleged cavity search of one of its own strongly rallied behind Khobragade and India's political parties competed to burnish their nationalist credentials ahead of national elections in April 2014 resulting in a public uproar. The Indian government initiated a series of retaliatory measures including the removal of concrete security barriers around the US Embassy in New Delhi, withdrawal of diplomatic immunity for certain American personnel and an investigation of the Embassy's compliance with Indian tax laws. The incident led to the cancellation of US Energy Secretary Erin Moniz's visit to India in mid-January¹²⁸¹ to discuss civilian nuclear cooperation among other issues (Moniz visited India two months later as political tempers in New Delhi began to cool).

¹²⁷⁹"Nonalignment 2.0- a Foreign and Strategic Policy for India in the 21st Century." (2012). Accessed on May 25 2014. http://www.cprindia.org/sites/default/files/NonAlignment%202.0_1.pdf

¹²⁸⁰ Adam, Sunil. "India and the United States: Why the Twain Shall Never Meet." *Huffington Post*, January 15 2014. Accessed on April 2 2014.

http://www.huffingtonpost.com/sunil-adam/india-united-states_b_4604460.html

Sirohi, Seema. "Nannygate: U.S.-India Relations Rocked" *The National Interest*, December 24 2013. Accessed on April 2 2014.

<http://nationalinterest.org/commentary/nannygate-us-india-relations-rocked-9626>

¹²⁸¹ Reuters. "U.S. Energy Secretary Delays India Trip Amid Diplomatic Row" (January 9, 2014). Accessed on April 2 2014. <http://in.reuters.com/article/2014/01/08/india-usa-diplomat-moniz-idINDEEA070I320140108>.

The top Indian political leadership convinced of the complacency of US ambassador to India Nancy Powell in arranging for the “evacuation” of Richard’s husband from India ahead of Khobragade’s arrest to avoid reprisal cold-shouldered her for months. Powell resigned on April 1 2014 dealing a blow to the much ballyhooed US-India strategic partnership premised on the nuclear deal that was already fraying due to differences on trade, patent rights, Afghanistan and the inability of US nuclear corporations to penetrate the Indian market. Seema Sirohi, a Washington-based foreign policy analyst described the increasing distrust in US-India relations following the Khobragade affair that claimed Powell.

US ambassador Nancy Powell’s resignation is the first real indication that Washington has woken up and is starting to smell the “chai.” The resignation offers a chance to start over and rebuild what should never have been broken and “Khobragaded.” It will take years to regain the level of trust between bureaucracies and buckets of political wisdom on both sides to stitch the hole. Whether Powell resigned under advisement from her superiors or came to the decision on her own is irrelevant. As an officer with 37 years in the Foreign Service, she knew that she had completely lost the confidence of her host government in the wake of the Devyani Khobragade affair.¹²⁸²

¹²⁸² Sirohi, Seema. "Why Nancy Powell’s Exit Can Help India-Us Rebuild Relations" *Firstpost* (April 1 2014). Accessed on April 2 2014. <http://www.firstpost.com/blogs/why-nancy-powells-exit-can-help-india-us-rebuild-relations-1460889.html>
Tellis, Ashley J. "India-U.S. Relations: ‘The Rupture Is Certainly Real and Quite Tragic’." *Rediff* (February 17, 2014). Accessed on April 2 2014. <http://carnegieendowment.org/2014/02/18/india-u.s.-relations-rupture-is-certainly-real-and-quite-tragic/h185>

Third, a key American motivation behind the nuclear outreach to India was to sell several multibillion dollar Light Water Reactors and keep in business a stagnating American nuclear industry even as it awaited a “nuclear renaissance” in the US. However, the expectations of corporations such as Westinghouse of gaining a quick foothold into the vast Indian nuclear market did not materialize, primarily due to the Indian Parliament’s passage of a nuclear liability bill (The Civil Liability for the Nuclear Damages Bill, 2010) with provisions not entirely in alignment with the prevailing international nuclear liability legislation. Section 17(b) of the bill introduced the concept of supplier liability, a “watershed moment in international nuclear liability jurisprudence” given the current norm of assigning nuclear liability “exclusively to the operator.”¹²⁸³

In the event of an accident, the law allows the victims to collect a maximum of Rs. 2,500 crores in all from the Government but takes away their right to sue the supplier. However, it allows the Government itself to seek recourse from the vendor and recover its losses.¹²⁸⁴

American nuclear corporations have opposed the nuclear liability legislation due to the potentially unlimited supplier liability that they would be exposed to in the aftermath of a nuclear accident and have demanded the excision of the supplier liability clause before entering the Indian market.

