ATOMS FOR PEACE: BALANCING THE PROMOTION OF NUCLEAR ENERGY AND NON-PROLIFERATION

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The resurgence of nuclear power that was highlighted by the successful conclusion of the recent Nuclear Security Summit in March 2010, in which 47 nations participated, has once again set the platform for the international community to deliberate on newer issues related to nuclear security. The significance of addressing these newer issues has accentuated post the Fukushima incident. The option of nuclear power as a viable source of energy is indeed valid today. However, there are concerns that need to be addressed before a country decides to depend mostly on nuclear power as its route to social development.

The idea of deriving electricity from nuclear power is not new. In the United States, the need to promote the civilian use of the dual use technology was felt way back in the 1950s.

The use of nuclear energy for peaceful purposes was demonstrated by the US in 1951 by generating electricity for the first time from nuclear fission. Internationally too, the use of this technology to serve developmental purposes was promoted by the United States throughout the Eisenhower Administration.

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The basic argument of the draft that Presidential adviser Baruch presented was that a worldwide international atomic energy development authority must be created in order to control or monitor the international nuclear activities leading to the production of fissile material.

Ironically, the United States championed the cause of peaceful nuclear energy just a few months after it dropped the bombs on Hiroshima and Nagasaki. The collateral damage witnessed by Japan during World War II resulted in a vehement reaction from the international community. The atomic experiment that the United States carried out with vigour led to the subsequent realisation of a dangerous scenario taking shape in the near future. The degree of destruction that resulted from the atomic bomb made the US realise the need to control the spread of this perilous technology to other parts of the world. In fact, the US exercised stringent secrecy control on nuclear weapons material, and cooperation was denied even to the United Kingdom, its closest war-time ally.

CIVILIAN NUCLEAR ENERGY: AN IDEA

One of the first ever attempts to launch the idea of civilian use of nuclear technology in the world was initiated by the United States through the Baruch Plan. The idea of promotion of peaceful use of nuclear technology was a strategic decision taken by the United States in order to counter a 'threat of destruction' through atomic weapons, which was realised clearly soon after the atomic bombings of the Japanese cities. This was an attempt to divert attention and focus from the military to the peaceful exploration of the atom.

The Baruch Plan (1946)

In his speech to the United Nations Atomic Energy Commission (UNAEC) Presidential Adviser Bernard Baruch offered the world community a choice

between the *"quick"* and the *"dead"*[1] or *"world peace"* and *"world destruction"*[2] as he presented the idea of peaceful use of atomic energy. Keeping a check on the proliferation of nuclear weapons worldwide became an important agenda of the US foreign policy and has remained so since then.

The basic argument of the draft that Presidential adviser Baruch presented was that a worldwide international atomic energy development authority must be created in order to control or monitor the international nuclear activities leading to the production of fissile material. Broadly, the Baruch Plan aimed at achieving an international mechanism that would be responsible for the inspection, monitoring and licensing, mining and processing of uranium ore.[3]

The Baruch Plan was authoritative in nature as it emphasised the need for effective enforcement by providing the international institution with the power to impose sanctions. Interestingly, the plan also suggested immunity from the UN Security Council's power of veto.[4] Consequently, the Baruch Plan faded away gradually, as it was not able to win the support of other major powers, mainly the Soviet Union, which regarded it as biased in favour of the US. Its rejection by the Soviet Union was inevitable as the plan allowed the US to retain the possession of nuclear weapons material as long as possible while restraining other states, primarily the Soviet Union, from the option of nuclear weapons. The strict supervision of the international authority was embedded in the plan to "*avoid any undeterable atomic wars in future.*"[5]

It was because of this provision of veto that scholars like McGeorge Bundy doubted if the Baruch Plan could become operational. The plan was indeed dead in less than six months. The provision of exemption from the veto was unacceptable to the Soviet Union. Although the discussions and

1. Lewis Copeland, Lawrence W. Lam, Stephen J. McKenna, *The World's Greatest Speeches (1999)*; Bernard Mannes Baruch, *The Control of Atomic Weapons* (Dover Publications), pp. 587-591.
2. Ibid.
3. David Fischer, *Stopping the Spread of Nuclear Weapons: The Past and the Prospects* (London: Routledge Publishers, 1992), p. 32.
4. Phillip Margulies, *Nuclear Non-Proliferation : Global Issues* (New Delhi: Viva Books, 2010), p. 25.
5. Henry D. Sokolski, *Best of Intentions : America's Campaign Against Strategic Weapons Proliferation* (Praeger Publishers, 2001), p. 2.

