BOOK REVIEW


The fundamental reality of proposals to internationalize the nuclear fuel cycle, or sensitive portions of the cycle, is that the maximum (or even minimum) utilization of nuclear power is inconsistent with that degree of international control required to prevent the spread of nuclear weapons. An agonizing choice must be made between control and the proliferation of nuclear reactors, including the fast breeders. Although the developing world, including the developing nations and even some OPEC members, desperately require additional sources of energy, the nuclear club (as personified by the London Club1) is greatly concerned over the diversion of nuclear waste materials, such as plutonium, that can be manufactured into bombs.

This basic conflict is all too apparent within the framework of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), wherein articles I and II2 seek to control the spread of nuclear

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* As is the practice of the SIPRI with its series of volumes, the names of the authors, editors, and researchers are indicated at the end of the preface. Frank Barnaby is the Director of the SIPRI, and the other editors are senior members of the research staff.

1 The London Club (also referred to as the London Suppliers Club or the London Nuclear Suppliers Group) is an unofficial group of government representatives of industrialized states, seeking to safeguard the export of nuclear materials. Their deliberations are held in camera. These fifteen nuclear suppliers have agreed to the Guidelines for Nuclear Transfers, which apply strict conditions for the export of an agreed list of nuclear items. Considerable resentment has arisen among the developing nations. Nonetheless, the controls have proved largely ineffective because supervision over materials cease once they have passed into the possession of recipient states.

Seven nuclear supplier states met in London in 1975: Canada, France, the Federal Republic of Germany, Japan, the United Kingdom, the United States, and the Soviet Union. They have been joined by eight others: Belgium, Czechoslovakia, The German Democratic Republic, Italy, The Netherlands, Poland, Sweden, and Switzerland.

2 Article I of the Non-Proliferation of Nuclear Weapons Treaty (NPT) provides:

Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture
weapons. Relatively weak measures of implementation are contained in article III; they are reinforced to some extent by articles V and VI, seeking to prevent proliferation. The controversial fourth article seeks the "fullest possible exchange" of peaceful nuclear equipment, materials and technology, and co-operation with the peaceful nuclear energy programme of the non-nuclear weapon states." The curtailment of the spread of nuclear power undoubtedly will become much more difficult during the 1980's, simply because of national aspirations on the part of states to "go nuclear."

The Stockholm International Peace Research Institute (SIPRI), during the period it prepared for the second review conference of the Non-Proliferation Treaty (NPT), reiterated its firm position: the SIPRI has opted in favor of maximum international control to stop the nuclear arms race and also to restrict severely even the spread of peaceful nuclear power. In particular, the SIPRI seeks to curtail the use of fast breeder reactors in order to control the supply of plutonium, the primary source material for nuclear devices.

Still, it would be incorrect to assume that the SIPRI and its distinguished panel of experts are insensitive to the needs of the developing world to obtain adequate sources of energy; rather, an extremely difficult choice has been made in order to further global disarmament and to achieve world peace.

As is true of all who are dedicated to the peaceful uses of nuclear power, the SIPRI is equally sympathetic to the needs of developing
states that view with hostility attempts by the United States to restrict the free flow of nuclear information. Developing countries contend, with considerable justification, that any restriction on the transfer of technology is a violation not only of the new international economic order but also of the "new international law." In fact, the entire field of development law is placed at issue, because the developing countries allege that such controls, as contained in the United States Nuclear Non-Proliferation Act, constitute a type of colonialism designed to hamper their industrial progress.

Not by chance, the SIPRI believes that "it may now be time to reconsider the policy of unilaterally imposed restrictions and to prepare the ground for the negotiation of mutually acceptable restraints between suppliers and recipients of nuclear material and equipment."5

The SIPRI, therefore, seeks possible solutions to the dilemma.6 Prior efforts, such as the International Nuclear Fuel Cycle Evaluation (INFCE), were generally unsuccessful in confronting the dangers posed by nuclear power. But the INFCE Conference in 1977 did create an awareness of the need for "international action to tackle the nuclear proliferation dilemma."7 In line with the position of the SIPRI, the conclusion was: "The time is clearly ripe for concerted steps towards co-operation between suppliers and recipients leading to internationalization of the sensitive parts of the nuclear fuel cycle."8