Since all civil nuclear facilities are owned by the Central Government (Nuclear Power Corporation of India Limited and the Bharat Navbhikiya

¹²⁸³ Mohit Abraham and M. P. Ram Mohan. "Don't Waver Now on Nuclear Liability" *The Hindu*, September 20 2013.

<http://www.thehindu.com/opinion/lead/dont-waver-now-on-nuclear-liability/article5147177.ece>

¹²⁸⁴ M V Ramana & Suvrat Raju. "Nuclear Dichotomy" *Countercurrents* (December 01 2011). Accessed on April 2 2014. <http://www.countercurrents.org/raju011211.htm>

Vidyut Nigam, both public sector enterprises), the liability issues arising from these installations are its responsibility. Under existing Indian legislation, foreign suppliers may face absolute, unlimited and non-delegable liability, something that prevents them from taking insurance cover. Private American firms are more affected than their government backed French and Russian counterparts.¹²⁸⁵

However, the Indian government refused to budge under American pressure due to counter pressure from opposition parties and civil society¹²⁸⁶ still haunted by the loss of 3600 lives during the Bhopal Gas Disaster and the subsequent escape without liability of Warren Anderson, the CEO of Union Carbide (subsidiary of Dow Chemicals in India). More recently, the Indian government has responded to the concerns of American nuclear corporations by promising to water down or work around the liability bill's stipulations at the bureaucratic level. But such promises have not materialized at the speed expected by the US and the Westinghouse Corporation only managed to sign a "preliminary pact for an Early Works Agreement (EWA)" for the construction of the first American reactor with the Indian operator (Nuclear Power Corporation of India Limited- NPCIL) in late 2013.¹²⁸⁷ On the American side, the perceived barriers placed by the liability bill to the entry of US nuclear corporations into India has drawn the ire of proponents of the nuclear

¹²⁸⁵ Ravi, Chaitanya. "India's Nuclear Liability Bill." (April 19 2010). Accessed on April 2 2014.

<http://www.ipcs.org/article/india/indias-nuclear-liability-bill-3098.html>

¹²⁸⁶ MV Ramana and Suvrat Raju,. "No Power to the People" *Hindustan Times*, November 29, 2011.

<http://www.hindustantimes.com/comment/columnsothers/no-power-to-the-people/article1-775750.aspx>

M V Ramana and Suvrat Raju,. "To Avoid a Disaster" *Hindustan Times*, August 15, 2010.

<http://www.hindustantimes.com/comment/columnsothers/to-avoid-a-disaster/article1-587276.aspx>

¹²⁸⁷ Ramesh, N. "Nuclear Liability Issue in Focus Post Npcil-Westinghouse Pact." *The Hindu*, October 2 2013

<http://www.thehindubusinessline.com/economy/nuclear-liability-issue-in-focus-post-npcilwestinghouse-pact/article5193566.ece>

deal including former Secretary of State Condoleezza Rice¹²⁸⁸, her Undersecretary Nicholas Burns¹²⁸⁹ and Obama administration officials¹²⁹⁰ with ramifications for the US-India relationship.