The panel suggested the means to get a reduction in the size of nuclear stockpiles of both the superpowers.

negotiations over the idea continued in the United Nations for the next two years, it was not able to render any substantive results.[6]

The Baruch Plan was indeed a short-lived endeavour as four years later, the Soviet Union acquired nuclear weapons and other nations followed suit. However, the Baruch Plan indirectly contributed towards subsequent non-proliferation efforts of the United States. The plan established the idea of promoting the peaceful use of atomic energy. This idea was taken forward by the United States in its Atoms for Peace programme that was aimed at promoting nuclear non-proliferation and nuclear technology for peaceful purposes.

THE ATOMS FOR PEACE PROGRAMME

In his Atoms for Peace proposal of December 8, 1953, President Eisenhower had proposed that the nuclear powers contribute portions of their stockpiles of normal uranium and fissionable materials to an international atomic energy agency, which would then allocate these materials toward peaceful uses.

The Baruch Plan failed, but behind the scene efforts to put the nuclear genie back into the bottle did not. One of these efforts was led by the technical director of the Manhattan Project; Robert Oppenheimer continued efforts to mobilise support from the Truman Administration to prevent an inevitable arms race. In the year 1952, a panel was established. Robert Oppenheimer through this panel conveyed the apprehensions regarding the arms race that was about to begin. The panel's report painted a grim picture of the nuclear world. It foresaw, *"a very rapid expansion of the stockpiles on both the sides to a point where both sides could have many thousands, and neither side could have any useable superiority."*[7] The panel suggested two measures to curb the forthcoming arms race. First, the United States must disclose publicly the strength of its own nuclear arsenal as an attempt

6. Ibid.
7. Ibid., p. 288.

to get a similar declaration by the Soviets, so that misinterpretation or mistrust could be avoided. Second, the panel suggested the means to get a reduction in the size of nuclear stockpiles of both the superpowers.[8]

The succeeding Administration of President Eisenhower too, continued the non-proliferation initiative. In the 470th plenary meeting of the United Nations General Assembly in 1953, President Eisenhower proposed the idea of international control of nuclear technology. He called for international efforts to monitor a certain amount of fissionable material of the two superpowers, such that it could be made available to other countries under the condition of its peaceful use. In essence, the Eisenhower Administration took the route of promoting the peaceful use of nuclear energy.[9]

In his "Atoms for Peace" speech, President Eisenhower spoke in the language of *"atomic warfare"*[10] and warned the world about the dangers that lay ahead if the arms race was not contained on time. It is noteworthy that the speech was delivered approximately four months after the Soviets had conducted their first thermonuclear test in the year 1953.

Meanwhile, deriving the reference from the United Nations Resolution (1953), the US President expressed the willingness of his country to carry forward the diplomatic and private talks with the powers principally involved to seek an acceptable solution to the United Nations report.[11]

The Eisenhower speech was much appreciated by the international community and especially by the states that wished to engage in nuclear energy for peaceful purposes. However, it is interesting to observe that by this time, the United States had already detonated the world's first ever thermonuclear weapon, that was approximately five hundred times more powerful that the previous atomic weapons. Hence, despite an open declaration to curb the further spread of nuclear weapons, the United States itself engaged in activities of building the nuclear arsenal. It could be argued that the promotion of peaceful use of atomic energy by the United States

8. Margulies n. 4, p. 27.
9. Dwight D. Eisenhower, "Atoms for Peace Speech to the UNGA," December 8, 1953, in Sokolski n. 5, p. 115-122.
10. Ibid.
11. Ibid.

was done in such a manner as to deny weapons capability to other states while retaining its own.

McGeorge Bundy has argued that through the Atoms for Peace programme, the United States wished to curtail the Soviet Union's nuclear capability. It hoped that with time, the Soviet Union would eventually be able to submit a considerable amount of fissionable material that, in turn, would serve as the basis for further negotiations between the two countries.[12] The Soviet Union in the beginning opposed the Atoms for Peace programme but later agreed to it, mainly because it was slightly different from the earlier Baruch Plan. It not only provided incentives for the states that complied with the international standards of control but also did not demand unacceptable provisions such as on-site inspections, deposition of nuclear weapons in the hands of an international agency or strict punishment for non-compliance.[13]

ROLE OF DOMESTIC FACTORS

Atomic Energy Act (1946)

The development of nuclear energy in the United States was a two-dimensional process. While the Atoms for Peace programme was conceived to promote the peaceful use of nuclear technology in other parts of the world, the United States itself had to undergo institutional and legal changes to accommodate the policy.

