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Safeguards Against Proliferation of Nuclear Materials

A Review and Bibliography

E. D. Blakeman

Prepared for the U. S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Under Interagency Agreements DOE 40-551-75 and 40-552-75

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SAFEGUARDS AGAINST PROLIFERATION OF NUCLEAR MATERIALS
A REVIEW AND BIBLIOGRAPHY

E. D. Blakeman
Engineering Technology Division

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FOREWORD

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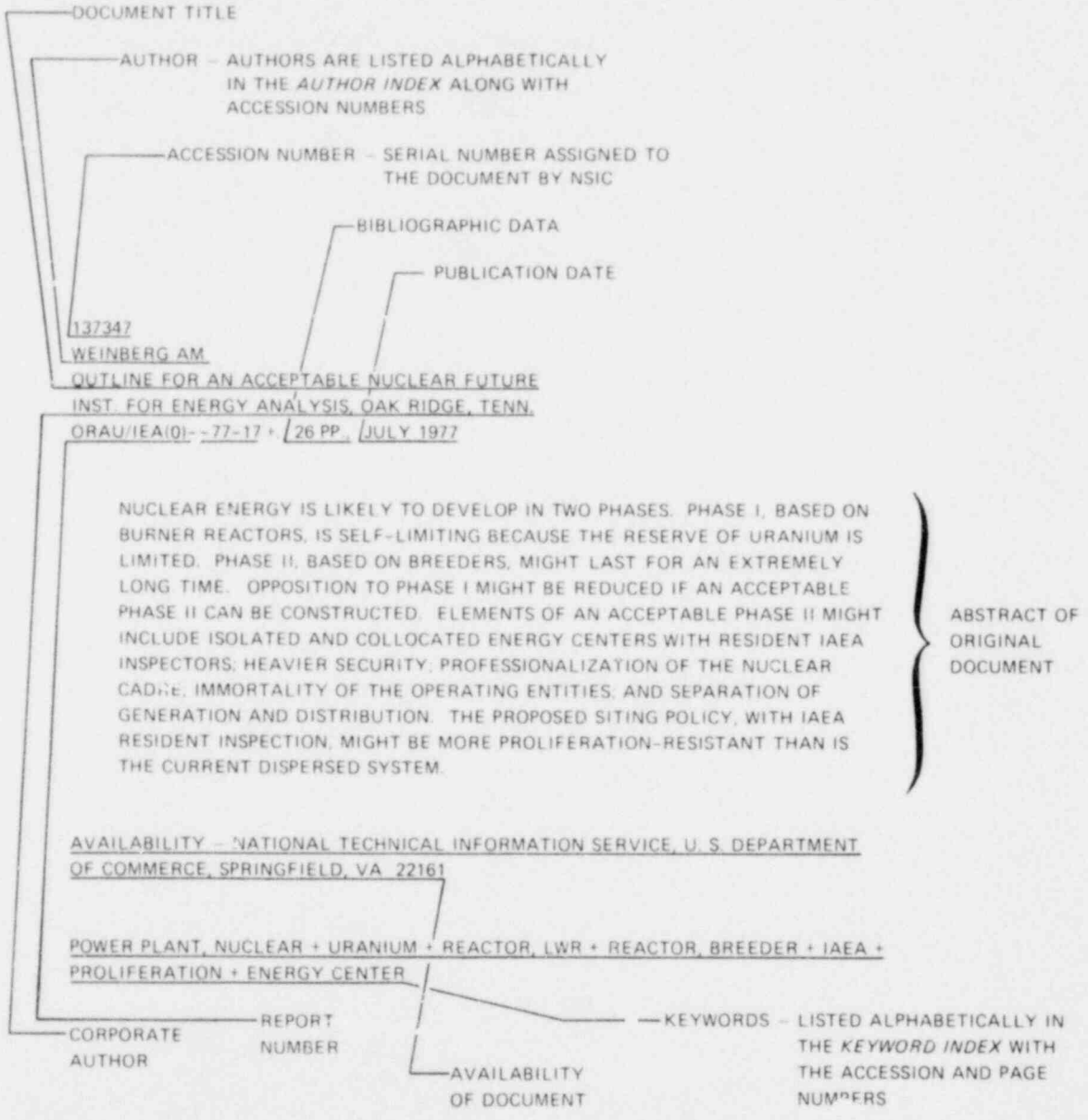

SAFEGUARDS AGAINST PROLIFERATION OF NUCLEAR MATERIALS
A REVIEW AND BIBLIOGRAPHY

E. D. Blakeman

ABSTRACT

The current status of nuclear safeguards is presented in this report. The text reviews domestic and international safeguards, and nuclear proliferation issues and policies. The bibliography contains 349 abstracts of publications covering a wide range of nuclear safeguards topics. Keyword, author, and permuted-title indexes are included for the readers' convenience.

INTRODUCTION

Nuclear safeguards can be defined as those measures employed to deter, prevent, or respond to (1) the unauthorized possession or use of significant quantities of nuclear materials through theft or diversion, (2) the sabotage of nuclear materials through theft or diversion, and (3) the sabotage of nuclear facilities by individuals, groups, or nations. Because of the rapidly increasing use of nuclear energy for peaceful purposes and the potentially devastating effects should nuclear materials fall into the hands of malevolent individuals or nations, the safeguarding of nuclear materials has inevitably become a worldwide concern.

As a result of this intensified concern for safeguarding nuclear materials and facilities, the rate of publication of reports dealing with safeguards and related topics has been steadily increasing. Since this trend has resulted in a large number of publications, the Nuclear Safety Information Center recently created an additional category (category 22) exclusively for documents related to safeguards. This bibliography lists the reports, papers, books, and other publications which were indexed to this new category.

Also provided herein is an overview of relevant safeguards concerns, including definitions, policies, issues, regulations, and concepts of safeguards systems. The reader who is already acquainted with safeguards topics may perhaps omit reading the text and make use of the bibliography

only. However, those unfamiliar with nuclear safeguards will hopefully find the text an interesting and beneficial introduction to safeguards and the references appropriate guides to further reading and understanding.

Nuclear safeguards can be divided into two general categories: (1) domestic safeguards and (2) international safeguards. Domestic safeguards are concerned with threats from subnational individuals or groups. "Subnational" in this context refers to persons or organizations acting out of self-interest and not under governmental guidance or direction. International safeguards, on the other hand, are primarily concerned with threats from national groups; for example, a government may attempt to covertly divert nuclear material from its own nuclear fuel facilities for purposes of constructing nuclear weapons.

The remainder of this report is divided into four main sections. The first two sections discuss the two main branches of nuclear safeguards — domestic safeguards and international safeguards; they are discussed separately and also in the context of how they relate to each other. The next section provides guidance on how to use the bibliography and discusses the categories into which the publications are grouped. The final section of the report is the bibliography itself. Keyword, author, and permuted-title indexes are appended to the report as a convenience to the reader.

DOMESTIC NUCLEAR SAFEGUARDS

Domestic nuclear safeguards systems (i.e., the prevention of subnational, or domestic, threats) may involve systems which are applicable on the international level also, but which have some differences in application because of the different nature of the threat. Domestic nuclear safeguards systems can, in general, be further subdivided into two categories: (1) physical protection systems and (2) material control and accounting systems. These categories are not entirely distinct; elements of a physical protection system may be included in a material control and accounting system and vice versa.

Physical Protection Systems

A physical protection system comprises those elements necessary to control, deter, or prevent personnel access to nuclear material, and to detect and communicate any unauthorized material access. A physical protection system may include physical barriers, intrusion alarm systems, access controls, containment mechanisms, internal surveillance systems, active delay and detection devices, security and response forces, and on-site and off-site communications systems.

A viable method for developing a conceptual physical protection system for a nuclear facility is to utilize a three-step approach:[1] (1) facility characterization, (2) development and evaluation of hardware-based safeguards system configurations, and (3) hardware and response force trade-off analysis.

In the first step, the facility is characterized by assembling all the relevant information needed to perform the physical protection system design and evaluation. The information required includes the performance requirements of the overall physical protection system, the range of threat attributes to be considered in the design, and the descriptions of facility buildings, processes, and systems. The range of threat attributes are determined by the spectrum of adversary attributes that should be included in the analysis. Such attributes include: (1) plant access — outsider, insider (employee), or outsider and insider in collusion, (2) number of adversaries; (3) mode of transportation; (4) weapons used; (5) explosives used; (6) other special equipment used; (7) technical and military skills; (8) knowledge of plant operations and layout; (9) knowledge of safeguards systems; and (10) dedication.

The description of the facility, processes, and systems includes (1) the site boundary, (2) access points, (3) building locations, (4) plan and elevation views of all significant buildings, (5) identification and classification of all doors, gates, hatches, vents, and other openings in structural surfaces, and (6) details of construction of all fixed barriers and controlled openings.

All the factors listed above are utilized in the first step (facility characterization). Analyses of theft, diversion, and sabotage

targets would be performed in this step. In this manner, the locations and characteristics of all potential targets in the facility are systematically identified, and all combinations of events that could lead to the loss of special nuclear material (SNM) or facility sabotage are determined.

In the second step, hardware-based safeguards system configurations and the components of the physical protection system for the detection and delay of adversaries are developed and evaluated. This hardware-based system includes barriers, detectors, associated computers, facility guards, and other components that provide for the detection and delay of adversaries. Adversary-path analysis is used to evaluate the effectiveness of these components for the different safeguards concerns identified in step 1. For each safeguards concern, several design alternatives may be developed, utilizing combinations of safeguards hardware components in order to meet minimum performance requirements.

In the third step, hardware and response force trade-off analysis and guard response options are combined with the hardware-based configurations from step 2. These options consider a number of attributes, including number of guards and armament levels. In this step, complete physical protection system conceptual designs are produced. These designs can be compared and the most economical design selected for further development.

The foregoing approach to physical protection system development and assessment represents a logical, utilitarian approach that is made possible and practical only by the use of modern computers which permit the rapid processing of tremendous amounts of data. Two such codes developed at Sandia Laboratory for evaluating the effectiveness of physical protection systems are the Forcible Entry Safeguards Effectiveness Model (FESEM)[2-4] and the Insider Safeguards Effectiveness Model (ISEM).[5,6]

For the purpose of this report it is important to outline such an approach to impress upon the reader that the development of a physical protection system in a nuclear facility requires much more than the development of the hardware components listed in the opening paragraph. Although some of the documents listed in this bibliography discuss

hardware development, a large number discuss analytical concepts such as adversary-path analysis, and the use of codes such as FESEM and ISEM described above.

Material Accounting and Control

Whereas a physical protection system serves to limit the access of personnel to certain materials, a safeguards material accounting and control system serves to monitor or control the location of the material. Although such a statement is an oversimplification and there is some overlap between physical protection and material accounting and control systems, it nevertheless describes a fundamental difference between the two approaches.

The remarks in this section are directed primarily toward material accountability and control at nuclear enrichment, fabrication, or reprocessing facilities. Accounting for nuclear fuel at commercial nuclear power plants, although equally important, is less difficult to do because of the way the fuel enters and leaves the plant; accountability is simply an item check of each fuel assembly.

A material accounting and control system can be defined by the following definitions for material control and material accounting:[7]

- Material control is that part of a safeguards program encompassing management and process controls to (1) assign and exercise responsibility for nuclear material, (2) maintain vigilance over the material, (3) govern its internal movement, location, and utilization, and (4) monitor the inventory and process status of all nuclear material.

- Material accountability is that part of the safeguards program encompassing the procedures and systems to (1) perform nuclear material measurements, (2) maintain records, (3) provide reports, and (4) perform data analysis to account for nuclear material.

The terms "accountability" and "accounting" are used interchangeably.

The above definitions define two separate safeguards methods — material control and material accounting. In practice and in safeguards

literature, the two methods are not entirely distinguishable and are therefore often referred to as one system — material control and accountability. In general, a material control system is responsible for the "real-time" management of nuclear material. "Real-time" in this context refers to detection and response within a short time interval (i.e., seconds to hours). The goal of a real-time system is to discover an SNM diversion attempt within as short a period as possible and apprehend the diverter before he/she has had an opportunity to leave the facility.

A material accounting system provides long-term assessment of nuclear material status by the performance and analysis of material balances. Over a prescribed time interval, a material balance is performed by subtracting the ending inventory (EI) and removals (R) from the beginning inventory (BI) plus additions to inventory (A). The result of this calculation is called the "material unaccounted for" (MUF) and is expressed mathematically as follows:

$$MUF = BI + A - EI - R.$$

Ideally, a perfect material balance in which no assessment errors occur, should result in an MUF value of zero. In practice, however, because of measurement errors, MUF is never zero. Therefore, an MUF value greater than zero must be allowed, but not a value so great that it masks a sizable diversion of SNM. The *Code of Federal Regulations*, Title 10, Part 70 (10 CFR 70)[8] specifies an allowable maximum limit of error of the material unaccounted for (LEMUF) of 0.5 to 1.0% of the plant's SNM throughput over the material balance period. LEMUF can be defined as a statistical limit such that there is 95% confidence that an MUF value will be below that limit after any recognized bias has been eliminated or its effect accounted for. These regulations apply to facilities processing as much as 1 effective kilogram of SNM. It further requires that material balances be performed over a 2- to 6-month interval.

Although 10 CFR 70 provides regulations for material accounting and control, no quantitative criteria are presented for material control performance. A Nuclear Regulatory Commission task force,[7] however, has issued a series of guidelines which prescribe the combined goals

that should be met by a material control and material accounting system. These guidelines state that a material control system (in conjunction with the accounting system) should have as a design goal the capability to detect the loss of 5 formula kilograms of SNM (2 kg of ^{233}U or Pu; 5 kg ^{235}U) with greater than 90% assurance (1) in the form of items or sealed containers, accessible to theft, during any single shift (2) from any controllable unit of a facility within any 24-hr period; (3) in a single loss or a combination of small losses from any controllable unit of a facility within the interval between physical inventories; (4) from an entire facility or from smaller accounting units comprising the entire facility on the basis of a periodic measured physical inventory; (5) from any single shipment; and (6) from any combination of shipments over any period of 12 consecutive months.

Real-Time Material Accounting

The basis for upgrading material control and accounting criteria, as described in the previous section, is the concern that an accounting system alone, based on 10 CFR 70 requirements, does not provide adequate assurance that material diversion will be detected. This is so because such a system, in which MUF and LEMUF values are calculated on a 2- to 6-month basis, allows too long a time interval between material balance determinations. Conceivably, a material diversion could occur immediately after a material balance and not be detected until 2 to 6 months later. The long period between balance periods has been necessary because material inventories are performed best after the plant has been shut down and the system drained or cleaned out.

Another problem is that the statistical evaluations (MUF-LEMUF) determined over a long-term material balance may be insufficient for the detection of small SNM diversions within a single material balance period. Material flows into and out of the process are measured, and most of the process is regarded as one large material balance area (MBA). If the plant inventory is large, the statistical inventory estimates may have large errors which may completely mask diversion of significant but relatively small quantities of SNM (e.g., $\leq$1 kg).

One approach to material accounting that may remedy the above problems is to perform material balances over an extremely short time interval (e.g., 1 day) and to divide the process into a number of material balance areas. Such an approach is referred to as real-time material accounting. When material balances are performed over a shorter time interval, less statistical error results from material throughput measurements. When the process is divided into a number of smaller MBAs, less inventory is present in each MBA, thereby reducing the potential for inventory measurement error in the material balances for each MBA.

In practice, such a system, by providing material accounting data on a real-time basis, would serve as both a material accounting and as a material control system. Although real-time systems seem promising, several problems must be overcome before applying real time principles to a large-scale facility such as a reprocessing or fabrication facility. One major problem is that of performing plant inventory measurements while the plant is in operation rather than shutting the plant down and draining equipment into easily measured vessels. Another problem is assembling the large amount of computer hardware and software required to perform the required calculation. A third problem is that of logically breaking up a plant into multiple material balance areas. All of these problems are being addressed in current safeguards documents.

Two real-time accounting systems that are under development and are currently receiving much attention are: (1) Dynamic Material Control (DYMAC)[9,10] developed at Los Alamos Scientific Laboratory and (2) the Controllable Unit Approach (CUA)[11] developed at Mound Laboratory. These systems will not be discussed here, since they are presented in detail in the referenced documents.

Material Control Systems

Safeguards systems other than real-time accounting are under consideration for use in nuclear facilities for monitoring the presence and movement of special nuclear material. One material control concept that is receiving support for development is referred to as "penetration monitoring" or "containment surveillance." By this approach, all penetrations leading into a compartment containing SNM are passively monitored

for the presence of material. These penetrations may include normal material flow lines along with steam lines, air lines, and other lines through which material would not normally flow. By carefully monitoring these lines on a go/no-go alarm basis, one can determine whether or not SNM has been removed from an unauthorized line.

Another material control concept is called "process monitoring." By this method, flows into and out of process equipment, process equipment levels, and other process data are monitored continually for data mismatches. Such a mismatch — for example, a decreasing tank level with no measurable output flow — could be indicative of a material diversion taking place.

Systems such as penetration monitoring and process monitoring are currently in the rudimentary stages of development and application to nuclear facilities. Material control systems such as these offer the advantage of extremely rapid detection of SNM anomalies. Undoubtedly, extensive analyses of such systems will appear in future safeguards documents.

The challenge of accurately accounting for nuclear material has additionally provided an area for the application of a number of advanced theoretical techniques such as Kalman filtering,[12] game theory,[13] and temporal response methodology.[14] The application of such techniques may provide a better evaluation of material accounting measurements and improve the likelihood of meeting stringent accounting requirements. Several articles dealing with such topics are included in this bibliography.