Fourth, the deleterious impact on the US-India relationship caused by the dissatisfaction of American nuclear corporations and the proponents of the nuclear deal (and their successors in the Obama administration) has been compounded by other differences including a number of trade disputes over drug patents, solar panels, software piracy and retroactive taxation¹²⁹¹ affecting the economic relationship. The trade disputes have emerged in a context of a slowdown in both the US and Indian economies due to the 2008 financial crisis, the determination of the Obama administration to enhance US access to large markets in Asia for exports-driven revival and the Indian government's policy of sourcing content domestically to build a robust industrial base. To summarize, the predictions made by the nuclear deal's proponents that the initiative and the strategic partnership wrapped around it would result in a significant dilution of India's non-aligned foreign policy as well as unprecedented economic cooperation have not materialized

¹²⁸⁸ ET, Bureau. "Opportunities Provided by Indo-US Nuke Deal yet to Be Tapped: Condoleezza Rice." *The Economic Times*, Dec 8, 2013.

http://articles.economictimes.indiatimes.com/2013-12-08/news/44943005_1_indo-us-nuke-deal-civil-nuclear-deal-former-us

¹²⁸⁹"Liability Law Has Put Nuclear Agreement in Jeopardy, Says Nicholas Burns." *The Hindu*, October 22, 2010.

<http://www.thehindu.com/todays-paper/tp-national/liability-law-has-put-nuclear-agreement-in-jeopardy-says-nicholas-burns/article841864.ece>

¹²⁹⁰ Lakshman, Narayan. "Manmohan, Obama to Meet Amid U.S. Concerns over Liability Law" *The Hindu*, September 27, 2013.

<http://www.thehindu.com/news/national/manmohan-obama-to-meet-amid-us-concerns-over-liability-law/article5172229.ece>

¹²⁹¹ Busvine, Douglas. "U.S. Seeks 'Talk and Trade' to Rebuild India Ties." *Reuters* (March 6 2014). Accessed on April 2 2014. <http://www.reuters.com/article/2014/03/06/us-india-usa-idUSBREA250ML20140306>

(although two-way trade continues to increase including big-ticket defense sales and reluctant Indian cooperation has been secured in terms of reducing but not eliminating oil imports from Iran).¹²⁹²

However, the nuclear deal and the US-India relationship may be poised for a period of substantial progress. As of June 4, 2014, India's newly elected Prime Minister Narendra Modi of the Hindu nationalist Bharatiya Janata Party has agreed to a bilateral summit meeting with US President Barrack Obama in September 2014 despite predictions in the commentariat that the former would be reluctant to engage the latter due to the decade long American visa ban and boycott in the aftermath of the 2002 Hindu-Muslim riots in Gujarat state that killed 2500 people¹²⁹³ during then Chief Minister Modi's tenure. A majority of the dead and the thousands that were displaced were Muslims.¹²⁹⁴ Although Modi is reportedly "bristling with resentment"¹²⁹⁵ over the American delay in reaching out to him despite his meteoric rise onto the national political milieu as the frontrunner for the post of Prime Minister, he has also referred to the US and India as "natural allies," a term first used by former Prime Minister Atal Behari Vajpayee of a previous BJP government. A high-level Obama administration official also indicated the American willingness to become a major player in the Indian defense sector thereby giving a fillip to the

¹²⁹² Ibid.

¹²⁹³ Bhowmick, Nilanjana. "Gujarat Riots: New Court Verdict Raises the Heat on Narendra Modi." *Time*, August 31, 2012.

<http://world.time.com/2012/08/31/gujarat-riots-new-court-verdict-raises-the-heat-on-narendra-modi/>

¹²⁹⁴ Krishnan, Murali. "Modi's Clearance in the Gujarat Riots Case Angers Indian Muslims." *Deutsche Welle* (April 11 2012). Accessed on April 2 2014. <http://www.dw.de/modis-clearance-in-the-gujarat-riots-case-angers-indian-muslims/a-15874606>

¹²⁹⁵ Luce, Edward. "Modi's Existential Challenge to Obama." (May 27 2014). *Financial Times*. <http://www.todayonline.com/chinaindia/modis-existential-challenge-obama?singlepage=true>

already improving US-India defense relationship. He also categorically indicated the centrality of India in the US Pivot to Asia strategy designed to contain China.