There were several requirements such as the passing of the US Atomic Energy Act (1946) and creation of the Department of Atomic Energy that ensured the smooth execution of the programme which had to be undertaken in line with this US nuclear energy policy .

Within its domestic realm, the United States in the immediate post World War II period, passed the McMohan Act or the Atomic Energy Act of 1946 that strengthened government control over the nuclear related activities, such as uranium mining, nuclear fuel production, etc. This legislation

12. Ibid., p. 26.
13. Ibid., p. 26.

nationalised all aspects of nuclear ventures, and also outlawed US exports of nuclear materials and technological knowhow to other states. The degree of secrecy was so intense that even its closest war-time ally, the United Kingdom, was denied collaboration.[14]

In the McMahon Bill (1945) which was later enacted into a law called the Atomic Energy Act of 1946, the findings highlighted the possibility of the spread of atomic knowhow for military purposes to other parts of the world. The Act contained a provision of control, which stated that the export or import of any fissionable material, directly or indirectly, in any manner, outside the United States was unlawful.[15]

The development of atomic energy for peaceful purposes in the United States was the responsibility of the US Atomic Energy Commission (AEC) that was established by the McMahon Act. The Act formally established three advisory committees — the Congressional Joint Committee on Atomic Energy, a Military Liaison Committee and a General Advisory Committee — that would look after the peaceful development of atomic energy. Within one year, the Manhattan Engineer district was replaced by the AEC in 1947. The US Congress also provided this commission with an immense amount of authority and freedom to carry out its work even in matters relating to personnel selection. Even the production facilities and nuclear reactors were government owned. The commission also controlled research findings and technical information concerning the development of peaceful nuclear energy. The Argonne National Laboratory (1946) was one of the first laboratories established to carry forward the mission of peaceful nuclear energy by the development of nuclear power reactors.[16]

The efforts to launch the peaceful atomic programme in the United States did not really kick-start even after President Eisenhower's Atoms

14. Gary T. Gardner, *Nuclear Non-Proliferation: A Primer* (United States: Lynne Rienner Publications, 1994), p. 38.
15. "The McMahon Bill, December 1945 (Atomic Energy Act-1946)," in. Robert C. Williams and Philip L. Cantelon, eds., *The American Atom : A Documentary History of Nuclear Policies From The Discovery of Fission To the Present (1933-1984) (*1984).
16. "The Atomic Energy Commission" (1947), The US Department of Energy, [Online:Web], Accessed on June 02, 2011, http://www.ch.doe.gov/html/site_info/atomic_energy.htm; and Argonne National Laboratory : History, http://www.anl.gov/Administration/history.html.

for Peace initiative, as the era of the late 1940s was marked by a massive competition between the two power blocs. This compelled the United Sates to concentrate more on the weapons development programme. By 1949, the Soviet Union had already detonated the nuclear device that ended the US monopoly over nuclear weapons. This came as a surprise to the United States since the scientific community had estimated that it would take much longer for the USSR to catch up with the American nuclear lead. The Iron Curtain, however, drew attention away from the peaceful use of nuclear energy.

Thus, it almost took a decade to actually start the peaceful programme. Most of post World War II period was spent in building a nuclear arsenal by the United States to sustain its competition with the USSR. The Soviet detonation had encouraged the AEC to take a *quantum jump* and pursue the development of thermonuclear weapons. Interestingly this development was supported by the Congressional Joint Committee on Atomic Energy; however, the General Advisory Committee was against it. Eventually, in 1950, the AEC was ordered by President Truman to make speedy progress on the thermonuclear weapon. The United States detonated the world's first thermonuclear device in November 1952 and by the end of 1953, approximately 30 weapon tests had been conducted successfully by the US.[17]

Hence, one could argue that no substantial progress in the realm of peaceful use of atomic energy was made for a long time. The US Atomic Energy Complex was more or less dedicated to largely military tasks. However, in December 1951, the Idaho test station successfully produced a small amount of electricity from an experimental fast breeder reactor.

Atomic Energy Act (1954)

The Atomic Energy Act of 1954 had a significant influence on the US nuclear energy policy as it revised the provisions of the previous Atomic

17. Alice L. Buck (1983), "A History of Atomic Energy Commission," US Department of Energy, [Online: Web], accessed on May 12, 2011, http://www.atomictraveler.com/HistoryofAEC.pdf.