INTERNATIONAL SAFEGUARDS

The safeguarding of nuclear materials on the international level is controlled by the International Atomic Energy Agency (IAEA) under the provisions of the Treaty on the Nonproliferation of Nuclear Weapons (NPT) (see the following section). Although many countries have not accepted the NPT, bilateral agreements between supplier and user countries in general also require IAEA safeguards. Parallel to that of domestic safeguards, the objective of international safeguards is to

provide for "the timely detection of the diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection."[15] The IAEA relies upon material accounting and physical protection systems[16] such as were described in the previous section for domestic safeguards to attain their stated objective. In addition, the IAEA has stated that the use of material accountancy shall be the safeguards measure of fundamental importance, with containment and surveillance as important complementary measures.[17] These systems are cooperatively implemented by each nuclear state under treaty agreement, but are subject to independent verification by the IAEA. For SNM accounting and control, IAEA safeguards can be summarized in four steps:[18]

1. Design Review: The nation must supply the IAEA with information on relevant design characteristics of its existing nuclear plants and of plants in the planning stage.
2. Records: The nuclear plant operator must keep a precise account of all nuclear material he receives, sends out, etc., based on exact measurements of the material.
3. Reports: On the basis of information given by the plant operator, the national authority sends the IAEA regular reports on the amount of nuclear material in each plant and of all changes in these amounts so that the IAEA can keep its own accounts for verification and comparison purposes.
4. Inspections: IAEA inspectors perform independent measurements and observations for verifying the information submitted by the country concerned. All inspectors must be approved by the IAEA's Board of Governors (34 member states) and designated with the consent of the country concerned.

It is obvious that the safeguarding of nuclear material on the international level is a more complicated venture than guarding against diversion or sabotage on a subnational level. Similarly, the objectives of international safeguards are somewhat different. The detection of the loss of a few kilograms of nuclear material on a real-time basis is of lesser importance; emphasis is placed on the detection of larger

losses of material over longer periods of time. The focus tends to be on national rather than subnational threats.

The degree of cooperation between nuclear countries will strongly influence the effectiveness of international safeguards. Clearly, the IAEA can only detect violations in cooperative countries where it is authorized to operate. For this reason, the concept of "nuclear proliferation" plays an important role in international safeguards and will be discussed in the ensuing sections. The following section briefly discusses the provisions of the Treaty on the Nonproliferation of Nuclear Weapons (NPT). The final section discusses U.S. policies towards nonproliferation.

Historical Perspective on Proliferation (The NPT)

Since the early days of nuclear energy development, there has been a widespread concern over the potentially drastic consequences of widespread proliferation of nuclear weapons technology. Although it has been generally assumed that all nations should be entitled to enjoy the peaceful benefits of nuclear power, the prospect of nuclear weapons in the hands of a large number of nations seems frightening to most people. How then can the situation be resolved such that a nation may use nuclear energy for peaceful purposes but forego nuclear weapon capabilities?

Such concerns as the above eventually led to an international treaty for control of the spread of nuclear materials. This treaty, the Treaty on the Nonproliferation of Nuclear Weapons (NPT), was drafted in 1968 by the Eighteen Nations' Disarmament Committee and implemented in March 1970. It is essentially an international, multilateral treaty designed to restrict the ownership of nuclear weapons to the existing weapons states.[18]

The following brief synopsis of the provisions of the NPT is taken from Ref. 19:

> "The main provisions of the Treaty are contained in Articles I, II and III. In Article I the nuclear-weapon States undertake not to transfer nuclear weapons or other nuclear explosive devices or control over them to anyone whatsoever. The nuclear-weapon States also undertake not to help any non-nuclear-weapon State to acquire nuclear

explosive capacity in any way. Article II contains the reciprocal undertaking by non-nuclear-weapon States neither to acquire these weapons or devices nor even to seek or receive assistance to this effect.

"The verification of these obligations is ensured by the application of international safeguards through agreements to be concluded with the International Atomic Energy Agency (IAEA) (Article III). The rights of non-nuclear-weapons States to undertake research, production and exploitation of nuclear energy for peaceful purposes and to receive due assistance are reaffirmed (Article IV). Article V is designed to ensure that the benefits of peaceful nuclear explosions should be made available to all Parties in accordance with appropriate arrangements. Article VI contains the undertaking that the nuclear-weapon States will pursue further negotiations on disarmament in good faith.

"The right to conclude regional treaties to ensure the total absence of nuclear weapons is also reaffirmed in Article VII, and in Article VIII a review of the operation of the Treaty is foreseen five years after its coming into force."

Nonproliferation Policies

The present Administration's nuclear nonproliferation policies can be summarized as follows:[20]

1. Defer indefinitely U.S. commercial reprocessing and recycling of plutonium.
2. Restructure the U.S. breeder program to give greater priority to alternatives to the plutonium breeder and to defer the introduction date of a commercial breeder.
3. Redirect the U.S. nuclear research and development program to accelerate research into alternate fuel cycles not involving direct access to materials useful for weapons production.
4. Increase U.S. enrichment capacity so that the United States can be a reliable supplier for both domestic and foreign needs.
5. Propose necessary legislative steps to permit the United States to sign firm supply contracts with other nations.
6. Continue to embargo the export of equipment or technologies which are needed for enrichment or chemical reprocessing.

7. Continue discussions with supplier and recipient countries on a wide range of international approaches and frameworks which permit all countries to achieve their own energy needs while at the same time reducing the spread of nuclear weapons capability.

As dictated by the above policies, the Department of Energy established the Nonproliferation Alternative Systems Assessment Program (NASAP) to investigate alternative fuel cycles which could supply adequate amounts of energy. Suggested fuel cycle alternatives, taken largely from Ref. 20, are summarized below:

1. Once-Through Fuel Cycles. In this concept, the spent fuel is not reprocessed but is simply disposed of as "waste." In addition to losing the energy content of the uranium and plutonium contained in the spent fuel, the amount of long-lived plutonium that must be disposed of as waste is increased by about an order of magnitude. A number of potential improvements for current light-water reactors (LWRs) could be developed and implemented; these improvements would permit increased utilization of U_3O_8 for the current once-through fuel cycle.

2. Other Reactor Types. Several other reactor types would give some improvement in resource utilization over the LWR when operated on a once-through cycle.

3. Partial Recycling. It is possible to modify the reprocessing stream so that uranium is separated from the wastes but plutonium is not, thereby improving resource utilization relative to the current once-through cycle for LWRs and other reactor concepts.

4. Tandem Fuel Cycles. In this concept, two classes of reactors are used: LWRs and a second reactor type that can use fuel having a lower residual fissile content, as do the Canadian deuterium-uranium (CANDU) systems. Spent fuel from the LWRs would then still be usable in the second class of reactors for additional energy generation, with up to 30% improvement in overall resource utilization.

5. Coprocessing. In this approach, plutonium is never cleanly separated from other materials. Instead, it is kept mixed with a relatively large amount of uranium. Obtaining weapons-usable materials under these conditions requires the diversion of larger quantities of

material and subsequent chemical separation. This safeguard can be further strengthened by incomplete separation of intensely radioactive fission products, as is done in spiking.

6. Spiking. Here, the separation of fission products is deliberately made sufficiently inefficient so that a high level of gamma activity remains, or other gamma emitters might be added in substantial quantities. Weapons-usable materials in the fuel cycle would then be somewhat self-protecting even before reactor irradiation, much as spent fuel is.

7. Denaturing. Fissile material can be rendered unsuitable for weapons by diluting it with sufficient quantities of a nonfissile material such that the mixture is not explosive. The denaturant must be very difficult to separate from the fissile material, and currently only a nonfissile isotope of the same element is judged to be adequate. No suitable denaturant is available for fissile plutonium, but ^{233}U produced in thorium cycles may be denatured by dilution with ^{238}U or natural uranium.

8. Molten Salt Reactors (MSRs). In this reactor concept, fissile uranium and fertile thorium fluorides are dissolved in a molten BeF_2-Li^7F mixture. An on-line reprocessing system is an integral part of the reactor plant and is enclosed within the reactor biological shield. Although fissile material is separated from fission products at some points, it could be made relatively inaccessible.

9. Nuclear Energy Centers. A widely discussed concept has been the restriction of weapons-usable materials or materials from which weapons-usable fissile material could be chemically separated to high-security nuclear energy centers. Only those materials from which it is more difficult to separate weapons-usable fissile material (such as natural or low-enrichment uranium, denatured ^{233}U-thorium, and spent fuels) would be permitted outside the energy centers. The technologies capable of such separations would be restricted to the energy centers. In many versions, control of the energy centers would be international.

From the preceding remarks it is clear that the current trend in U.S. nuclear policy is to defer reprocessing indefinitely to investigate a wide range of alternatives to the plutonium breeder. In addition

to promoting nuclear safeguards and nonproliferation, it can be argued that deferral of reprocessing has additional advantages, that is, that reprocessing is currently uneconomical, that the spent fuel can be recycled later so that no resources are lost, and that time is gained to strengthen institutions for safeguards and control. However, to some critics, such a policy is considered unsatisfactory from the standpoint of proliferation and safeguards as well as from an economic and diplomatic standpoint. As one such critic[21] states: "The U.S. would in effect be saying to non-weapons countries, including all those aspiring to a higher standard of living through more abundant energy, 'We and the other great nuclear powers already have our weapons, but to prevent the danger of further spread of nuclear weapons we ask you to follow us in giving up the most economic use of civilian nuclear power.'" This critic goes on to state that "denying a government access to civilian reprocessing does not erect a significant obstacle or delay in implementing a decision to produce weapons. Spent fuel from research or power reactors can be reprocessed rapidly and with relative ease — and especially if it is done without the various commercial and legal constraints that apply to civilian reprocessing plants....[I]nhibiting the effective use of civilian nuclear energy supply in countries that have limited energy options open to them can result in enhancement of the propensity for international conflict."

In light of arguments such as the above, it becomes clear that there is no simple solution to preventing the proliferation of nuclear materials and safeguarding such materials on the international level. Any nonproliferation measure must be considered with respect to economic feasibility and worldwide diplomatic effects. Clearly, the success of future U.S. nuclear policies and their influence on the remainder of the world will depend on the outcome and the intelligent application of the alternative fuel cycle analyses described herein.

ORGANIZATION OF BIBLIOGRAPHY

This bibliography lists a total of 349 documents selected from documents published after 1974. The documents are grouped in five sections, which are described below:

Section 1. Nuclear Policies and Regulations

This section contains a potpourri of document types dealing with (1) nuclear policy, (2) NRC rules and regulations, (3) legal proceedings, (4) historical perspectives, (5) controversial or speculative issues, and (6) general opinions. These documents are primarily of a nontechnical nature and the bulk of them deal with the problems and policies of international safeguards.

Section 2. Alternate Fuel Cycles and Energy Centers

This section contains primarily technical documents dealing with studies concerning proliferation-resistant fuel cycles and the location of nuclear facilities in internationally controlled energy centers.

Section 3. Material Control and Accounting

This section contains documents dealing with (1) material control and accounting strategies, (2) data analysis and advanced statistical techniques, and (3) measurement techniques and measurement standards.

Section 4. Physical Protection

This section contains documents dealing with (1) physical protection system strategies, (2) analytical analyses of physical protection systems, (3) physical protection system instrumentation, (4) guard forces, and (5) SNM security.

Section 5. General

This section contains documents which for one or more reasons do not fit in one of the preceding four sections. It contains primarily technical documents that deal with several safeguards topics. For

example, a quarterly summary of work performed in both physical protection and material control and accounting would be placed in this section

REFERENCES

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2. L. D. Chapman, *Effectiveness Evaluation of Alternative Fixed-Site Safeguards Security Systems*, SAND76-6159 (April 1977).

3. L. D. Chapman, G. A. Kinemond, and D. W. Sasser, *User's Guide for Evaluating Fixed-Site Physical Protection Systems Using FESEM*, SAND77-1367 (November 1977).

4. L. D. Chapman, *Fixed-Site Physical Protection System Modeling*, SAND75-6061 (December 1975).

5. D. D. Boozer and D. Engi, *Simulation of Personnel Control Systems Using the Insider Safeguards Effectiveness Model (ISEM)*, SAND76-0682 (April 1977).

6. D. D. Boozer and D. Engi, *Insider Safeguards Effectiveness Model (ISEM) User's Guide*, SAND77-0043 (November 1977).

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8. *Code of Federal Regulations*, Title 10, Energy, Part 70, Special Nuclear Material, Rev. June 7, 1977.

9. G. R. Keepin and W. J. Maraman, "Nondestructive Assay Techniques and In-Plant Dynamic Materials Control – DYMAC," pp. 305–24 in *Proceedings of the IAEA Symposium on Safeguarding Nuclear Materials, Vienna, Austria, October 20–24, 1975*, IAEA-SM-201/32, Vol. 1, International Atomic Energy Commission, Vienna, Austria, 1976.

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11. P. W. Seabaugh et al., *Application of Controllable Unit Methodology to a Realistic Model of a High-Throughout, Mixed-Oxide Fabrication Process*, MLM-MU-77-68-0001 (draft report) (Aug. 19, 1977).

12. D. H. Pike, G. W. Morrison, and G. W. Westley, *Application of Kalman Filtering to Nuclear Material Control*, ORNL/NUREG/CSD-1 (1977).

13. H. Frick, *Game Theoretical Treatment of Material Accountability Problems*, KFK-2564 (December 1977).

14. S. M. Ziri and W. B. Seefeldt, *Temporal Response Methods for Dynamic Measurement of In-Process Inventory of Dissolved Nuclear Materials*, NUREG-0249 (1977).

15. Sigard Eklund, "Aspects of International Safeguards of Nuclear Materials," *IAEA Bulletin* 17(6): 2–6 (December 1975).

16. Wojciech Moramiecki, "IAEA's Approaches to Physical Protection of Nuclear Materials," *IAEA Bulletin* 18(1): 25–28 (February 1976).

17. *Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Nonproliferation of Nuclear Weapons*, INFCRC/153, International Atomic Energy Agency, Vienna, Austria (June 1972).

18. *International Nuclear Safeguards* (pamphlet), International Atomic Energy Agency, Vienna, Austria, 1976.

19. *A Short History of Non-Proliferation*, International Atomic Energy Agency, Vienna, Austria (February 1976).

20. D. C. Williams and B. Rosenstroch, *A Review of Nuclear Fuel Cycle Alternatives Including Certain Features Pertaining to Weapon Proliferation*, SAND77-1727 (January 1978).

21. C. Starr, "Nuclear Power and Weapons Proliferation — The Thin Link," *Nucl. News* 20(8): 54–57 (June 1977).

BIBLIOGRAPHY

SECTION I: NUCLEAR POLICIES AND REGULATIONS

139536
IAEA FRENCH SIGN AGREEMENT
I PU. NUCLEAR NEWS, 21(11), PG. 82 (SEPT. 1978)

THE AGREEMENT BETWEEN FRANCE AND THE INTERNATIONAL ATOMIC ENERGY AGENCY, COVERING THE APPLICATION OF INTERNATIONAL SAFEGUARDS IN FRANCE, WAS SIGNED IN VIENNA ON JULY 27. THE FRENCH ENTERED INTO NEGOTIATION OF THE AGREEMENT LAST YEAR WHEN IT BECAME CLEAR THAT IAEA SAFEGUARDS WOULD BE A PRECONDITION FOR URANIUM AND ENRICHMENT SERVICES SUPPLIED BY COUNTRIES SUCH AS AUSTRALIA CANADA AND THE UNITED STATES. AN AGREEMENT WITH THE UNITED STATES WAS APPROVED IN SEPTEMBER 1976, WHILE THE U.K. AGREEMENT WAS SIGNED LAST YEAR AND CAME INTO FORCE ON AUGUST 14 THIS YEAR. IN EFFECT, ALL THREE COUNTRIES HAVE VOLUNTARILY AGREED TO PLACE CIVIL NUCLEAR FACILITIES AND MATERIALS UNDER IAEA SAFEGUARDS.

*IAEA + SAFEGUARDS, NUCLEAR MATERIAL + FRANCE + FUEL, NUCLEAR + UNITED STATES + UNITED KINGDOM

139543
REGULATORY GUIDE 5.56 - STANDARD FORMAT AND CONTENT OF SAFEGUARDS CONTINGENCY PLANS FOR TRANSPORTATION
U.S. NUCLEAR REGULATORY COMMISSION
NRC REG/GUIDE 5.56 +. 90 PPS. MARCH 1978

A STANDARD FORMAT FOR A SAFEGUARDS CONTINGENCY PLAN IS PROPOSED AND AN EXAMPLE GIVEN. THE FORMAT APPLIES TO TRANSPORTATION OF SNM SUBJECT TO REQUIREMENTS OF 10CFR73.30 THROUGH 73.36. TOPICS ADDRESSED IN THE FORMAT ARE: (1) BACKGROUND, (2) GENERIC PLANNING BASE, (3) LICENSEE PLANNING BASE, (4) RESPONSIBILITY MATRIX, AND (5) PROCEDURES SUMMARY.

AVAILABILITY - NRC, OFFICE OF STANDARDS DEVELOPMENT, WASHINGTON, D.C. 20555

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *REGULATION, NRC + *TRANSPORTATION AND HANDLING

139542
REGULATORY GUIDE 5.55 - STANDARD FORMAT AND CONTENT OF SAFEGUARDS CONTINGENCY PLANS FOR FUEL CYCLE FACILITIES
U.S. NUCLEAR REGULATORY COMMISSION
NRC REG/GUIDE 5.55 +. 121 PPS. MARCH 1978

A STANDARD FORMAT FOR A SAFEGUARDS CONTINGENCY PLAN IS PROPOSED AND AN EXAMPLE PRESENTED. THE FORMAT APPLIES TO FUEL CYCLE LICENSEES WHO ARE SUBJECT TO 10CFR73.50 AND 73.60. TOPICS ADDRESSED IN THE FORMAT ARE: (1) BACKGROUND, (2) GENERIC PLANNING BASE, (3) LICENSEE PLANNING BASE, (4) RESPONSIBILITY MATRIX, AND (5) PROCEDURES SUMMARY.

AVAILABILITY - NRC, OFFICE OF STANDARDS DEVELOPMENT, WASHINGTON, D.C. 20555

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *REGULATION, NRC + *FUEL CYCLE

139541
REGULATORY GUIDE 5.54 - STANDARD FORMAT AND CONTENT OF SAFEGUARDS CONTINGENCY PLANS FOR NUCLEAR POWER PLANTS
U.S. NUCLEAR REGULATORY COMMISSION
NRC REG/GUIDE 5.54 +. 64 PPS. MARCH 1978

A STANDARD FORMAT FOR A SAFEGUARDS CONTINGENCY PLAN IS PROPOSED AND AN EXAMPLE PRESENTED. THE FORMAT APPLIES TO NUCLEAR POWER PLANTS AND RESEARCH AND TEST REACTORS SUBJECT TO REQUIREMENTS OF 10CFR73.50, 73.55, AND/OR 73.60. TOPICS ADDRESSED IN THE FORMAT ARE: (1) BACKGROUND, (2) GENERIC PLANNING BASE, (3) LICENSEE PLANNING BASE, (4) RESPONSIBILITY MATRIX, AND (5) PROCEDURES SUMMARY.

