



CBRN South Asia

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CBRN South Asia is an online monthly bulletin of the Nuclear Security Programme of the Institute of Peace and Conflict Studies, providing a coverage of commentaries and news reports relating to chemical, biological, radiological and nuclear weapons material and substances in South Asia.

The bulletin also flags important reports that appear worldwide on the subject and features exclusive interviews.

IPCS is now partnering with the Nuclear Security Project of the Nuclear Threat Initiative (NTI), working towards global nuclear security.

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Institute of Peace and Conflict Studies

April 2010, Vol. 3, No. 4

President Obama came to Prague last year to lay out his vision of “a world without nuclear weapons.” A year later, he returns on April 8 to sign a treaty with Russia that envisions a world with thousands of nuclear weapons.

The environment of United States-Russia relations is now ripe for action after a year of intense negotiations. This treaty will send a clear signal that the two largest nuclear powers are ready to lead the world in strengthening global efforts to stop the spread of nuclear weapons. Under the new Strategic Reduction Arms Treaty (START), the two powers will cut by 25 percent the number of deployed strategic nuclear weapons, limiting both sides to 1,550 warheads each.

This development will place the spotlight on those nations that are believed to be pursuing nuclear weapons and not fulfilling their international obligations. It aims to bring the return of the Non-Proliferation Treaty (NPT) as the cornerstone of the non-proliferation strategy and engage countries like North Korea and Iran to comply with NPT principles.

It is also a significant step in making progress towards two approaching events, the Nuclear Security Summit in mid-April and the NPT Review Conference in May. But mostly it is meant to encourage the influential non-nuclear-weapons states who remain skeptical of President Obama’s disarmament agenda.

Within India, the Nuclear Liability Bill emerged as an issue as controversial as the Indo-US civilian nuclear deal. The passage of the bill in the Indian Parliament is crucial to the implementation of the deal. The Indian Government witnessed intense resistance from the Opposition over the legislation. The Opposition parties have blocked the bill arguing that nuclear plant operators are being let off with meager liability in the event of accidents.

The Bhopal tragedy comes to mind in this

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instance and the necessity for adequate compensation in case of an accident. Particularly since a nuclear accident would be far more devastating than what happened in Bhopal.

There is no doubt that the liability bill is necessary as it is an important element in enabling foreign companies to work in India’s nuclear power sector. The Government has been forced to redraft certain clauses of the bill to address concerns of the Opposition and the ambiguities that exist in the text. One such change may include the formulation which gives the impression that all liabilities are to be paid by the operator, letting international suppliers off the hook. Another may relate to the Rs 500 crore proposed cap as the no-fault liability of the operator.

For now the bill has been sidelined, but the Government remains committed in moving forward with the legislation to successfully reap the benefits of nuclear commerce.

Modular Nuclear Reactors: Solution or Problem?

PR Chari, Research Professor, Institute of Peace and Conflict Studies

Nuclear submarines are powered by small atomic reactors fitted into their hulls. Can they be used to meet the requirements of small, scattered communities living in remote parts of the country? Can they be clustered together to feed into the grid?

"Scientific American" has recently discussed this issue pertaining to modular nuclear reactors. The magazine notes that it was developed in the Los Alamos National Laboratory in the United States and is now being offered by Hyperion Power, situated in Santa Fe. It is a US\$50 million enclosed reactor roughly 1.5 meters wide and 2.5 meters high, capable of generating 25 megawatts of electricity. Buried underground it could last for at least seven years. The promotional sales line compares these reactors to an oversized underground battery, which is an exaggeration, since the heat produced by the reactor must heat water and produce steam for revolving the turbines for producing electricity. Hence, a steam turbine, generator and cooling device would be additionally required, apart from the project colony that would have to be located over ground.

It is tempting to believe that these reactors could serve the local population in remote, inaccessible parts of the country by augmenting their developmental programs. Transmission and distribution costs would also be minimized that add considerably to the costs of electricity for the consumer. These modular reactors could also be compared to wind, solar, and geo-thermal energy projects that have catalyzed local development and helped in stemming the mad rush to the cities in search of employment.

What is the downside to this solution for the energy crisis? There is initially the matter of costs. No doubt, a modular nuclear reactor can be manufactured elsewhere and transported to the location site. A costing exercise in the Indian context is needed to compare the total construction and generating costs of these reactors along side other energy sources (including light-water and heavy water nuclear reactors). It requires emphasizing that modular nuclear reactors also require highly skilled engineers, working in isolated locations. There are personnel issues here of recruitment, training and retention that need no elaboration. Moreover, these reactors work at roughly 500 degrees Celsius, somewhat higher than traditional reactors, and require cooling by a liquid metal like sodium to enable fast neutron fission, which is an inherently dangerous technology. In other words, modular nuclear reactors, like their larger cousins, are also capable of having a meltdown accident due to uncontrolled fission. Necessarily, these reactors must be equipped, therefore, with control rods to

avoid this contingency, but the inherent risks involved cannot be wished away as non-existent.

Furthermore, there is the problem of nuclear wastes, which remain radioactive for infinitely long periods of time, and for which a permanent repository has yet to be found. The United States, for instance, has not been able to operate its Yucca Mountain storage site in Nevada due to unresolved problems of background radiation and the stability of the geological structures involved over the lifecycle of the nuclear wastes. In India, the possibility of vitrifying nuclear wastes in silica blocks is accepted, but has not been attempted on any scale. This problem will be compounded with modular reactors being scattered across the country, raising serious safety and security questions in a milieu where terrorism related incidents are not infrequent. Transporting these wastes to a central disposal site raises additional problems of their safety and security en route that are not trivial. Some theoretical work is

It is tempting to believe that these reactors could serve the local population in remote, inaccessible parts of the country by augmenting their developmental programs...These modular reactors could also be compared to wind, solar, and geo-thermal energy projects that have catalyzed local development and helped in stemming the mad rush to the cities in search of employment.

proceeding to devise an atomic reactor that would be proliferation resistant by converting highly radioactive waste into less harmful fission residues, but no breakthrough has yet been achieved. In other words, the problems of handling nuclear wastes shall be greatly compounded with modular reactors being sited in different locations.