Energy Act to enable the commission to share technical and scientific information with foreign governments. The new Atomic Energy Act also enabled the commission to participate fully with foreign governments in the promotion of peaceful use of atomic energy. The Act contained liberal licensing provisions and the right to own reactors made way for further private development of nuclear power in the United States.[18] In 1955, the AEC announced its Power Reactor Demonstration Programme that provided the research and development funding to utility companies operating prototype nuclear power plants. This programme gave birth to the first ever commercial nuclear power plant of the United States that was connected to the electricity grid. This 60 megawatts power plant became operational in 1957 in Pennsylvania, and was built by Westinghouse Electric Corporation.[19]

The Atomic Energy Act of 1954 gave the Atomic Energy Commission the responsibility for regulating and licensing of commercial atomic activities. The amendments to the 1954 Atomic Energy Act (AEA) legally allowed nuclear cooperation for peaceful purposes. Further amendments to the Act were incorporated later by the Nuclear Non-Proliferation Act (NNPA) of 1978 that added more requirements for controlling US exported nuclear related materials to other countries. These amendments play a major role in the contemporary US nuclear energy policy as the conditions defined in the AEA and the NNPA serve as the basis of civilian nuclear cooperation of the United States with any country. According to the provisions stated in both the Acts, the exported material of US origin was subjected to the international safeguards of the International Atomic Energy Agency (IAEA). Thus, both the Atomic Energy Act and the NNPA govern any bilateral agreement of the United States in terms of peaceful use of nuclear energy.[20]

18. Ibid.
19. The US Nuclear Engineering Education : Status and Prospects (1990), "The National Academic Press", Committee on Nuclear Engineering Education, National Research Council, [Online:Web], accessed on June 01, 2011, http://books.nap.edu/openbook.php?record_id=1696&page=15.
20. "Origins & Evolution of the Department of Energy," US Department of Energy, [Online: Web], accessed on May 12, 2011, http://www.energy.gov/about/origins.htm.

The Contribution of Private Players

The US nuclear power industry also owes its origin to the Atomic Energy Act of 1954 as certain provisions in the Act encouraged the private industry to build its own nuclear power plants by making use of the fissionable material leased from the government. By the end of 1957, the private industry was able to participate with the Atomic Energy Commission in the development and production of electricity, until the mid-1960s.[21]

In 1962, President Lyndon Johnson ordered a 25 percent cutback in the production of enriched uranium and the shutdown of plutonium piles in order to extract significant cuts from other nations as well. It is argued that the Soviet Union did announce production cutbacks in response. In the realm of the nuclear power industry, the very same year, a significant development occurred. The Jersey Central and Power and Light Company contracted for a large nuclear power reactor to be built by Oyster Creek in New Jersey.[22]

The private players influenced the growth of the US nuclear power industry. However, for a long time, the government retained monopoly on the ownership of nuclear materials. This was changed after the "Private Ownership of Special Nuclear Material Act" was signed by President Lyndon Johnson in 1964. This Act ended the eighteen-year government control over nuclear material and permitted private ownership of special nuclear material.[23] No longer would enriched uranium for power reactors have to be leased from the government, and private entities were permitted to assume title to special nuclear materials. This takeover by the private industry of the government function was given a transition period of approximately ten years. After 1973, private ownership was made mandatory and the AEC was authorised to offer uranium enriching services to both domestic and foreign customers under long-term contracts.[24]

There remained licensing issues which led the Atomic Energy Commission to take further steps such as regulations for licensing and

21. Buck, n. 17.
22. Ibid.
23. n. 19.
24. Buck, n. 17.

establishing a specific material and accounting procedure in 1967. The next year, the AEC assumed sole responsibility to oversee materials safeguards applicable to private industry. In response to the increase in international trade in nuclear material, the AEC issued regulations regarding physical protection requirements for nuclear material for licensees to protect against terrorist and other threats.[25]

It is noteworthy that by the end of the 1970s, the US nuclear energy industry was operating in full swing. Since the beginning of the civilian nuclear energy programme until the Three Mile Island incident that halted the US nuclear energy industry, the annual production of electricity ranged from 0.2 billion kilowatt-hours (1958) to 255.2 billion kilowatt-hours by the year 1979. In a span of about 22 years, the average nuclear electricity generation was registered around 7,293.63 billion kilowatts-hours. This implies an average share of 3.8 percent of nuclear power electricity generation in the last two decades.[26]

Major Boost to the Nuclear Energy Industry

The Nixon Presidency in 1973 had directed the AEC to conduct a review of the overall energy research activities. The review report came in the form of recommendations of the "Nation's Energy Future" after which the President announced a five-year $10 billion energy research and development programme. In the year 1974, the Energy Reorganisation Act was passed that ended the Atomic Energy Commission's supervision over the US' civilian nuclear programme.[27]

