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Atoms For Peace: Thirtieth Anniversary

By

J. T. Ramey

Remarks by
James T. Ramey*

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Atoms for Peace: Thirtieth Anniversary

Anniversaries offer useful occasions both to look back and to look ahead; to take stock of the past and, on that basis, to try to discern what the future might have in store. Above all, we use these occasions to help us learn from past achievements and mistakes so that we can better influence future events to advance our goals.

I appreciate the opportunity which the Nuclear Law Association has given me to contribute to that process today as we near the Thirtieth Anniversary of President Dwight Eisenhower's proposal to change the course on which nuclear development was headed. By acknowledging that official secrecy for essentially civilian developments was not appropriate and that the cause both of world peace and economic progress could be better served by putting nuclear energy to peaceful ends, the Atoms for Peace proposal opened the door both to domestic nuclear power development and international cooperation.

President Eisenhower's initiative was received enthusiastically both in the United States and abroad, and quickly attracted the title of Atoms for Peace. I can remember those heady days when the original Atoms for Peace concept was being implemented by the AEC, with the leadership of Admiral Strauss, and by the Joint Congressional Committee on Atomic Energy under the leadership of Senators Pastore and Anderson, and Congressmen Cole and Durham.

Today, the program that emerged from President Eisenhower's proposal is the subject of widespread criticism and opposition, and its many problems--real, exaggerated, or imagined (and all three categories exist)--have largely obscured its impressive achievements, thanks to the cynical process of depreciation practiced so widely by today's media and the anti-nuclear movement.

Few, if any, reports mention that, despite project cancellations and slow-downs, the 130,000 MW of nuclear power capacity already installed or under construction in the United States exceeds the entire U.S. electrical generating capacity when Eisenhower spoke in 1953. Nuclear power has made major contributions to the reduction of oil imports at the very time that the reduction of dependence on imported oil was vital both to U.S. foreign policy objectives and international economic interests. In New England alone, the U.S. region which is most dependent on imported oil, the seven nuclear units already in operation represent a savings of nearly 50 million barrels of oil annually, and already generate 30 percent of New England's electric power, at costs far below those of the oil fired stations which they have displaced or which would otherwise be necessary.

*Former Commissioner, U.S. Atomic Energy Commission

In addition to the 80 nuclear power units already in operation in the U.S., 56 more continue under construction, representing some 20 percent of the projected total electrical generating capacity by the end of the century, even if no further nuclear plants are ordered and built. This large complex involves an investment of \$160 billion, of which about half has already been expended, and employment to some 250,000 of our citizens.

I cite these U.S. data only because of their easy availability. Much the same has occurred in varying degrees, in other industrialized countries. In several nations, such as Sweden, Switzerland, Finland, and Belgium, nuclear power already constitutes 25 percent or more of total national generation, double the U.S. level. France's commitment to nuclear power is, proportionately, the largest in the world, with 26,000 MW in operation and 32,000 MW under construction. In 1982, nuclear power supplied 40 percent of France's electricity, and by 2000 it is hoped that nuclear power will furnish 90 percent of France's electricity needs. We are all aware that Japan is also increasing its commitment to civilian nuclear power.

These facts hardly correspond to the moribund failure so often depicted by the media, usually with apparent satisfaction. The de facto moratorium in the ordering of additional nuclear units in the U.S. does reflect serious problems of which we are all well aware, but it is also a reflection of the reduced demand which has affected all forms of electrical generation. As additional generating capacity is required--as it will be if U.S. economic growth is to continue--nuclear power can and should once again provide a substantial part of the needed new facilities.

Like other great achievements, nuclear energy reflects the accomplishments of many individuals, from many countries and with a wide variety of backgrounds. We naturally think first of the towering scientific personalities whose contributions were unique and indispensable: Fermi, Lawrence, Wigner, and Bethe, to name only a few. But those contributions, essential as they were, could be translated into practical systems for the generation of nuclear power only through the efforts of uniquely talented physicists, applied scientists, engineers, and managers in a variety of countries; men such as Zinn, Rickover, and Simpson in the United States; Lewis in Canada; Hinton in the United Kingdom; and Giraud in France, again to name only a few.