AVAILABILITY - NRC, OFFICE OF STANDARDS DEVELOPMENT, WASHINGTON, D.C. 20555

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *REGULATION, NRC + *POWER PLANT, NUCLEAR

139539
AN EVALUATION OF THE ADMINISTRATION'S PROPOSED NUCLEAR NON-PROLIFERATION STRATEGY
U.S. GENERAL ACCOUNTING OFFICE
PB-272,399 + ID-77-53 +. 70 PPS. OCT. 1977

THIS REPORT PRESENTS THE GENERAL ACCOUNTING OFFICE'S EVALUATION OF THE PROPOSED STRATEGY TO CURB NUCLEAR PROLIFERATION. GAO ANALYZED THIS STRATEGY AS IT RELATES TO: IMPROVING NUCLEAR EXPORT CONTROLS; STRENGTHENING INTERNATIONAL NUCLEAR SAFEGUARDS; MAINTAINING U.S. RELIABILITY AS A SUPPLIER OF URANIUM ENRICHMENT SERVICES; DEFERRING U.S. REPROCESSING OF SPENT FUEL AS AN EXAMPLE FOR OTHERS; AND REDUCING RISK OF PROLIFERATION BY CONTROLLING SPENT REACTOR FUEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *PROLIFERATION + *FUEL REPROCESSING + *SPENT FUEL + *ENERGY POLICY + REVIEW

139529

139329 *CONTINUED*
NUCLEAR POWER AND NUCLEAR WEAPONS PROLIFERATION REPORT OF THE ATLANTIC COUNCIL'S FUELS POLICY WORKING GROUP
143 PPS. PUBLISHED BY THE ATLANTIC COUNCIL OF THE U.S., 1978 (ISBN 0-917258-13-9)

THE PURPOSE OF THIS POLICY PAPER IS TO RECOMMEND ACTIONS THAT WILL HELP TO KEEP WITHIN ACCEPTABLE BOUNDS THE RISKS OF THE FURTHER SPREAD OR PROLIFERATION OF NUCLEAR WEAPONS, WHILE MEETING THE NEEDS OF NATIONS FOR NUCLEAR ENERGY. THE RELATIONSHIP BETWEEN PEACEFUL NUCLEAR POWER AND NUCLEAR WEAPONS PROLIFERATION IS EXPLORED HERE TO ASSESS ITS NATURE, TO EXAMINE THE FACTORS WHICH AFFECT THE DEGREE OF PROLIFERATION RISK POSED BY THE USE OF NUCLEAR POWER THROUGHOUT THE WORLD, AND TO COMPARE THIS RISK WITH RISKS OF PROLIFERATION INDEPENDENT OF NUCLEAR POWER.

AVAILABILITY - THE ATLANTIC COUNCIL OF THE U.S., 1616 H ST., N.W., WASHINGTON, D.C. 20006

*PROLIFERATION + *SAFEGUARDS, NUCLEAR MATERIAL + SOCIO/PHILOSOPHICAL CONSIDERATION + PLUTONIUM + NUCLEAR DEBATE + REACTOR, BREEDER

139128
KRATZER MB
NUCLEAR POWER AND NONPROLIFERATION - AN OPTIMISTIC VIEW
INTERNATIONAL ENERGY ASSOCIATES LTD.
36 PPS. PAPER PRESENTED AT 40TH ANNUAL AMERICAN POWER CONFERENCE, CHICAGO, ILL., APRIL 24-26, 1978

THERE ARE ENCOURAGING SIGNS THAT WIDESPREAD ENJOYMENT OF THE BENEFITS OF NUCLEAR POWER MAY BE HAD WITHOUT UNACCEPTABLE PROLIFERATION RISKS. EVOLUTION OF THE INTERNATIONAL NUCLEAR POLICY IS REVIEWED AND RECENT DEVELOPMENTS WHICH GIVE RISE TO THESE OPTIMISTIC HOPES ARE DISCUSSED. GENERAL OUTLINES OF WHAT THE FUTURE CONCENSUS MIGHT ENTAIL ARE PRESENTED.

AVAILABILITY - MYRON B. KRATZER, SENIOR CONSULTANT, INTERNATIONAL ENERGY ASSOCIATES LTD., WASHINGTON, D.C.

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *PROLIFERATION + *SPECIAL NUCLEAR MATERIAL + *ENERGY POLICY

139398
NUCLEAR FUEL REPROCESSING AND HIGH-LEVEL WASTE MANAGEMENT: INFORMATIONAL HEARINGS. VOLUME XIII NUCLEAR SAFEGUARDS, PROLIFERATION, AND ALTERNATE FUEL CYCLES, PART 1
CALIF. ENERGY RESOURCES CONSERVATION & DEVELOPMENT COMMISSION, SACRAMENT, CALIF.
NP-22631/13/1 +, 442 PPS. JUNE 13, 1977

THE FOLLOWING TOPICS ARE ADDRESSED IN THE PROCEEDINGS OF JUNE 13, 1977 OF HEARINGS BEFORE THE CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION: 1. OVERVIEW OF SAFEGUARDS AND PROLIFERATION CONCERNS; 2. "HOW TO DEVELOP NUCLEAR POWER WHILE LIMITING ITS DANGERS"; 3. U.S. SAFEGUARDS AND PROLIFERATION POLICIES; 4. OVERVIEW OF ERDA RESPONSES TO THE CHANGES IN NATIONAL POLICY; 5. ALTERNATIVES TO THE PLUTONIUM BREEDER; 6. NUCLEAR POWER AND WEAPONS PROLIFERATION; AND 7. TERRORIST THREAT TO U.S. NUCLEAR PROGRAMS.

AVAILABILITY - CALIF. ENERGY RESOURCES CONSERVATION & DEVELOPMENT COMMISSION, SACRAMENTO, CALIF.

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *THEFT/DIVERSION + *SABOTAGE + *PROLIFERATION + *WASTE MANAGEMENT + *FUEL REPROCESSING + *FUEL CYCLE

139096
JACOBY HD
URANIUM DEPENDENCE AND THE PROLIFERATION PROBLEM
MASS. INST. OF TECHNOLOGY, CAMBRIDGE
MIT-EL-77-008WP +, 36 PPS, 4 TABS, 3 FIGS, MAY 1977

EFFECTS OF THE FEAR OF DEPENDENCE ON INSECURE SOURCES OF FUEL ON DEVELOPMENT OF WORLDWIDE NUCLEAR INDUSTRY IS DISCUSSED. MANY NATIONS ARE BECOMING INCREASINGLY ANXIOUS TO ACQUIRE PROCESSING TECHNOLOGY TO LOOSEN TIES TO FOREIGN SUPPLIERS. ALSO, FEAR OF DEPENDENCE HAS INCREASED THE PUSH FOR BREEDER REACTORS. BOTH RESPONSES LEAD TO CONCERN OVER WEAPONS PROLIFERATION. ADEQUACY OF THE PRESENT U.S. NUCLEAR PROGRAM WHICH HAS POSTPONED COMMERCIALIZATION OF THE BREEDER IS OPTIMISTICALLY DISCUSSED IN VIEW OF PROBABLE URANIUM RESERVES.

AVAILABILITY - MASS. INST. OF TECHNOLOGY, ENERGY LAB, CAMBRIDGE, MASS.

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *PROLIFERATION + *ENERGY POLICY + *REACTOR, BREEDER + *FUEL REPROCESSING

138312
THE NUCLEAR FUEL SUPPLY
1 PG, NUCLEAR NEWS, 21(9), PG. 25 (JULY 1978)

THE ATLANTIC COUNCIL OF THE UNITED STATES FAVORS INTERNATIONALIZED ENRICHMENT AND REPROCESSING AND CITES URANIUM ENRICHMENT AND PLUTONIUM REPROCESSING AS THE KEY NUCLEAR FUEL SUPPLY TECHNOLOGIES THAT CAN ALSO PRODUCE WEAPONS-GRADE EXPLOSIVE MATERIAL. THEY PROPOSE THAT THESE TECHNOLOGIES AND THEIR FACILITIES BE DECOUPLED FROM NATIONAL NUCLEAR POWER PROGRAMS, AND BECOME PART OF A NEW MULTILATERAL SYSTEM OF NUCLEAR FUEL SUPPLY AND ATTENDANT SAFEGUARDS. JOHN GRAY, CHAIRMAN OF THE WORKING GROUP, SAID THE CURRENT U.S. POLICY APPEARS TO SEEK WAYS TO LIVE WITHOUT PLUONIUM; HOWEVER, THE RECENT ANNOUNCEMENTS BY FRANCE, WEST GERMANY, AND JAPAN THAT THEY WILL PROCEED WITH REPROCESSING AND BREEDER REACTORS INDICATES THAT PLUTONIUM IS HERE TO STAY.

138312 *CONTINUED*
FUEL CYCLE * FUEL REPROCESSING * ENRICHMENT FACILITY * PLUTONIUM * TECHNOLOGY * SAFEGUARDS* NUCLEAR MATERIAL

138136
IAEA PROPOSED RULES AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION, DC
13 PGS. LTR W/ENCL. TO ALL NEPOWER REACTOR LICENSEES, JUNE 8, 1978

ON MAY 25, 1978, THE COMMISSION PUBLISHED FOR COMMENT AMENDMENTS TO 10 CFR PARTS 40, 50, 70, 75 AND 150 THAT WILL PERMIT THE INTERNATIONAL ATOMIC ENERGY AGENCY TO APPLY ITS SAFEGUARDS TO CERTAIN NUCLEAR ACTIVITIES IN THE UNITED STATES. THIS RULE WILL BE IMPLEMENTED ONLY AFTER THE SENATE HAS GIVEN ITS CONSENT TO THE US/IAEA AGREEMENT ON SAFEGUARDS. A COPY OF THE PROPOSED RULES IS PROVIDED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555 (50 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*IAEA * REGULATION, IAEA * SAFEGUARDS, NUCLEAR MATERIAL * LEGALISTICS * MATERIAL UNACCOUNTED FOR * PROCEDURES AND MANUALS * UNITED STATES

137671
NON-PROLIFERATION AND NUCLEAR EXPORTS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NRC NEWS RELEASE S-78-5 *, 3 PPS, MAY 10, 1978

COMMISSIONER RICHARD T. KENNEDY OF NRC SPOKE AT THE INTERNATIONAL CONFERENCE ON REGULATING NUCLEAR ENERGY (AIF) AT BRUSSELS BELGIUM ON THE UNITED STATES NON-PROLIFERATION POLICY, AND ABOUT THE DIRECTIONS WHICH THE NEW NUCLEAR NON-PROLIFERATION ACT OF 1978 MAY TAKE. HE SAID THAT WHAT THE ADMINISTRATION'S POLICY SEEKS IS AN INTERNATIONAL CONSENSUS ON THE DESIRABILITY OF PREVENTING THE FURTHER SPREAD OF NUCLEAR WEAPONS AND ON THE NATURE AND MANAGEMENT OF THE FUEL CYCLE. THE PRESIDENT'S POSITION ON SENSITIVE FACILITIES WAS BASED ON HIS BELIEF THAT THERE IS STILL TIME TO EXPLORE THE TECHNICAL AND ECONOMIC FEASIBILITY OF ALTERNATIVE FUEL CYCLES WHICH ARE MORE PROLIFERATION RESISTANT.

AVAILABILITY - NRC

*PROLIFERATION * UNITED STATES * LEGISLATION * *SAFEGUARDS, NUCLEAR MATERIAL * *EXPORTS * FUEL CYCLE * FUEL MANAGEMENT

137394
EXECUTIVE CONFERENCE ON SAFEGUARDS
AMERICAN NUCLEAR SOCIETY, LA GRANGE PARK, ILL.
350 PPS, FROM EXECUTIVE CONFERENCE ON SAFEGUARDS, CAPE COD, MASS., OCT. 16-19, 1977

PRESENTS PAPERS GIVEN AT THE AMERICAN NUCLEAR SOCIETY'S CONFERENCE ON SAFEGUARDS AT CAPE COD, MASS., ON OCTOBER 16-19, 1977. THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION AND IAEA SAFEGUARDS WERE 2 PROMINENT TOPICS. NATIONAL SAFEGUARDS SYSTEMS AND POLICIES OF FRANCE, JAPAN, FEDERAL REPUBLIC OF GERMANY, THE UNITED KINGDOM, EURATOM, AND THE UNITED STATES ARE PRESENTED. OF THESE THE U.S. PROGRAM IS DISCUSSED IN MOST DETAIL, WITH NON-PROLIFERATION POLICY, U.S. REGULATIONS, INDUSTRY VIEWS AND SAFEGUARDS TECHNOLOGY ALL ON THE AGENDA. THE CONFERENCE ALSO INCLUDES PAPERS ON LAW AND REGULATIONS, AND ON SANCTIONS.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY PUBLICATIONS, 555 N. KENSINGTON AVE., LA GRANGE PARK, ILL. 60525

*SAFEGUARDS, NUCLEAR MATERIAL * *PROLIFERATION * FRANCE * JAPAN * GERMANY * UNITED KINGDOM * UNITED STATES * FUEL CYCLE * IAEA * REGULATION, FEDERAL * LEGISLATION * SABOTAGE

135955
NRC CALLED "EVASIVE"
2 PPS, NUCLEAR NEWS, 21(5), PP. 37-38 (APRIL 1978)

NRC HAS BECOME EMBROILED IN AN EXTENDED HASSLE WITH SOME MEMBERS OF CONGRESS OVER TESTIMONY GIVEN ON TWO SEPARATE OCCASIONS LAST SUMMER BY ITS EXECUTIVE DIRECTOR FOR OPERATIONS CONCERNING STRATEGIC MATERIAL UNACCOUNTED FOR (MUF). AFTER IT RECEIVED STINGING ACCUSATIONS FROM THE CONGRESSMEN FOR ITS "LACK OF CANDOR," THE NRC ORDERED A FULL-SCALE INVESTIGATION OF THE WHOLE AFFAIR, AND HAS PUBLISHED ITS FINDINGS IN A THREE-VOLUME REPORT. THE WHOLE ISSUE TURNS ON GOSSICK'S TESTIMONY ABOUT MUF AND ON THE POSITION THAT THE NRC AND OTHER GOVERNMENT AGENCIES HAVE TAKEN THAT "NO EVIDENCE" EXISTS THAT ANY SIGNIFICANT QUANTITIES OF SUCH MATERIAL HAS EVER BEEN DIVERTED.

AGENCY, DOE * CONGRESSIONAL ACTIVITY * THEFT/DIVERSION * MATERIAL UNACCOUNTED FOR * SAFEGUARDS, NUCLEAR MATERIAL

135851
COHEN BL
THE CASE FOR THE BREEDER REACTOR
UNIV. OF PITTSBURGH, PA
5 PPS, INFO, 1977 (REPRINTED FROM NATIONAL REVIEW, SEPT. 1977)

135331 *CONTINUED*
THIS ARTICLE IS PRIMARILY ABOUT PLUTONIUM - WHAT IT CAN DO IN A REACTOR FOR ENERGY PRODUCTION, ITS HAZARDS, CLAIMS OF ITS DANGERS THAT ARE NOT TRUE, AND THE DANGERS FROM TERRORISTS. THE AUTHOR EXPRESSES DISAPPOINTMENT WITH PRESIDENT CARTER FOR HIS OPPOSITION TO REPROCESSING AND THE BREEDER REACTOR PROJECT. QUOTING THE LAST PARAGRAPH FROM THIS ARTICLE, "OUR COUNTRY IS JUST BEGINNING TO BLEED FROM ENERGY SHORTAGES, AND THINGS ARE BOUND TO GET MUCH WORSE. INDEED THEY MAY WELL BE FATAL TO OUR POLITICAL AND ECONOMIC SYSTEMS. OUR MAGIC SUBSTANCE (PLUTONIUM) CAN SAVE US, BUT IT DOESN'T SEEM TO BE 'IN THE CARDS.' A GREAT AMERICAN TRAGEDY IS IN THE MAKING."

AVAILABILITY - ATOMIC INDUSTRIAL FORUM INC., PUBLIC AFFAIRS & INFORMATION PROGRAM, 7101 WISCONSIN AVE., WASHINGTON, D.C. 20014

PLUTONIUM + REACTOR, BREEDER + HAZARD, RELATIVE + ENERGY + THEFT/DIVERSION + PROLIFERATION + SAFEGUARDS, NUCLEAR MATERIAL

135349
JACOBSSON M
LEGAL ASPECTS OF TRANSPORT OF NUCLEAR MATERIALS
JUSTITIEDEPARTEMENTET, STOCKHOLM, SWEDEN
INIS-MF-3741 *, 32 PP., FROM NORDIC SEMINAR ON TRANSPORT OF NUCLEAR MATERIALS; TAVASTEHUS, FINLAND, NOV. 2-4, 1976

VARIOUS CONVENTIONS ARE DISCUSSED RELATING TO CIVIL LIABILITY FOR NUCLEAR DAMAGE, AND CIVIL LIABILITY IN THE FIELD OF MARITIME CARRIAGE OF NUCLEAR MATERIALS. INSURANCE PROBLEMS ARISING IN CONNECTION WITH TRANSPORT OF NUCLEAR MATERIALS ARE SURVEYED AND AN OUTLINE IS GIVEN OF THE ADMINISTRATIVE PROVISIONS CONCERNING TRANSPORT (BASED ON THE IAEA TRANSPORT REGULATIONS) WHICH GOVERN TRANSPORT OF RADIOACTIVE MATERIALS BY DIFFERENT MEANS: ROAD, RAIL, SEA AND AIR. FINALLY, THE 1968 TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS IS DISCUSSED. (NEA)

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

TRANSPORTATION AND HANDLING + LIABILITY + PROLIFERATION + SAFEGUARDS, NUCLEAR MATERIAL

135259
NONPROLIFERATION BILL PASSED
2 PPS., NUCLEAR INDUSTRY, 25(3), PP. 6-7 (MARCH 1978)

EARLY IN FEBRUARY THE SENATE OVERWHELMINGLY APPROVED A STRICTLY WORDED NUCLEAR NONPROLIFERATION BILL THAT SOME INDUSTRY OBSERVERS HAD FORECAST WOULD BE A "LEGISLATIVE MORATORIUM" ON AMERICAN NUCLEAR EXPORTS. A MAJOR ELEMENT OF THE BILL LIES IN TITLE III, WHERE SIX CRITERIA ARE SPELLED OUT THAT MUST BE ACCEPTED BY ALL IMPORTING COUNTRIES. THESE CRITERIA DEAL WITH IAEA REGULATIONS FOR SAFEGUARDS AGAINST PROLIFERATION.