The AEC's research and development responsibilities were assumed by the Energy Research and Development Administration (ERDA) and the regulatory licensing functions by the Nuclear Regulatory Commission (NRC). Approximately, 6,320 employees went to the ERDA, while 1,970 former regulatory personnel became part of the new NRC. Today, the

25. n. 19.
26. See Table 9.1, Nuclear Generating Units, 1955-2009 and 9.2, Nuclear Power Plants Operation, 1957-2009, Report No. DOE/EIA-0384(2001), US Energy Information Administration, Annual review 2001, [Online: Web], accessed on May 12, 2011, http://www.eia.doe.gov/emeu/aer/pdf/pages/sec9_.pdf.
27. Buck, n. 17.

The IAEA was formed as an autonomous body of the United Nations. Its function is to conduct, and assist in, peaceful nuclear activities.

NRC is the most important player and the only US government agency that is responsible for the regulation of the US nuclear industry.

ROLE OF INTERNATIONAL FACTORS (1960-1970)

By this time, the significance of nuclear power as one way to achieve socio-economic development was realised not just by the United States but also by the international community. Even though the UNAEC was formally abolished in the year 1952, new efforts to promote civilian nuclear energy with adequate safeguards had begun to take place in the late 1960s.

The International Atomic Energy Agency

On March 19, 1954, the United States presented the Soviet Union with a draft of the proposed IAEA. The first official position of the US on the IAEA included a safeguards provision, which emphasised health and safety and control over plutonium.[28] In the year 1957, the International Atomic Energy Agency (IAEA) was established; as head of the United States delegation to the first IAEA conference, Lewis Strauss, who was a part of the US Atomic Energy Commission, delivered the President's message to the agency.

Today, the international agency is one of the pillars of the nuclear non-proliferation regime. The IAEA was formed as an autonomous body of the United Nations. Its function is to conduct, and assist in, peaceful nuclear activities.[29] Since its founding, the IAEA has promoted two interrelated goals: (a) it sought to promote internationally the use of civilian nuclear energy; (b) it was also tasked to prevent and detect the diversion of civilian nuclear energy for nuclear weapon purposes.

The beginning of the 1960s also saw the rise of many developments that made way for further negotiations of arms control and non-proliferation

28. John A. Hall, "International Atomic Energy Agency: Origins and Early Years" Tropical Reports; Thirtieth Anniversary Year, *IAEA Bulletin*, 1978, pp. 47-54.
29. Gardner, n. 14, p. 40.

agreements, such as the development of long range rockets, and environmental hazards caused by nuclear testing. Other events, such as the Cuban missile crisis in the year 1962, and the Chinese detonation of a nuclear device in the year 1964, etc gave impetus to the non-proliferation efforts. Combined with these, Germany and Japan also gained the technological competence needed to build a nuclear bomb. With this backdrop, various measures were taken to strengthen the non-proliferation regime in the 1960s, such as the efforts towards the Limited Test Ban Treaty, which was concluded in the year 1963, that prevented nuclear testing on land, water and anywhere in the atmosphere.[30]

Subsequently, in 1968, governments represented at the Eighteen-Nation Disarmament Committee (ENDC) finished negotiations on the text of the nuclear Non-Proliferation Treaty (NPT). In June 1968, the United Nations General Assembly endorsed the NPT with General Assembly Resolution 2373 (XXII), and the very next month, the NPT was opened for signatures. The NPT entered into force in March 1970.[31]

The Nuclear Non-Proliferation Treaty

The NPT came into being a decade after the IAEA was established; however, the origin of this effort lay in Ireland's resolution to the United Nations General Assembly in 1958. The Irish resolution drew attention to the dangers inherent in the further spread of nuclear weapons. Three years later, the General Assembly again responded to the Irish initiative by calling for the international negotiation of an agreement for the "prevention of the wider dissemination of nuclear weapons."[32]

By the year 1967, the United Kingdom, the Soviet Union and the US reached an agreement over the draft of the non-proliferation treaty. However, the treaty was yet to be launched. The treaty finally came into effect in the year 1970. It remains committed towards nuclear non-proliferation. The treaty provisions have also extracted commitments from

30. Ibid.
31. Sarah J. Diehl and James Moltz, *Nuclear Weapons and Non Proliferation: A Reference Handbook* , Chronology (ABC-CLIO Publishers, 2002), pp. 93-94.
32. Fischer, n. 3, pp. 5-6.

the nuclear weapon states to not assist any non-weapon states to develop nuclear weapons.