The contributions to the achievement of practical nuclear power, however, go beyond the remarkable scientific and engineering accomplishments which first come to mind. The introduction of nuclear power into our complex societies brought with it a myriad of institutional issues in whose solution lawyers, both in their capacity as practitioners and frequently as lawmarkers, have played a leading role.

One such problem that comes to mind was the need, in the highly unlikely event of a major reactor incident, to provide adequate financial protection to the manufacturers and operators of nuclear facilities and above all to the public; a problem whose solution was a sine quo non for the initiation of the nuclear power era. The system of private sector insurance, national legislation and international agreements which was fashioned surprisingly quickly to overcome this obstacle--the national and international insurance pools, the Price-Anderson Act in the U.S., and the Paris, Brussels, and Vienna Conventions, as well as

national legislation in many other countries--represents one of the most striking contributions of lawyers working with financial people and engineers.

But, just as the achievements of the scientists and engineers were, in some cases, not without fault, this same example illustrates that even one of the most successful accomplishments in the institutional and legal sphere was not completely adequate. In the case of the most serious reactor accident to date, TMI, the financial protection available fell far short of covering the full costs to the plant owners. The cost of cleanup and replacement power, which were appreciated only dimly, if at all, when the financial protection system was created, proved to be dominant and nearly ruinous. As a result, the industry, once again with commendable speed, has moved to fill at least part of this gap with new insurance arrangements.

Under current legislation, the Price-Anderson Act is scheduled to expire in 1987, unless extended, and a report by the Nuclear Regulatory Commission examining various options is being submitted to the Congress this year. Extension in some form is important to the future growth of the nuclear power industry. Accordingly, attempts by the anti-nuclear lobby to foreclose such extensions are predictable. One issue which must be examined is the limit of liability and its relationship to the damage which might ensue from a serious reactor accident. In this regard, there is growing evidence, based on TMI and other data, that the "source term" for radioactive release has been seriously over-estimated in earlier studies. A more realistic source term should have some effect on attempts to increase or eliminate the limit on liability under Price-Anderson; and more immediately, affect the zoning areas in emergency evacuation requirements.

I am sure that there is much to be learned from international experience on insurance and indemnities at these and other meetings.

Another obvious area where the legal contribution has been important, if not dominant, was the creation of a regulatory framework for nuclear power. The nuclear regulatory system, at least as it has evolved in the United States, has attracted extensive criticism, much of it well deserved. Indeed, only the fact that this criticism is more or less equally divided between those who believe the regime to be too permissive and those who view it as too strict suggests that perhaps something was done right. In short, the nuclear regulatory system, of this country at least, is hardly a monument to the practice of the nuclear legal profession, although it has provided much of the latter's financial sustenance.

Looking back on my period of service as Staff Director of the Joint Committee on Atomic Energy and as an AEC Commissioner, I am inclined to believe that some of the technical innovations which I had a hand in bringing into the regulatory system were more constructive and important than legal requirements, as such. I am referring, for example, to the Quality Assurance program which was adapted from Adm. Rickover's Naval Reactor program first into the AEC Reactor Development program in the Mid 60s, and then into civilian regulatory program in the late 60s and early 1970s.

As many of you know, we in the U.S. are once more considering extensive changes in our regulatory system--under the title of "regulatory reform." In

this area we have not been very successful, since similar proposals were first introduced back in 1971. Something happened shortly thereafter called the Calvert Cliffs case and we had to regroup. The Arab oil embargo, and the inflation, recessions and lowered power demand, together with TMI, all also got in the way of nuclear power orders and concomitant licensing.

By our success in 1982 with the enactment of comprehensive High Level Waste Disposal Legislation has emboldened the Administration and the nuclear community to have another try at licensing Reform. This would cover such matters as advanced site approval, standardized plants, combined construction and operating permits, backfitting limitations, and hybrid hearings. Whether we will be successful in whole or in part remain to be seen.

In this connection, there is a widespread impression in the United States, which I am inclined to share, that nuclear regulation has proceeded somewhat more smoothly, and successfully in at least some other countries than in the U.S. Given the importance of this issue, it is clearly essential that we in the United States develop a full understanding of the nuclear safety and regulatory systems of other countries, an objective which, so far as I know, has not been achieved or extensively pursued.