The United States is ready to give a special role to India in its "Asia-Pacific rebalance" strategy and is "flexible" to adapt itself to meet the Indian defence needs, a former US government official has said. The official, who played a key role in India-US defence ties in past few years, hoped the Narendra Modi-led government with a decisive mandate would clear the high-tech projects that the two countries can co-produce for their respective armed forces. He said the Obama administration is ready to go that extra mile to help India realize its ambition of being self-reliant in defence research, development and production. About 10 months ago, the then deputy secretary of defence Ashton Carter had submitted to the then UPA government a comprehensive list of defence systems, which the US was ready to co-develop and co-produce with India. "Those were projects that our industry would like to do with the Indian industry," the official told PTI (Press Trust of India) in a recent interview on condition that his name would not be disclosed given the sensitivity of the defence relationship between the two countries.¹²⁹⁶

¹²⁹⁶ "US Flexible to Adapt Itself to Meet India's Defence Needs". *The Times of India*, June 3, 2014. <http://timesofindia.indiatimes.com/world/us/US-flexible-to-adapt-itself-to-meet-Indias-defence-needs/articleshow/35979361.cms>

APPENDIX-A

For Immediate Release
Office of the Press Secretary
July 18, 2005

Joint Statement between President George W. Bush and Prime Minister Manmohan Singh

Prime Minister Manmohan Singh and President Bush today declare their resolve to transform the relationship between their countries and establish a global partnership. As leaders of nations committed to the values of human freedom, democracy and rule of law, the new relationship between India and the United States will promote stability, democracy, prosperity and peace throughout the world. It will enhance our ability to work together to provide global leadership in areas of mutual concern and interest. Building on their common values and interests, the two leaders resolve:

- To create an international environment conducive to promotion of democratic values, and to strengthen democratic practices in societies which wish to become more open and pluralistic.
- To combat terrorism relentlessly. They applaud the active and vigorous counterterrorism cooperation between the two countries and support more international efforts in this direction. Terrorism is a global scourge and the one we will fight everywhere. The two leaders strongly affirm their commitment to the conclusion by September of a UN comprehensive convention against international terrorism.

The Prime Minister's visit coincides with the completion of the Next Steps in Strategic Partnership (NSSP) initiative, launched in January 2004. The two leaders agree that this provides the basis for expanding bilateral activities and commerce in space, civil nuclear energy and dual-use technology.

Drawing on their mutual vision for the U.S.-India relationship, and our joint objectives as strong long-standing democracies, the two leaders agree on the following:

FOR THE ECONOMY

- Revitalize the U.S.-India Economic Dialogue and launch a CEO Forum to harness private sector energy and ideas to deepen the bilateral economic relationship.

- Support and accelerate economic growth in both countries through greater trade, investment, and technology collaboration.
- Promote modernization of India's infrastructure as a prerequisite for the continued growth of the Indian economy. As India enhances its investment climate, opportunities for investment will increase.
- Launch a U.S.-India Knowledge Initiative on Agriculture focused on promoting teaching, research, service and commercial linkages.

FOR ENERGY AND THE ENVIRONMENT

- Strengthen energy security and promote the development of stable and efficient energy markets in India with a view to ensuring adequate, affordable energy supplies and conscious of the need for sustainable development. These issues will be addressed through the U.S.-India Energy Dialogue.
- Agree on the need to promote the imperatives of development and safeguarding the environment, commit to developing and deploying cleaner, more efficient, affordable, and diversified energy technologies.

FOR DEMOCRACY AND DEVELOPMENT

- Develop and support, through the new U.S.-India Global Democracy Initiative in countries that seek such assistance, institutions and resources that strengthen the foundations that make democracies credible and effective. India and the U.S. will work together to strengthen democratic practices and capacities and contribute to the new U.N. Democracy Fund.
- Commit to strengthen cooperation and combat HIV/AIDs at a global level through an initiative that mobilizes private sector and government resources, knowledge, and expertise.

FOR NON-PROLIFERATION AND SECURITY

- Express satisfaction at the New Framework for the U.S.-India Defense Relationship as a basis for future cooperation, including in the field of defense technology.
- Commit to play a leading role in international efforts to prevent the proliferation of Weapons of Mass Destruction. The U.S. welcomed the adoption by India of legislation on WMD (Prevention of Unlawful Activities Bill).
- Launch a new U.S.-India Disaster Relief Initiative that builds on the experience of the Tsunami Core Group, to strengthen cooperation to prepare for and conduct disaster relief operations.