The treaty since then has become the backbone of the efforts to control the spread of nuclear weapons, and as one of the most important elements of the global non-proliferation regime, the treaty has institutionalised the norm of non-proliferation around the world. It is one of the most widely observed arms control agreements in history and relevant even today.

The Nuclear Suppliers Group

Four years after the NPT came into effect, India conducted its first Peaceful Nuclear Explosion (PNE). This questioned the adequacy of the NPT for regulating the flow of nuclear materials and technology. Also, two incidents of thefts of nuclear material by Israel came to the forefront in 1964 and 1968 respectively through the routine inspections by the US Atomic Energy Commission. It was evident by this time that the neither the NPT nor the IAEA were adequate to prevent such incidents. A decade earlier, the Chairman of the General Advisory Commission of the US Atomic Energy Commission, Isador Rabi, had warned the US State Department about the inadequacy of international controls that may lead to diversion of commercial nuclear materials into military purposes. This indeed was prophetic. By the end of the 1960s, the international concern towards this issue had already emerged. This led to the creation of an informal arrangement called the Nuclear Suppliers Group (NSG), or the London Club, to further prevent the supply of the materials that might be utilised in advancing another nuclear programme.[33]

The NSG has today become an important part of the nuclear non-proliferation regime that regulates the nuclear power commerce of the member states. It operates under strict export conditions of import of nuclear material to any country that may or may not be its member. Any international nuclear material related commerce is undertaken on the basis

33. Gardner, n. 14, p. 58; Thomas B. Cochran, "Secrecy and Nuclear Power", *The Bulletin of Atomic Scientist*, August-September 1981, p. 37; and Peter R. Lavoy, "The Enduring Effects of Atoms for Peace", Arms Control Association, [Online: Web], accessed on May 11, 2011, http://www.armscontrol.org/act/2003_12/Lavoy.

of the strict provisions of the NSG guidelines. The countries that wish to engage in nuclear commerce with other NSG members are required to accept international safeguards on all their imported materials and technology and on facilities using or replicating sensitive materials and technology. The states are also required to provide for the physical security for the transferred nuclear facilities and materials. They also remain committed not to transfer nuclear materials or technology to any third party without consultation with, or agreement from, the original exporter. The idea behind these strict provisions is to further prevent the manufacture of nuclear explosives.

The Atoms for Peace programme set the ball rolling for further international endeavours to promote peaceful use of nuclear energy.

It may not be incorrect to suggest that the NSG may be called a revision of the "Atoms for Peace" programme, which remains committed to the promotion of nuclear power for the purpose of socio-economic development.

ATOMS FOR PEACE: A REVIEW

Every foreign policy option has two types of consequences: the intended ones which justify the rationale behind the policy decision, and the unintended consequences, that might fallouts from the intended ones. These unintended consequences may later transcend into challenges of the policy option that had once been adopted. Similar is the case with the US "Atoms for Peace" policy, which indeed promoted the peaceful use of a dual use technology, but, at the same time, posed many future challenges for the United States and the world. It is, thus, important to review the progress made by the Atoms for Peace programme. Overall, the policy offered mixed results.

(a) Intended Consequences

On the brighter side, the Atoms for Peace programme set the ball rolling for further international endeavours to promote peaceful use of nuclear energy, and brought into the limelight the prospects of international

cooperation towards these objectives. It also led to the creation of the IAEA alongside the first ever open international conference on nuclear security.

In the United States itself, the policy was much appreciated and within the first three years, the US concluded about 40 civilian nuclear agreements with other states. Not only this, the states allowed the American inspectors to monitor the US technology.[34] Statistically, as of 2009, more than 2,000[35] bilateral civilian nuclear cooperation agreements have been signed by countries that further promote the peaceful use of this dual technology.

In essence, the "Atoms for Peace" promoted the development of the peaceful use of dual use technology and this principle has remained intact in today's nuclear non-proliferation regimes such as the NPT. The treaty dating back to 1970 is very much alive today and supports the principle of peaceful use of nuclear technology through various treaty provisions.

The success of "Atoms for Peace" may be gauged from the fact that the very institution that oversees the smooth execution of international, multilateral and bilateral civilian nuclear cooperation today owes its origin to the "Atoms for Peace" initiative. The IAEA contributes not only towards the advancement of use of nuclear science and technology but also attempts to prevent the spread of nuclear weapons through its checks and control, together with the NPT. This idea was originally articulated by Eisenhower's Atoms for Peace initiative.

