CTBT EXHUMED: NEED INDIA WORRY?

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In 1999, the Comprehensive Test Ban Treaty (CTBT), an international agreement meant to proscribe nuclear testing[1] went comatose. The then Republican-dominated Senate orchestrated a major legislative defeat by refusing to ratify this instrument that had been concluded in 1996.[2] That one decision of the US Senate effectively buried the treaty, and the Bush Administration, over two terms, made no effort to reverse the decision. President Obama, however, had made his intentions of reviving the treaty clear throughout his election campaign. In a landmark speech at Prague on April 5, 2009, he declared that his Administration would "immediately and aggressively pursue US ratification of the CTBT."

As Obama's Administration now exhumes the treaty and dusts it for Senate ratification, the domestic process of securing two-thirds majority in the US Senate is not yet a given. Of course, if the President was to set his heart on it, then the 59 Democrats currently in control of the Senate would need only 8 Republicans to vote it into ratification, provided all the Democrats voted

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1. From July 1945 to September 1992, the USA had conducted 1,054 nuclear tests. The Soviet Union had conducted 715 tests up to 1990 when it announced a moratorium. France is believed to have conducted 204 tests , the UK 45 tests and China 41 tests.
2. Then Senator Joseph Biden, now Vice President of the USA had declared, "This is the most serious mistake the Senate has ever made".

along party lines. However, the numbers do not appear to add up as of now.[3] Several formulations have appeared on the permutations and combinations that could make the ratification possible.[4] The situation, nevertheless, remains unclear, though a few factors do raise the prospects of US ratification and these are discussed in the body of this paper.

Meanwhile, the forthcoming nuclear Non-Proliferation Treaty (NPT) Review Conference (RevCon) in May 2010 (a few months from now) and the desire of the new US Administration to showcase good nuclear behaviour, provides a context and urgency to the vote on the CTBT. In any case, it may be highlighted that so far, of the 44 countries whose ratification is mandatory as per Article XIV of the treaty for its entry into force, 9 are still holding out—China, Egypt, India, Indonesia, Iran, Israel, North Korea and Pakistan. Of these, the US actually holds the controls because if the American ratification was to come through, it would bring tremendous pressure on the others and they would most likely follow suit.

Given the heightened prospects of the CTBT springing back to life some time in the near future, which could be as early as next year (if the US wanted to make a point at the RevCon) or some time in the latter half of the four years of the Obama Presidency (if the executive felt the need to allow enough time to schedule and conduct hearings to build domestic opinion, as well as craft an international consensus), the time is certainly ripe for India to examine various aspects of the treaty in order to arrive at a considered decision on how New Delhi should deal with the possibility of the CTBT coming into force.

Since the treaty's rejection by India in 1996, and the manner in which the subject of testing surfaced in the context of the Indo-US civilian nuclear agreement, the CTBT has become an emotive issue associated in public perception with surrender of national sovereignty. Therefore, a national

3. A Congressionally mandated bipartisan expert panel chaired by William Perry reported in early May 2009 that its members were divided over whether the US Senate should ratify the CTBT. See *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington DC: United States Institute of Peace Press, 2009).

4. For a good analysis of the kind of "political capital" that the President would have to invest, in order to avoid a repeat of Senate's rejection of ratification, see Jofi Joseph, "Renew the Drive for CTBT Ratification", in *Washington Quarterly*, vol. 32, no.2, April 2009, pp. 79-90.

consensus on the treaty needs to be built through a debate pitched at the level of national security that must steer clear of partisan politics – a difficult proposition, to say the least. India must objectively examine the ramifications on its strategic deterrent and work out a national acceptability quotient of the CTBT. This paper performs this critical task by looking at three important dimensions of the issue: Obama's motivations for reviving the CTBT and their relevance, if any, for India; India's core concerns on the treaty; and, whether India should sign the treaty, and with what conditions and safeguards.

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REASONS FOR REVIVAL OF THE CTBT

"Treaties never die, even when defeated and returned to the executive calendar of the Senate. Therefore, we will have another chance to debate the CTBT." These prophetic words were spoken by the Republican Senator Pete Domenici who was personally in favour of the CTBT but toed the party line and voted against it on October 18, 1999. The Senate rejected the treaty on a 51-48 vote, far short of the 67 votes needed for its ratification. Two major concerns were then voiced in opposition to the treaty – one, that there was no way to guarantee that the US would never need to test in the future in order to maintain a safe and reliable nuclear arsenal, especially as the warheads aged[5]; secondly, there was no effective mechanism to detect tests, especially of the low yield variety. In the past decade, the situation has substantially altered on both counts. This provides one rationale for revival of the treaty in the US. At the same time, two other factors also propel a reconsideration of the CTBT – one, the need to impose testing constraints on emerging or prospective nations with nuclear weapon capabilities, or in other words, more specifically to find a way to cap Iran's alleged nuclear ambitions; and second, the requirement

5. Most of the nuclear warheads in the US arsenal were produced in the late 1970s and 1980s, with W-88 submarine launched warheads of 1988 being of most recent vintage. The warheads were then anticipated to have life-times of 20-25 years, which is today believed to be a gross underestimation.