PROLIFERATION + LEGISLATION + CONGRESSMAN + IAEA + SAFEGUARDS, NUCLEAR MATERIAL

135224
HOLDREN JP
FUSION POWER AND NUCLEAR WEAPONS: A SIGNIFICANT LINK?
UNIV. OF CALIF., BERKELEY
2 PPS., BULLETIN OF THE ATOMIC SCIENTISTS, 34(3), PP. 4-5 (MARCH 1978)

PRODUCTION OF FISSION BOMBS WITH FISSILE MATERIALS FROM COMMERCIAL POWER PROGRAMS IS CREDIBLE FOR SOPHISTICATED SUBNATIONAL GROUPS AS WELL AS FOR SOVEREIGN STATES. FUSION IS DIFFERENT. FUSION BOMBS ARE MUCH MORE DIFFICULT TO DESIGN AND CONSTRUCT THAN ARE FISSION BOMBS, SO MUCH SO THAT OBTAINING THE NEEDED FUSION FUELS IS ONLY A SMALL PART OF THE TASK. THE KNOWLEDGE RELATED TO MAGNETIC CONFINEMENT IS IRRELEVANT TO THE TASK OF DESIGNING A BOMB. HOWEVER, THE ASPECTS OF RESEARCH ON INERTIAL CONFINEMENT APPROACHES TO FUSION ARE RELEVANT TO THE DESIGN OF FUSION BOMBS. SO, THE AUTHOR SUGGESTS THAT WE SHOULD DROP RESEARCH ON INERTIAL CONFINEMENT BECAUSE OF THE DANGERS OF WEAPONS PROLIFERATION.

FUSION + PROLIFERATION + SAFEGUARDS, NUCLEAR MATERIAL + CONTAINMENT

135167
SAFEGUARDS DILEMMA: NO QUICK FIX SEEN
4 PPS., NUCLEAR INDUSTRY, 24(11), PP. 28-31 (NOV. 1977)

HYANNIS - NEW NUCLEAR SAFEGUARDS AIMED AT CURBING THE THREAT OF WEAPONS PROLIFERATION COULD LEAD TO A COSTLY PROLIFERATION OF A DIFERENT SORT - THAT OF AN UNWIELDY STRUCTURE OF NATIONAL AND INTERNATIONAL CONTROLS AND CONTROLLING ORGANIZATIONS. THE SCOPUE OF THE PROBLEM WAS EXAMINED AT AN ANS SPONSORED EXECUTIVE CONFERENCE ON SAFEGUARDS HELD. RUDOLPH REMETSCH, DEPUTY DIRECTOR GENERAL, DEPT. OF SAFEGUARDS, IAEA SAID, "BEFORE ANY UNIVERSALLY ACCEPTABLE PACKAGE OF NON-PROLIFERATION MEASURES CAN BECOME EFFECTIVE, A NUMBER OF INTERNATIONAL UNDERSTANDINGS IN ADDITION TO THOSE REALIZED IN THE WORK OF THE IAEA HAVE TO BE ACHIEVED." "POLITICAL, ECONOMIC AND SOCIAL APPROACHES TO INTERNATIONAL SAFEGUARDS WILL NOT BE ABLE TO CONTROL THE BEHAVIOR OF VARIOUS COUNTRIES."

SAFEGUARDS, NUCLEAR MATERIAL + PROLIFERATION + IAEA + SECURITY

134869

134869 *CONTINUED*
MARSHALL W
NUCLEAR POWER AND THE PROLIFERATION ISSUE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY, UK
41 PPS. FIGS. GRAHAM YOUNG MEMORIAL LECTURE, FEB. 24, 1978

BASIC COMMENTS ARE PRESENTED CONCERNING THE POTENTIAL PROLIFERATION OF PLUTONIUM. TECHNOLOGIES AND POLICIES ARE EXAMINED THAT WILL LIMIT THE AVAILABILITY OF PLUTONIUM. FUNDAMENTALS OF PLUTONIUM PRODUCTION ARE DISCUSSED AND FOUR LEVELS OF SAFEGUARDS PROTECTION ARE ASSIGNED TO PLUTONIUM DEPENDING ON ASSOCIATED RADIOACTIVITY OR CHEMICAL FORM. ESTIMATES OF WORLDWIDE PLUTONIUM GROWTHS ARE MADE. A PROGRAM IS PRESENTED TO MINIMIZE PROLIFERATION: (1) SET UP SMALL NUMBER OF LARGE REPROCESSING PLANTS. (2) ACCELERATE BREEDER PROGRAMS AND EVALUATE. (3) DISCOURAGE STORAGE OF SPENT FUEL AT WIDE NUMBER OF WORLDWIDE LOCATIONS. (4) DISCOURAGE WIDESPREAD CONVENTIONAL REPROCESSING. (5) IMPROVE ORGANIZATION IN THE USE OF PLUTONIUM.

AVAILABILITY - HER MAJESTY'S STATIONERY OFFICE, 49 HIGH HOLBORN, LONDON WC1V 6HB, ENGLAND

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *PROLIFERATION + PLUTONIUM + SPECIAL NUCLEAR MATERIAL + *REACTOR, BREEDER + *FUEL REPROCESSING

134870
A NONPROLIFERATION BILL
1 PG. NUCLEAR NEWS, 21(4), PG. 19 (MARCH 1978)

A NONPROLIFERATION BILL WAS PASSED 88-3 IN THE U.S. SENATE. A SOMEWHAT DIFFERENT VERSION OF THE BILL HAD PASSED 411-0 LAST YEAR IN THE HOUSE OF REPRESENTATIVES. SINCE INDIA EXPLODED ITS NUCLEAR WEAPON IN 1974, THE MOOD ON CAPITOL HILL HAS RUN HEAVILY IN FAVOR OF STRONGER EXPORT CONTROLS ON NUCLEAR MATERIALS. SENS. JAMES MCCLURE (R., IDAHO) AND PETER DOMENICI (R., N.M.) WORKED HARD TO AMEND THE BILL TO MAKE IT MORE ACCEPTABLE TO THE BUSINESS COMMUNITY DIRECTLY INVOLVED IN THIS EXPORT BUSINESS. THESE SENATORS, AND OTHERS, HAVE VIEWED THE BILL AS A VEHICLE THAT COULD LEGISLATE THE UNITED STATES OUT OF THE INTERNATIONAL NUCLEAR MARKET. ALL COUNTRIES RECEIVING NUCLEAR MATERIALS FROM THE UNITED STATES MUST AGREE TO "FULL-SCOPE SAFEGUARDS." THIS IS THE EQUIVALENT OF ADHERING TO THE INTERNATIONAL NONPROLIFERATION TREATY, ALTHOUGH A REQUIREMENT TO SIGN THE TREATY IS NOT PART OF THE BILL.

PROLIFERATION + LEGISLATION + CONGRESSMAN + SAFEGUARDS, NUCLEAR MATERIAL + INDUSTRY, NUCLEAR

134894
ALIKONIS NA + GRAY JE + HARNED J*
NUCLEAR SAFEGUARDS TECHNOLOGY HANDBOOK
INTERNATIONAL ENERGY ASSOCIATED LTD., WASHINGTON, D.C.
NCP/30540-01 +. 250 PPS. TABS. FIGS. REFS. DEC. 1977

THIS HANDBOOK EXPLAINS THE CURRENT SAFEGUARDS TECHNOLOGY DEVELOPMENT PROGRAM OF THE SAFEGUARDS AND SECURITY BRANCH OF DOE. PROSPECTIVE RELEVANCE OF THE PROGRAM TO U.S. INDUSTRIAL AND UTILITY ORGANIZATIONS, AS WELL AS TO OTHER U.S. GOVERNMENT AGENCIES AND INTERNATIONAL ORGANIZATIONS IS PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *PROLIFERATION + *THEFT/DIVERSION + *SABOTAGE + *AGENCY, DOE + *ASSAY, NONDESTRUCTIVE + JACOBS

134247
MYERS D
THE NUCLEAR POWER DEBATE - MORAL, ECONOMIC, TECHNICAL, AND POLITICAL ISSUES
155 PPS. BOOK PUBLISHED BY PRAEGER PUBLISHERS, N.Y., 1977 (ISBN 0-275-56440-1)

TOPICS INCLUDE THE CONTROVERSY OVER NUCLEAR POWER; THE ENERGY ECONOMY; THE ECONOMICS OF NUCLEAR POWER; THE GOVERNMENT'S ROLE IN NUCLEAR POWER DEVELOPMENT; THE GROWTH OF THE NUCLEAR INDUSTRY; THE STATUS OF NUCLEAR TECHNOLOGY; ACCIDENTS AT NUCLEAR PLANTS; POTENTIAL AND PROBABILITY; SAFEGUARDING RADIOACTIVE MATERIAL; COMPETITION WITH COAL-FIRED PLANTS; AND WASTE DISPOSAL ISSUES.

*NUCLEAR DEBATE + N-POWER, SAFETY OF + INDUSTRY, NUCLEAR + GROWTH/DEVELOPMENT + *ECONOMICS + ACCIDENT ANALYSIS + ACCIDENT, PROBABILITY OF + SAFEGUARDS, NUCLEAR MATERIAL + COMPARISON + POWER PLANT, FOSSIL FUEL + COAL + WASTE DISPOSAL

134246
NUCLEAR PROLIFERATION AND SAFEGUARDS
U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT
270 PPS. BOOK PUBLISHED BY PRAEGER PUBLISHERS, N.Y., 1977 (LIBRARY OF CONG. CAT. NO. 77-600024)

THIS STUDY SEEKS TO FACILITATE AN UNDERSTANDING OF THE PROBLEM AND ITS IMPLICATIONS, IN TERMS OF BOTH A COMPREHENSIVE OVERVIEW AND A DETAILED INDEPTH ANALYSIS OF KEY ELEMENTS. TECHNOLOGICAL, INSTITUTIONAL, ECONOMIC AND POLITICAL ASPECTS, AND THE LINKAGES AMONG THEM, ARE EXAMINED. POLICY OPTIONS ARE OUTLINED AND ANALYZED IN TERMS OF THREE MAJOR PERSPECTIVES CORRESPONDING TO DIFFERENT WEIGHTINGS OF THE KEY FACTORS DISCUSSED ABOVE. THIS REPORT IS INTENDED TO LAY THE GROUNDWORK FOR AN INFORMED CONSIDERATION BY CONGRESS OF POSSIBLE LEGISLATIVE ACTION CONCERNING PROLIFERATION.

*PROLIFERATION + *SAFEGUARDS, NUCLEAR MATERIAL + ECONOMICS + LEGALISTICS + CONGRESSIONAL ACTIVITY + SPECIAL

134246 *CONTINUED*
NUCLEAR MATERIAL + THEFT/DIVERSION + TEST, *EAPONS

134277
BECKMANN P
NUCLEAR PROLIFERATION: HOW TO BLUNDER INTO PROMOTING IT
15 PPS, 1977

A STRONGLY PRO-NUCLEAR ARGUMENT IS PRESENTED STATING THAT PRESIDENT CARTER'S PROPOSAL TO BAN PLUTONIUM FROM THE CIVILIAN SECTOR BY INDEFINITELY DEFERRING BOTH NUCLEAR FUEL REPROCESSING AND CONSTRUCTION OF A PLUTONIUM BREEDER PLANT MAY HAVE UNDESIRABLE CONSEQUENCES. IT IS ARGUED THAT THIS POLICY MAY DEPRIVE THE U.S. OF A THOUSAND YEARS WORTH OF ENERGY SUPPLIES AND ADDITIONALLY RESULT IN THE ACCELERATION OF NUCLEAR MATERIAL PROLIFERATION.

AVAILABILITY - THE GOLEM PRESS, BOX 1342, BOULDER, COLO. 80306

*PROLIFERATION + *SAFEGUARDS, NUCLEAR MATERIAL + *SABOTAGE + *NUCLEAR DEVICE AND EQUIPMENT + *PLUTONIUM

133134
LOVINS AB
SOFT ENERGY PATHS - TOWARD A DURABLE PEACE
231 PPS, BOOK PUBLISHED BY BALLINGER PUBLISHING CO., CAMBRIDGE, MASS. 1977 (LIB. CONG. CAT. CARD NO. 77-4349)

THIS BOOK WAS AUTHORED BY AMORY LOVINS WHO IS ASSOCIATED WITH THE FRIENDS OF THE EARTH. THE VARIOUS ENERGY STRATEGIES ARE DISCUSSED FROM SOCIO-PHILOSOPHICAL, SOCIO-ECONOMIC, POLITICAL AND PSYCHOLOGICAL ASPECTS. THE SO-CALLED SOFT ENERGY SOURCES OF TRANSITIONAL FOSSIL FUEL SYSTEMS, WIND SYSTEMS, GEOPHYSICAL AND BIOCONVERSION SYSTEMS, AND SOLAR HEAT SYSTEMS ARE SUGGESTED AS THE PATHS TO FOLLOW. NUCLEAR POWER IS DISCUSED FROM THE STANDPOINTS OF SAFEGUARDS AND PROLIFERATION.

*ENERGY POLICY + *SOCIO/PHILOSOPHICAL CONSIDERATION + DEVELOPMENT + SOLAR + WIND + COMPARISON + N-POWER, SAFETY OF + SAFEGUARDS, NUCLEAR MATERIAL + *PROLIFERATION + ECONOMICS

132825
CAN WE LIVE WITH PLUTONIUM?
13 PPS, NEW SCIENTIST, 66(951), PP. 494-506 (MAY 29, 1975)

THREE ARTICLES PRESENT THE VIEWS OF FOUR PEOPLE WITH A PARTICULAR INTEREST IN PLUTONIUM STUDIES. THE FIRST, FRANK BARNABY, POINTS OUT WHY IT IS SO IMPORTANT TO BE SURE OF OUR FACTS REGARDING PLUTONIUM SAFETY--THE GROWTH OF NUCLEAR POWER WILL GENERATE A RAPIDLY EXPANDING PLUTONIUM "ECONOMY". THERE THEN FOLLOW TWO OPPOSING VIEWS OF THE HOT-PARTICLE HYPOTHESIS--DR. ARTHUR TAMPLIN AND THOMAS COCHRAN EXPLAIN WHY THEY ARE SUCH FERVENT SUPPORTERS OF THE THEORY; AND DR. ROBIN MOLE ARGUES THAT THE "ESTABLISHMENT" HAS EXAMINED THE THEORY AND FOUND IT WANTING.

SAFEGUARDS, NUCLEAR MATERIAL + SAFETY PRINCIPLES AND PHILOSOPHY + RADIOCHEMICAL PLANT SAFETY + CODES AND STANDARDS + DOSE + DOSIMETRY + PLUTONIUM

132636
ROMETSCH R
PROBLEMS OF NUCLEAR ENERGY SUPPLY: SAFEGUARDS TO ASSURE PEACEFUL USE
GOTTLIEB DUTTWEILER INSTITUT
13 PPS, FROM 'CRISIS IN THE NUCLEAR INDUSTRY' INTERNATIONAL SYMPOSIUM; ZURICH, FEB. 26-28, 1976

REVIEWS MEANS OF PROTECTION AGAINST RISK OF TERRORIST ATTACK, SAFEGUARDS TO ENSURE PEACEFUL USAGE IN ACCORDANCE WITH THE NON-PROLIFERATION TREATY, AND THE PAST HISTORY OF THE WORLD NUCLEAR DEVELOPMENT PROGRAM.

AVAILABILITY - BRITISH LIBRARY LENDING DIVISION, BOSTON SPA, WETHERBY, YORKSHIRE LS23 7EQ, ENGLAND

*SAFEGUARDS, NUCLEAR MATERIAL + REVIEW + PROTECTION SYSTEM

131947
COLE RJ + BENNETT CA + EDELHERTZ H + WOOD MT + BROWN RJ + ROBERTS FP
STRUCTURE AND DRAFTING OF SAFEGUARDS REGULATORY DOCUMENTS
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
NUREG-0377(EX, SUMMARY, VOL. 1 AND 2) + BNWL-2408 +, 236 PPS, FIGS, REFS, NOV. 1977

DEVELOPED HYPOTHESES ON THE RELATIONSHIP BETWEEN THE STRUCTURE AND DRAFTING OF SAFEGUARDS REGULATORY DOCUMENTS AND THE ABILITY OF THE DOCUMENT USERS TO UNDERSTAND AND IMPLEMENT THEM IN A WAY THAT REFLECTS THE INTENT AND REQUIREMENTS OF THE NRC. LICENSING OFFICES, LICENSEES, INSPECTORS, AND THE GENERAL PUBLIC MUST UNDERSTAND THE NRC'S REQUIREMENTS IF THE REGULATORY SYSTEM IS TO FUNCTION EFFECTIVELY AND IN COMPLIANCE WITH LEGAL REQUIREMENTS. A SERIES OF FOUR DECISIONS THAT WILL BE REQUIRED TO IMPROVE COMMUNICATIONS WITH LICENSEES WERE SET FORTH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + *AGENCY, NRC + *PROCEDURES AND MANUALS + COMMUNICATION + NRC-13 + HJCK

131366
COMMONWEALTH EDISON UNDER INVESTIGATION CONCERNING SAFEGUARDS ACTIVITIES AT QUAD CITIES
U.S. NUCLEAR REGULATORY COMMISSION, GLEN ELLYN, IL
1 PG, LTR TO COMMONWEALTH EDISON CO., NOV. 9, 1977, DOCKETS 50-254/265, TYPE--D&M, MFG--G.E., AE--SGT & LUNDY

RESULTS OF AN NRC INSPECTION/INVESTIGATION OF SAFEGUARDS ACTIVITIES AT QUAD-CITIES CONDUCTED DURING APRIL AND MAY 1977 HAS BEEN MADE AVAILABLE TO THE UNITED STATES ATTORNEY IN SPRINGFIELD, ILLINOIS FOR HIS INFORMATION AND CONSIDERATION IN CONNECTION WITH THE PENDING FBI INVESTIGATION AND POSSIBLE PRESENTATION OF THE MATTER TO A FEDERAL GRAND JURY. PENDING THE U.S. ATTORNEY'S DECISION, THE DEPARTMENT OF JUSTICE HAS REQUESTED THAT THE NRC POSTPONE THE INITIATION OF ANY CIVIL ENFORCEMENT ACTION UNTIL THE DEPARTMENT OF JUSTICE HAS DECIDED IF PROSECUTION IS APPROPRIATE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*INDUSTRY, UTILITY + QUAD CITIES 1 (BWR) + QUAD CITIES 2 (BWR) + REACTOR, BWR + COMPLIANCE + *SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + AGENCY, FEDERAL

131083
GILINSKY V
PLUTONIUM, PROLIFERATION, AND POLICY
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
8 PPS, TECHNOLOGY REVIEW, 79(4), PP. 58-65 (FEB, 1977)

THE AUTHOR GIVES AN EXPLICIT HISTORY OF THE NUCLEAR INDUSTRY, PRESIDENT EISENHOWER'S ATOMS FOR PEACE, AND AN EXPLANATION OF HOW WE GOT TO WHERE WE ARE. HE SAYS SEPARATED PLUTONIUM IS NOT SAFEGUARDABLE, BECAUSE IT CAN SUDDENLY BE APPROPRIATED FROM ITS STORAGE PLACE AND INSERTED INTO WARHEADS IN THE MATTER OF A FEW DAYS. ALSO, HE SAYS THAT NUCLEAR WEAPONS CAN BE MANUFACTURED FROM REACTOR-GRADE PLUTONIUM. HE SUGGESTS CHANGES IN OUR NATIONAL POLICIES, WITH CLOSER ADHERANCE TO THE NONPROLIFERATION TREATY AND IMPROVED AND/OR INTENSIFIED INSPECTION ACTIVITIES.