In the year 2003, the "Atoms for Peace" completed 50 years. On this occasion, the Former Deputy Director General of the IAEA highlighted its relevance. He stated that in principle, the commitment of "Atoms for Peace," that is, the development of peaceful use of nuclear technology, is now being carried forward by the IAEA as the agency believes in promoting the peaceful use of nuclear technology to address socio-economic needs. It was concluded that the Atoms for Peace policy in the

34. Gardner, n. 14, p. 40.
35. Mathew Fuhrmann, "Spreading Temptation: Proliferation and Peaceful Nuclear Cooperation Agreements," *International Security*, vol. 34, no. 1, 2009, pp. 7-41.

long run has been able to bring about a complete international rethinking of the approaches involved in maintaining the safety of nuclear power plants that had been supported by many countries and accepted worldwide.[36]

The Atoms for Peace programme played the role of a catalyst in developing the weapons capability of many states.

The programme, which was initiated six decades ago, clearly altered the way the world treated nuclear energy in the time to come. The most significant elements of the present non-proliferation regime were indeed laid down by Atoms for Peace policy. It contributed in the way of norm setting of the international regime both for the promotion of nuclear energy and prevention of nuclear proliferation.

Ever since the gradual decline of the Atoms for Peace programme, the international community has come together many times, for the civilian use of nuclear power. The IAEA, NSG and NPT are examples of how states have sustained the will to spread nuclear energy for peaceful purposes while constraining the proliferation of nuclear weapons. Of course, the mechanisms have suffered from limitations, and failures have taken place.

(b) Unintended Consequences

The Atoms for Peace programme went into effect but could not effectively function as by the end of the 1990s, the intentions of development of the nuclear weapons complex by many states became evident. It may be argued that the Atoms for Peace programme played the role of a catalyst in developing the weapons capability of many states. Even though there is no pertinent data to suggest whether the "Atoms for Peace" directly fuelled the nuclear weapon ambitions of other states, it is assumed so,

36. The International Atomic Energy Agency and World Nuclear Order, L. Scheinman, Resources for the Future, Washington D.C. (1987), Atoms for Peace and IAEA. Accessed on May 11, 2011. Source: http://www.iaea.org/newscenter/statements/ddgs/2003/waller08122003.html, Statements of the Deputy Director General, December 08, 2003, Washington D.C., USA, Statement at the "Atoms for Peace: A Future After 50 Years?" Conference, Atoms for Peace: A perspective from the IAEA, by Mr. David Waller, IAEA Deputy Director General.

because the programme involved training of selected scientists all over the world, in the field of peaceful nuclear energy.

The NPT that was one of the derivatives of the "Atoms for Peace" has been criticised on various grounds. To start with, it divides the countries into two groups: the five states that have already tested nuclear weapons (the US, the Soviet Union, Britain, France and China), and the rest of the world that has not yet developed these weapons. Secondly, the treaty has been breached and has not been able to prevent countries from testing nuclear devices. This adds to the non-proliferation failures.

(c) Proliferation of Nuclear Weapons: A Challenge for the Future

One of the most severe challenge of the Atoms for Peace policy emerged in the form of horizontal proliferation of nuclear weapons. It is ironic that the policy indirectly made way for the objective it was fundamentally against. Prior to the conception of the programme, only two countries possessed the weapons capability.

Even in the late 1950s and 1960s, the weapons capability was limited only to the United States , Soviet Union, Great Britain, France and China because of the secrecy and high cost involved in weapons production that acted as a technological bulwark against the spread of dual use technology to other parts of the world. The Atoms for Peace programme reduced to a great extent the cost barrier by providing the basic assistance in terms of nuclear research. Immediately after the Atoms for Peace programme was launched, the United States began imparting technical knowhow to foreign scientists at Argonne Laboratory and later released hundred of declassified studies related to nuclear research. Countries such as Argentina, Brazil, and Pakistan that had no prior experience in the nuclear programme, received assistance in the development of a civilian nuclear programme through the Atoms for Peace programme.[37]

The sharing of technological knowhow that began as part of the programme was later diverted into clandestine weapons production by

37. The process of uranium enrichment was complex that required huge technological investments and electricity that many countries in the 1950s-1960 could afford. James L. Ford and Richard Schullar, "Controlling Threats to Nuclear Security: A Holistic Model," p. 77, and Lavoy, n. 33.

many countries. The linkages between the civilian nuclear programme and its diversion into the weapon programme have been highlighted by many scholars.