One of the major reasons cited by the opponents of the CTBT in 1999 was the inability of the US to maintain the reliability of its ageing nuclear warheads in the absence of some fresh testing in the future.

to contextualise the CTBT in the larger framework of nuclear disarmament, a commitment that the new US President is willing to make. The following sections examine these four motivations for revival of the CTBT in some detail.

Adequacy of the Stockpile Stewardship Programme

One of the major reasons cited by the opponents of the CTBT in 1999 was the inability of the US to maintain the reliability of its ageing nuclear warheads in the absence of some fresh testing in the future. The supporters, though, argued that the treaty did not adversely impact US national security because the nuclear weapons labs had adequate ability for the surveillance, assessment and refurbishment of the nuclear weapons through the Stockpile Stewardship Programme (SSP) established in 1994, and which removed the need for physical testing.[6] The purpose of the SSP was to equip and enable the weapon labs to "conduct an extensive series of non-nuclear tests on both production-line and stockpiled warheads to determine if there are any problems with the warheads themselves, their components, or their production procedures."[7] It enabled virtual nuclear testing to ensure continued viability of US nuclear weapons, to train a new generation of weapon scientists, and to refine weapon designs and production processes in order to maintain a trained and capable work force that could respond to circumstances quickly, if necessary. In fact, the rejection of the CTBT provided an opportunity to leverage greater funding for these science-based programmes at the US nuclear weapon labs. It was also stated then by Domenici that "if the potential for stockpile stewardship during the next decade can be realized," it may become possible to reconsider the CTBT.

6. For more on the SSP, see Francis Slakey and Benn Tannenbaum, "What About the Nukes?" at http://www.spectrum.ieee.org, 2008.
7. Robert Nelson, "3 Reasons why the US Senate Should Ratify the Test Ban Treaty", *Bulletin of Atomic Scientists*, vol. 65, no.2, March/ April 2009, p. 57.

Exactly a decade from then, the CTBT might be presented before the Senate yet again. Much has changed in the US nuclear weapons complex and its nuclear thinking since then. The country has gone through yet another debate on the issue of nuclear testing in the context of the Congressional approval for financing a new nuclear warhead during the Bush Administration. With a view to renewing the stockpile in order to enhance the reliability of the warhead against possible degradation of the weapon's core plutonium components or the pits, and in order to strengthen the safety of the weapons through addition of new features to make them less dangerous in case of their falling into terrorist hands, the idea of the Reliable Replacement Warhead (RRW) had surfaced.

In 2005, the RRW programme was initiated when the Congress allocated $9 million to explore how to lengthen the life of existing nuclear warheads without diminishing their explosive power. The objective of the programme was "to improve the reliability, longevity and certifiability of existing weapons and their components,"[8] besides also enhancing their safety and security. It was also endowed with a more "benign" purpose of providing research and engineering problems to the "unchallenged" nuclear workforce in labs that were also to be refurbished as part of the RRW programme. In fact, the National Nuclear Security Administration (NNSA) had then argued that the programme would be useful for revitalising the existing "decrepit" nuclear infrastructure, which it claimed had suffered under "decades of neglect, intense Congressional scrutiny and legal enforcement actions in the late 1980s and 1990s." In an October 2006 report, the NNSA stated that a revamped complex would "improve the capability to design, develop, certify, and complete production of new or adapted warheads in the event of new military requirements."[9] It has also been argued that the new warheads would be simpler and cheaper to construct and maintain using modern manufacturing techniques.

In order to make the RRW possible, the Departments of Defence and Energy commissioned a design competition between the nuclear weapon

8. Jonathan Medalia, "Nuclear Weapons: The Reliable Replacement Warhead Program", *Congressional Research Service*, May 24, 2005, p.6
9. Wade Boese, "New US Warhead Design Selected", *Arms Control Today*, April 2007.

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labs in 2006. The Lawrence Livermore National Laboratory in California and the Los Alamos National Laboratory in New Mexico submitted competing designs for a new warhead. A period of review followed during which, in January 2007, Bush even hinted at the possibility of a hybrid of the two designs to arrive at one that would be more robust and resistant to accidental or unauthorised use. But, in March 2007, the NNSA chose the Livermore Laboratory design since it invoked greater confidence of being certified *without nuclear testing*. While announcing the choice of the new design that would replace the W76 warhead for submarine-launched ballistic missiles, NNSA's acting administrator, Thomas D'Agostino explained that the RRW programme would use a warhead design that had been tested in the 1980s. It would be packaged with new features such as insensitive high explosives less liable to explode by accident, as well as locking devices that would prevent the warhead from being used even if it fell into the hands of terrorists.[10]

Therefore, the retention of the moratorium on testing was apparently a factor in the selection of the RRW, and while providing funding between 2004-07, often reluctantly, the Congress insisted that the warhead be developed without any testing. From 2008 onwards, the Congress has even refused to fund the RRW. Meanwhile, in 2006, JASON, an independent panel of scientists and engineers that has long advised the US government on nuclear weapons issues, concluded on the basis of data received from weapon labs that the core plutonium components in US warheads could last from 85-100 years, and perhaps even beyond. More recently too, John Holdren, advisor to the President, has stated on the basis of a study that he conducted in 1999 for President Clinton at the National Academy of Sciences that the "safety and effectiveness of the current nuclear stockpile could

10. Walter Pincus, "Nuclear Warhead Plan Draws Opposition", *Washington Post*, March 4, 2007.

be maintained indefinitely without developing new warheads but by monitoring the situation and making modifications if necessary."[11]

Any decision taken by the US President will have to carefully assess the technical pros and cons of the treaty as well as the political climate at home and abroad.