If I may make one other personal observation, as a lawyer working with engineers and scientists, I have often heard complaints about "legal technicalities and nit picking." My reply from my experience is that there are just as many "nitpickers" among scientists and technical people as there are among lawyers!

All in all, I believe that nuclear lawyers, like their scientific and technical counterparts, have done their work reasonably well. The unique institutional, legal, and regulatory regime which has been fashioned largely through their efforts, while not without flaws, has provided a generally acceptable and effective framework for the conduct of peaceful nuclear activities-- a framework which provides strong protection for both public health and safety and for international peace and security.

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The most immediate and, in many respects, still the most important institutional accomplishment following President Eisenhower's proposal was the formulation and passage of the Atomic Energy Act of 1954, the fundamental concepts of which remain in effect despite numerous amendments and the separation of the nuclear development and regulatory functions. From the inception of the Atoms for Peace program and the adoption of the Atomic Energy Act of 1954, the program enjoyed broad bi-partisan support both in the Congress, and through successive Administrations of both parties. This bi-partisan character, which was exemplified in the close friendship and cooperation between former Congressman Chet Holifield until his retirement the senior Democratic member of the Committee, and the late Craig Hosmer, the senior Republican member, was an indispensable factor in the development of a strong U.S. civilian nuclear program. The erosion of this strong bi-partisan base of support and the substitution of numerous overlapping Congressional Committee jurisdictions for the previous Joint Committee on Atomic energy, if not a contribution factor to today's problems, is at the very least a major obstacle to their resolution.

A major element in the institutional framework which was and is essential to development of peaceful uses are the arrangements which assure that peaceful uses remain peaceful, and that the materials and facilities of which they make use are not diverted to nuclear explosives. The nuclear legal profession has played a key role in the development of these arrangements, which have been aptly called "the non-proliferation regime," and I will devote most of the remainder of my remarks this morning to this topic.

The term non-proliferation is of comparatively recent origin. It is not found in either President Eisenhower's speech of December 8, 1953, or in the Atomic Energy Act as adopted in 1954, but the objective of avoiding the spread of nuclear weapons is as old as the atomic age itself.

In recent years, the governments of a number of countries that have not developed nuclear weapons have strongly criticized the nuclear weapons states for their lack of progress in limiting their own nuclear arsenals. The term "vertical proliferation" has been applied to the growth in the nuclear stockpiles of the nuclear weapons states, in contrast to the potential "horizontal proliferation," the growth in the number of states possessing nuclear explosives. The limitation of the nuclear arms race is an objective which is shared by governments and citizens of both the nuclear weapons countries and the non-nuclear weapons countries. It seems clear to me, however, that the further spread of nuclear weapons would not only greatly increase the risk to international peace in its own right but would seriously complicate the already difficult task of achieving arms limitations by the nuclear weapons states. Citing the lack of progress in nuclear arms limitations as an objection to an effective non-proliferation regime--as the term non-proliferation is normally understood--strikes me as unwarranted and contrary to the interests of the very countries that are most critical of the slow pace of the nuclear arms limitation process.

While President Eisenhower put forward his proposal in only general terms, it was clear that what was envisioned was a bargain, in which cooperation and assistance in developing the peaceful uses of atomic energy was given in exchange for undertakings that such assistance would be used only for peaceful uses under controls designed to assure compliance with this undertaking. The Eisenhower proposal was specific in proposing the creation of an International Atomic Energy Agency--an event which, of course, came to pass a short period later.

Despite extensive evolution and progress in defining its terms, and even some back-sliding, this "bargain" remains the central feature of the non-proliferation regime and was explicitly incorporated in the Non-Proliferation Treaty of 1968 itself. Although it came as a later development, the Non-Proliferation Treaty has become in many ways the centerpiece of the non-proliferation regime, extending its scope not only to nuclear activities undertaken with outside assistance but to a signatory country's entire nuclear program. Even the well-intentioned but unfortunate policies of the Carter Administration and the Nuclear Non-Proliferation Act of 1978 (NNPA), which attempted to qualify and limit the assistance side of the bargain, did not, in fact, abandon the fundamental concept.