The two books under review, and earlier publications,9 offer a number of possible solutions, both temporary in nature and piecemeal, as well as all-encompassing plans. Beyond question, the major contribution of the 1980 books (unlike some of the earlier studies that were concerned primarily with the technical and scientific aspects of the nuclear problem) is that a series of concrete solutions, accompanied by precise recommendations, are advanced: bilateral arrangements between participating governments (suppliers and recipients), increased competence by the International Atomic Energy Agency (IAEA), and the use of regional agreements. This latter proposal is supported strongly by the reviewer because considerable progress has been made by European regional institu-

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5 The N.P.T., supra note 2, at 30.
6 Id. at 30-32.
7 Id. at 30-31.
8 Id. at 31.
tions in such areas as economic integration, environmental issues, and the protection of human rights. The success of EURATOM (functioning within the philosophy of the IAEA), including its relations with third states, can be cited as legal precedent for regional and international cooperation. The detailed proposal of SIPRI is set forth in Part One of *Internationalization to Prevent the Spread of Nuclear Weapons.* In the first instance, "internationalization" serves as the ultimate objective. In the opinion of SIPRI, it is the only viable solution to halt the present arms race. In another sense, "internationalization" serves as the umbrella, or the philosophical concept, pursuant to which precise proposals can be contributed. It appears that the SIPRI utilizes "internationalization" in a manner somewhat reminiscent of "social justice," as the concept is codified in the Constitution of the International Labour Organization. Internationalization in the future could be treated as a phase of social justice. That is to say, future consideration of internationalization of the nuclear fuel cycle may provide for the evolution of a fully mature philosophical concept that can aid the cause of disarmament and world peace.

As indicated above, the SIPRI has made the difficult, indeed agonizing choice to restrict the spread of plutonium from which most nuclear devices are manufactured. This stand foresees the restriction (and even the eventual elimination) of fast breeder reactors, which may be necessary for the future of nuclear power due to the fairly limited supply of uranium, a non-renewable resource. However, the position taken is that a double-tier system of control such as that applied by the United States should be followed, whereby materials and even information are withheld from non-nuclear countries. Although this system (originally supported by the Club of London) began to break down when West German firms exported a reactor to Brazil, there still remains considerable support in favor of the two-tier approach, notwithstanding bitter op-

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10 As concerns the issue of the superiority of regional solutions over United Nations programs relative to environmental protection, as a fundamental human right, see W. Gormley, Human Rights and Environment: The Need for International Co-operation (1976).


position from the developing world. The strong criticism that continues of plans to restrict the transfer of technology could prove fatal to attempts to sustain the two-tier system and to internationalize sensitive stages in the fuel cycle, as SIPRI and its panel of experts seek to establish a binding regime of internationalization through an international consensus of states. Essential is a consensus for restricting nuclear energy to peaceful uses. No spin-off of materials would be permitted, and no materials could be diverted to weapons manufacture, provided the international system of controls is sufficiently strong to prevent any clandestine diversions similar to those that have occurred during the past decade. Any system of regional and international regulation of plutonium must be supported by legal, political, and economic sanctions.

Recognized, but not thoroughly discussed, is the growing danger of terrorist intervention. Not only may nuclear facilities be seized, but diverted plutonium, or spent fuel, can be converted into primitive bombs. The possibility of such terrorist use of atomic devices haunts civilized governments. Consequently, adequate safeguards must be provided by the world community.

Fundamental to the arrival at regional, and ultimately international, consensus is the surrender of significant portions of national sovereignty to multinational authorities, as demonstrated by EURATOM and to a lesser degree the IAEA. In addition to inherent opposition raised by the industrialized powers, especially the present nuclear club, newly independent states are jealous of their sovereign rights; furthermore, this assertion of absolute sovereignty is reinforced by the need for additional sources of energy.