Yet, there are contrarian voices too, the most influential being that of the current US Secretary of Defence, Robert Gates. He believes that even with diligent inspection and maintenance, America's current arsenal would become unreliable over time and, hence, the need to design and build new warheads. Echoing the same thought, the December 2008 Interim Report on the Strategic Posture of the US recommended on the CTBT that "before submission [to the US Senate for ratification], the Department of Energy and Department of Defense should receive from the labs and STRATCOM clear statements describing the future capability and flexibility required to minimize the risks of maintaining a credible, safe and reliable nuclear deterrent without nuclear explosive testing."[12]

Two other recent reports add to the confusion over the CTBT. An Independent Task Force Report prepared by the Council on Foreign Relations and entitled "US Nuclear Weapons Policy" favours ratification of the CTBT.[13] Meanwhile, another Report of the Congressional Commission on the Strategic Posture of the US, entitled *America's Strategic Posture*, conveys a divide amongst the bipartisan group on whether the US should ratify the treaty.[14] In the light of these differing viewpoints, any decision taken by the US President will have to carefully assess the technical pros and cons of the treaty as well as the political climate at home and abroad. Given President Obama's expressed desire to start the US towards a Nuclear Weapon Free World (NWFW), it is more likely than not that he would push for the ratification of the CTBT as

11. Interview of Holdren by Marin Butcher, AAAS website, www.aaas.org, March 2009.
12. *America's Strategic Posture*, Interim Report of the Congress and Commission on the Strategic Posture of the US, December 2008, p. 11.
13. William Perry and Brent Scowcroft, *US Nuclear Weapons Policy: Independent Task Force Report No. 62* (New York: Council on Foreign Relations, 2009).
14. See n. 3

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one means of illustrating his commitment to the cause. More on this will begin to unveil in the next few months.

As far as India is concerned, the debate over the reliability of the arsenal because of its degradation with age is an irrelevant issue, given that most of the warheads are of recent vintage. The reliability of the weapons in terms of yield, and their safety against an accident is based on the limited number of tests that the country has conducted. There are two schools of thought on whether India can build a credible arsenal (with optimum yield to weight ratios or weapons of the megaton variety) on the basis of the five tests of 1998. While technical issues can best be addressed by weapon scientists and the government must engage with them, for the purpose of this paper, three non-technical aspects that have a strong bearing on deterrence must be highlighted. One, India is believed to have the capability of increasing or decreasing the yield of the weapon between 20-200 kilotonnes (kt); secondly, given the densities of population in India's adversaries and better knowledge of targeting on how to cause more damage than that suffered by Hiroshima and Nagasaki, the existing types of weapons should suffice to cause "unacceptable damage"; thirdly, deterrence is only partially derived from the warhead and its yield. A large part of its credibility depends on a number of other factors such as the range, reliability and penetrability of the delivery mechanisms and the survivability of the command and control as well as the political will to retaliate. This issue is further detailed in a later section of the paper. Suffice here to say that given that nuclear deterrence is an exercise in manipulation of perceptions, and if the role of nuclear weapons is deterrence alone, then the technical issues being raised in the US debate on ratification of the CTBT are of as limited relevance to the US as to India.

Maturing of Verification Technologies

A new debate has emerged in the US now on the definition of what constitutes a nuclear test and, hence, proscribed under the CTBT.

The CTBT was concluded as a verifiable treaty. This was to be enabled through the development of an International Monitoring System (IMS) crafted as a worldwide network of monitoring stations that would detect signatures of a nuclear explosion such as seismic waves (ground vibrations), low frequency sound waves in the atmosphere (atmospheric vibrations) or oceans (hydroacoustics or water vibrations), or radioactive products generated at the time of a nuclear explosion. The IMS has been under development since 1999 and when complete will consist of 337 worldwide facilities and an international data analysis centre in Vienna. By May 2009, nearly 75 per cent of the monitoring stations had been certified as operational. Their capability is to be supplemented with thousands of regional seismic stations across the globe. The National Academy of Sciences is confident of the ability of the IMS to detect underground nuclear explosions as small as 0.1 kt anywhere in the world. Experts point to the fact that the North Korean nuclear test of October 2006 which had a yield of only about 0.5 kt was picked up by 21 IMS seismic stations.

However, a new debate has emerged in the US now on the definition of what constitutes a nuclear test and, hence, proscribed under the CTBT. This is brought out in the report of the *Congressional Commission on the Strategic Posture of the US*, concluded in early May 2009. Commission Chairman, William Perry, argues that the most important condition to be met prior to ratification is that "the US should seek clarification—and a clear understanding—on what tests are banned by this treaty, since there seems to be some ambiguity and confusion on that point." According to the report, there is a difference in the understanding of the United States and that of Russia and China on what constitutes "any nuclear weapon test explosion or other nuclear explosion" banned by the treaty.[15] "From the time of the agreement, there has been a

15. As quoted in Elaine M. Grossman, "Strategic Posture Panel Reveals Split Over Nuclear Test Pact Ratification", *Global Security Newswire*, May 7, 2009.