The non-proliferation regime has, as suggested, many elements that derive from, and build upon, the basic bargain. Among the most important, visible, and

at times, controversial element is that of "safeguards" the measures by which compliance with peaceful use undertakings is verified--or, non-compliance is detected.

The central and unique role of these safeguards, about which I will have more to say in a moment, has at times overshadowed other features of the non-proliferation regime and led to misunderstanding as to their role and limitations. These other features include the peaceful use undertakings themselves, which form the judicial basis for the verification system. Despite the cynicism which sometimes prevails, countries normally keep their promises, if only because it is in their best interest to do so, and do not lightly violate their solemn treaty obligations. The positive side of the bargain, the undertakings to provide assistance in peaceful uses, is also a key feature of the regime, and the failure to fulfill these undertakings can be as damaging to the regime as is the failure to meet peaceful use obligations themselves.

One of the most important and effective of these positive elements has been the supply of nuclear materials, and particularly enriched uranium fuel. The early enrichment supply arrangements developed by the U.S. and later adopted by other countries were unique in many respects. By offering nuclear fuel on a long-term, stable, and economically attractive basis, these arrangements made an indispensable contribution to the widespread application of nuclear power. Above all, the reliability of these arrangements, which the U.S. sought to assure by international agreement and contract, was a key element in securing the agreement of other countries to safeguards and other features of the non-proliferation system. The steps taken in the late 1970s which had the effect of reducing the attractiveness of these fuel supply arrangements and raising doubts as to their reliability were not only unnecessary but contrary to the interests of an effective non-proliferation system.

The International Atomic Energy Agency itself, and not simply its safeguard program, is a key feature of the regime, providing one of the mechanisms through which the bargain is implemented and its status monitored. The Agency serves as an important channel for advice and assistance to the less-developed countries which have an interest in and potential need for nuclear power or other peaceful uses of nuclear energy. The Agency's total budget has grown since 1963 from about \$9.3 million to \$130 million in the current year, with funding for its technical assistance program now more than \$34 million, exceeding the increase in safeguards costs by a considerable margin.

In this connection, the IAEA has developed a broad range of programs and activities which are of direct value not only to developing member states but to the most advanced and industrialized as well. Among these are operation of the International Nuclear Information Service (INIS), a computerized data base which abstracts the world's nuclear literature. Another example of the Agency's activities is its program for the development of internationally recognized nuclear safety standards, NUSS. In all about \$11 million of the Agency budget is devoted directly to support of nuclear power, including nuclear safety while many other expenditures, such as those on information services, contribute to this goal.

The IAEA also gives considerable support to nuclear research, much of it of interest to the Agency's developing members for whom nuclear power is not

yet a realistic option. This aspect of the Agency's program includes nearly \$5 million annually in food and agriculture and more than \$2 million for the operation of two respected international laboratories; one devoted to marine radioactivity and the other to theoretical physics.

Another area of IAEA activity in which I have had a long personal interest is that of medium sized power reactors, and the application of reactors to sea water desalting. Although considerable doubt remains as to the economic attractiveness of medium sized reactors, reactor manufacturers in several countries other than the U.S. are offering reactors in the 200 to 450 MW range. The IAEA has encouraged this development over the years, and assists its developing members in assessing the potential for these units. Although the developments of the last several years in the economics of both nuclear power and desalting have not been encouraging, I remain optimistic that these two technologies can eventually be joined in practical, economic large-scale nuclear desalting plants. If this is achieved, it could make major contributions to the economic development and, therefore, to the peace and stability of some of the world's most troubled regions. The Agency played a highly constructive role in past examinations of these prospects and is, undoubtedly, prepared to do so again when technical progress leads to reviewed activity in this area.

The actions to be taken and penalties to be applied in the rare case that violations of peaceful use undertaking are detected provide still another element of the non-proliferation regime. This area represents one of the most difficult of all aspects of the non-proliferation policy, given the constraints on international action and the mixed record of success of "sanctions." Yet the non-proliferation regime is clearly incomplete if the "whistle is blown" on violations, only to find that nothing happens. I believe that increased attention should be given to how safeguard and non-proliferation violations should be dealt with, with the objective of arriving at an international consensus that such actions, should they ever occur, would represent intolerable departures from acceptable norms of international behavior and would be met with a strong and effective response.