It will be difficult, as is evidenced by the results of the second review conference of the NPT, to arrive at the basic consensus between governments, much less a definitive course of action. However, the SIPRI continues to strive in this direction as an essential phase of its efforts to support world-wide disarmament, simply because any treaty commitments must be based upon mutual agreement. Similar consensus lies at the base of any new multinational or international institutions that may be created.

The objective, indeed the absolute necessity, is to include all states within the scope of the NPT and any newly established support structures. Incorporated within this goal is universal member-

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14 Meerburg, A New International Consensus in the Field of Nuclear Energy for Peaceful Purposes, in INTERNATIONALIZATION, id. at 77-81.
ship in the IAEA. As implied above, two courses of action are possible: first, the creation of new institutions, and second, the utilization and expansion of existing organizations. This latter alternative appears to be the most practical: EURATOM and the IAEA can be accorded enlarged jurisdiction. As existing institutions are concerned primarily with the peaceful uses of nuclear power, they will be in a position to facilitate further peaceful applications of nuclear energy and, simultaneously, regulate excess materials that might be used to manufacture weapons.

The specific recommendations discussed in the two books would implement the broader plan (by the creation of an international plutonium storage facility or an international fuel bank) that will support the objectives set forth in articles I and II of the NPT, the programs of the IAEA, the goals of the INFCE, and the experiments of newly created institutions.

The reviewer believes, as does the SIPRI, that An International Fuel Bank, the title of Dr. Siazon's chapter, is a key point in the establishment of any viable scheme of regulation. Indeed, the creation of such fuel banks is an underlying proposal found in the series of books, for the reason that materials can be controlled while simultaneously assuring an adequate supply of materials for peaceful purposes. Included within the scope of a "pool" would be provision for the storage, indeed the safeguard, of spent reactor fuel. The danger of diversion to armaments manufacture by potential military users, including even terrorist groups, must be eliminated if any planned experiment of internationalization is to succeed.

The methods by which these objectives are to be realized are set forth in the chapters devoted to the "institutional contribution" that will attempt to implement the recommendations. Consequently, functioning as the conclusions to the study and to the SIPRI's position, the possible institutional framework is advanced. Dr. B.W. Lee stresses regional planning, a position supported by the reviewer. Henceforth, regional planning could achieve positive results, at least in the immediate future. The desirability of regional planning was recognized at the first NPT review conference in 1975. In this instance, it is proposed that states in close proximity pool their resources. As a result, regional institutions will be substituted for national centers and facilities, until such time as international machinery becomes functional.

In the opinion of this reviewer, the most important chapter in

15 Siazon, An International Fuel Bank, in INTERNATIONALIZATION, id. at 135-41.
the book is: Multinational Arrangements for Enriching and Processing, by I. Smart. Here, the reality of any international control of the nuclear fuel cycle (or in fact of any disarmament plan) becomes apparent. States, particularly nuclear powers, must undertake binding treaty commitments with which all states, including those not members of the United Nations, will comply. When dealing with potential weapons of mass destruction, universal acceptance becomes mandatory. While the economic and social benefits to all participating countries are considerable, such agreements in themselves cannot prevent proliferation.

Obviously, multinational fuel arrangements cannot prevent proliferation, any more than international safeguards can do so, if only because a country determined to produce nuclear explosives, or to keep a weapon option open, will either stand aside or withdraw from them. However, as a complement to safeguards, multinationalization can present an additional deterrent to proliferation, in that a country subscribing to it must expect to incur some political penalty if it violates or renounces multinational obligations in order to obtain nuclear explosives. Smart is forced to concede: “No general solution to the problem of technology transfer under multinational process arrangements is plausible. The issue will have to be negotiated on a case-by-case basis.” All too obviously, excluded governments will believe (or at the very least allege) that they have been the victims of discrimination, even though such grant or denial of technology and materials is determined pursuant to an international convention. Although not discussed in the books, some form of international adjudication, for example non-binding conciliation, arbitration, or judicial settlement, may be required. Realistically, any system of control will result in disputes between states that are parties to multinational conventions. Perhaps the adjudicative machinery accepted by the Third United Nations Conference on the Law of the Sea might suggest possible systems of conflict-resolution that could be duplicated within the scope of the IAEA and a revised NPT.