Given the close nuclear and missile relationship between China and Pakistan, the new weapons becoming available to Pakistan cannot be ruled out.

dispute about what that means precisely, and there have been differences between ourselves and Russia with respect to it, and even earlier going back to the Soviet Union," according to the Vice-Chairman of the Commission, James Schlesinger. In the understanding put forth in 1999, the US took the position that all explosions that had more than zero nuclear yield stood banned, including extremely low-yield nuclear experiments, as also hydronuclear experiments. However, Schlesinger believes that the US view that such experiments would be banned "was not agreed to by other participants" in the treaty negotiations. Therefore, it was the Commissioners' unanimous recommendation that "the Administration must be able to assure the Senate and the American public that there is an agreed understanding with the other nuclear-weapon states about the specific testing activities banned and permitted under the treaty."

Clarity on this issue is of great importance to India since China, which is in possession of a technical sophistication superior to that of India, could use the ambiguous language to develop new types of nuclear weapons through hydronuclear testing. Also, given the close nuclear and missile relationship between China and Pakistan, the new weapons becoming available to Pakistan cannot be ruled out. This argument, however, is not to suggest that the CTBT is a bad idea *in toto*, but to highlight the kind of clarifications that must be obtained on the issue. India cannot afford to accept any ambiguity on this issue and must, therefore, act on an informed scientific view on the precise types of virtual testing acceptable under the CTBT and an assessment of its own capability in this regard.

Increasing Dangers of Nuclear Proliferation

The US mood to accede to the CTBT is also driven by the mounting dangers of more countries becoming nuclear weapons capable in the future. This is a result of mainly two developments and the American inability to make a

major breakthrough in either case. The first of these is the inability of the international community to consensually deal with the issue of nuclear weapons proliferation to new states. The inability of the Six-Party Talks to get the Democratic People's Republic of Korea (DPRK) to disarm its nuclear capability and return to the NPT fold, as also the lack of consensus on how to deal with Iran's nuclear ambitions, and the possible precedents these cases set for other nations is a major preoccupation.

In order to rein in nuclear proliferation, the US could consider the trade-off of its right to test in exchange for more stringent controls on nuclear technology under the NPT.

The second, and largely inter-related factor, is the growing attraction of nuclear power as a source of electricity. Countries wanting to reap the benefits of this in any big way, in the light of the increasing vulnerabilities of dependence on volatile imported oil and gas and the growing environmental concerns, would be keen to acquire the capability to enrich their own uranium to power the reactors. This technology, however, can quickly graduate to enrich uranium for weapons and, hence, the theoretical possibility of every country that can operate enrichment plants being able to develop nuclear weapons too. This is obviously a disconcerting thought for non-proliferation and its self-appointed champion, the US that is grappling with the nuclear programmes of states of proliferation concern and the possibility of lax controls or willful compliance of some nations resulting in non-state actors acquiring the capability to conduct nuclear terrorism.

Therefore, in order to rein in nuclear proliferation, the US could consider the trade-off of its right to test in exchange for more stringent controls on nuclear technology under the NPT. In any case, the US has a strong conventional force with global reach, besides the most sophisticated nuclear arsenal and the means to maintain it through the SSP. Therefore, the bargain should appear attractive from the American point of view.

In the case of India, proliferation is a major concern given that the country lies in a region where sophisticated nuclear proliferation networks have operated and where the danger of the paths of these networks crossing with

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those of terrorist organisations is palpable. The availability of fissile material with more countries raises the possibility of lax controls somewhere leading to the material becoming available to determined and motivated non-state actors. Also, the increasing possibility of some states with nuclear weapons succumbing to the persuasion of extremist tendencies raises the danger of nuclear weapons use since classical deterrence may not apply in such a case.

Of course, one could well argue that imposition of a ban on testing would not stop potential proliferators from making simple fission bombs without testing, nor reduce chances of nuclear terrorism engineered through the clandestine acquisition of nuclear material or weapons. However, the CTBT would certainly make it harder for the countries to make nuclear weapons of the size and weight that could be effectively deliverable through rudimentary missiles. It would also reinforce the international consensus against non-proliferation and thereby reinforce the many mechanisms crafted to deal with the dangers in a more united, and, hence, more effective fashion.

Showcase Good Conduct at NPT RevCon and Redefine American Image

The ratification of the CTBT by the USA would offer a useful opportunity to showcase US good conduct at the NPT meeting next year. Since 1995 when the NPT secured its indefinite and unconditional extension, the two RevCons in 2000 and 2005 have proved to be non-events. No worthwhile issues were resolved or even taken up during these conferences and the level of dissatisfaction and frustration of the Non-Nuclear Weapon States (NNWS) with their inability to get the Nuclear Weapon States (NWS) to commit to any measures that would reduce the salience of nuclear weapons as a currency of power has only grown. Meanwhile, during this period, the US Nuclear Posture Review of 2002 explicitly recommended reducing the preparedness

time for conduct of a nuclear test, and the US withdrew from the Anti-Ballistic Missile (ABM) Treaty in 2003. The Bush Administration also withheld funding for the CTBT Organisation (CTBTO), the international secretariat responsible for facilitating the treaty's entry into force.[16]

At this juncture then, new life being breathed into the CTBT through a gesture from the US would go a long way in indicating a reversal of course and a renewal of the US commitment to multilateral rule-based mechanisms. This would also indirectly signal faith in the NPT and the larger non-proliferation regime. In fact, this would also significantly smoothen the way for any new non-proliferation measures that the US would like to push through the NPT RevCon, especially those regarding restrictions on export of Enrichment and Reprocessing (ENR) technologies to countries that do not already have them.