Mathew Fuhrmann has argued about the linkages between peaceful nuclear cooperation and nuclear weapons proliferation by analysing the case study of India and Pakistan. There is no denying the fact that dual use technology and materials such as uranium enrichment and plutonium reprocessing have a legitimate civilian application and are linked to the nuclear weapons programme. Also, civilian nuclear cooperation increases knowledge in nuclear-related matters, such as handling of radioactive materials, the process of fuel fabrication and the operation and function of reactors and electronic control systems. This knowledge, in turn, can be applied to weapons related endeavours. The states receiving this kind of assistance would be likely to consider a nuclear weapons option as the knowledge base provided by the civilian nuclear programme reduces the expected cost of a weapons programme.[38] The civilian nuclear assistance in this manner helps the recipient country prepare for a weapons base. Although not every recipient country in the end may divert from the civilian nuclear programme to acquire the destructive capability, there are rationales such as that the prevailing security circumstances may compel a state to take the route towards the nuclear capability.

CONCLUSION

Atoms For Peace: US Cold War Strategy

There is no doubt that the American Atoms for Peace policy had an embedded concept of peace attached to it. The promotion of the peaceful use of atoms in one way aimed at encouragement of the use of nuclear energy to provide an impetus to socio-economic development. However, it cannot be overlooked that the American promotion of peaceful use of nuclear energy was executed in the immediate period of the containment era, during the heightened Cold War politics. Hence, it could be argued

38. Fuhrmann, n. 35, pp. 7–41.

Under the Eisenhower Administration that was in favour of the peaceful use of nuclear energy, the US nuclear stockpile grew from 1,005 to more than 20,000 weapons.

that the Atoms for Peace policy was also partially influenced by the Cold War political gains.

The Atomic Energy Act of 1954 was so modified that nuclear material and technology could be exported to the developing countries under the American terms of engaging solely in peaceful nuclear activities. It was argued that this was done in a manner to *strengthen the American world leadership.*[39] In March 1955, the Eisenhower Administration increased its efforts to promote peaceful nuclear use and also directed the Atomic Energy Commission to provide *'free world'* nations with assistance for building power reactors. It could be argued that this assistance was aimed to reduce the Soviet influence. The NSC 5507/2: Peaceful Uses of Atomic Energy was approved by President Eisenhower in 1955 to utilise nuclear technology exports to promote the international and regional interests of the United States.[40]

Hence, it is clear that the policy indeed promoted the American Cold War interests. It is noteworthy that under the same Eisenhower Administration that was in favour of the peaceful use of nuclear energy, the US nuclear stockpile grew from 1,005 to more than 20,000 weapons.

The American policy-makers have turned to the options of nuclear energy from time to time in order to suit their own national interest. It is significant to note that during the period of energy crisis in 1974, the United States looked towards the possibility of exploration of other sources of energy. For instance, one year after the oil embargo of the Organisation of Petroleum Exporting Countries (OPEC), the United States speeded up the development of its domestic nuclear energy. In the years 1973 and 1974, as many as 42 and 55 units became operable respectively, as compared to 27 units in the previous year. It is important to note that maximum numbers of construction permits of nuclear reactors were issued in the same year.

39. Lavoy, n. 33.
40. Ibid.

From 1966-74, the number of operable units increased as ordered units were constructed, tested, licensed for full power operation and connected to the electricity grid. However, the number of units ordered surpassed the number of units operable due to the long time required for construction.[41]

The Arab oil embargo compelled the United States to rethink about its dependence on imported oil. The oil embargo led the OPEC nations to unilaterally cut oil production to about 25 percent that raised the oil prices by 17 percent. This led to an overnight decrease in the oil imports of the United States from the Arab nations, from 1.2 million barrels of oil per day to approximately 20,000 barrels per day.[42]

The very same year, President Nixon directed the Chairman of the Atomic Energy Commission to undertake an immediate review of federal and private energy research and development activities and to recommend an integrated programme for the US. He proposed a five-year energy research and development programme worth $10 billion.[43]

More than 35 years have passed since the idea of promoting the civilian use of nuclear technology was conceived, and yet, till date, France generates approximately 76 percent of its electricity from nuclear energy. It is ironical that the US, the nation that popularised the idea of peaceful use of nuclear technology, lags far behind and generates only 19 percent of electricity from nuclear power.[44]

41. n. 26.
42. Alan. M. Herbst and George W. Hopley (2007), "Warheads to Washing Machines: Post-WWII Nuclear Developments," cited in *Nuclear Energy Now: Why the Time has Come for the World's Most Misunderstood Energy Source* (John Wiley & Sons), p. 15.
43. Buck, n. 17.
44. "Nuclear Power by Country" [Online: Web], accessed on July 01, 2010, URL: http://en.wikipedia.org/wiki/Nuclear_power_by_country#cite_note-World_Nuclear-0.