So, how does all this concern India and its Atomic Energy Commission? There are 20 atomic power reactors operating in the country with a total installed capacity of 4500MWs. Apparently, two more 700MW pressurized heavy water reactors are being planned for Andhra Pradesh and Madhya Pradesh. Three 1000MW light water reactors are being planned for Gujarat, Andhra Pradesh and West Bengal. Work on these five projects would start in 2012. A sixth 220MW reactor in Rajasthan has just gone on stream. Two 1000MW reactors, along with a 500MW Prototype Fast Breeder Reactor in Tamil Nadu, and another 220MW reactor in Karnataka are scheduled to go critical in the next two years. No doubt, the Atomic Energy Commission has estimated whether modular nuclear reactors will serve India's purposes. However, this issue is worth discussing in the public domain to evaluate its pros and cons to be clear on what should be the national policy towards this nuclear energy option. Apparently, Ms. Hyperion plans to deliver its first modular nuclear reactor by 2013.

Global Nuclear Zero: Is Skepticism Logical?

Yogesh Joshi, Research Scholar, JNU

After the 2007 New York Times article of the famous gang of four retired American Secretaries of State and Secretaries of Defence, nuclear weapons elimination has again caught the attention of the whole world. The election of President Obama and his fervent desire to establish a world free of nuclear weapons has added another dimension to the debate. The declarations at Prague and the June summit with Russian President Medvedev have rekindled the hope that world powers have shed the nuclear inertia of the Cold War. It also suggests that they have embraced the fact that nuclear weapons are redundant in the new security scenario and are in fact the cause, not the solution for 21st century security dilemmas, nuclear terrorism being the most dangerous of them. Though these are individual and state responses to the problem, particularly from the North Atlantic, other states such as Japan, Australia, Britain and France have joined the chorus. The governments of Japan and Australia commissioned the International Commission on Nuclear Non-proliferation and Disarmament which has recently unveiled its report, again emphasizing the need for such steps. Gordon Brown, the British Prime Minister, echoed the same resolution last year.

However, these state sponsored responses have stimulated the global civil society to come together and express its own concerns over the existence of nuclear weapons. Though state responses are always a necessary condition for fruitful outcomes in international politics, however they are not sufficient. The historic judgment of the world court on the illegality of nuclear weapons is a case in point. Without the crucial role played by non-state actors such as the International Association of Lawyers against Nuclear Arms (IALANA), The International Peace Bureau (IPB) and the International Physicians for the Prevention of Nuclear War (IPPNW), it is difficult to comprehend whether such an attempt to seek an advisory opinion by the UN General Assembly would have ever been made.

In this new wave of global efforts towards nuclear disarmament, the civil society movement called the 'Global Zero' stands out. Launched in April 2008, with the support of more than 200 world leaders, former top military commanders, diplomats and academicians, the movement has developed a niche in the civil society efforts on the issue of nuclear weapon elimination. In its second global summit, held in Paris from 2 to 4 February, it was able to clearly put the agenda in front of the global community. Buoyed by the presence of 30 young student leaders from 12 countries, a first of its kind initiative, it is diligently trying to convey the message across different regions of the world and is evolving as a global initiative in itself. It was in fact the first of such global congregations this year, which was to be followed by the recently concluded Munich Security Summit and

subsequently, the Nuclear Security Conference called upon by President Obama in April and the most crucial of all of them, the NPT Review Conference, due in May this year.

However, even when the world is slowly gearing up to the idea of accepting a non-nuclear world as something normal, rather than an aberration (as was the case during the Cold War), the Indian strategic community seems to be reluctant to accept the evolving political situation. The supporters of nuclear weapons in the country have two special reservations towards such efforts. First of all, they are highly skeptic of the sudden change of heart of the erstwhile nuclear hawks such as Henry Kissinger, George Schultz and many other leaders from across the world including India, who are now spearheading the movement for de-nuclearisation. However, this kind of objection appears to be specious at best. If the goal is nuclear disarmament, then the reflection of these

It is important that civil society groups in India, who have constantly opposed the nuclearization of the sub-continent, should join hands with such international endeavors as Global Zero and others in order to pressurize the government to undertake a critical evaluation of the need and viability of nuclear weapons for our security.

individuals on their own experiences of the peril associated with nuclear politics, having served in such crucial positions, should be welcomed as a necessary input for present day action rather than be subjected to summary rejection on the ground of skepticism of their intentions.

Second is the idea why, at this point in time, is the West so vehement about nuclear weapon elimination? India's experiences with international disarmament diplomacy have added to this general skepticism towards such efforts. However, a preliminary reading of EH Carr and Hans Morgenthau makes it clear that for initiatives as bold and important as these, power is a crucial element. If the goal is nuclear disarmament, then inadvertently the West

especially the United States has to take the lead. There is no other way out of it. However, if such skepticism is just an opportunistic tool to maintain the interests of certain sections in India, there is no doubt that it will rouse public passions. Therefore, it is important that civil society groups in India, who have constantly opposed the nuclearization of the sub-continent, should join hands with such international endeavors as Global Zero and others in order to pressurize the government to undertake a critical evaluation of the need and viability of nuclear weapons for our security.

Discussion on the Global Zero Summit Held in Paris, February 2-4, 2010

Report of the IPCS Panel Discussion held on 10 March 2010

SPEAKERS:

Amb Kanwal Sibal, *Former Foreign Secretary of India*
Air Chief Marshal SP Tyagi, *Former Chief of Air Staff,*
Indian Air Force

Yogesh Joshi, *M. Phil Student, Centre for International*
Politics, Organization and Disarmament, JNU

Introductory Remarks: Maj. Gen. Dipankar Banerjee

The issue of nuclear weapons elimination has gained momentum and interest around the world following President Barack Obama's Prague speech in April 2009. A number of initiatives have emerged since, and some preceding, the speech: the Wall Street Journal articles by four former American leaders followed by the Base Camp project and then the Global Zero. The Global Zero has been a larger, international initiative. It held its second summit in Paris last month. It is important for India to closely monitor these developments in order to better understand its policy options.

Amb. Kanwal Sibal

The Global Zero is spearheaded by more than 200 leaders worldwide. A Global Zero Action Plan was submitted at the Summit that proposes a four-phased approach with each phase offering specific and concrete steps to be reached. Despite skepticism from some quarters, the plan has exuded optimism and confidence of being achievable by 2030.

Phase I is from 2010 to 2013 under which the US and Russia, following the conclusion of a START replacement treaty, would bilaterally negotiate an accord to reduce the total number of weapons down to 1,000 warheads per country (to be implemented by 2018). After the ratification of this accord, all other nuclear countries would freeze the total number of warheads in their arsenals and commit to participate in multilateral negotiations for proportionate reductions of stockpiles. From the Indian perspective this presents a difficulty since the prerequisite is to reveal the number of warheads in its inventory.