It would also indicate US support for the commitment made by Obama in his Prague speech that en route to nuclear disarmament, the US would reduce the role of nuclear weapons in national security strategy. In that context, the CTBT ratification has rather graphically been described by one analyst at a "down payment on the Obama pledge to work toward a nuclear-free world."[17]

While the fate of the NPT is largely immaterial to India as a non-signatory, its collapse would, however, render a blow to the cause of non-proliferation which should be a matter of concern to the country for the reasons highlighted in the section on dangers of proliferation. Meanwhile, the CTBT as a step towards a world free of nuclear weapons is certainly welcome for India. It would not only halt horizontal nuclear proliferation, but also halt modernisation of strategic capabilities and the concomitant development and deployment of new types of nuclear weapons, including those with improved explosive power or miniaturised versions for missile deployment.

16. The arrears total $40 million and are a pittance compared to the annual spending of $ 6.5 billion on the SSP in 2008.

17. Joseph, n. 4, p. 82.

INDIA'S CORE CONCERNS

In 1996, when the CTBT was rustled through the UN General Assembly instead of being passed through the Conference on Disarmament (CD) for fear of its being jettisoned by India since the CD works on the basis of consensus, New Delhi had opposed it for two ostensible reasons. The first of these was the absence of any linkage with universal nuclear disarmament, a long-standing Indian objective. India perceived that instead of being a step towards the eventual elimination of nuclear weapons, the treaty that emerged only appeared to drive nuclear testing into laboratories. Modernisation of existing arsenals was likely to continue through computer modelling and simulation by those among the NWS that had such technological capability. For others not so equipped, their level of capability was being frozen at current levels. Overall, there appeared to be little willingness on the part of the NWS to *actually give up* their nuclear arsenals. In fact, before the 1999 vote, the Clinton Administration proposed six safeguards to its ratification of the CTBT with a clear objective of protecting the US nuclear deterrent.[18]

The second reason for India's non-acceptance of the CTBT was that it did not meet the country's security concerns considering that nuclear weapons had made themselves apparent in India's neighbourhood, from 1964 with China and from 1987 with Pakistan. In the light of India's threat perceptions where both adversaries had a close nuclear and missile relationship, and the growing propensity of Pakistan to use its nuclear weapons as a shield for indulging in provocative sub-conventional conflict against India, New Delhi could not have afforded to tie its hands with the CTBT, thereby denying itself a nuclear deterrent. Therefore, unless the CTBT was able to address the security issue in any comprehensive way, it was not considered to be

18. The six safeguards were: A. conduct a Science-Based Stockpile Stewardship programme to ensure a safe, secure and reliable nuclear arsenal; B. maintain modern nuclear laboratory facilities and programmes; C. maintain the capability to resume nuclear test activities; D. improve treaty monitoring via a comprehensive R & D programme; E. assess through a vigorous intelligence programme the status of nuclear programmes worldwide; F. understand that the President, in consultation with Congress, would be prepared to withdraw from the treaty if the Secretaries of Defence and Energy inform the President that they could no longer certify a high level of confidence in the safety or reliability of a nuclear weapon type deemed critical to the US deterrent force. As reproduced in CFR Task Force Report, n. 13, p. 104.

in India's national interest. In fact, the Background Paper, "Evolution of India's Nuclear Policy" that was tabled in Parliament on May 27, 1998, stated in the context of the CTBT, "our perception then was that subscribing to the CTBT would severely limit India's nuclear potential at an unacceptably low level. Our reservations deepened as the CTBT did not also carry forward the nuclear disarmament process."[19]

The Indian decision on the CTBT must now take into account the kind of nuclear force structure it aspires to build and whether that would require any further testing.

In 1998, India tested and declared itself a state with nuclear weapons. The last decade since then has been spent in operationalising the deterrent by way of articulating a nuclear doctrine, building the arsenal and the requisite delivery capabilities, institutionalising a robust and redundant command and control structure, etc. In other words, the frame of reference for the consideration of the CTBT by India has altered. Therefore, the Indian decision on the CTBT must now take into account the kind of nuclear force structure it aspires to build and whether that would require any further testing. This consideration must be juxtaposed with the growing interest in moving towards the gradual elimination of nuclear weapons. Together, the two developments provide the present context for the reconsideration of the CTBT in India.

IMPACT ON STRATEGIC CAPABILITY

The CTBT is meant to prevent further horizontal nuclear proliferation by disallowing nuclear tests and to restrain countries with existing nuclear arsenals from developing more sophisticated designs through fresh tests. Subscribing to the treaty would, therefore, amount to India's surrender of its right to conduct any more tests and, hence, largely end up freezing its nuclear weapons design and yield to the present capability derived from the five tests. However, it must not be overlooked that the freeze would also apply to its adversaries, China and Pakistan. Is it such a bad idea, then, for India to accept the CTBT?