FOR HIGH-TECHNOLOGY AND SPACE

- Sign a Science and Technology Framework Agreement, building on the U.S.-India High-Technology Cooperation Group (HTCG), to provide for joint research and training, and the establishment of public-private partnerships.
- Build closer ties in space exploration, satellite navigation and launch, and in the commercial space arena through mechanisms such as the U.S.-India Working Group on Civil Space Cooperation.
- Building on the strengthened nonproliferation commitments undertaken in the NSSP, to remove certain Indian organizations from the Department of Commerce's Entity List.

Recognizing the significance of civilian nuclear energy for meeting growing global energy demands in a cleaner and more efficient manner, the two leaders discussed India's plans to develop its civilian nuclear energy program.

President Bush conveyed his appreciation to the Prime Minister over India's strong commitment to preventing WMD proliferation and stated that as a responsible state with advanced nuclear technology, India should acquire the same benefits and advantages as other such states. The President told the Prime Minister that he will work to achieve full civil nuclear energy cooperation with India as it realizes its goals of promoting nuclear power and achieving energy security. The President would also seek agreement from Congress to adjust U.S. laws and policies, and the United States will work with friends and allies to adjust international regimes to enable full civil nuclear energy cooperation and trade with India, including but not limited to expeditious consideration of fuel supplies for safeguarded nuclear reactors at Tarapur. In the meantime, the United States will encourage its partners to also consider this request expeditiously. India has expressed its interest in ITER and a willingness to contribute. The United States will consult with its partners considering India's participation. The United States will consult with the other participants in the Generation IV International Forum with a view toward India's inclusion.

The Prime Minister conveyed that for his part, India would reciprocally agree that it would be ready to assume the same responsibilities and practices and acquire the same benefits and advantages as other leading countries with advanced nuclear technology, such as the United States. These responsibilities and practices consist of identifying and separating civilian and military nuclear facilities and programs in a phased manner and filing a declaration regarding its civilians facilities with the International Atomic Energy Agency (IAEA); taking a decision to place voluntarily its civilian nuclear facilities under IAEA safeguards; signing and adhering to an Additional Protocol with respect to civilian nuclear facilities; continuing India's unilateral moratorium on nuclear testing; working with the United States for the conclusion of a multilateral Fissile Material Cut Off Treaty; refraining from transfer of enrichment and reprocessing technologies to states that do not have them and supporting international efforts to limit their spread; and ensuring that the necessary steps have been taken to secure nuclear materials and technology through

comprehensive export control legislation and through harmonization and adherence to Missile Technology Control Regime (MTCR) and Nuclear Suppliers Group (NSG) guidelines.

The President welcomed the Prime Minister's assurance. The two leaders agreed to establish a working group to undertake on a phased basis in the months ahead the necessary actions mentioned above to fulfill these commitments. The President and Prime Minister also agreed that they would review this progress when the President visits India in 2006.

The two leaders also reiterated their commitment that their countries would play a leading role in international efforts to prevent the proliferation of weapons of mass destruction, including nuclear, chemical, biological and radiological weapons.

In light of this closer relationship, and the recognition of India's growing role in enhancing regional and global security, the Prime Minister and the President agree that international institutions must fully reflect changes in the global scenario that have taken place since 1945. The President reiterated his view that international institutions are going to have to adapt to reflect India's central and growing role. The two leaders state their expectations that India and the United States will strengthen their cooperation in global forums.

Prime Minister Manmohan Singh thanks President Bush for the warmth of his reception and the generosity of his hospitality. He extends an invitation to President Bush to visit India at his convenience and the President accepts that invitation.¹²⁹⁷

¹²⁹⁷ "Joint Statement between President George W. Bush and Prime Minister Manmohan Singh ". (July 18, 2005). Accessed on April 22 2014. <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>

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CURRICULUM VITAE

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