Phase II is from 2014 to 2018 under which, the US and Russia will agree to reduce the numbers to 500 total warheads each by 2021 in a multilateral framework. This would be contingent upon all other nuclear weapons countries agreeing to maintain the freeze on their stockpiles until 2018, followed by proportionate reductions until 2021. The thing to note here is that the reduction to 500 warheads will not be a bilateral US-Russia affair; it will be multilateral, where countries like India will presumably be invited to maintain their freeze. In this period a comprehensive verification and enforcement system will be established including no-notice, on-site inspections among others.

Phase III is from 2019 to 2023 where there will be negotiations on a Global Zero accord, a legally binding international agreement, signed by all nuclear capable countries for a phased, verified, proportionate reduction of all nuclear arsenals to zero total warheads by 2030. Under Phase IV from 2024 to 2030, the idea is to complete the phased, verified, proportionate dismantlement of all nuclear arsenals to zero total warheads by 2030 and simultaneously continue the comprehensive verification and enforcement system prohibiting the development and possession of nuclear weapons.

They have taken a practical and realistic view regarding the stage in which the other nuclear capable countries will enter the process. While all nuclear capable countries must sign and ratify the Global Zero accord, it is not necessary for them to participate at the outset in the diplomatic process. This phased approach recognizes that some countries may be reluctant to join until the US and Russia takes concrete steps at reducing the number of warheads to 1,000. The plan also recognizes that it will take years of technical, diplomatic and political preparation before negotiations on an agreement on eliminating nuclear weapons can even begin.

In preparation for the Nuclear Security Summit and the NPT Review Conference, it is important to create conditions on the ground. The NPT controversy is hinged on the failure of nuclear weapons states to move forward on Article VI. The best way for these countries to show that they are taking serious steps on nuclear disarmament is to engage in this plan. It mentions that nothing would do more to strengthen the NPT than the initiation of these global talks.

Air Chief Marshal SP Tyagi

Global Zero precedes the arrival of President Obama. During the Bush Administration, concern emerged that whatever role nuclear weapons played during the Cold War in keeping the situation stable no longer applied. Essentially the reason why people joined the Global Zero movement is that when the numbers (of nuclear weapons) were small the world was manageable. Globally the problem is that people are uncomfortable with states like North Korea and Iran, which is not to suggest that they are not (concerned) with India and Pakistan as well, but they are already de facto nuclear weapons states. The fear is that once proliferation expands, it will be difficult to control and, therefore, it needs to be halted now. For the first time the hierarchy of the NPT is being challenged by new players on the scene. India joined Global Zero for its own reasons, to have its voice heard and to reinforce the government policy on nuclear disarmament.

Global Zero formed a Commission in 2008 to launch the movement and develop a plan. New global issues emerged and it was necessary to bring nuclear disarmament back on the agenda. There were obvious difficulties in developing a plan that would incorporate the concerns and reservations of all countries since each had to take their own geopolitical and

strategic situations into account. To incorporate states like North Korea, the Commission created the distinction between nuclear weapon and nuclear capable states. The starting point was that the main weapon holdings are with the US and Russia. Therefore, the most practical step in Phase I was for the US and Russia to reduce their warhead numbers before engaging the other nuclear states. This would illustrate the intentions and commitment of the two to get to zero. Ultimately a plan was necessary whether or not the timeframes were realistic. The Indians and the Chinese, in particular, argued that all nuclear weapons states should retain a No First Use (NFU) policy to automatically delegitimize the weapons. It was also clear that the British and the French nuclear capabilities would continue for the foreseeable future.

The nuclear weapons states have retained their nuclear arsenals even though they have not been used since Hiroshima. Due to the heavy costs involved in holding on to them, such as on upgrading, a reduced number seems like a logical first step. Incidentally, the four year timeframe came from a study that on an average all international treaties take four years to accomplish.

The Commission also states that as the situation changes, plans will have to reflect the concerns of others. The biggest concern is from the Russians that a role reversal has occurred after the Cold War. The Russians claim they do not have sufficient conventional strength and their only source of defense is from nuclear weapons. Currently, they believe that they can come down to a reasonable number.

Yogesh Joshi

What if the new momentum on Global Zero intensifies and the initial processes of such a movement such as the START treaty, the CTBT and negotiations on the FMCT unfold? Would India then be flummoxed by such a process? It is therefore important to look at the Indian contribution and approach to nuclear disarmament and the kind of opportunities this phase in global nuclear disarmament brings for the country.

There are a number of problem areas in the Indian approach and practice towards nuclear disarmament. First is India's record on non-proliferation. A paper published by the Institute of Science and International Security (ISIS) in 2006 identified India as 'not a determined proliferator, not a responsible nuclear state.' Apropos, there are three concerns: one is the end user verification of Indian procurements; two is the centrifuge know-how dissemination and three is regarding the poorly implemented national export controls. The first two do not hold much veracity and can therefore be ignored; however, it is pivotal for India to strengthen the implementation of its export control regime especially when it is looking at exporting nuclear material in the future.

The second problem area is regarding India's NFU policy

which has been diluted by the 2003 doctrine. Third issue is fissile material production which India has to take care of if it is serious about nuclear disarmament. The international panel on fissile material has noted that the Indian capability has increased post the Indo-US nuclear deal; however, it is imperative to note that the Indian conversion of fissile material into warheads is not proportional to the fissile material inventory it has. Fourth is the deployment of ballistic missile defence, which according to experts will destabilize South Asian security if India pursues the same. Fifth area of concern is the discourse in the Indian strategic community about the upper limit of the size of India's nuclear arsenal and fissile material stocks. There is consternation in the international community over the eventual nature of India's deterrence. Lastly, India's take on nuclear fuel bank is another area of concern. It was India that scuttled the June 2009 IAEA meeting on the Nuclear Threat Initiative's (NTI) proposal on nuclear fuel bank. There are concerns regarding the Additional Protocol as well as the state of the Fast Breeder Reactors.

What can and should India do? Firstly, India should chart out its nuclear history. This is not to disclose information on inventories or auditing process on fissile material, but instead to have a record purely as an internal process so that India is prepared when issues arise. The US and the UK have come with their entire nuclear history. Then, the sole purpose idea of nuclear doctrine should come back if India is serious about its NFU commitments. Lastly, India should not focus on only augmenting its strategic capability but also on how it deals with disposing the fissile material and warheads if disarmament unfolds in reality.