19. "Evolution of India's Nuclear Policy" Paper laid on the table of the House on May 27, 1998. Available at http://ww.indianembassy.org.

Dr A.P.J. Kalam had also stated in 1998 that the tests had "enhanced our design and simulation capability… We believe that subscribing to the CTBT will not affect our status as a nuclear weapon state."

The question requires a deeper examination of not only the capabilities of the adversaries but also India's concept of nuclear deterrence and its ability to impose it with the type of nuclear weapons it has or will manage to build on the basis of the tests carried out so far. According to some Indian weapon scientists, the tests have managed to provide a sufficient enough database for refinement of weapons through computer simulations and modelling as well as sub-critical testing. The Department of Atomic Energy (DAE) Chairman at the time of the Indian tests, Dr R. Chidambram, and presently the Principal Scientific Adviser to the Prime Minister (PM), has assured the country on more than one occasion that no further tests are required.[20] He had also expressed confidence in India's ability to conduct sub-critical tests. Similarly, Dr A.P.J. Kalam had also stated in 1998 that the tests had "enhanced our design and simulation capability… We believe that subscribing to the CTBT will not affect our status as a nuclear weapon state."[21] The Background Paper accordingly stated, "The data provided by these tests is critical to validate our capabilities in the design of nuclear weapons of different yields for different applications and different delivery systems. Further, these tests have significantly enhanced the capabilities of our scientists and engineers in computer simulation of new designs and enabled them to undertake sub-critical experiments in future, if considered necessary." It was on the basis of their advice that then the Prime Minister had immediately announced a voluntary moratorium on testing that has since been upheld by every government.

Therefore, the view is that future testing may only be necessary if a radically new material were to be tested. But if it was only a matter of upscaling or reducing the yield of the weapon, it could be done based on present capability.

20. Interview conducted by Nirmala George with Dr R. Chidambram, <http://www.meadev.gov.in>
21. "Kalam Proposes, Fernandes Opposes", *The Times of India*, September 22, 1998.

Of course, one could always argue that more tests would be desirable to enhance the reliability of the weapon. Some contend that "perfect weaponisation" requires at least 100 nuclear tests. However, the silver lining in the mind game of deterrence is the unlikelihood of the adversary to try testing the true strength of the declared capability since the risks are too high.

The nature of India's likely targets (mega cities with high density of population) negates the need for very high yield or even very many low yield weapons.

As mentioned earlier, the tests conducted in May 1998 are deemed to have provided India the capability to build weapons between 20–200 kt. The trend internationally is coalescing around 120 kt as optimum yield weapons, which certainly is within India's capability. Even so, it must be highlighted that even the low yields of 15-20 kt that were used in Hiroshima and Nagasaki were of such high destructive nature that they have scarred the human mind enough to restrain such inhuman action since. This, when the nuclear weapons were dropped from a height that was less than optimum (or the damage to Hiroshima would have been far greater); and on a target not well chosen (since Nagasaki's topography saved it from a lot more destruction). Therefore, if the weapon is employed with far greater intelligence and clever planning, even the low yield, especially in the region that India inhabits, could well cause damage that no civilised state could deem acceptable. In fact, the nature of India's likely targets (mega cities with high density of population) negates the need for very high yield or even very many low yield weapons.

If the basic purpose of the CTBT is to proscribe the development of more lethal weapons or halt modernisation of arsenals with more sophisticated thermonuclear designs, then India has nothing to lose in terms of its strategic capability since, as has been established in the above paragraphs, India does not need these for nuclear deterrence. Even if frozen at current capability, India has a viable enough nuclear deterrent, whose credibility can be further enhanced through intelligent development and use. At the same time, India does not suffer from an ageing arsenal. Rather, most of

Even in the case of the retention of the option of testing by rejecting the CTBT, it is highly unlikely that the country would indulge in a fresh round of testing unless provoked into doing so by such an act being carried out by an adversary.

its weaponry is freshly minted and it has the capability to maintain the safety and reliability of the arsenal without further nuclear testing.

However, one technical question that must be answered by the country's weapon scientists is whether India would be able to develop MIRVing capability without testing because this requires the ability to develop smaller, lightweight warheads necessary to place multiple warheads on a single ballistic missile? This issue is of importance given the development of missile defence in the region. However, this is a two-edged sword. Just as India needs this capability to defeat the missile defence of its adversaries, they too need the same against an Indian Ballistic Missile Defence (BMD). China is believed to have developed the MIRVing capability, though it is not yet known to have operationalised any such missiles. The availability of the sophistication with China, nevertheless, always raises the prospect, based on past experience, of the same being handed over to Pakistan. India, under such circumstances, would be at a disadvantage and, hence, the scientists must debate this question. However, yet another manner of considering this question is that in case India does not have this capability, it is certainly unlikely to conduct a fresh round of testing in order to acquire it. Therefore, it will have to explore other options of enhancing the robustness of its BMD, or reducing its reliance on BMD in favour of enhancing deterrence through other means. These issues need to be seriously examined by those in the nuclear decision-making loop in order to make suitable trade-offs.