Another important facet of the non-proliferation regime is the understandings among suppliers which help ensure that safeguards and other non-proliferation conditions will be observed. I will have a little more to say about this later.

Finally, and not inconsequentially, a non-proliferation ethic has evolved in the world; a widely shared consensus that the acquisition of nuclear weapons is an inappropriate and undesirable step, far more likely to decrease than to improve the national security of the country that takes it.

Eisenhower's proposal also did not employ the term "safeguards," and it made no explicit mention of the protection of the fissionable materials made available to other countries, but its call for the "protection" of the "bank of fissionable material" to be provided to the proposed International Agency clearly implied the extension of this "protection" to material redistributed by the Agency to its members.

The term "safeguards" in its present context of arrangements relating to assurances of peaceful uses first appears in the Atomic Energy Act of 1954,

which required from the beginning a "guarantee that safeguards as set forth in agreements" would be maintained, but the Act provided little guidance as to the nature of these safeguards. It was not until the negotiation of the U.S. agreements for cooperation which were authorized by the 1954 Act, a process that began in 1955 and proceeded quickly thereafter, that the term "safeguards" began to take on concrete meaning. Safeguards provisions similar to those found in U.S. agreements were also incorporated in the IAEA Statute, which was concluded in 1956, and adhered to by the United States in 1957, following Senate ratification of the Statute and passage of the IAEA Participation Act.

The IAEA Statute and U.S. Agreements for Cooperation on civil nuclear power provide for an unprecedented system of verification, whose central feature is on-site inspection by inspectors having broad rights of access to places and data needed to account for peaceful use materials and to verify compliance with non-proliferation undertakings. In the case of U.S. bilateral agreements, these inspectors were to be U.S. nationals. In the case of the IAEA statute, the inspectors were to be international civil servants drawn from the Agency's member states.

Although the U.S. favored IAEA inspection from the start, this proved impossible, and U.S. cooperation with other countries began with safeguards implemented by U.S. inspectors. As the IAEA's ability to conduct safeguards grew, the U.S. undertook a vigorous and finally successful effort to transfer responsibility for safeguards implementation to the IAEA. Other suppliers followed the same policy, and the Agency's unique responsibility in this field was ultimately confirmed by the adoption in 1968 of the Non-Proliferation Treaty, which designates the IAEA as the safeguards authority.

Without going into detail, it is an interesting footnote to history that, with few exceptions, U.S. agreement partners in the early 1960's generally preferred the continuation of U.S. safeguards to IAEA administration and vigorously resisted the U.S. proposals for the transfer of this responsibility. The negotiations of the Tarapur Agreement with India in 1963 was widely recognized as the crucial test of the safeguards transfer effort, and India's agreement to accept IAEA safeguards, even though the agreement allowed a deferral in the transfer of safeguards to the IAEA, was the key element in assuring the success of the safeguards transfer policy. Moreover, despite the skepticism of many, India fulfilled its undertaking to accept IAEA safeguards following initial operation of the Tarapur station.

As an AEC Commissioner, I strongly supported peaceful nuclear cooperation with India, including the Tarapur project. I believed then, and continue to believe, that India is one of the best examples of a developing country which has proceeded far enough in the process of industrialization to use nuclear power safely and effectively, if provided with a reasonable amount of outside assistance. Largely through the efforts of several exceptional individuals, including Homi Bhabha, the first head of India's nuclear energy program, and his successors, Vikram Sarabhai and Homi Sethna, India established a sizeable and effective nuclear R&D and power program. It has conditions, including adequate electric demand, a sizeable electric grid, and limited and poorly distributed coal reserves, which make nuclear power economically attractive in several regions.

Moreover, we should not forget, as many apparently have, that the United States did not conceive and promote the Tarapur project. It was an Indian project for which there was vigorous international competition and it would have been built and operating today under some auspices, regardless of U.S. cooperation.