Why is it important that India consider such contingencies? First, there are always great political conjectures in international politics. This particular resurgence, of the disarmament bid, as a political conjecture can grow further to yield some major changes despite the skepticism involved in its attainment. The levers of international economy have shifted from G-8 to G-20 and India has the capability to influence the outcome. It therefore, can negotiate bargains (UNSC permanent membership) in this process. Second is the idea of a great power and global status, which is not static in nature. If one looks at the discourse today, the idea of a global international citizenship is doing rounds. If India takes certain steps that do not compromise its strategic capability but instead demonstrate its intent towards nuclear disarmament, then India would be more readily accepted. One has to build upon the idea of a good international citizenship and if nuclear disarmament helps India in this process, then it has to go forward with the process.

(Log on to www.ipcs.org for complete report of the Panel Discussion)

Pakistan: Holding a Mirror to South Asian Nuclear Deterrence

Tara Sarin, Research Officer, Institute of Peace and Conflict Studies

The Genesis of South Asian Nuclear Deterrence:

Pakistan's Perspective

Naeem Salik

Oxford University Press, 2009

Pages: 324

Price: Rs. 495

The concept of deterrence has been a feature of nations since time immemorial. Since the first bombs were dropped on Hiroshima and Nagasaki, deterrence acquired a special significance, particularly due to the development of nuclear weapons. It would not be an exaggeration to say that in the post-war period peace and stability have largely been functions of the policy and strategy of deterrence. The conditions and context under which nuclear deterrence functions has drastically altered since the Cold War period. In fact South Asia is seen as the most dangerous case of contemporary nuclear standoff where deterrence can fail.

Brigadier Naeem Ahmad Salik provides a comparative study of the dynamics of the South Asian nuclearization. There are several seminal works on the Indian nuclear programme and policies by both Indian and foreign strategic analysts and academics. Unfortunately, no substantive literature on the genre has emerged from Pakistan exposing the shortcomings in contemporary analysis and reflecting a need for a publication of this sort.

Given the controversies surrounding the nuclear safety and security of Pakistan's nuclear arsenal and the AQ Khan proliferation network, the volume offers an alternate perspective on a matter of great concern to the region and the international community. Salik is an authority on nuclear proliferation and strategic issues. He was among a distinct group of officers who conceived and established the Pakistan Nuclear Command and Control Structure and formulated its nuclear policies after the May 1998 nuclear tests. Given his background, one can deduce that he was privy to a great deal of sensitive information and that his arguments will be influenced by the official Pakistani stance.

The ten chapters comprising the book revisit some familiar terrain, while simultaneously exploring uncharted territory. The author begins by describing the motives behind the evolution of the Indian and Pakistani nuclear programmes, their nuclear capabilities and doctrines and the nuances of the countries' respective policies towards the international non-proliferation regime and missile defence. He goes on to discuss the development of their nuclear delivery systems and their command and control systems in relation to deterrence stability and confidence building measures.

He concludes by addressing the concerns surrounding both the AQ Khan network and the safety and security of Pakistan's nuclear arsenal by offering new insights to the debate. Salik's ultimate objective is to systematically examine the developments since May 1998 in the two countries with respect to their efforts at stabilizing the nuclear environment in South Asia.

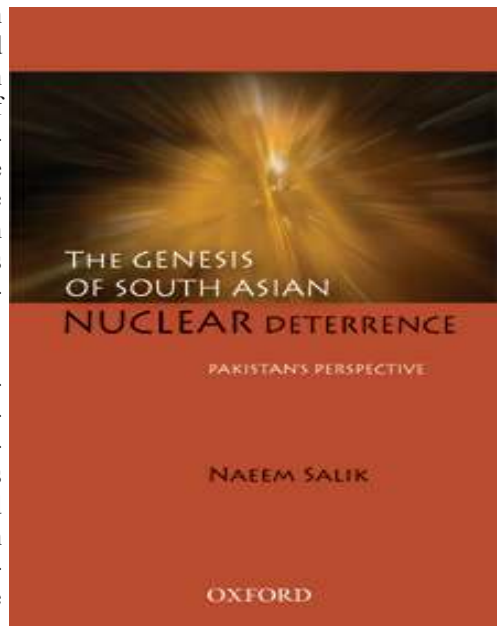
The author traces the origin of India's nuclear programme from its inception to the 1998 atomic tests. India's quest for nuclear power began with the ambition of Prime Minister Jawaharlal Nehru and Atomic Energy Commission Chairman Dr. Homi Bhabha. They both recognized the importance of the dual-use of nuclear technology and sought the prestige and benefits associated with being a nuclear power, including the option of building a nuclear bomb. Yet, India's nuclear programme was triggered by the Chinese nuclear test in October 1964 and India's experience in the 1962 border war with China. Salik characterizes the Indian approach to nuclearisation as assertive and the Pakistani stance as purely defensive and adamantly views the "action-reaction" phenomena as the sole contribution to Pakistan's quest for achieving nuclear parity with India.

Pakistan's motives for deriving its nuclear programme are solely based on the threat from India, tracing back to 1971, and that

India's peaceful nuclear explosion in 1974 alarmed Pakistan and triggered it to seek unconventional means to acquire the necessary materials and equipment to pursue nuclear weapons. This, according to Salik, "led to some potentially dangerous practices, which subsequently were to haunt Pakistan" and damage its international credibility, seemingly implying AQ Khan.

Underscoring the significance of the 2010 Non-Proliferation Treaty Review Conference approaches, the book is of particular relevance, as it attempts to provide an understanding of Pakistan's nuclear ambitions and reasons for why Pakistan should not be "discriminated against on the pretext of the past doings of the AQ Khan network, while there is a failure to acknowledge the measures it has taken to remedy the situation" (p.292).

Salik devotes an entire chapter to the role of the "father of the Pakistani bomb" and spends considerable time in distancing Pakistan's military from Khan's "nuclear wal-mart," stating that initially it was promoted for national purposes, but later for private gain. Khan's extensive language skills, translating abilities and European contacts enabled him to establish the network rooted in Dubai. What is not explained is how these skills gave him the ability to transfer nuclear equipment to Iran, North Korea and Libya without official



knowledge or sanction.