Finally, the last question is whether given India's voluntary moratorium on testing that has sustained over the last decade, is there anything that India would do differently in the future if it were to ratify the CTBT as against what it would do without ratifying the CTBT. The most likely answer to this seems to be: "nothing". Even in the case of the retention of the option of testing by rejecting the CTBT, it is highly unlikely that the country would indulge in a

fresh round of testing unless provoked into doing so by such an act being carried out by an adversary.

Therefore, if there is going to be no difference in behaviour, whether with or without the signature on the CTBT, then the decision could well rest on two assessments: one, what could possibly be the benefits of subscribing to the treaty; and two, how India could mitigate, or hedge, the risks of accepting the obligations under the treaty. Both these issues are discussed at length in the third and final section of the paper. Before moving on, however, it would be useful to examine how the CTBT is likely to connect with disarmament, the second ground on which India had rejected the treaty in 1996.

India highlighted that "the conclusion of a CTBT is an indispensable measure to put an end to the nuclear arms race and to achieve the complete elimination of these weapons."

Linkage with Disarmament

India has long argued that the CTBT must not be seen as an end in itself but as a means to get to a state where the nuclear weapons begin to become irrelevant. Therefore, it establishes a clear and direct link between the treaty and nuclear disarmament. In fact, it was in 1978 that India had made a proposal on a defined programme of nuclear disarmament and a ban on nuclear testing was amongst the four recommended steps.[22] This linkage was reiterated several times through the years. Another significant incident was in 1994 on the eve of the adoption of the negotiating mandate for the Adhoc Committee entrusted with the task of negotiating the CTBT. At the time, India once again highlighted its understanding that "the conclusion of a CTBT is an indispensable measure to put an end to the nuclear arms race and to achieve the complete elimination of these weapons."[23] This

22. This proposal was made by then Prime Minister Morarji Desai to the Special Session of the UNGA on June 9, 1978. For details of the proposal, see Arundhati Ghose, "Negotiating the CTBT: India's Security Concerns and Nuclear Disarmament", *Journal of International Affairs*, vol. 51, no. 1, Summer 1997.

23. Ibid.

was reiterated more recently by Shyam Saran, Special Envoy of the Prime Minister, when he said that for India "it was not acceptable to legitimise, in any way, a permanent division between nuclear weapon states and non-nuclear weapon states."[24]

It is a different matter that this stance has not been supported by very many other states. In fact, for the US, the NPT, CTBT and Fissile Material Cut-off Treaty (FMCT) are stand-alone treaties to check nuclear proliferation. During the late 1990s, the CTBT for the US was a means of bringing Russia and China into a verifiable control regime. Meanwhile, for the UK, France and others, it was a non-proliferation measure aimed at other NNWS. Today, with Obama's expressed desire to move towards an NWFW, there may be hope for a change in thinking. While it is no longer feasible to amend treaty language to reflect the linkage with nuclear disarmament (as India had lobbied for through the negotiations), it is nevertheless possible to provide nuclear indications of credible movement towards the path of universal nuclear disarmament.

SHOULD INDIA SIGN?

Given the above discussion on the many issues revolving around the CTBT, this last section of the paper considers the crucial question of whether India should sign the treaty and under what conditions. It should be clarified, however, that this question is being considered in a scenario where the USA and China, as also the other hold-out nations have already ratified the CTBT. It was stated by Atal Behari Vajpayee during his term as Prime Minister that India will not stand in the way of the treaty's entry into force. This remains a valid position for the simple reason that even after the ratification of the US and China, India need not rush to sign the treaty but can promise not to obstruct its entry into force once other hold-outs have signed on. Such a position would allow India to hedge against the possibility of a situation where a country like North Korea (that has no fear of international sanctions or opprobrium) holds

24. Address on "Indo-US Civil Nuclear Agreement: Expectations and Consequences", at Brookings Institution, Washington, March 23, 2009. Full text available at *http://www.mea.gov.in/speech*.

back its signature, thereby providing a test site for a country like Pakistan even if the latter might have signed the treaty itself. Therefore, India's acceptance of the CTBT must cater for such eventualities, however far-fetched they might seem.

One basic requirement for India's acceptance of the CTBT would have to be its universal, non-discriminatory nature.

In the considered judgment of this paper, India should consider its signature on the CTBT on the following terms:

- One basic requirement for India's acceptance of the CTBT would have to be its universal, non-discriminatory nature. In this context, it may be recalled that there have been reports that the P-5 had made a secret agreement at the time of the treaty's conclusion that would have granted them special rights on nuclear testing. During the Congressional hearings at the time of the vote on ratification of the treaty in the US Senate in 1999, it was revealed that the P-5 had secretly negotiated some agreements among themselves. Little else is known about the contents of these agreements. In case they do exist, and thence reinforce the discrimination between states, then it would be impossible for India to accept the CTBT. The basic precondition for the Indian signature to the treaty has to be the extension of equal rights to all states. Any whiff of discrimination under the treaty would make it completely unacceptable to India, as also several other countries, and must be studiously avoided. In fact, such a possibility would rapidly erode the existing consensus on non-proliferation and have adverse effects on the fate of the NPT too.
- Clarity on the definition of what exactly constitutes nuclear testing. The treaty text states that it bans "any nuclear weapon test explosion or other nuclear explosion." The ambiguity on this has already been brought out earlier in the paper. India must seek total clarity on the subject, and in case of no consensus on definitions, New Delhi must let its interpretation be known at the time of the signature on the CTBT. In this context, it would be imperative to look out for any possible agreement that the P-5 might reach on the issue, without consultation with the other nuclear weapon

states. For instance, the recommendations put forth by the Final Report of the Congressional Commission on the Strategic Posture of the US include "the Administration must be able to assure the Senate and the American public that there is an agreed understanding with the other nuclear weapon states about the specific testing activities banned and permitted under the treaty… Equity must be demonstrated by an agreement of the P-5." In the light of the recent exceptionalisation of India by the Nuclear Suppliers Group (NSG) and acknowledgment of India as a nation with "advanced nuclear technology," this earlier formulation will have to take the new reality into account.