Against this background, India's test of a nuclear explosive device in 1974 raises a number of legitimate and complex issues. India's test was an unfortunate event, which has not benefited India and has seriously and unnecessarily complicated international nuclear cooperation, to the disadvantage of other countries which badly need outside help. At the same time, the plutonium for India's test device did not come from Tarapur, and the withholding by the U.S. of cooperation to which it is committed under the Tarapur agreement will in no way limit the availability to India of plutonium from its research reactor which, along with its heavy water, was supplied to India under very early agreements which were not subject to safeguards.

India, to the best of my knowledge, has fulfilled its obligations under the Tarapur agreement. The use in a nuclear explosive program of plutonium derived from the research reactor and heavy water that had been supplied for peaceful purposes by Canada and the U.S. took advantage of an ambiguity in these early and atypical agreements. After some interruption of supply under the Tarapur agreement, however, we reaffirmed the validity of the agreement in exchange for reaffirmed assurances by India that plutonium from Tarapur would not be used in India's nuclear explosive program.

Given these circumstances, I question whether our unwillingness to continue fuel deliveries under the Tarapur agreement serves any legitimate national objective. Recently, the Administration has indicated its willingness to allow the export of spare parts which are needed for safe operation of the Tarapur reactors, but this step has encountered strong opposition in the Congress and elsewhere and has not yet been implemented. The perception which these problems foster among other countries that the U.S. cannot be relied upon even for spare parts for the reactors which its exports could diminish U.S. influence and the effectiveness of the non-proliferation regime.

Following the negotiations of the Tarapur Agreement, the development of the Agency safeguards system proceeded quickly. In 1965, the system, which had already been extended to large power reactors, was further extended to reprocessing plants, under provisions which call for continuous inspection of plants of substantial size. The conclusion of the Non-Proliferation Treaty in 1968 confirmed the IAEA's key role in international safeguards, following the resolution of the difficult issue of the status of the regional safeguards system of Euratom.

Members of the Joint Committee on Atomic Energy, including Senator John Pastore and Congressman Chet Holifield played key roles in stimulating Executive Branch actions on the Treaty and in urging a resolution of the Euratom issue through a compromise which would take account of Euratom's important contribution to international safeguards.

This U.S. role, which I believe is generally acknowledged to have been critical to the successful negotiation of the NPT, would have been impossible had not the

U.S. then been a strong and reliable partner in the development of nuclear energy. There is no doubt in my mind that the NPT could not have been achieved under today's conditions of weakened domestic support for nuclear energy and the decline in international confidence in the reliability of U.S. supply and cooperation arrangements.

Along with the evolution of the IAEA system, the Agency's ability to implement safeguards also progressed steadily. On my first visit to IAEA headquarters as an AEC Commissioner, in 1962, the IAEA had adopted its first safeguards system, covering only small reactors, and its total safeguard staff numbered only some 25. Each year that I visited the IAEA with the U.S. Delegation, I would inquire as to the growth in the size of the safeguard staff. We would also be informally briefed by the multi-national inspectorate. Today, the Agency's safeguards staff has grown to nearly 400 and the safeguards cost of \$25 million per year amounts to about one-quarter of the IAEA's assessed budget.

The cost of safeguards has been the subject of considerable criticism by the Agency's developing member countries, and I have great sympathy for their desire for increased assistance in sharing the benefits of nuclear power and other peaceful uses of nuclear energy. The fact is, however, that the cost of safeguards is not the cause of the current limitations on technical assistance. There is general agreement among budget authorities that the need to finance the Agency's safeguards activities has attracted more, not less, technical assistance funds to the IAEA than would otherwise be the case. More importantly, safeguards costs remain minimal, corresponding to about 0.003 mills per kilowatt hour by the IAEA's own estimate, an almost undetectable figure. Safeguards funding is undoubtedly now at the lowest acceptable level, and means will have to be found to increase it as the number and complexity of safeguarded facilities grows.

Something of a milestone in safeguards was passed in 1981 when the Agency's Director General at the time, Dr. Sigvard Eklund--who served with great distinction during 16 years of the Agency's most formative period--announced for the first time that the Agency was no longer able to verify compliance at certain on-load-fueled reactors. While no countries were named at the time, the Agency later indicated that the difficulty was with the KANUPP reactor in Pakistan. The Agency's statements do not, of course, constitute a conclusion that diversion had occurred; only that the absence of diversion could no longer be verified with an appropriate level of assurance.