In light of the recently concluded Indo-US civilian nuclear deal, after its endorsement by the Nuclear Suppliers Group (NSG) and agreement on safeguards between India and the IAEA, Salik concedes that unless Pakistan is afforded similar benefits it may “lead to consequences which would be undesirable both for regional stability as well as the cause of non-proliferation” (p.292). It is evident that Pakistan felt discriminated and victimized by the international community when India was granted defacto nuclear weapons status. Under these circumstances, Salik argues that it is essential to develop “an arrangement that accommodates all the three non-NPT nuclear states of India, Pakistan and Israel, one country or the other out of the mainstream, is likely to prove counter productive in the long run” (p.297).

Salik covers in some detail the salient features of the nuclear programmes of both Pakistan and India. In the comparison, he analyzes each country’s capacity to produce fissile material and build nuclear weapons. He is of the opinion that the Indo-US nuclear deal has dealt the international non-proliferation regime a serious setback.

Salik estimates that with assured supplies of fissile material from the NSG, India would be free to divert fissile material produced from its indigenous uranium resources to build “about 75 to 90 additional weapons per year” (p.185). He predicts that this could trigger a nuclear arms race, thereby jeopardizing the very concept of deterrence and seriously disturbing strategic stability.

Throughout the book Salik advocates the policy of minimum nuclear deterrence for Pakistan. This is no different than what is stated in India’s nuclear doctrine. The author considers that the India centric approach has resulted in “... a situation in which Pakistani policies are bound to be affected by the actions and policy positions taken by India, with the undesirable possibility of being wittingly or unwittingly sucked into a nuclear and missiles arms race with India” (p.154).

In the final paragraphs of the epilogue, he takes an opposing approach, “...Pakistan will do what it must to maintain its strategic autonomy, and would not let India get away with strategic dominance of the region” (p.297). If Salik maintains the notion that Pakistan’s policy of credible minimum deterrence is inherently linked to India’s actions then his view that Pakistan should articulate an independent nuclear stance seems misplaced.

It is evident that both countries have similar nuclear doctrines on avoiding a nuclear arms race in the region, supporting non-discriminatory nuclear non-proliferation regimes, refraining from further nuclear testing but remain steadfast on reserving their position to join the Comprehensive Test Ban Treaty (CTBT) and negotiations for a Fissile Material Cut-off Treaty (FMCT).

It is fair to conclude that the book provides dependable scholarly material to develop an understanding about the South Asian nuclear deterrence model through a Pakistani lens. What can be deduced from this volume is that the potential for an India and Pakistan conflict to escalate from a conventional to a nuclear armed one remains dangerously conceivable, particularly with the culmination of the Indo-US nuclear deal, and presents a constant danger to the international regime. In the short term the status of nuclear deterrence has prevented this situation from evolving but there is no assurance that it will not crumble at the slightest test. The sole solution to the existing danger in South Asia is the complete elimination of nuclear weapons in the region.

Major Events in South Asia - March 2010

Nuclear Disarmament/Proliferation/ Security

INDIA

PAKISTAN

26 March 2010

Pakistan questions India's concerns over nuclear deal- Pakistan on Thursday questioned the concerns expressed by India over the possibility of a United States-Pakistan civil nuclear deal and referred to a 2008 statement by the former External Affairs Minister, Pranab Mukherjee, to expose the frequent shifts in the Indian position. Amid reports of the U.S. being open to hearing out Pakistan's case for a civil nuclear deal, official sources in India said on Monday: "We hope the international community would strike the right balance between meeting energy needs of any country while taking on board its track record with regard to proliferation of nuclear technology and weapons of mass destruction." (*The Hindu*, 26 March 2010)

Pakistan's nuclear reactors likely in operation

Pakistan may be operating a second nuclear reactor under the country's nuclear weapons programme, according to an expert at the Washington-based Institute for Science and International Security. Paul Brannan, Senior Analyst at ISIS, today told *The Hindu* that GoogleEarth satellite images showing steam distorting the view of some cooling tower fan blades at the second plutonium production reactor at Khushab "indicates to me that the reactor is in some state of initial operation such as a power start-up." Explaining that the steam was emerging from "mechanical drafting cooling towers" beside a visible, rectangular reactor structure, Mr. Brannan said that as the operation of the reactor progresses, he would expect to see more steam emerging from the adjacent MDCTs. (*The Hindu*, 26 March 2010)

30 March 2010

Dr AQ Khan barred from talking about N-proliferation Justice Ijaz Ahmad Chaudhry of the Lahore High Court allowed nuclear scientist Dr Abdul Qadeer Khan on Monday to move freely but restricted him from speaking to the media about nuclear weapons and proliferation. The judge issued the directions in light of a recent agreement between the government and the scientist. However, the judge said due to security concerns Dr Khan would have to inform the government half an hour before going somewhere within Islamabad and a day in advance when leaving for somewhere outside the city so he could be provided security. Dr Khan's counsel Barrister Ali Zafar welcomed the government's decision, saying Dr Khan's petition had somewhat borne fruit. (*Daily Times*, 30 March 2010)

12 March 2010

'Agni-V to be test-fired within a year'

Defence Research Development Organisation (DRDO) is all set to launch its Agni-V missile by early 2011, said DRDO distinguished scientist and Chief Controller (R&D), Life Sciences, Dr W Selvamurthy on Thursday. Selvamurthy was addressing presspersons at the Defence Food Research Laboratory (DFRL). "The Agni-V 'surface to surface missile' will be able to cover 5,000 km radius with a pay load of 1.5 tonne of both nuclear and conventional warfare," he said. Selvamurthy said that Agni-V was a three-stage missile unlike Agni-III- - which was a stage 2 missile. He said that the Agni-V could be called an 'Inter Continental Ballistic Missile (ICBM)' since it had the capacity to cover 5,000 km radius. (*The New Indian Express*, 12 March 2010)

25 March 2010

Iran to host nuclear disarmament meet, wants India support

Recent hiccups in its relations with India over its controversial nuclear programme notwithstanding, Iran is looking forward to Indian participation in a conference on nuclear disarmament it is organising next month in Tehran. Scheduled for April 17-18, the conference — Nuclear Energy for All, Nuclear Weapon for None — has led to much heartburn as the West believes it is an attempt by Tehran to deflect pressure it has been subjected to internationally for its nuclear activities. Sources said Iran is expected to formally extend an invitation to the government next week for facilitating participation of officials and nuclear experts. Tehran is also likely to take up the issue with foreign minister S M Krishna when he visits Iran soon. (*The Times of India*, 25 March 2010)