In seeking international treaty commitments, and even less formal arrangements more in the nature of contracts, elements of flexibility and security are sought, because “security is, in fact, the key to the success of any multinational fuel cycle arrangement

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17 Id. at 188-89.
18 Id. at 193.
But those concerned to develop peaceful uses of nuclear energy will also demand that any multinational agreement should serve security. If this end cannot be achieved, "potential participants in multinational arrangements will instead create that sort of choice by embarking upon enrichment or reprocessing on a national basis." None of us should minimize the significance of this alternative: no provision in the NPT prevents a state from developing its own nuclear capacity for legitimate peaceful purposes, and no restraints can be imposed upon non-adherents to the treaty (e.g. France, China, Israel, and South Africa), as the SIPRI is all too aware.

Lawyers, scientists, political scientists, and decision-makers are aware of the fact that international agreements create binding obligations; however, the enforcement of these commitments too frequently is not forthcoming. Consequently, systems of sanctions drawn from both private and public international law will be required because existing measures at the disposal of the IAEA, EURATOM, or national systems such as the United States Nuclear Energy Agency, are limited. The moral sanction from classical international law will deter those states dedicated to the rule of law. Similarly, violations by peaceful users are more readily subject to eventual compliance, as the mere threat of suspension of necessary supplies, such as nuclear fuel, can remedy the situation. Political pressure from a supplier will have profound effects on recipient states. Yet, as Dr. Szasz observes: "it still remains true that a control system devoid of sanctions is perceived to be incomplete and thus ineffective . . . [for] . . . peoples and governments will be unwilling to entrust their security in this field to a system that appears to be inadequate."

Dr. Szasz suggests the evolution of a control system, in view of the fact that traditional political and economic sanctions are likely to be ineffective against a determined violator. He believes, and correctly so, that measures taken against the offending state's nuclear facilities will, in the immediate instance, prove largely ineffective because such counter measures as stockpiling can anticipate termination of supplies. Therefore, if sanctions are to have the effect of forcing compliance with prior treaties, the interna-
tional fuel cycle at the very least must have been partially internationalized, in order that significant phases of the fuel cycle can be disrupted as a means of sanctioning. For this to occur, the offending state must be dependent upon the regional or international cycle and fuel bank. Obviously, the most serious offense would be the diversion of materials to weapons production. Still there might be clandestine shipments to other non-military users in violation of the original agreement, possibly to achieve a nationally independent nuclear capability or even for use as a shield against future sanctions. This latter danger will be ever-present when states attempt to assert their sovereign authority. Nevertheless, the author maintains that "by internationalizing part of the fuel cycle and expecting or especially requiring states to rely on that part of the cycle, any attempts by the latter to achieve nuclear self-sufficiency would be negated." If such a system exists, the cost of imposing such sanctioning measures will be reduced.

Remaining unresolved is the role to be assumed by sanctioning authorities, acting individually pursuant to their authority, or with the cooperation of member states. Within this context, an additional possibility may be considered. Valuable precedent exists in the sanctioning authority of the supranational European Communities (EC), primarily against non-governmental entities, companies, and private persons. While the sanctioning authority of the Court of Justice and supporting community organs is less effective against member states, compliance has been forthcoming largely due to the moral force of its judgments. Accordingly, an examination of EC enforcement measures, as also contained within EURATOM and the EEC treaties, can support some of the goals sought. Valuable procedures, such as the employment of municipal forums to enforce judgments, might be emulated.

The final chapter, which actually serves as a summary and conclusion to the book, is correlated rather effectively with the SIPRI viewpoint as set forth in Part I of the book. The special contribution of Dr. Larson is that he deals with the potential role of international organizations. Beginning with the need to reestablish the dialogue, and, it is hoped, arriving at a consensus through the INFCE, it is mandatory that political and legal commitments be reached, at least among the leading nuclear states. Any future accomplishment lies in the political realm. "A consensus developed

\[\text{Szasz, Sanctions as an Aspect of International Nuclear Fuel Cycles, in INTERNATIONALIZATION, supra note 11, at 203.}\]
\[\text{Larson, supra note 13.}\]
among the participants that although technological developments may help to achieve non-proliferation objectives, the more promising area for future action lies in the development of institutional arrangements.”24