PLUTONIUM + PROLIFERATION + IAEA + LEGISLATION + SAFEGUARDS, NUCLEAR MATERIAL

131038
WILSON R
HOW TO HAVE NUCLEAR POWER WITHOUT WEAPONS PROLIFERATION
HARVARD UNIVERSITY
6 PPS, BULLETIN ATOMIC SCIENTISTS, 33(9), PP. 39-44 (NOV, 1977)

PROLIFERATION OF NUCLEAR WEAPONS AND ITS RELATION TO NUCLEAR POWER IS DISCUSSED. IT IS THE AUTHOR'S OPINION THAT ANY COUNTRY WITH AN INDUSTRIAL BASE CAN CONSTRUCT A NUCLEAR WEAPON AND THAT NUCLEAR POWER HAS LITTLE EFFECT ON THE PROBABILITY OF NUCLEAR WEAPONS PROLIFERATION. THE CARROT AND STICK APPROACH TO NONPROLIFERATION IS PRESENTED AND THE USE OF MODIFIED FUEL CYCLES TO REDUCE AVAILABILITY OF WEAPONS GRADE MATERIAL IS DISCUSSED.

*PROLIFERATION + *SPECIAL NUCLEAR MATERIAL + *SAFEGUARDS, NUCLEAR MATERIAL

130825
TINKER J
URANIUM THEFT SHATTERS NUCLEAR SAFEGUARDS
1 PG, NEW SCIENTIST, 74(1050), PG. 251 (MAY 5, 1977)

IN NOVEMBER 1968, 200 TONS OF URANIUM ORE FROM THE CONGO, WERE SHIPPED OUT OF ANTWERP IN BELGIUM ON A WEST GERMAN SHIP BOUND FOR GENOA VIA ROTTERDAM. THEN IT DISAPPEARED. SOME WEEKS LATER, THE SHIP REAPPEARED IN ALGIERS, WITH A NEW NAME, A NEW LIBERIAN REGISTRATION, A NEW MASTER AND CREW -- BUT NO URANIUM. IN THE MEANTIME, THE VESSEL HAD STEAMED EAST TO HAIFA, WHERE THE URANIUM WAS TRANSFERRED TO THE ISRAELI "EXPERIMENTAL" DIMONA REACTOR. THIS 26MW (THERMAL) HEAVY WATER REACTOR, FUELLED WITH NATURAL URANIUM, WAS BUILT BY THE FRENCH IN ABOUT 1962 FOR THE PRODUCTION OF ABOUT 20 KG OF WEAPONS-GRADE PLUTONIUM -- ENOUGH FOR TWO OR THREE BOMBS -- EACH YEAR.

URANIUM + THEFT/DIVERSION + ISRAEL + TRANSPORTATION AND HANDLING + SHIP/BARGE + SAFEGUARDS, NUCLEAR MATERIAL

130380
IMPOSITION OF CIVIL PENALTIES - NUCLEAR FUEL SERVICES
U.S. NUCLEAR REGULATORY COMMISSION, DC
18 PGS, LTR W/ENC, TO NUCLEAR FUEL SERVICES, INC., AUG. 11, 1977

NRC HAS ORDERED THAT CIVIL PENALTIES TOTALING $53,000 BE IMPOSED ON NUCLEAR FUEL SERVICES. NRC NOTED THAT NFS HAS HAD ABOUT 3 YEARS TO DEVELOP AND TO IMPLEMENT PROPERLY AN ADEQUATE SAFEGUARDS PROGRAM. THE FACT THAT NFS IMPLEMENTED WHAT SEEMED TO BE AN ACCEPTABLE PROGRAM FOR SEVERAL MONTHS AFTER EARLY 1976 DISCUSSIONS IS A MITIGATING FACTOR WHICH NRC CONSIDERED. BUT, IN VIEW OF THE NATURE AND NUMBER OF ITEMS OF NONCOMPLIANCE WHICH NRC INSPECTORS FOUND IN EARLY 1977 WITH REGARD TO THE SAFEGUARDS PROGRAM, IT APPEARS THAT SUFFICIENT MANAGEMENT CONTROLS WERE NOT EMPLOYED TO ASSURE CONTINUED COMPLIANCE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

130380 *CONTINUED*
AGENCY, NRC * COMPLIANCE * RNFS * SECURITY * *SAFEGUARDS, NUCLEAR MATERIAL * *FAILURE, ADMINISTRATIVE CONTROL * ECONOMICS

128682
NUC IP MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM
UNION CARBIDE CORP., COMPUTER SCIENCES DIV., OAK RIDGE, TENN.
K/CSD/TM-4 *, 82 PPS, 16 FIGS, OCT, 1976

THIS MANUAL IS THE FIRST IN A SERIES OF THREE USER MANUALS BEING DEVELOPED ON THE NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM. IT IS AN OVERVIEW OF THE CONCEPT, DEVELOPMENT, OPERATION, AND USE OF THE SYSTEM TO SERVE THE INTERESTS OF THE UNITED STATES IN THE NATIONAL AND INTERNATIONAL UTILIZATION OF NUCLEAR MATERIALS. IT DESCRIBES THE COOPERATION OF GOVERNMENT AGENCIES AND ORGANIZATIONS IN THE FORMATION OF AN INFORMATION SUPPORT SYSTEM WITH A NATIONAL DATA BASE ON NUCLEAR MATERIALS; INCLUDES A DESCRIPTION OF THE RANGE AND SCOPE OF INFORMATION; AND DESCRIBES THE APPLICATION OF HUMAN RESOURCES AND COMPUTERS AND COMMUNICATIONS SYSTEMS IN THE SUPPORT OF SAFEGUARDS AND MATERIALS MANAGEMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL * INFORMATION RETRIEVAL * DATA PROCESSING * UNITED STATES * COMPUTER PROGRAM

128795
KEEPIN GR
SAFEGUARDS TECHNOLOGY: PRESENT POSTURE AND FUTURE IMPACT
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-UR-76-1310 * CONF-761014-1 *, 35 PPS, FROM 1ST PACIFIC BASIN TOPICAL CONFERENCE ON NUCLEAR DEVELOPMENT & THE FUEL CYCLE; HONOLULU, HAWAII, OCT. 11, 1976

WITH WIDESPREAD AND GROWING CONCERN OVER THE ISSUES OF NUCLEAR SAFEGUARDS, INTERNATIONAL NUCLEAR TRADE, AND NUCLEAR WEAPONS PROLIFERATION, THE FULL DEVELOPMENT OF THE WORLD'S NUCLEAR ENERGY POTENTIAL COULD WELL DEPEND ON HOW EFFECTIVELY WE ARE ABLE TO SAFEGUARD AND CONTROL THE STRATEGIC NUCLEAR MATERIALS THAT FUEL NUCLEAR POWER. THE BROAD U.S. PROGRAM IN NUCLEAR SAFEGUARDS AND SECURITY IS DIRECTED TOWARD A BALANCED SAFEGUARDS SYSTEM INCORPORATING THE TWO MAJOR COMPONENTS OF PHYSICAL SECURITY AND MATERIALS CONTROL. THIS PAPER OUTLINES THE CURRENT POSTURE OF MODERN SAFEGUARDS TECHNOLOGY, ITS IMPACT ON PLANT OPERATIONS, AND THE KEY ROLE IT MUST PLAY IN THE IMPLEMENTATION OF STRINGENT COST-EFFECTIVE SAFEGUARDS SYSTEMS IN FACILITIES THROUGHOUT THE NUCLEAR FUEL CYCLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL * PROLIFERATION * ECONOMICS * ENERGY * POWER PLANT, NUCLEAR * INTERNATIONAL * FUEL CYCLE

128662
PETITION FOR RULE MAKING - PHYSICAL SEARCHES AT NUCLEAR POWER REACTORS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
22 PPS, LETTER WITH ATTACHMENTS TO WASHINGTON PUBLIC POWER SUPPLY SYSTEM, RICHLAND, SEPT. 23, 1977 (DOCKET 50-460)

PRESENTS A FEDERAL REGISTER NOTICE OF A PETITION FOR RULEMAKING REGARDING PHYSICAL SEARCHES OF INDIVIDUALS ENTERING A PROTECTED AREA OF A NUCLEAR POWER PLANT AND A COPY OF A PROPOSED NRC REGULATION WHICH WOULD REQUIRE CLEARANCES FOR THOSE INDIVIDUALS WHO ARE PERMITTED UNESCORTED ACCESS WITHIN NUCLEAR POWER PLANTS. NRC IS ASSESSING THE IMPLICATIONS OF THESE TWO ACTIONS, PARTICULARLY THE "PAT DOWN" SEARCHES OF INDIVIDUALS, AND THEIR VALUE AS ELEMENTS OF THE TOTAL PHYSICAL PROTECTION SYSTEM NEEDED FOR NUCLEAR POWER PLANTS. ALSO, NRC IS CONCERNED WITH THE POTENTIAL EFFECTS ON EMPLOYEE EFFECTIVENESS AND MORALE OF THE PHYSICAL SEARCH AND OTHER REQUIREMENTS FOR THE PHYSICAL PROTECTION. NRC IS REQUESTING COMMENT ON THE PROPOSED RULEMAKING FROM THOSE WHO WOULD BE AFFECTED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

AGENCY, NRC * REGULATION, FEDERAL * *POWER PLANT, NUCLEAR * *SECURITY * SAFEGUARDS, NUCLEAR MATERIAL * REACTOR, POWER

128026
LAMBERT RD * HESTON AW * COFFEY JI
NUCLEAR PROLIFERATION: PROSPECTS, PROBLEMS, AND PROPOSALS
UNIV. OF PITTSBURGH, PA.
236 PPS, VOL. 430 OF THE ANNALS OF THE AMERICAN ACADEMY OF POLITICAL & SOCIAL SCIENCE, PHILADELPHIA, PA., MARCH 1977

FURTHER PROLIFERATION MAY INCREASE THE LIKELIHOOD OF NUCLEAR WAR THROUGH ACCIDENT, NUCLEAR BLACKMAIL, OR ESCALATION OF CONFLICTS. PROBLEMS OF SAFEGUARDING NUCLEAR FACILITIES FROM NUCLEAR DIVERSION, SABOTAGE, AND THEFT BY TERRORISTS ARE REASONS FOR CURBING NUCLEAR PROLIFERATION. NUCLEAR PROLIFERATION IS ALMOST INEVITABLE; THE QUESTION IS NOT WHETHER IT WILL OCCUR BUT AMONG WHAT COUNTRIES, TO WHAT EXTENT, AND AT WHAT PACE. SUGGESTED WAYS TO SLOW OR CONTROL PROLIFERATION ARE: (1) PROMOTE DETENTE; (2) AMELIORATE DIFFERENCES; (3) ESTABLISH POLICIES TO INHIBIT ACQUISITION OF NUCLEAR ENERGY SYSTEMS BY ADDITIONAL NATIONS WHILE OFFERING ALTERNATIVES;

124326 *CONTINUED*
(4) APPLY ECONOMIC SANCTIONS AGAINST DETONATION OF NUCLEAR DEVICES; AND (5) ACCORD STATUS TO COUNTRIES ON THE BASIS OF FACTORS OTHER THAN NUCLEAR CAPABILITIES.

PROLIFERATION + THEFT/DIVERSION + SAFEGUARDS, NUCLEAR MATERIAL + POWER PLANT, NUCLEAR + DEVELOPING COUNTRIES + NUCLEAR DETONATION + MILITARY CONSIDERATION

127509
NUCLEAR PROLIFERATION AND SAFEGUARDS
U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D.C.
APPROX. 270 PPS. 40 FIGS. JUNE 1977

DISCUSSES THE FOLLOWING TOPICS: PAST APPROACHES TO PROLIFERATION CONTROL, DEFINITION OF PROLIFERATION, POLICY IMPLICATIONS, INCENTIVES AND DISINCENTIVES FOR PROLIFERATION, THE NON-STATE ADVERSARY, NUCLEAR WEAPONS, SOURCES OF NUCLEAR MATERIAL, CONTROL OF PROLIFERATION, COMPARISON OF ROUTES TO NUCLEAR MATERIAL, AND THE INTERNATIONAL NUCLEAR INDUSTRY.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*PROLIFERATION + *SAFEGUARDS, NUCLEAR MATERIAL + SOURCE MATERIAL + CONTROL + INTERNATIONAL + JACOBS + *CONGRESSIONAL ACTIVITY

126916
WILLRICH M
INTERNATIONAL SAFEGUARDS AND NUCLEAR INDUSTRY
310 PPS. BOOK PUBLISHED BY THE JOHNS HOPKINS UNIV. PRESS, BALTIMORE, 1973

THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS (NPT), WHICH ENTERED INTO FORCE ON MARCH 5, 1970, IS A MAJOR ATTEMPT TO REDUCE THE RISK OF NUCLEAR WAR. THE IAEA/NPT SAFEGUARDS SYSTEM IS INTENDED TO ENSURE THAT NUCLEAR MATERIAL DESTINED FOR USE IN PEACEFUL ACTIVITIES, SUCH AS THE GENERATION OF ELECTRIC POWER, IS NOT DIVERTED TO USE IN NUCLEAR WEAPONS OR OTHER EXPLOSIVE DEVICES. THIS BOOK CONTAINS AN EXTENSIVE STUDY OF THE IAEA/NPT SAFEGUARDS SYSTEM AND THE PROBLEMS WHICH IT MUST DEAL WITH NOW. THE STUDY WAS CONDUCTED WITH THE NEED FOR GREATER PUBLIC UNDERSTANDING OF THE ISSUES INVOLVED IN MIND.

*SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + PROLIFERATION + IAEA + *INDUSTRY, NUCLEAR

124664
MIRANDA U + BRESESTI M + DE BIEVRE P + KOCH L
DEVELOPMENT AND APPLICATION OF SAFEGUARDS TECHNIQUES IN THE NUCLEAR FU[illegible]CLE
COMMISSION OF THE EUROPEAN COMMUNITIES
IAEA-CN-36/307 +. 10 PPS. FROM INTERNATIONAL CONFERENCE ON NUCLEAR PUR[illegible] AND ITS FUEL CYCLE: SALZBURG, AUSTRIA, MAY 2-13, 1977

EURATOM IS A SUPRANATIONAL SAFEGUARDS SYSTEM WHICH HAS RECEIVED INTERNATIONAL RECOGNITION FOR ITS EFFECTIVENESS. FOLLOWING ACCEPTANCE OF THE NON-PROLIFERATION TREATY BY ALL THE COMMUNITY MEMBER STATES (WITH THE EXCEPTION OF FRANCE), AN AGREEMENT WAS MADE BETWEEN THE IAEA AND EURATOM UNDER WHICH THE FORMER VERIFIES THE SAFEGUARDS ACTIVITIES OF THE LATTER IN THE MEMBER STATES IN RESPECT OF THE NPT. WITH A VIEW OF SOUND TECHNICAL IMPLEMENTATION, THE EURATOM SAFEGUARDS ACTIVITIES REQUIRE DAY-TO-DAY SUPPORT TO FACILITATE THE SOLUTION OF PRACTICAL PROBLEMS AND LONG-TERM WORK TO DEFINE OBJECTIVES, STRATEGIES AND CHOICE OF TECHNIQUES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*R AND D PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE + REGULATION + SURVEILLANCE PROGRAM + SEAL + EQUIPMENT DEVELOPMENT

124653
BENNETT CA
CURRENT TECHNICAL ISSUES IN INTERNATIONAL SAFEGUARDS
BATTELLE MEMORIAL INST., SEATTLE, WASH.
IAEA-CN-36/40 +. 7 PPS. FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE: SALZBURG, AUSTRIA, MAY 2-13, 1977

CERTAIN TECHNICAL ISSUES ARE INVOLVED IN ASSURING THE CONTINUING VIABILITY OF INTERNATIONAL SAFEGUARDS. THE FIRST IS THE GRADING OF MATERIALS IN TERMS OF THEIR SAFEGUARDS IMPORTANCE IN THE LIGHT OF ASSUMED HAZARDS. THE SECOND IS THE NEED TO AMPLIFY AND UPGRADE SAFEGUARDS SYSTEMS. THE THIRD MAJOR ISSUE IS THE NEED TO MEASURE THE TECHNICAL EFFECTIVENESS OF SAFEGUARDS, BOTH AS A MEANS OF REDUCING CONFLICTING OPINIONS CONCERNING THE DEGREE OF ASSURANCE PROVIDED AND A METHOD OF ESTABLISHING FEEDBACK FOR IMPROVING SYSTEMS EFFECTIVENESS. AN IMPORTANT ADJUNCT IS THE NEED FOR DATA PROCESSING AND ANALYSIS TO SUPPORT THE NEEDED ASSESSMENTS OF PERFORMANCE. SAFEGUARDS EFFECTIVENESS HAS BECOME A PRIMARY ISSUE WHICH CAN BE RESOLVED ONLY BY AGREEMENT ON THE TECHNICAL BASES FOR ITS MEASUREMENT.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + PROLIFERATION + THEFT/DIVERSION