26 March 2010

Voluntary moratorium is the policy, says Krishna

External Affairs Minister S. M. Krishna on Friday said India would uphold its voluntary moratorium on nuclear-weapon tests. "That is the policy," he said. He was responding to a question from *The Hindu* on New Delhi's stand on the CTBT in the run-up to the U. S.-sponsored Nuclear Security Summit and the Nuclear Non-Proliferation Treaty (NPT) Review Conference in the next two months. He was asked specifically whether India was coming under pressure from Japan and Australia, which now submitted common proposals to the United Nations on "practical" steps for non-proliferation and nuclear disarmament. "India's position is that we have imposed on ourselves a moratorium on all [nuclear-arms] tests. And, we will continue that [policy]," said Mr. Krishna. Asked whether India would not look at the CTBT right now, he quipped: "You can draw your own conclusion on that." (*The Hindu*, 26 March 2010)

28 March 2010

Nuclear-capable Agni-I successfully test-fired

India successfully test-fired the nuclear-capable Agni-I, the surface-to-surface, single stage missile from Wheeler Island on Bay of Bengal with a high degree of accuracy. The salvo-mode

test-firing was done by personnel of the Strategic Forces Command as part of a user-training exercise at 1.05 pm from LC-4 of Wheeler Island, about 70 km across the sea Chandipur-on-sea in Balasore district of Orissa. The missile which has a range of 700 km, covered a distance of 633 km, said a senior official of Integrated Test Range. Agni-I is designed to bridge the gap between indigenously built short-range Prithvi, already deployed in the Army, and medium range Agni-II, that has a range of more than 2,000 km. (*The Indian Express*, 28 March 2010)

Nuclear Energy/Environment

9 March 2010

Revive R&D in thorium, says India

India struck a different tone at the ongoing global meet on nuclear energy, drawing attention to the pitfalls of relying solely on uranium fuel for atomic reactors. It said the world must revive research in utilising thorium and join hands with India, only country engaged in this endeavour, to ensure that energy is sustainable for the next few centuries. Warning that the reliance on uranium will not be sustainable beyond this century, Atomic Energy Commission Chairman Srikumar Banerjee said the "world must wake up" and support India's three-stage nuclear programme. "The constraint in relying only on uranium was never addressed in this conference. The world has to pay attention to uranium 238 using plutonium in a closed fuel cycle — this transition is essential for the whole world. (*The Hindu*, 9 March 2010)

16 March 2010

Indian farmers battle against nuclear plant

A robust people's movement against a major nuclear power project has built up in a cluster of small villages on India's picturesque Konkan coast. The BBC's Zubair Ahmed reports: Some 350km (220 miles) from India's commercial capital, Mumbai, lies the village of Madban overlooking the vast expanse of the Arabian Sea. It is in this village that a 10,000 megawatt nuclear power plant is proposed - and farmers and fishermen, backed by campaigners, are hardening their stance against it. People from Madban believe the project will cause havoc to the environment and to their livelihoods. Pravin Gavhankar, a local farmer who is leading the campaign against the plant, expresses his resolve in no uncertain terms: "We have been living here for centuries; we will die but not abandon our ancestral homes and farms." (*BBC News*, 16 March 2010)

29 March 2010

New nuclear reactor sites

Nuclear power reactors of 700 MWe capacity each will come up at two new inland sites – at Kumharia in Haryana and Bargi in Madhya Pradesh. These reactors will be indigenous Pressurised Heavy Water Reactors (PHWRs) that will use natural uranium as fuel and heavy water as both moderator and coolant. The Union government has also

approved building imported reactors of a minimum of 1,000 MWe each at Chhayamithi Viridi in Gujarat, Kovvada in Andhra Pradesh and Haripur in West Bengal. These reactors will use enriched uranium as fuel and light water as both coolant and moderator. All these reactors will be built by the Nuclear Power Corporation of India Limited (NPCIL). Its officials said pre-project activities such as estimation of the land required and land acquisition were on in the five sites. (*The Hindu*, 29 March 2010)

Nuclear Cooperation/Treaties/Agreements

5 March 2010

Human resources critical to Indian nuclear plans

India's nuclear industry is preparing for a major expansion after assuring international cooperation with a round of cooperation deals, but the limited supply of human resources in the sector remains a concern. Over the next ten years, the country's nuclear power generation is expected to rise from 4000 MWe to around 20,000 MWe by 2020 with a corresponding rise in demand for skilled workers. According to Kameshwar Rao, Indian utilities expert at PricewaterhouseCoopers, the next seven to eight years will see the annual requirement for new recruits in the Indian nuclear industry rise to around 1900. "We do not have mechanical engineers who can go into the nuclear field," said Jammi Srinivasa Rao, chief science officer in US technology company Altair. (*World Nuclear News*, 5 March 2010)

7 March 2010

Where Indian nuclear scientists cut their teeth....

As one leaves the closed but chic confines of Paris and drives down the motorway, a squat clump of buildings set between fields recovering from the unusually severe winter comes into view. It was here, at this modest-looking, lightly guarded site that Indian nuclear scientists cut their teeth on the beneficial uses of atomic energy a full 55 years ago. The laboratories at Saclay also contributed heavily to the first phase of India's nuclear programme. With the experience gained here and helped subsequently by the French, one of India's first three and lesser known reactors — Zerlina — was set up at what is now known as the Bhabha Atomic Research Centre. As was the case with the better known Apsara and CIRUS reactors, Zerlina, which became critical in 1961, was to provide the experience to set up the next generation of reactors. In this case, the Dhruva. (*The Hindu*, 7 March 2010)

11 March 2010

Hillary gets certification power on Indo-US nuke deal

Secretary of State Hillary Clinton was on Thursday named as the new certification authority by US President Barack Obama to verify the Indo-US Civilian Nuclear Act for the US Congress after every six months. "I hereby delegate to you (Secretary of State) the functions conferred upon the President by section 204(c) of the United States-India Nuclear Cooperation Approval and Nonproliferation Enhancement Act (Public

Law 110-369)," Obama said in a signed memorandum issued to the Secretary of State. Under the Act, the US President needs to certify to the appropriate congressional committees that it is the policy of the US to work with members of the Nuclear Suppliers Group, individually and collectively, to agree to further restrict the transfers of equipment and technology related to the enrichment of uranium and reprocessing of spent nuclear fuel. (*The Indian Express*, 11 March 2010)