- Attachment of necessary provisos to its signature. As in the case of the US, certain safeguards can be proposed by the Administration to be included in the Senate resolution that ratifies the treaty.[25] While the Indian political system has no provision for ratification by the legislature, the executive can certainly attach its own list of safeguards or riders that allow it to hedge against the risks accepted in the treaty. Some of these could be such as:
  - India's adherence to the treaty would automatically end on the conduct of tests by any other nation.
  - India would conduct a periodic review of the national security consequences of its continued adherence to the treaty and might reconsider its subscription in case supreme national interest demands otherwise.
  - India would maintain the capability to resume nuclear test activities.

  This list of stipulations is only illustrative and not exhaustive.
- Link to disarmament – that the treaty establishes a clear link with disarmament, if not through an amendment of treaty language, then through visible indications of movement towards a world free of nuclear weapons.

What would India stand to gain by this subscription? The first, though intangible, benefit would be the flow of goodwill and reinforcement of its non-proliferation credentials. As a state with nuclear weapons and having gained

25. In 1999, President Clinton had proposed six safeguards that have been listed out in footnote 18 of this paper.

the NSG waiver even in the face of stringent opposition by some NSG members who perceived this exceptionalisation as a reward to India, the accession to the CTBT would allay some of the misperceived objections. As one Indian analyst had put it in 2000, "Signing the CTBT and giving the US (and the rest of the world community) some of the reassurances on our nuclear weapons programme will put the seal of international acceptance on India's emergence as a mature and stable nation-state, destined for a place in the first tier of nations."[26]

Nuclear deterrent is not the direct function of only the yield or number of nuclear weapons. Rather, it is the sum total of other components as well such as the range and reliability of delivery mechanisms, the robustness of the command and control systems and the perception in the enemy's mind about the survivability of the arsenal.

Secondly, this would not amount to any loss of strategic autonomy given India's nuclear doctrine, based as it is on the concept of credible minimum deterrence and assured retaliation to cause unacceptable punishment. India's existing nuclear capability equips the nation to impose the nature of deterrence that it has chosen for itself.

Thirdly, the CTBT would help to put a halt to further improvements in the nuclear weapons of its adversaries. The treaty will help to create a worldwide nuclear status quo. Parties to the CTBT would be unable to conduct nuclear explosive tests to improve the existing weapons or develop stronger ones. Of course, this would mean that the Indian nuclear deterrent would always remain stronger vis-a-vis Pakistan but weaker against China. However, it must be understood that a nuclear deterrent is not the direct function of only the yield or number of nuclear weapons. Rather, it is the sum total of other components as well such as the range and reliability of delivery mechanisms, the robustness of the command and control systems and the perception in the enemy's mind about the survivability of the arsenal. Therefore, the relative Chinese nuclear superiority could be met with improvements in the other components of nuclear deterrence.

26. Prem Shankar Jha, "Significance of the CTBT", *The Hindu*, January 10, 2000.

Fourthly, the treaty would help to rein in horizontal proliferation and, thus, help reduce overall threats to international security from the dangers of accidental or miscalculated launch or nuclear terrorism.

Fifthly, the signature will also give a boost to Indo-US relations and help alleviate the traditional concerns of the Democrats with a nuclear India. This would help in resolving some of the pending issues on the Indo-US civilian nuclear agreement such as the grant of reprocessing rights on imported fuel.

Finally, the CTBT would help in the pursuit of an NWFW, a situation that is best suited to India's security interests.

CONCLUSION

As the situation appears today, the CTBT might be exhumed by the present US Administration and presented to the Senate for ratification. There are no clear indications on whether this would be successful given the doubts that have still been raised on the efficacy of the treaty and its benefits to the US. The Obama Administration would not take a chance of going to the Senate unless it was sure to secure the ratification. This could take time if elaborate hearings are scheduled to slowly build the necessary consensus on the issue. The US could likely start the process before the start of the RevCon next year and schedule a vote later into the four-year presidency.

This probable schedule provides India with some time to seriously examine all aspects of the CTBT and be prepared to handle its possible ratification, as and when it may appear on the horizon. In the absence of any movement on the issue by the USA and China, there is little that India need do on the treaty. However, in case the US ratification does come about, India need not worry that the treaty would in any way degrade its strategic capability. Technically, India has the wherewithal to impose deterrence. The decision to sign or reject the treaty would have to be a purely political one and as highlighted earlier, India has enough to gain and little to lose if it can make sure that it signs the right kind of a treaty and with the right conditions or safeguards attached to it. The time until the US ratification must be well spent in identifying what these provisos specific to India should be.