124554

124554 *CONTINUED*
SANDERS B + RAINER RH
SAFEGUARDS AGREEMENTS - THEIR LEGAL AND CONCEPTUAL BASIS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-CN-36/432 +. 11 PPS. FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

IN AN ATTEMPT TO TRACE THE DEVELOPMENT OF INTERNATIONAL RELATIONS, FROM THE POINT OF VIEW OF NON-PROLIFERATION AND SAFEGUARDS THREE MAIN PERIODS ARE DISTINGUISHED. THESE 'PERIODS' ARE USED HERE TO IDENTIFY POLICY TRENDS, WHICH HAVE GRADUALLY EVOLVED AND WHICH ALL RUN IN PARALLEL, TO FORM TOGETHER WHAT ONE MIGHT TAKE TO BE THE PRESENT SAFEGUARDS AND NON-PROLIFERATION REGIME. THE PRESENT SAFEGUARDS REGIME - IN THE SENSE OF THE CIRCUMSTANCES LEADING TO THE APPLICATION OF SAFEGUARDS, THEIR SCOPE, OBJECTIVE, COVERAGE, DURATION - IS NOT YET CHARACTERIZED BY A HOMOGENOUS APPROACH BUT RATHER THE CO-EXISTENCE OF SAFEGUARDS CONCEPTS, AND CONSEQUENTLY AGREEMENTS, WHICH DIFFER SUBSTANTIALLY.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + PROLIFERATION + REVIEW

124551
SCHLEICHER HW + SHARPE BK
THE EURATOM SAFEGUARDS SYSTEM AS A REGIONAL CONTROL SYSTEM
EURATOM SAFEGUARDS DIRECTORATE, LUXEMBOURG
IAEA-CN-36/434 +. 10 PPS. FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THE EURATOM SAFEGUARDS SYSTEM - BY WHICH A REGIONAL CONTROL OF NUCLEAR MATERIAL WITHIN THE EUROPEAN COMMUNITY IS EXERCISED HAS UNDERGONE NEW DEVELOPMENTS. THE RIGHTS AND OBLIGATIONS DEVOLVING UPON THE COMMISSION OF THE EUROPEAN COMMUNITIES FOR SAFEGUARDS ARE ANALYSED AND THE RELATIONSHIP VIS-A-VIS IAEA UNDER NPT AS A REGIONAL SYSTEM OF CONTROL IS EXAMINED. GENERAL DESCRIPTIONS ARE GIVEN OF THE INITIAL PHASES OF THE IMPLEMENTATION OF THE 1973 AGREEMENT BETWEEN SEVEN MEMBER STATES IN THE COMMUNITY, EURATOM AND IAEA WITH REGARD TO THE PROCESSING AND TRANSMISSION OF DATA AND THE INITIAL INSPECTION ACTIVITIES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + CONTROL SYSTEM + SURVEILLANCE PROGRAM + STATE PROGRAM + REGULATION + IAEA + *REGULATION, IAEA

124542
KENNEDY RT + LYON ME
ASSURANCE OF THE EFFECTIVENESS OF SAFEGUARDS IN LIGHT OF THEIR OBJECTIVES
US NRC + US ERDA
IAEA-CN-36/414 +. 14 PPS. FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THIS BRIEF SURVEY WILL DESCRIBE AND EXAMINE THE NATURE OF THE U.S. SAFEGUARDS SYSTEMS. IT WILL CONSIDER HOW THE U.S. IS ORGANIZED TO DEVELOP AND APPLY SAFEGUARDS AND SOME METHODS AND TECHNIQUES FOR ASSESSING THE EFFECTIVENESS OF SAFEGUARDS SYSTEMS. FINALLY, THE MEANS FOR BRINGING THE U.S. KNOWLEDGE TO THE ATTENTION OF OTHER NATIONS THAT ARE SIMILARLY CONCERNED WILL BE DISCUSSED.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + *SYSTEM DESCRIPTION + UNITED STATES + PROTECTION SYSTEM + REGULATION + ANALYTICAL TECHNIQUE + ANALYTICAL MODEL

124472
IMAI H
THE ROLE OF IAEA SAFEGUARDS IN CONNECTION WITH NUCLEAR TRADE
THE JAPAN ATOMIC POWER CO., TOKYO, JAPAN
IAEA-CN-36/157 +. 16 PPS. FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

TECHNOLOGY TRANSFER BETWEEN NATIONS IS ONE OF THE MAJOR NEW PROBLEMS OF OUR TIME, AND NUCLEAR TRADE IS A TYPICAL EXAMPLE. IAEA SAFEGUARDS IS AN INSTRUMENT TO ASSURE THAT THE TRANSFER FOR THE PURPOSE OF MEETING THE GLOBAL SOCIAL NEEDS WOULD NOT RESULT IN MISUSE OF TECHNOLOGY. THIS GENERAL PROBLEM CANNOT BE SOLVED JUST BY INSTITUTING TECHNICAL OR PROCEDURAL MEANS. WHAT IS NEEDED TO MAKE IAEA SAFEGUARDS EFFECTIVE AND MEANINGFUL IN TOMORROW'S WORLD IS THE BASIC WISDOM WHICH APPRECIATES NUCLEAR PROLIFERATION AS A PART OF MORE GENERAL PROBLEM.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + *IAEA + REGULATION, IAEA + INTERNATIONAL + BENEFICIAL USE, COMMERCIAL + SOCIO/PHILOSOPHICAL CONSIDERATION + PROLIFERATION

124457
ANDERSON AR
CONTRIBUTION OF THE 'SAFEGUARDED' TO THE DEVELOPMENT OF SAFEGUARDS

124457 *CONTINUED*
UKAEA, AERE HARWELL
IAEA-CN-36/76 +. 20 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THIS PAPER IS CONCERNED SOLELY WITH AN EXAMINATION OF THE TECHNICAL CONTRIBUTION WHICH HAS BEEN MADE BY NUCLEAR ORGANIZATIONS AND MEMBER STATES, I.E. THOSE BEING SAFEGUARDED, TO THE DEVELOPMENT OF THE CONTROL PROCEDURES BY THE SAFEGUARDING AUTHORITY. IN SO DOING, IT IS PARTLY AN HISTORIC REVIEW BUT ALSO EMPHASISES THE CONTINUING NATURE OF THIS COLLABORATION AND IDENTIFIES AREAS OF POTENTIAL IMPORTANCE FOR THE FUTURE.

AVAILABILITY UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *REVIEW + IAEA + MEASUREMENT + TEST, NONDESTRUCTIVE + STATISTICAL ANALYSIS + RECORDS

124320
BUNDY M + KEENY SM + ABRAHAMSEN S + KAYSEN C
NUCLEAR POWER ISSUES AND CHOICES
THE MITRE CORP.
418 PPS, PUBL. BY BALLING PUBLISHING CO., CAMBRIDGE, MASS., SPONSORED BY THE FORD FOUNDATION, 1977

PRESENTS THE RESULTS OF A YEAR LONG STUDY OF THE DEBATE OVER NUCLEAR POWER ISSUES SPONSORED BY THE FORD FOUNDATION GRANT TO THE MITRE CORP. MITRE PROVIDED ADMINISTRATIVE SUPPORT TO THE 21 MEMBERS OF THE PANEL, THE NUCLEAR ENERGY POLICY STUDY GROUP, WHO WERE ASSEMBLED TO PERFORM THE STUDY. THE GROUP SOUGHT TO DEVELOP A FRAMEWORK FOR ASSESSING THE DIFFICULT PROBLEMS RELATING TO NUCLEAR POWER NOW BEFORE THE U.S. GOVT. ISSUES CONSIDERED WERE: THE REPROCESSING AND RECYCLE OF PLUTONIUM; THE BREEDER REACTOR PROGRAM; THE MANAGEMENT OF NUCLEAR WASTES; THE EXPANSION OF URANIUM ENRICHMENT CAPACITY; AND THE EXPORT OF NUCLEAR TECHNOLOGY AND MATERIALS. MAJOR SECTIONS OF THE BOOK ARE ENTITLED: ENERGY ECONOMICS AND SUPPLY; HEALTH, ENVIRONMENT, AND SAFETY; NUCLEAR PROLIFERATION AND TERRORISM; AND ISSUES FOR DECISION.

*N-POWER, SAFETY OF + SAFETY PRINCIPLES AND PHILOSOPHY + FUEL RECYCLE + FUEL REPROCESSING + WASTE MANAGEMENT + EXPANSION + ENRICHMENT FACILITY + ECONOMICS + ENVIRONMENTAL QUALITY + PROLIFERATION + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + *N-POWER FORECAST + REACTOR, BREEDER + ATMOSPHERIC DIFFUSION + PLUTONIUM

124312
ATOMIC ENERGY LAW - BIBLIOGRAPHY AND SOURCES
445 PPS, PUBL. IN GERMANY BY INST. FUR VOLKERRECHT DER UNIVERSITAT GOTTINGEN, 1976 (LIBRARY OF CONGRESS CATALOG 63-48739)

THIS BIBLIOGRAPHY PRESENTS CITATIONS PERTAINING TO RADIATION PROTECTION, ENVIRONMENTAL PROTECTION, REACTOR SAFETY, SAFEGUARDS, TRANSPORTATION AND HANDLING OF NUCLEAR MATERIAL, ETC. THESE CITATIONS CONCERN REGULATIONS, GUIDES, AND LAWS FOR 52 COUNTRIES FROM ARGENTINA TO YUGOSLAVIA CONCERNING ALL ASPECTS OF NUCLEAR POWER.

*LAW + REGULATION + GUIDE + *INTERNATIONAL + *N-POWER, SAFETY OF + ENVIRONMENTAL QUALITY + TRANSPORTATION AND HANDLING + SAFEGUARDS, NUCLEAR MATERIAL + RADIATION SAFETY AND CONTROL

123743
BICKEMAN RL
SAFEGUARDS PERSPECTIVES AN EXPRESSION OF INDUSTRY'S RESPONSIBILITIES AND VIEWS
EXXON NUCLEAR CO, INC., BELLEVUE, WASH.
5 PPS, J. INST. NUCLEAR MATERIALS MANAGEMENT, V(II), PP. 42-46 (SUMMER 1976)
INDUSTRY CAN PROVIDE EFFECTIVE, ADEQUATE AND CREDIBLE SAFEGUARDS FOR PLUTONIUM EVEN TO INCLUDING, IF NECESSARY PROTECTION AGAINST THE EXTREME THREAT OF ATTACK BY A WELL-TRAINED AND WELL-EQUIPPED PARAMILITARY FORCE. INDUSTRY HAS THE EXPERIENCE AND SELF-INTEREST FOR THE TASK OF IMPLEMENTATION. WE MUST REMIND OURSELVES OF THE INTERNATIONAL NATURE OF THE SAFEGUARDS PROBLEM. WE ENDORSE EXTRAORDINARY SECURITY MEASURES IN ASSOCIATION WITH CONCENTRATED PLUTONIUM AND HIGHLY ENRICHED URANIUM.
SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + PLUTONIUM + FUEL CYCLE + LEGALISTICS

123188
NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM
OAK RIDGE GASEOUS DIFFUSION PLANT, TENN.
K/CSD/TM-4 +. 82 PPS, FIGS, OCT. 1976

THE NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM (NMMSS) IS THE NATIONAL DATA BASE AND INFORMATION SUPPORT SYSTEM ON NUCLEAR MATERIALS CONTROLLED BY THE UNITED STATES GOVERNMENT. THE SYSTEM ENCOMPASSES THE NUCLEAR RESEARCH, DEVELOPMENT, AND PRODUCTION PROGRAMS OF THE FEDERAL GOVERNMENT, THE PRIVATE NUCLEAR PROGRAMS SUBJECT TO FEDERAL REGULATIONS, AND THE FOREIGN NUCLEAR PROGRAMS UNDER INTERNATIONAL AGREEMENTS FOR COOPERATION. IT OPERATES WITH A CENTRAL DATA BASE AND INTERACTING COMMUNICATIONS WITH MANY NUCLEAR FACILITIES AND WITH THE HEADQUARTERS, FIELD, AND REGIONAL OFFICES OF THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION (ERDA) AND THE NUCLEAR REGULATORY COMMISSION (NRC).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

122188 *CONTINUED*
SAFEGUARDS, NUCLEAR MATERIAL + AGENCY, ERDA + DATA COLLECTION + DATA PROCESSING + MATERIAL

122120
MASTER PLAN
U.S. ERDA, WASHINGTON
ERDA-76/122 *, 120 PPS, 3 TABS, 12 FIGS, SEPT, 1976

DETAILS THE INTERRELATIONSHIP AMONG ALL OF THE PROGRAM ELEMENTS AND TASKS DESCRIBED IN THE 'NATIONAL PLAN FOR ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION' (ERDA 76-1), SAFEGUARDS SECTIONS OF APPROPRIATE ENVIRONMENTAL IMPACT STATEMENTS, AND OTHER ERDA PUBLICATIONS. THIS PLAN SERVES AS A BASIS FOR ALL DSS SAFEGUARDS AND SECURITY ACTIVITIES. THE PLAN INCLUDES A BACKGROUND SECTION - WHICH CONTAINS A BRIEF HISTORY OF THE DEVELOPMENT OF NUCLEAR SAFEGUARDS AND SECURITY ACTIVITY AND A STATEMENT OF THE OBJECTIVES OF THE PROGRAM - AND A DESCRIPTION OF THE CURRENT STATUS OF DOMESTIC AND INTERNATIONAL SAFEGUARDS AND SECURITY ACTIVITIES. THE ESSENCE OF THE PLAN IS A DETAILED DESCRIPTION OF THE CURRENT AND PLANNED PROGRAM DESIGN AND DEVELOPMENT AND OPERATIONAL TASKS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AGENCY, ERDA + *SAFEGUARDS, NUCLEAR MATERIAL + REVIEW + *GUIDE + INTERNATIONAL + UNITED STATES + JACOBS

122060
U.S. NUCLEAR POWER EXPORT ACTIVITIES. FINAL ENVIRONMENTAL STATEMENT. VOL. 2 - APPENDICES AND COMMENT LETTERS
U.S. ERDA, WASHINGTON
ERDA-1541(VOL.2) *, 1138 PPS, APRIL 1976

CONTAINS APPENDICES TO VOL. 1. APPENDIX A REPRINTS AGREEMENTS BETWEEN THE U.S. AND AUSTRIA, IAEA, AND ARGENTINA. APPENDIX B REPRINTS ENVIRONMENTAL SURVEYS ON URANIUM MINING AND MILLING. APPENDIX C REPRINTS SEVERAL ITEMS RELATED TO THE SAFEGUARDING OF NUCLEAR MATERIAL. APPENDIX D REPRINTS SECTIONS ON TECHNOLOGICAL ALTERNATIVES, RELATED ERDA PROGRAMS, AND NON-U.S. NUCLEAR SUPPLIER CAPABILITY. APPENDIX E REPRINTS 33 LETTERS OF PUBLIC COMMENT. APPENDIX F CONTAINS MATERIAL ON THE GLOBAL EFFECTS OF NUCLEAR POWER AND AN IAEA ACTIVITIES CONCERNED WITH NUCLEAR SAFETY AND ENVIRONMENTAL PROTECTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*STATEMENT, ENVIRONMENTAL + REACTOR POWER + COST BENEFIT + ECONOMICS + ENVIRONMENT + MINING + *FUEL CYCLE + ENRICHMENT FACILITY + FABRICATION + FUEL ELEMENTS + *WASTE MANAGEMENT + POWER PLANT, NUCLEAR + TRANSPORTATION AND HANDLING + DEVELOPING COUNTRIES + JACOBS + SAFEGUARDS, NUCLEAR MATERIAL

121131
ROSS L
HOW 'ATOMS FOR PEACE' BECAME BOMBS FOR SALE
12 PPS, THE NEW YORK TIMES MAGAZINE, DEC. 5, 1976

ATOMIC BOMBS (CRUDE ONES LIKE THE FIRST ONES) ARE THE THREAT. THEY ARE NOT DIFFICULT TO MAKE, FOR A COUNTRY WITH DEVELOPING INDUSTRIAL CAPACITY AND PLUTONIUM. THE PLUTONIUM CAN BE OBTAINED FROM SPENT FUEL FROM NUCLEAR REACTORS. COUNTRIES THAT COULD DETONATE A BOMB IN 3 YEARS ARE CANADA, ISRAEL, ITALY, JAPAN, S. AFRICA, SPAIN, SWEDEN, SWITZERLAND, AND THAILAND. EXTRACTION OF PLUTONIUM FROM SPENT FUEL REQUIRES A SMALL-SCALE REPROCESSING PLANT ($10 TO $50 MILLION) WHICH COULD PROBABLY BE BROUGHT FROM FRANCE OR WEST GERMANY. INDIA HAS FOLLOWED THE TRAIL DESCRIBED ABOVE, BUILT A BOMB AND DETONATED IT. ALSO DISCUSSED ARE INTERNATIONAL SAFEGUARDS, ATOMS FOR PEACE, NON-PROLIFERATION, BRAZIL'S PURCHASE OF REACTORS AND A URANIUM ENRICHMENT PLANT FROM WEST GERMANY, AND THE FRENCH-PAKISTANI REPROCESSING DEAL WHICH WOULD HAVE MADE BOMB PRODUCTION POSSIBLE FOR PAKISTAN.