12 March 2010

Nuclear cooperation will cover all areas: Putin

India-Russia cooperation in civil nuclear energy will be wide ranging and cover areas such as nuclear waste and safety of reactors as well, Russian Prime Minister Vladimir Putin said, during a video conference with businessmen from the country's main metros here. Mr. Putin also advised a section of Indian business and strategic community to be "realistic" in its attitude towards Pakistan and take into consideration the action taken by Islamabad against some militant organisations operating along its border with Afghanistan. Indian officials have already described the civil nuclear cooperation between the two countries as "beyond the Indo-U.S. 123 agreement" since the Indo-Russian pact has "forward looking" language on enrichment and reprocessing, technology transfer and fuel supply assurances. (*The Hindu*, 12 March 2010)

14 March 2010

Plan for nuclear fuel plant in India

India and Russia are considering the setting up of a joint venture to produce nuclear fuel in India, Russia's nuclear chief said. "A project to build a factory in India for the production of nuclear fuel is under consideration," Russia's state nuclear corporation Rosatom chief Sergei Kiriyenko said in the wake of Prime Minister Vladimir Putin's visit to India. The possibility of setting up a nuclear fuel facility in India is envisaged in the Inter-Government Agreement on Cooperation in the use of Atomic Energy for Peaceful Purpose, signed on Friday in New Delhi. The accord is also understood to provide for the reprocessing of spent nuclear fuel in India under international safeguards. Diplomatic sources in Moscow said the Indo-Russian nuclear agreement was "to India's full satisfaction" in contrast to the 123 agreement with the United States. (*The Hindu*, 14 March 2010)

Russia to build up to 16 nuclear reactors in India

Russia will build up to 16 nuclear reactors for power stations in India, Russia's deputy premier said during a visit to India with Prime Minister Vladimir Putin to reaffirm decades-old ties. Russia is competing with French and American firms for lucrative contracts to build nuclear power plants for energy-hungry India because Asia's third-largest economy needs to boost its supply to help sustain rapid economic growth. "The agreement sees construction of up to sixteen nuclear reactors in three locations," Deputy Prime Minister Sergei Ivanov told reporters. Putin had pledged on Friday to boost banking and technology coop-

eration with India, seeking to bolster ties with a Cold War ally that has been shifting focus towards the United States. (*Business Standard*, 14 March 2010)

15 March 2010

Russia offers India uranium field stake: Agencies

Russia offered India a stake in one of the world's largest uranium fields during Prime Minister Vladimir Putin's visit last week, Russian news agencies quoted the head of the state nuclear company as saying. Russia, holder of a tenth of the world's uranium reserves, is positioning itself to become a major supplier to the nuclear power industry. It aims to build up to 16 reactors in India. "We have agreed with our Indian partners the creation of a joint venture for geological exploration and production of uranium," Rosatom head Sergei Kiriyenko was quoted by state-run RIA news agency as saying on Monday. "We offered them participation in the Elkton field," he said, adding that the prospective joint venture could operate in third countries as well and build uranium processing plants in both Russia and India. (*The Economic Times*, 15 March 2010)

17 March 2010

Is the nuclear bill a good idea?

It is useful to keep in mind that the proposed Civil Liability for Nuclear Damage Bill is in line with the principles followed by 28 of the 29 other nations that operate civil nuclear power plants (NPPs), including China and Russia — the sole exception is Pakistan which has no nuclear liability bill and, as of now, no prospects of significantly increasing its civil nuclear programme. If you ignore the ideological campaign (that it will help only US firms) against the Bill, the main reasons for opposition are: It limits the liability of the operator to Rs 500 crore and that for all the damage to 300 million SDR (Rs 2,100-2,300 crore); the public will have to bear substantial costs of damage and it exonerates suppliers of equipment from liability charges. (*Business Standard*, 17 March 2010)

18 March 2010

NPCIL, Areva finalizing contracts for two reactors

The Nuclear Power Corporation of India Limited (NPCIL) and Areva, one of the biggest reactor manufacturers of France, are finalising contracts for two 1,650 MWe-European Pressurised Reactor plants at Jaitapur, Maharashtra, by the year-end, according to French Ambassador to India Jerome Bonnafont. Mr. Bonnafont, who was here on Wednesday to attend the inauguration of the Renault-Nissan Alliance plant at Oragadam near here, told *The Hindu* that the process of finalising the contracts, despite being complex and time-consuming, was moving in a positive direction. Initially, there would be two plants, and four more would be added later. (*The Hindu Business Line*, 18 March 2010)

24 March 2010

Pak focuses on N-deal, India as strategic talks with US begins

US and Pakistan on Wednesday opened their first strategic dialogue with both sides talking about cooperation in the field of energy, an apparent reference to a nuclear deal that Islamabad is seeking from Washington on the lines of the Indo-US

atomic pact. Pakistan Foreign Minister Shah Mehmood Qureshi also harped on the Kashmir issue asking the US to "constructively engage" in the process of its peaceful resolution with India. In his opening remarks at the strategic dialogue, the first of its kind at the level of Foreign Ministers, Qureshi sought "non-discriminatory" access to vital energy resources. "We hope non-discriminatory access to vital energy resources will also be made available to us, so that we too can pursue our economic and industrial development plans," Qureshi, who is leading the Pakistani delegation that also includes Army Chief Kayani, said. (*Hindustan Times*, 24 March 2010)

US not talking to Pak about any N-deal: State dept

The United States has not been talking to Pakistan about any nuclear deal and it will be in a "listening mode" if the issue is brought before it during the US-Pak Strategic Dialogue in Washington on Wednesday, the State Department said on Tuesday night. "As far as I know, we have not been talking to Pakistan about a civilian nuclear deal. If Pakistan brings it up during the course of the meetings in the next two days, we will be happy to listen," Assistant Secretary of State for Public Affairs P J Crowley told reporters. When asked if the civilian nuclear deal with Pakistan has been considered in any of the bilateral working groups, Crowley said: "Well, one of the groups that will meet tomorrow will be focused on energy. If this comes up during the course of the meeting, there will be a press conference tomorrow with Secretary Clinton and Foreign Minister Qureshi, you can ask if this came up tomorrow." (*The Indian Express*, 24 March 2010)