The Agency has more recently made it known that the difficulties in Pakistan have been resolved and it is once again in a position to verify adequately. While this is welcome news, it is an unfortunate technical fact of life that the Agency can no longer provide assurances of the absence of diversion during the period when verification arrangements were inadequate. One consequence of this is that the Agency must now exercise particular care to ensure that if any diversion of spent reactor fuel occurred, that cannot be further processed without detection. This means that any reprocessing activities which take place in Pakistan should be adequately safeguarded.

While the Agency's disclosure that it could not verify adequately in Pakistan was not good news, it did have the important positive effect of demonstrating that the Agency can and will sound the alarm when necessary, even when the country of concern is a widely-accepted member in good standing of the international community.

Agency safeguards have been subjected to other tests as well. The Indian nuclear test of 1974, which triggered a widescale international review of the non-proliferation system, was viewed by some as a failure of safeguards. This reflected an unfortunate misunderstanding of the role of safeguards in the non-proliferation regime since, as I have already pointed out, the activities from which India derived the plutonium for this test were not subject to safeguards.

Still another "test" occurred when a research reactor in Iraq was destroyed by an Israeli air attack. Since Iraq is an NPT party this facility was subject to IAEA safeguards. In the opinion of safeguards experts, the Agency would have been able to detect any significant diversions from the Iraqi facilities. Thus, an important issue was what would have been done if such diversion took place and was detected.

Both of these events illustrate an important point: The role of safeguards within the non-proliferation regime is to detect diversion or other violations. They cannot perform this role if, as in the Indian case, they are not invoked by agreement or treaty. And they cannot themselves overcome or reverse violations, if any are detected, which seems to have been the Israeli concern. This is the task of follow-on steps, in which the IAEA itself has only a limited role.

It is somewhat ironic that the Agency itself has in recent months felt it necessary to make clear the limitations of the safeguards system which constitutes its most important single responsibility. But while the Agency cannot ensure that safeguards violations are effectively acted on, it can and should ensure that safeguards effectively detect significant diversions.

Despite these limitations, safeguards play a central role in the non-proliferation regime. Beyond their technical function of verifying compliance and detecting diversion, they constitute a political statement by countries engaged in peaceful uses of nuclear energy that they are prepared to subject these activities to international scrutiny. That statement not only reinforces the country's peaceful use undertakings but strengthens the rationale for and the likelihood of international action if serious violations are detected. As I have suggested earlier, how to ensure an appropriate response to violations is a major unfinished task in the area of non-proliferation policy.

A particularly valuable feature of the IAEA, as foreseen in President Eisenhower's original policy, is the fact that, alone among international nuclear organizations, it brings together East and West. The Soviet Union has been an active and affirmative participant in a large number of the Agency's activities, and has recently joined the U.S., the United Kingdom and France by offering to place a portion of its peaceful nuclear activities under IAEA safeguards. Although it is too early to be certain, this step could signify an increased willingness on the part of the USSR to allow on-site verification of arms control agreements. It should also be noted that the People's Republic of China has evidenced a strong interest in becoming a member of the IAEA.

Over the years, the Non-Proliferation Regime had been subject to considerable criticism, and general public neglect. However, by 1974, two developments had taken place which raised legitimate questions as to the effectiveness of certain features of the nonproliferation regime. One of these was the Indian nuclear explosion of 1974, the first and only such explosion which depended on material

produced in peaceful nuclear activities. The second was the sale to several countries in unstable regions of the world of reprocessing facilities for which they appeared to have little or no near-term need.

By 1976, steps were taken to strengthen the regime to avoid a repetition of these developments. The most significant of these steps was the development of the so-called London Suppliers' Guidelines, a set of self-imposed rules by the world's principal nuclear suppliers to constrain the dissemination of sensitive technologies, such as reprocessing and enrichment, to sensitive countries and regions; and to ensure that safeguards and nonproliferation arrangements would not be undercut through competition for international nuclear sales.

Various initiatives were undertaken following the Indian test explosion by the Ford and Carter administrations, and the U.S. Congress, including a moratorium on reprocessing and the enactment of the Non-Proliferation Act of 1978.