PLUTONIUM + POWER PLANT, NUCLEAR + PROLIFERATION + NUCLEAR DETONATION + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL

121087
NUCLEAR ENERGY AND NATIONAL SECURITY
COMMITTEE FOR ECONOMIC DEVELOPMENT
87 PPS, 2 FIGS, SEPT, 1976

PRESENTS THE FINDINGS OF A STUDY BY THE COMMITTEE FOR ECONOMIC DEVELOPMENT (CED) WHICH IS A NONPROFIT, NONPARTISAN RESEARCH AND EDUCATIONAL ORGANIZATION. THIS STUDY EXAMINES THE ROLE OF THE UNITED STATES IN THE SAFE AND CONTROLLED DEVELOPMENT OF NUCLEAR POWER ON A WORLD-WIDE BASIS AND IN SAFEGUARDING THE NUCLEAR POWER INDUSTRY THROUGH EXPORT CONTROLS, IMPROVED INSPECTION, AND IN MULTINATIONAL CONTROL OF DANGEROUS NUCLEAR MATERIALS. THE PURPOSE OF THIS CED STUDY IS TO EXPLORE WAYS TO PREVENT OR AT LEAST SLOW THE SPREAD OF INDIVIDUAL NATIONAL CAPABILITIES TO PRODUCE NUCLEAR EXPLOSIVES WHILE STILL MEETING THE WORLD'S ENERGY NEEDS. CED CONCLUDES THE ONLY OPTION FOR THE U.S. IS TO CONTINUE TO PARTICIPATE AND TO EXERCISE INFLUENCE AND LEADERSHIP IN THE NUCLEAR WORLD.

AVAILABILITY - COMMITTEE FOR ECONOMIC DEVELOPMENT, 477 MADISON AVE., NEW YORK, N.Y. 10022

N-POWER, SAFETY OF + *SAFEGUARDS, NUCLEAR MATERIAL + SAFETY PRINCIPLES AND PHILOSOPHY + *PROLIFERATION + SECURITY + GROWTH/DEVELOPMENT

120112
CHILK SJ
MIXED OXIDE FUEL ASSESSMENT - SCOPE, PROCEDURES AND SCHEDULE FOR GENERIC ENVIRONMENTAL IMPACT STATEMENT AND CRITERIA FOR INTERIM LICENSING ACTIONS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NP-23793 +, 46 PPS, NOV. 11, 1975

IN THE MAY 8, 1975 FEDERAL REGISTER (40 F.R. 20142), THE NRC REQUESTED PUBLIC COMMENT ON THE SUBJECT OF PROCEDURES FOR DECISIONS RELATING TO WIDE-SCALE USE OF MIXED OXIDE FUEL IN LIGHT WATER NUCLEAR POWER REACTORS. IN ORDER TO FOCUS ATTENTION ON THE MAJOR ELEMENTS OF THE DECISIONS IT WOULD HAVE TO MAKE, NRC STATED ITS PROVISIONAL VIEWS IN THAT NOTICE. AFTER A CAREFUL REVIEW OF ALL COMMENTS REVIEWED ON ITS MAY 8TH PROVISIONAL VIEWS, NRC HAS DETERMINED THAT THE SUBJECT OF WIDE-SCALE USE OF MIXED OXIDE FUEL IN THE LIGHT WATER POWER REACTOR FUEL CYCLE REQUIRES A FULL ASSESSMENT OF SAFEGUARDS ISSUES BEFORE ITS DECISION IS MADE. AT THE SAME TIME, NRC FIRMLY BELIEVES THAT IT IS IN THE NATIONAL INTEREST TO EXPEDITE THE DECISION-MAKING PROCESS TO THE EXTENT CONSISTENT WITH SOUND AND FULL EXAMINATION OF THE ISSUES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*AGENCY, NRC + FUEL, NUCLEAR + *MIXED OXIDE + SAFETY EVALUATION + SAFETY PRINCIPLES AND PHILOSOPHY + *SAFEGUARDS, NUCLEAR MATERIAL + PUBLIC RELATIONS

120121
OMB SUPPORTS ERDA IN SHIPPING SWITCH
1 PG, NUCLEAR NEWS, 19(13), PG. 85 (OCT. 1976)

THE OFFICE OF MANAGEMENT AND BUDGET DECIDED TO GO ALONG WITH THE DECISION OF ERDA TO TAKE OVER THE TRANSPORTATION OF STRATEGIC QUANTITIES OF SPECIAL NUCLEAR MATERIAL (SNM) FROM THE CIVILIAN NUCLEAR PROGRAM. SAM EDLOW, A CIVILIAN SHIPPING CONTRACTOR, OPPOSED THIS CHANGE, BUT ESSENTIALLY DECIDED TO DROP HIS OPPOSITION AFTER THIS FINDING, AND INDICATED THAT HE WOULD LET THE VARIOUS AGENCIES INVOLVED TO ARGUE OUT THE ISSUES OF 'INCREASED SECURITY' AND 'COST EFFECTIVENESS.'

*TRANSPORTATION AND HANDLING + SPECIAL NUCLEAR MATERIAL + SAFEGUARDS, NUCLEAR MATERIAL + SECURITY

120370
ROTSEY WB
CONDITIONS APPLYING TO AUSTRALIAN URANIUM EXPORTS - SAFEGUARDS OBLIGATIONS UNDER NPT
AUSTRALIAN ATOMIC ENERGY COMMISSION
7 PPS, ATOMIC ENERGY IN AUSTRALIA, 1(2), PP. 1-7 (APRIL 1976)

THIS PAPER DEFINES TWO SAFEGUARDS REGIMES, ONE APPLYING TO COUNTRIES SUCH AS AUSTRALIA WHICH ARE PARTY TO THE TREATY ON NON-PROLIFERATION OF NUCLEAR WEAPONS (NPT), THE OTHER TO THOSE WHICH ARE NOT PARTIES. THE APPLICATION OF SAFEGUARDS AND THE ROLE OF THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) ARE BRIEFLY EXPLAINED. AUSTRALIA'S OBLIGATIONS UNDER THE NPT AND THOSE STEMMING FROM SPECIFIC UNDERTAKINGS TO THE IAEA ARE STATED. THE LATTER REQUIRE AUSTRALIA TO ENSURE THAT NON-NUCLEAR WEAPONS STATES NOT PARTY TO THE NPT GIVE ASSURANCES THAT AUSTRALIAN URANIUM WILL NOT BE USED FOR THE MANUFACTURE OF NUCLEAR EXPLOSIVES AND THAT THEY WILL PERMIT VERIFICATION BY THE IAEA.

AUSTRALIA + IAEA + PROLIFERATION + SAFEGUARDS, NUCLEAR MATERIAL

119824
FLOWERS B
(1) A WARNING IN BRITAIN; (2) A WATCHDOG'S VIEW
6 PPS, BULLETIN OF THE ATOMIC SCIENTISTS, 32(10), PP. 22-27 (DEC. 1976)

IN A REPORT WHICH WILL BE STUDIED CAREFULLY ON BOTH SIDES OF THE ATLANTIC, BRITAIN'S ROYAL COMMISSION ON ENVIRONMENTAL POLLUTION HAS CAUTIONED AGAINST THE HASTY DEVELOPMENT OF NUCLEAR POWER. IT SOUNDED A NOTE OF WARNING IN THE AREAS OF PLUTONIUM SAFEGUARDS AND RADIOACTIVE WASTE MANAGEMENT. THE COMMISSION SAID THE ABANDONMENT OF NUCLEAR POWER WOULD BE NEITHER WISE NOR JUSTIFIED, BUT A MAJOR COMMITMENT TO FISSION POWER AND A PLUTONIUM ECONOMY SHOULD BE POSTPONED AS LONG AS POSSIBLE. THE FIRST ARTICLE PRESENTS HIGHLIGHTS FROM THE COMMISSION'S CONCLUSIONS AND RECOMMENDATIONS. THE SECOND ARTICLE IS ADAPTED FROM A TALK PRESENTED BY SIR BRIAN FLOWERS WHO WAS RESPONSIBLE FOR THE REPORT FROM THE ROYAL COMMISSION AT A CONFERENCE IN LONDON REGARDING BRITAIN'S NUCLEAR POWER INDUSTRY.

PLUTONIUM + UNITED KINGDOM + WASTE MANAGEMENT + SAFEGUARDS, NUCLEAR MATERIAL + GROWTH/DEVELOPMENT + INDUSTRY, NUCLEAR + SECURITY + FUEL RECYCLE

119266
PALFREY JG
NUCLEAR EXPORTS AND NONPROLIFERATION STRATEGY
COLUMBIA UNIVERSITY
28 PPS, PP. 129-56, BOOK PUBLISHED BY PRENTICE-HALL INC., ENGLEWOOD CLIFFS, N.J., 1976

CHAPTER 5 OF THE BOOK 'THE NUCLEAR POWER CONTROVERSY' IS A TREATMENT OF THE INTERNATIONAL ASPECTS OF THE PROBLEM WITH PRIMARY EMPHASIS UPON THE SITUATION OF THE UNITED STATES AS AN ACTUAL OR POTENTIAL EXPORTER OF TECHNOLOGY. THE AUTHOR TREATS IN DETAIL THE PROBLEM OF OUR RELATIONS WITH PARTICULAR REFERENCE TO THE POSSIBILITIES OF JOINT AND UNILATERAL ACTION TO PREVENT THE EXPORT OF

119206 *CONTINUED*
TECHNOLOGY BEING ACCOMPANIED BY NUCLEAR PROLIFERATION.

*PROLIFERATION * TECHNOLOGY * SAFEGUARDS, NUCLEAR MATERIAL * IAEA * FUEL REPROCESSING * PLUTONIUM * ENRICHMENT FACILITY

119259
SAFEGUARD ENFORCEMENT NEEDED
6 PPS, NUCLEAR INDUSTRY, 23(7), PP. 3-8 (JULY 1976)

SPEAKERS OF THE FORUM'S INTERNATIONAL CONFERENCE ON URANIUM ENRICHMENT VOICED UNCERTAINTIES RELATIVE TO SAFEGUARDS. MYRON KRATZER, DEPUTY ASSISTANT SECRETARY OF STATE, SAID, "IT IS ABSOLUTELY ESSENTIAL THAT WE CREATE AN UNMISTAKABLE PRESUMPTION THAT VIOLATIONS OF SAFEGUARDS--THE DIVERSION OF NUCLEAR MATERIAL COMMITTED TO PEACEFUL USE--WILL IN FACT BE FOLLOWED BY QUICK, EFFECTIVE SANCTIONS APPLIED BY THE WORLD COMMUNITY AS A WHOLE". THE CONFERENCE CONCENTRATED ON ISSUES PERTAINING TO UNSETTLED PROBLEMS OF URANIUM ENRICHMENT PARTICULARLY UNITED STATES UNSETTLED POLICY.

URANIUM * ENRICHMENT FACILITY * SAFEGUARDS, NUCLEAR MATERIAL * PROLIFERATION

119220
U.S. NUCLEAR EXPORT POLICY
ATOMIC INDUSTRIAL FORUM INC., WASHINGTON, D.C.
5 PPS, AIF POSITION PAPER, JULY 21, 1976

THE ATOMIC INDUSTRIAL FORUM'S COMMITTEE ON NUCLEAR EXPORT POLICY AS WELL AS THE NUCLEAR INDUSTRY AS A WHOLE STRONGLY SUPPORTS THE LONG-STANDING UNITED STATES POLICY TO LIMIT THE PROLIFERATION OF NUCLEAR WEAPONS. U.S. POLICY DEPENDS ON THREE INTERLOCKING FUNDAMENTALS: FIRST, TO RETARD NUCLEAR WEAPON PROLIFERATION; SECOND, TO PROVIDE ADEQUATE ASSURANCE THAT NATIONS WILL HAVE ACCESS TO NUCLEAR FUEL AND A MEANS OF DISPOSING OF SPENT FUEL; AND THIRD, TO SUPPORT A VIABLE AND COMPETITIVE EXPORT PROGRAM IN ORDER TO INFLUENCE THE NUCLEAR POLICIES OF OTHER NATIONS. U.S. LEADERSHIP IN ATTAINING THESE OBJECTIVES WILL BE ENHANCED BY CONTINUED COOPERATION WITH OTHER NATIONS IN THE DEVELOPMENT OF NUCLEAR POWER UNDER APPROPRIATE SAFEGUARDS.

AVAILABILITY - ATOMIC INDUSTRIAL FORUM INC., PUBLIC AFFAIRS & INFORMATION PROGRAM, 475 PARK AVENUE SOUTH, NEW YORK, NY 10016

PROLIFERATION * REGULATION, FEDERAL * FUEL, NUCLEAR * FUEL REPROCESSING * INDUSTRY, NUCLEAR * SAFEGUARDS, NUCLEAR MATERIAL

119205
DRAFT ENVIRONMENTAL STATEMENT ON THE TRANSPORTATION OF RADIOACTIVE MATERIAL BY AIR AND OTHER MODES
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NUREG-0034 *, 378 PPS, 80 TABS, 25 FIGS, MARCH 1976 (DOCKETS PR-71,73 (40 FR 23768))

THIS STATEMENT WAS PREPARED IN CONNECTION WITH THE NRC RE-EVALUATION OF ITS PRESENT REGULATIONS GOVERNING AIR TRANSPORTATION OF RADIOACTIVE MATERIALS, TO PROVIDE SUFFICIENT ANALYSIS TO DETERMINE THE EFFECTIVENESS OF THE PRESENT RULES AND OF POSSIBLE ALTERNATIVES TO THESE RULES. THE REPORT CONSISTS OF SEVEN CHAPTERS AND APPROPRIATE APPENDICES. THE SUBJECTS OF THE CHAPTERS ARE: INTRODUCTION; REGULATIONS GOVERNING RADIOACTIVE MATERIALS TRANSPORT; RADIOLOGICAL EFFECTS; TRANSPORT IMPACTS UNDER NORMAL CONDITIONS; EFFECT OF TRANSPORT UNDER ACCIDENT CONDITIONS; ALTERNATIVES; AND SECURITY AND SAFEGUARDS.

AVAILABILITY - NRC, OFFICE OF STANDARDS DEVELOPMENT, WASHINGTON, D.C. 20555

*TRANSPORTATION AND HANDLING * AIRCRAFT * SAFEGUARDS, NUCLEAR MATERIAL * INDUSTRY, TRANSPORTATION * *DRAFT STATEMENT, ENVIRONMENTAL * REGULATION, NRC * AGENCY, NRC * SECURITY

118902
U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION FIRST PUBLIC MEETING ON A NATIONAL PLAN FOR ENERGY RESEARCH, DEVELOPMENT AND DEMONSTRATION: ATLANTA, GEORGIA, OCTOBER 20, 21, 1975
U.S. ERDA, WASHINGTON
ERDA-48(M-1) *, 75 PPS, FROM 1ST MEETING ON A NATIONAL PLAN FOR ENERGY RESEARCH, DEVELOPMENT & DEMONSTRATION; ATLANTA, GA., OCT 20, 1975

THE PURPOSE OF THESE MEETINGS IS TO ACQUAINT THE PUBLIC WITH ERDA'S LONG-TERM COMPREHENSIVE ENERGY PLAN AND TO ELICIT PUBLIC COMMENT. IT IS ERDA'S INTENT TO INITIATE A MEANINGFUL DIALOGUE WITH LOCAL, STATE, AND REGIONAL GROUPS CONCERNING PARTICULAR REGIONAL ENERGY ISSUES. AT THE ATLANTA MEETING SEVERAL SPEAKERS COMMENTED ON THE DEVELOPMENT OF HYDROGEN AS A FUEL. OTHER COMMENTS CONCERNED NUCLEAR SAFEGUARDS, ENVIRONMENTAL CONCERNS, AND SAFETY. A STATE REPRESENTATIVE QUESTIONED PROLIFERATION

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

AGENCY, ERDA * SAFEGUARDS, NUCLEAR MATERIAL * PROLIFERATION * POWER PLANT, NUCLEAR

118893
GILINSKY V
NRC SAFEGUARDS AND RELATED ISSUES

118873 *CONTINUED*
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
8 PPS, NUCL. MATER. *ANAGE., 4(3), PP. 9-16 (JUNE 18, 1975)

ISSUES RAISED BY THE NEED FOR NUCLEAR SAFEGUARDS ARE DISCUSSED. EXISTING SAFEGUARDS MEASURES, IMPROVEMENTS, AND NE* MEASURES UNDER CONSIDERATION ARE DISCUSSED. GUARDS, SECURITY, AND THE RESULTING EFFECT ON CIVIL LIBERTIES ARE DISCUSSED.

SAFEGUARDS, NUCLEAR *ATERIAL + SECURITY + REGULATION, NRC + PUBLIC RELATIONS

118890
ROMETSCH R
IAEA INTERNATIONAL SAFEGUARDS AND THE NPT REVIE* CONFERENCE
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
17 PPS, NUCL. MATER. MANAGE., 4(3), PP. 17-33 (JUNE 18, 1975)

THE NON-PROLIFERATION TREATY (NPT) AND ITS ASSOCIATED SAFEGUARDS ARE DISCUSSED. A NPT CONFERENCE *AS HELD IN GENEVA ON MAY 5 TO 30, 1975, AND ITS DELIBERATIONS ARE SUMMARIZED, *ITH DISCUSSIONS OF THE VARIOUS ARTICLES OF THE TREATY.

IAEA + SAFEGUARDS, NUCLEAR MATERIAL + PROLIFERATION

117579
ROTSEY *B
CONDITIONS APPLYING TO AUSTRALIAN URANIUM EXPORTS - SAFEGUARDS OBLIGATIONS UNDER NPT
AUSTRALIAN ATOMIC ENERGY COMMISSION
AAEC/IP4 +, 13 PPS, AUG. 1975

DEFINES T*O SAFEGUARDS REGIMES, ONE APPLYING TO COUNTRIES SUCH AS AUSTRALIA *HICH ARE PARTY TO THE TREATY ON NON-PROLIFERATION OF NUCLEAR *EAPONS (NPT), THE OTHER TO THOSE *HICH ARE NOT PARTIES. THE APPLICATION OF SAFEGUARDS AND THE ROLE OF THE INTERNATIONAL ATOMIC ENERGY AGENCY ARE BRIEFLY EXPLAINED. AUSTRALIA'S OBLIGATIONS UNDER THE NPT AND THOSE STEMMING FROM SPECIFIC UNDERTAKINGS TO THE IAEA ARE STATED. THESE OBLIGATIONS GIVE RISE TO A SET OF MINIMUM CONDITIONS APPLYING TO EXPORTS OF AUSTRALIAN URANIUM *HICH VARY ACCORDING TO THE NPT STATUS OF THE IMPORTING COUNTRIES.

AVAILABILITY - THE AUSTRALIAN EMBASSY, *ASHINGTON, D.C.