25 March 2010

N-liability Bill fine, govt erred in not talking to Oppn: Brajesh

Former National Security Advisor Brajesh Mishra finds nothing 'unusual' in India trying to fix financial liability of the operator of a nuclear power plant in the event of a nuclear accident, but is of the view that the government committed a 'political mistake' by not taking the opposition into confidence before introducing the Nuclear Liability Bill in Parliament. "The government was very well aware of the concerns of the Opposition parties — the BJP and the Left — on this Bill. It should have taken these parties into confidence, consulted them properly, before rushing through the Bill. I think it was a political mistake on the part of the government not to have done so," Mishra, also the Principal Secretary to former Prime Minister Atal Bihari Vajpayee, told *The Indian Express*. (*The Indian Express*, 25 March 2010)

Liability Bill will not impinge on nuclear deal: Krishna

India's civil nuclear deal with the United States "does not have to be altered" because of the "democratic process" of New Delhi's initiative for a relevant parliamentary Bill, according to External Affairs Minister S.M. Krishna. The passage of the Bill on civil nuclear liability is generally seen as an important aspect of implementing the India-U.S. accord. "The basic understanding between the U.S. and

India continues [to exist] in its own steam," Mr. Krishna said in a conversation with *The Hindu*. He is on a four-day visit to the City-State for talks with its leaders. Asked whether he really expected U.S. firms to set up nuclear power reactors in India, Mr. Krishna said, "The basic thrust [of the accord with Washington] is to augment our power resources." (*The Hindu*, 25 March 2010)

28 March 2010

More work needed to get nod for N-bill

The civil nuclear liability bill may be in for a drastic overhaul if it is to pass muster in Parliament. Despite the government's claims that placing the onus on operators of nuclear facilities provides a clear chain of accountability, criticism that foreign suppliers have been given a pass seems hard to shake off. A close reading of the bill, which the government was forced to defer, shows that even the clauses under where an operator can seek a "right to recourse" if a nuclear incident has resulted from a "wilful act or gross negligence on part of a supplier of material, equipment or services" may not be more than statements of intent. While the object of the clause — to allow an insurer, in this case the operator, to recover money from a party responsible for losses even after an indemnity is paid — is clear enough, there is no clarity on how this can be made enforceable. (*The Times of India*, 28 March 2010)

Renewed efforts to sell nuclear reactors to Kazakhstan

India is renewing efforts to sell nuclear reactors to Kazakhstan after a hiatus caused by the turmoil in Kazatomprom following the arrest of several of its senior officials, including its chief executive, on charges of embezzlement. If India manages to convince Kazakhstan about the efficacy of its reactors over Russian ones, this would be the first-ever export of indigenously designed and manufactured reactors, official sources said. The sale of the reactors will be outside the civil nuclear Inter-Governmental Agreement being negotiated between the two countries, which envisages the import of uranium and co-operation in mining and training of personnel. Kazakhstan has consistently ranked among the world's top three producers of uranium and has tied up with a Japanese nuclear major to further modernise its uranium mining industry. (*The Hindu*, 28 March 2010)

29 March 2010

While govt still bats for N-bill, Cong focuses on other tasks

Congress remains less than enthusiastic over prioritising the civil liability for nuclear damage bill in Parliament as it seems to feel that political capital would be better utilised to drum up support for politically more crucial legislation like the national food security and education bills. In a bid to dispel deep misgivings in Congress over the political cost of civil liability for nuclear damage bill, the government is stepping up its attempts to explain need for a liability Act and counter the impression that the law is essentially designed to suit US interests. But the view that proposed law is geared to meet US interests has seeped in quite deeply and government is working on two fronts simultaneously. It must convince the Opposition, primarily BJP and smaller regional parties, that the bill is not a "sellout" and at the same time address doubts in the Congress

itself. (*The Times of India*, 29 March 2010)

30 March 2010

India, US tie up n-deal loose ends

India today announced it had completed negotiations on the reprocessing arrangement with the United States, taking one of the last steps towards implementing the nuclear deal with Washington. "India and the United States have taken an important step towards implementing the civil nuclear cooperation agreement by completing negotiations on arrangements and procedures for reprocessing US-obligated spent nuclear fuel," a statement by the Ministry of External Affairs said. As first reported by *The Indian Express*, the two sides sorted out differences on the reprocessing of spent fuel during a final round of negotiations earlier this month. The date of announcement was a delicate matter. It is learnt that the first date agreed upon was March 22 but that was deferred by a week by the US, possibly not to send a wrong signal to Pakistan whose Foreign Minister Mehmood Qureshi visited Washington last week. (*The Indian Express*, 30 March 2010)

Nuclear liability Bill an internal issue: France

France on Monday said the proposed Civil Nuclear Liability Bill would be an "important element" in enabling foreign companies to work in India's nuclear power sector. With the Bill in limbo, France and India were working out the modalities for setting up two reactors at the Jaitapur nuclear park in Maharashtra, allocated to the French company Areva, French Ambassador Jerome Bonnafont told journalists here. France's approach contrasts with that of the U.S. companies, which are wary of initiating talks till the Bill is passed in Parliament. "It will be [a] very important protection for American companies who are seeking to do more business in the civil nuclear area in India," U.S. Assistant Secretary of State Robert Blake had said in a recent interview. (*The Hindu*, 30 March 2010)

31 March 2010

Nuclear summer (Editorial)

After more than nine months of tedious wrangling and patient negotiation, India and the US have finally reached an agreement granting India the right to reprocess spent nuclear fuel. It caps the groundbreaking Indo-US civil nuclear agreement that gave us access to nuclear fuel and technology. The deal was intended to inaugurate billions of dollars worth of nuclear commerce between the two countries, but had been stuck so far because of India's discomfort with American oversight (there will be none, India will only answer to the IAEA in Vienna) and US concerns about proliferation. For India, a concrete arrangement on reprocessing terms was vital before buying reactors, to avoid another Tarapore — where we bought American nuclear reactors but US policy did not allow us to reprocess or return the fuel. (*The Indian Express*, 31 March 2010)

US can suspend reprocessing if 'national security' is threatened

The 'arrangements and procedures' (A&P) under which

India can reprocess U.S.-obligated spent fuel allow Washington to suspend reprocessing permission if it apprehends a "serious threat" either to its national security or to the physical protection of the facility where the reprocessing is taking place that makes suspension unavoidable. But the A&P also specify a detailed consultation process similar to that contained in the Indo-U.S. nuclear cooperation agreement (the 123 agreement) prior to suspension. In the event of any suspension of reprocessing stretching beyond six months, the A&P envisage payment of compensation "for the adverse impact on the Indian economy due to disruption in electricity generation and loss on account of disruption of contractual obligations." (*The Hindu*, 31 March 2010)