Another initiative, undertaken by the Carter Administration, was the International Nuclear Fuel Cycle Evaluation--INFCE. INFCE was designed to raise the consciousness of other governments to the proliferation risks of plutonium and reprocessing, and to seek technical approaches which would minimize these risks. Some allege that after spending millions of dollars carefully reviewing old technical studies and reports, it at least succeeded in its first objective: "consciousness raising," a step which constituted perhaps the only lasting contribution of the previous Administration to the nonproliferation regime. Rather than achieve agreement on a so-called "technical fix," or alternative fuel cycles, however, INFCE demonstrated that other governments were virtually unanimous in believing that the established fuel cycles can operate without unacceptable proliferation risks, provided that this is done under effective safeguard arrangements.

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What can we say today of the success of Atoms for Peace and its non-proliferation regime which had its origins nearly thirty years ago? Despite repeated predictions of unbridled proliferation, the fact is that proliferation has proceeded at a dramatically slower pace than foreseen by the doomsayers. Since 1953, three additional nations--France, China, and India--have achieved nuclear explosions. Only in the case of India has that development been related to peaceful nuclear activities. To date no country has employed plutonium derived from the nuclear power fuel cycle to initiate its nuclear explosive program.

There are many reasons for which so many countries with the unquestioned technical capability to produce nuclear explosives have not done so, and the aspects of the non-proliferation regime on which I have concentrated today cannot be given all the credit. Nevertheless, the results speak for themselves and lead to the conclusion that the Atoms for Peace Program initiated by President Eisenhower 30 years ago has, from the viewpoint of its goal of reducing the spread of nuclear weapons, been a singularly successful foreign policy.

Given this success, the continued efforts of critics in this country to embark on still another experiment in the exercise of unilateral control, which the U.S. does not possess, over other countries' nuclear policies and programs is particularly puzzling and disturbing. We learned to our dismay in 1976 that Presidential politics and non-proliferation policy do not mix. I would hope that today's Presidential candidates will resist the temptation of making this traditionally bi-partisan matter a partisan political issue.

Effective non-proliferation policy calls for understanding and cooperation with the vast majority of our partners whose non-proliferation credentials are not in doubt. Attempts to deny cooperation to these partners because of concern over the intentions of a few suspect or unreliable countries represents a reversion, at least in part, to the unsuccessful policies of secrecy and denial that prevailed prior to 1953, and are especially inappropriate in an era when U.S. dominance is long since at an end.

Constant shifting in the U.S. position must also be avoided. U.S. influence, which has been the key element in the development of the nonproliferation regime, was seriously diminished by the unilateral changes in U.S. policy and legislation that took place only five or six years ago. Further attempts at unilateral dictation of the terms of nuclear cooperation, as some now propose, would probably destroy U.S. credibility and influence.

More broadly, successful non-proliferation policy calls for continued strong support for the development of civilian nuclear power. In my opening remarks, I called attention to the modest progress we have made for civilian nuclear power in the United States, and the more spectacular success in certain countries abroad.

I would remind you that it was the promise of nuclear power that made possible the creation of the non-proliferation regime, and the denial of that promise—whatever its motivation—will just as surely lead to the destruction of the regime, and, along with it, the erosion of the constraints that have successfully separated the peaceful and military uses of nuclear energy for three decades.

While current United States policies on both domestic and international nuclear issues represent a welcome improvement over the negative attitudes of the recent past, we now need more than passive support if we are to realize the promise of the peaceful atom that Dwight Eisenhower foresaw 30 years ago. The economic revival now underway in the United States, and which hopefully will be duplicated soon in many countries, affords an opportunity to resume nuclear progress. I do not share the pessimistic view of either the critics or many sectors of industry itself that demand for electric power in the industrialized countries is nearly saturated, and will grow only slowly in the future. Certainly nuclear power is going to be increasingly necessary in developing countries as they mature technologically, socially, and politically.

Looking to the next thirty years, one can expect further energy crises in which electric power will increasingly displace other power sources. Other resource crises will also probably emerge, particularly water scarcity. Under these or more normal circumstances, nuclear power can undoubtedly play a larger role. Thus the future for nuclear power can be as bright as it appeared to be thirty years ago if we are prepared to rededicate ourselves to the goals of Atoms for Peace.