Rather than propose new institutions, a more conservative recommendation is advanced, based on international cooperation at several levels. At the first stage, harmonization of practices can result from direct cooperation. (This reviewer wonders why the precedent of the Nordic Council has not been cited as a possible example, as for instance the Scandinavian practice of the harmonization of national legislation?) In addition to states, private parties and nongovernmental entities should be included, thereby incorporating private law solutions. National law, regulations, and codes of conduct should be harmonized or even coordinated. Within this approach, “national regulations for storage and transport of spent fuel and for waste management [should] be harmonized with a view to the formulation of internationally agreed codes of conduct.”25 Joint ventures, for example multinational commercial joint ventures, will bring private enterprise within the internationalized structure, as for example, private investment. Basic to such recommendations are the benefits that will accrue to all participants in fuel cycle management and arrangements.

The public law counterpart of such multinational cooperation is the potential role of international organizations, in terms of the goals of participating governments. Realistically, opposition must be surmounted if the IAEA is to be given a greater degree of competence, despite the present political climate within the United Nations. As implied by Dr. Larson, and generally by the SIPRI, broader utilization of the IAEA is the preferred solution, at least for the present. Consequently, the INFCE, the NPT, and the Statute of the IAEA serve as the foundation for a continuing dialogue between states (and nongovernmental entities), a consensus (at regional and international levels), and finally an expanded IAEA. The NPT and the Statute of the IAEA also can serve as the springboard for future activities, which in turn can lead toward new regional and international organizations. As previously indicated in regard to sanctions, EURATOM can serve as the inspiration, and even legal precedent, for other regional groupings.

Regional fuel centers also support the IAEA.26 In particular, both

24 Id. at 208.
25 Id. at 210.
26 The N.P.T., supra note 2, at 31.
books under review stress the absolute necessity of a halt to nuclear testings. Within this context, the creation of nuclear free zones offers the opportunity to safeguard at least some portions of the earth’s environment, as can be seen from existing nuclear free zones in the Indian Ocean area and in North Africa.

The thoughtful recommendations proposed by the SIPRI and the distinguished panel of authors are realistic in terms of the “attainable” in view of the East-West split, the confrontation in the North-South dialogue, and the deterioration of détente between the superpowers. Notwithstanding the fact that new solutions undoubtedly will be forthcoming, the available “possibilities” were prepared for the recently concluded second review conference of the NPT. Although additional refinements can be made by further research, realistic solutions have been offered in light of the contemporary deterioration of international relations coupled with the growing demand for additional sources of energy. These demands for new sources must not be underrated.

If a negative approach were adopted, it would be relatively simple to attack the proposals and recommendations that seek to implement the internationalization of nuclear power, particularly in view of the disappointing results of the 1980 NPT Second Review Conference, the controversy over the pending SALT II agreement, and the impasse at the Madrid Review Conference of the Helsinki Declaration. Beyond question, it will be extremely difficult even to establish negotiations between existing nuclear states; there is little likelihood of military powers reaching a consensus to ban weapons; and the establishment of international machinery more properly should be considered as a longer range objective. The SIPRI and its dedicated participants have recognized and discussed those issues that must be surmounted in order to preserve our planet earth and its peoples. The reality of the present situation is that a significant bloc of states has withheld adherence to the NPT; only limited aspects are covered by the NPT; the existing NPT is too limited in its scope; and a few states can disrupt and even destroy any international order. Israel, South Africa, and Pakistan pose special threats. Also, France and the People’s Republic of China have opted to retain their complete freedom of action as an expression of their national sovereignty. Even the Brazilian policies have caused considerable concern.

The SIPRI is fully aware of these problems, which have been

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examined in a scholarly and objective manner. As indicated earlier in this review, the books render a permanent contribution to literature. Despite the disappointing results of the 1980 NPT Second Review Conference, these books have not become obsolete; they will be consulted for the remainder of this century, because the SIPRI has offered a realistic plan for internationalization that can serve as a basis for further study and research.

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