AUSTRALIA + SAFEGUARDS, NUCLEAR MATERIAL + *URANIUM + IAEA

117544
FINAL GENERIC ENVIRONMENTAL STATEMENT ON THE USE OF RECYCLE PLUTONIUM IN MIXED OXIDE FUEL IN LIGHT *ATER COOLED REACTORS - HEALTH, SAFETY AND ENVIRONMENT. VOLUME 5
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
NUREG-0002(VOL.5) +, APPROX. 425 PPS, FIGS, REFS, AUG. 1976

VOLUMES 2 THROUGH 4 CONTAIN THE BODY OF THE STATEMENT. THIS VOLUME PRESENTS PUBLIC COMMENTS AND NRC RESPONSES. THE TEXT OF SIXTY-NINE LETTERS ARE PRESENTED ALONG *ITH RESPONSES FROM FEDERAL, STATE AND LOCAL AGENCIES, ENVIRONMENTAL AND PUBLIC INTEREST GROUPS, INDUSTRY, AND CITIZENS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM + REACTOR, L*R + SAFEGUARDS, NUCLEAR MATERIAL + MIXED OXIDE + AGENCY, NRC + *FUEL RECYCLE + STATEMENT, ENVIRONMENTAL + JACOBS

117543
FINAL GENERIC ENVIRONMENTAL STATEMENT ON THE USE OF RECYCLE PLUTONIUM IN MIXED OXIDE FUEL IN LIGHT *ATER COOLED REACTORS - HEALTH, SAFETY AND ENVIRONMENT. VOLUME 4
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
NUREG-0002(VOL.4) +, 200 PPS, TABS, FIGS, AUG. 1976

VOLUMES 2 THROUGH 4 PRESENT THE BODY OF THE STATEMENT. THIS VOLUME PRESENTS CHAPTERS 5 THROUGH 11, OF *HICH, THE SUBJECTS ARE: SAFEGUARDS REFERENCE; ADVERSE ENVIRONMENTAL EFFECTS; MITIGATION OF ADVERSE EFFECTS; ALTERNATIVE DISPOSITIONS OF PLUTONIUM; SHORT/LONG TERM IMPACTS; IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES; AND ECONOMIC ANALYSIS AND COST-BENEFIT BALANCING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + *PLUTONIUM + REACTOR, L*R + SAFEGUARDS, NUCLEAR MATERIAL + COST BENEFIT + *MIXED OXIDE + AGENCY, NRC + *FUEL RECYCLE + STATEMENT, ENVIRONMENTAL + JACOBS

117540
FINAL GENERIC ENVIRONMENTAL STATEMENT ON THE USE OF RECYCLE PLUTONIUM IN MIXED OXIDE FUEL IN LIGHT *ATER COOLED REACTORS - HEALTH, SAFETY AND ENVIRONMENT. VOLUME 1
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
NUREG-0002(VOL.1) +, 125 PPS, FIGS, REFS, AUG. 1976

THIS VOLUME IS A SUMMARY OF THE ENVIRONMENTAL STATEMENT. THE BODY OF THE STATEMENT IS CONTAINED IN VOLUMES 2 THROUGH 4. ALL CHAPTERS OF THE STATEMENT ARE SUMMARIZED AND INCLUDE THE FOLLOWING SUBJECTS: BACKGROUND AND EXPERIENCE *ITH PLUTONIUM; PROJECTED PU RECYCLE INDUSTRY; ENVIRONMENTAL

117549 *CONTINUED*
IMPACT DUE TO THE IMPLEMENTATION OF PU RECYCLE; SAFEGUARDS REFERENCE; PROBABLE ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED; MEANS FOR MITIGATING ADVERSE ENVIRONMENTAL EFFECTS; ALTERNATIVE DISPOSITIONS OF PLUTONIUM; COMMITMENTS OF RESOURCES; AND ECONOMIC ANALYSIS ARE COST-BENEFIT BALANCING.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + *PLUTONIUM + REACTOR, LWR + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + RESOURCE, NATURAL + COST BENEFIT + MIXED OXIDE + AGENCY, NRC + *FUEL RECYCLE + STATEMENT, ENVIRONMENTAL + SPECIES

117539
LICENSING AND REGULATORY CONTROL OF NUCLEAR INSTALLATIONS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/421 P. 313 PPS. FROM STUDY GROUP MEETING ON REGULATIONS AND PROCEDURES FOR LICENSING NUCLEAR INSTALLATIONS; ATHENS, GREECE, DEC. 16-20, 1974 (PUBLISHED IN NOV. 1975)

THE TEXT OF 19 PAPERS ARE PRESENTED TO SERVE AS REFERENCE MATERIAL ON TYPICAL APPROACHES TO LICENSING AND REGULATORY CONTROL OF NUCLEAR FACILITIES AND ON LEGAL ASPECTS OF NUCLEAR SAFEGUARDS FROM AN INTERNATIONAL STANDPOINT.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*REGULATION + *REVIEW + SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + POWER PLANT, NUCLEAR + *LICENSING PROCESS

117538
LICENSING AND REGULATORY CONTROL OF NUCLEAR INSTALLATIONS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/421 P. 313 PPS. FROM STUDY GROUP MEETING ON REGULATIONS AND PROCEDURES FOR LICENSING NUCLEAR INSTALLATIONS; ATHENS, GREECE, DEC. 16-20, 1974 (PUBLISHED IN NOV. 1975)

THE TEXT OF 19 PAPERS ARE PRESENTED TO SERVE AS REFERENCE MATERIAL ON TYPICAL APPROACHES TO LICENSING AND REGULATORY CONTROL OF NUCLEAR FACILITIES AND ON LEGAL ASPECTS OF NUCLEAR SAFEGUARDS FROM AN INTERNATIONAL STANDPOINT.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*REGULATION + *REVIEW + SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + POWER PLANT, NUCLEAR + *LICENSING PROCESS

116694
VAUGHAN JE
NUCLEAR DIVERSION: AN INTERNATIONAL PROBLEM IN NEED OF AN INTERNATIONAL SOLUTION
53 PPS, ATOMIC ENERGY LAW JOURNAL, 17(3), PP. 179-231 (FALL 1975)

AS THE QUANTITIES OF SPECIAL FISSIONABLE MATERIALS USED IN THE NUCLEAR POWER INDUSTRY INCREASE, THE PROBABILITY WILL BE THAT SOME OF THESE MATERIALS WILL BE DIVERTED INTO USE FOR NUCLEAR WEAPONS. THIS IS THE HORIZONTAL PROLIFERATION PROBLEM. THIS ARTICLE DISCUSSES THE HORIZONTAL PROLIFERATION PROBLEM, AND EXAMINES HOW IT HAS BEEN HANDLED THROUGH INTERNATIONAL LAW CHANNELS. IT LOOKS AT THE FUTURE, THE GROWING WORLD PRODUCTION OF PLUTONIUM, AND HOW TO ENFORCE THE SAFEGUARDING OF THIS MATERIAL FROM NUCLEAR WEAPONS USAGE.

SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS

116608
HOLDREN JP
THE NUCLEAR CONTROVERSY AND THE LIMITATIONS OF DECISION-MAKING BY EXPERTS
UNIVERSITY OF CALIFORNIA, BERKELEY
3 PPS, BULLETIN OF THE ATOMIC SCIENTISTS, 32(3), PP. 20-22 (MARCH 1976)

EXPERTS IN THE NUCLEAR FIELD - IF LAID END TO END, THEY'D NEVER REACH A CONCLUSION. INDIVIDUALS WITH SPECIALIZED TRAINING IN THE NUCLEAR FIELD FAIL TO AGREE ON THE ANSWERS TO IMPORTANT QUESTIONS SUCH AS THE TOXICITY OF PLUTONIUM; THE PROBABILITY OF REACTOR ACCIDENTS; OR THE EXTENT OF DAMAGE, INJURIES, AND DEATHS IF THERE WERE A SERIOUS REACTOR ACCIDENT; AND THE MANAGEMENT OF RADIOACTIVE WASTES. WHERE QUANTITATIVE ANSWERS ARE POSSIBLE, THE ACTUAL MAGNITUDE OF DIFFERENCES IN EXPERT OPINIONS ARE OFTEN VERY LARGE. WHEN QUANTIFICATION IS IMPOSSIBLE, SUCH AS POWER PLANT SECURITY AND SAFEGUARDS FOR NUCLEAR MATERIALS, UNCERTAINTIES OF EXPERT OPINIONS IS DISTURBING. THE TOUGHEST QUESTIONS CANNOT BE SOLVED BY TECHNICAL EXPERTISE. HOW TO DEAL WITH THE UNCERTAINTIES - WHAT RISKS CAN BE ACCEPTED IN EXCHANGE FOR THE BENEFITS; THESE QUESTIONS MUST BE ANSWERED BY THE PUBLIC BY USE OF PUBLIC REFERENDUMS SUCH AS THE CALIFORNIA INITIATIVE. THIS ARTICLE IS BASED IN PART ON THE AUTHOR'S TESTIMONY ON THE CALIFORNIA NUCLEAR SAFEGUARDS INITIATIVE PRESENTED LAST NOVEMBER TO THE STATE OF CALIFORNIA ASSEMBLY COMMITTEE ON ENERGY AND DIMINISHING MATERIALS

ACCIDENT + PLUTONIUM + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + INDUSTRY, NUCLEAR + LEGALISTICS + POWER PLANT, NUCLEAR + SECURITY

116444
PUBLIC ISSUES IN THE NUCLEAR FUEL CYCLE
3 PPS, TABS, TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, VOL. 23, PP. 243-45 (JUNE 14-18, 1976) (ABSTRACTS

116494 *CONTINUED*
ONLY)

THE INVITED PAPERS BY THE NUCLEAR FUEL CYCLE DIVISION *ERE: THE ISSUE OF URANIUM AVAILABILITY; SAFEGUARDING NUCLEAR *ATERIALS AND AN INTEGRATED APPROACH TO PROBLEMS IN THE NUCLEAR FUEL CYCLE.

ECONOMICS + MILLING + MINING + PLUTONIUM + URANIUM + HAZARDS ANALYSIS + ENVIRONMENT + URANIUM, NATURAL + ELECTRIC POWER, ALTERNATE + SAFEGUARDS, NUCLEAR MATERIAL + N-POWER, SAFETY OF + FUEL CYCLE

115003
NADER R
NUCLEAR POWER: MORE THAN A TECHNOLOGICAL ISSUE
6 PPS, 23 REFS, MECHANICAL ENGINEERING, 98(2), PP, 32-37 (FEB, 1976)

RALPH NADER ATTACKS NUCLEAR POWER *ITH THE FOLLOWING STATEMENTS: THE RASMUSSEN REPORT DIDN'T COVER TRANSPORTATION OF NUCLEAR MATERIALS, RADIOACTIVE *ASTE DISPOSAL, SABOTAGE, THEFT, TERRORISM, FUEL REPROCESSING, OR MINING. SEVERAL AGENCIES *HO REVIEWED THIS REPORT DISAGREED *ITH PROBABILITY CALCULATIONS. INSURANCE IS EITHER NOT ENOUGH OR AN ADMISSION OF THE GRAVE DANGERS. THE PLUTONIUM RISK ENDANGERS *ORKERS AND THE ENVIRONMENT TO RADIOACTIVITY EXPOSURE BY AN INDUSTRY THAT HAS NOT YET DEMONSTRATED THAT IT CAN HANDLE THE SUBSTANCE. THERE IS A THREAT FROM DEVELOPING NATIONS THAT GET REACTORS. INCREASED SECURITY TO PROTECT PLANT *ILL REDUCE CIVIL LIBERTIES. HIS SUMMARY IS: 'SURELY THIS COUNTRY CANNOT LET SUCH A FRAIL TECHNOLOGY BECOME A MAJOR ENERGY SOURCE....' THE SUMMARY OF COMMENTS FROM MECHANICAL ENGINEERING MAGAZINE IS 'MR. NADER'S ARTICLE DOES NOT HAVE THE OBJECTIVITY OR TECHNICAL ACCURACY USUALLY REQUIRED BY THIS MAGAZINE.'

ACCIDENT + ACCIDENT, PROBABILITY OF + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + *N-POWER, SAFETY OF + *OPPONENT + POWER PLANT, NUCLEAR + THEFT/DIVERSION

114367
A 'MORE' HISTORY OF NON-PROLIFERATION - OUTLOOK FOR 1975-1980
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
4 PPS, PP, 36-39, FEB, 1976

AS TO THE CONTROL AND DEVELOPMENT OF NUCLEAR ENERGY TWO MAIN THEMES ARE LIKELY TO BE PREDOMINANT: SAFETY IN ITS BROADEST SENSE (I.E. INCLUDING INTERNATIONAL SECURITY) AND ECONOMIC VIABILITY, *ITH EMPHASIS ON: SAFEGUARDS, PHYSICAL PROTECTION, AND REGIONAL NUCLEAR FUEL CENTRES. THE COMPETITIVE ADVANTAGE OF NUCLEAR POWER HAS MARKEDLY IMPROVED BECAUSE OF THE RISE IN THE PRICE OF FOSSIL FUELS. URANIUM PRICES ALSO NEARLY DOUBLED IN 1974/75. COSTS HAVE FALLEN TO LESS THAN 1/3 OF THOSE OF OIL-FIRED ELECTRIC POWER STATIONS. PARTLY AS A RESULT OF THIS, NEW ORDERS FOR NUCLEAR PLANTS ROSE BY 25% FROM 60,000 MW IN 1973 TO 75,000 MW IN 1974. HOWEVER, OTHER FACTORS HAVE TENDED TO SLOW DOWN THE RATE OF GROWTH OF NUCLEAR POWER AND IT IS NOW POSSIBLE THAT NUCLEAR CAPACITY *ILL REACH ONLY 220,000 MW BY 1980, *HICH *ILL BE ABOUT 10% OF TOTAL ELECTRICAL PRODUCTION.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY, KARNTNER RING 11, A-1010 VIENNA, AUSTRIA

ECONOMICS + *IAEA + *FORECAST + SAFEGUARDS, NUCLEAR MATERIAL + N-POWER FORECAST + POWER PLANT, NUCLEAR

114240
U.S. NUCLEAR REGULATORY COMMISSION ANNUAL REPORT, 1975. CHAPTER FIVE - SAFEGUARDING MATERIAL AND PLANTS
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
8 PPS, PP, 69-76, JAN, 1976

THROUGHOUT 1975, THE COMMISSION CARRIED OUT MAJOR PLANNING TASKS, *HILE TIGHTENING EXISTING REGULATIONS, AIMED AT UPGRADING SAFEGUARDS. DETAILED SAFEGUARDS REQUIREMENTS AND REGULATIONS ARE AVAILABLE *HICH ARE BELIEVED ADEQUATE FOR NOW, BUT NEW RISKS, AND TECHNOLOGICAL DEVELOPMENTS REQUIRES THAT THE CURRENT REGULATIONS BE CONTINUALLY EVALUATED. NEW GUIDELINES FOR INVENTORY DISCREPANCIES *AS PUBLISHED IN JULY 1975 AND SENT OUT FOR COMMENTS. BETTER METHODS FOR MEASURING OR DETERMINING THE AMOUNT OF MATERIAL ON HAND ARE BEING DEVELOPED. A NEW SAFEGUARDS REGULATION *AS TO BE ISSUED IN 1975 COVERING PHYSICAL PROTECTION OF NUCLEAR POWER PLANTS. ALSO, A NEW REGULATION COVERING TRANSPORTATION IS TO BE ISSUED IN 1975.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, *ASHINGTON, D.C. 20402

*TRANSPORTATION AND HANDLING + PROTECTIVE ACTION GUIDE + *SAFEGUARDS, NUCLEAR MATERIAL + *POWER PLANT, NUCLEAR + *ACCOUNTABILITY + REGULATION, NRC

114236
U.S. NUCLEAR REGULATORY COMMISSION ANNUAL REPORT 1975
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
200 PPS, TABS, FIGS, 1976

COVERS THE PERIOD FROM JAN. 19, 1975 (THE EFFECTIVE DATE OF THE ENERGY REORGANIZATION ACT) THRU DEC. 31. REPORT IS COMPRISED OF 12 CHAPTERS AND 6 APPENDICES. TITLE OF THE CHAPTERS FOLLOW: INTRODUCTION AND OVERVIEW, REGULATING NUCLEAR REACTORS, PROTECTING THE ENVIRONMENT, CONTROLLING NUCLEAR MATERIALS, SAFEGUARDING MATERIALS AND PLANTS, ENSURING COMPLIANCE, EVALUATING OPERATING EVENTS, EXPANDING CONFIRMATORY RESEARCH, DEVELOPING NUCLEAR STANDARDS, COOPERATING *ITH THE STATES, COOPERATING *ITH OTHER NATIONALS, RESPONDING TO PUBLIC CONCERN. THAT'S *HAT THE REPORT IS ABOUT, AND *AS *RITTEN TO COMPLY *ITH SECTION 307(C) OF THE REORGANIZATION ACT *HICH DIRECTS

114236 #CONTINUED#
THE COMMISSION TO ISSUE AN ANNUAL REPORT ON SHORT AND LONG-RANGE GOALS, PRIORITIES AND PLANS AS THEY RELATE TO BENEFITS, COSTS, AND RISKS OF COMMERCIAL NUCLEAR POWER.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, #ASHINGTON, D.C. 20402

CODES AND STANDARDS + COMPLIANCE + ENVIRONMENT + #REPORT, OPERATIONS SUMMARY + R AND D PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + BENEFIT VS RISK + POWER PLANT, NUCLEAR + REGULATION, NRC + #AGENCY, NRC

113506
POSSIBLE LOSS OF URANIUM ORE CONCENTRATE AT ALLIED CHEMICAL CORP
U.S. NUCLEAR REGULATORY COMMISSION, SAFEGUARDS BRANCH, REGION III
20 PGS. LTR #/ATT TO NRC SAFEGUARDS BRANCH, OFFICE OF I & E, REGION I, FED. 23, 1976

CAUSE - UNKNOWN. ONE DRUM OF A 51 DRUM SHIPMENT OF URANIUM ORE CONCENTRATES FROM NUCLEAR FUELS CORP, OF SOUTH AFRICA #AS FOUND TO BE ABOUT 300 LBS. SHORT OF THE RECORDED #EIGHT SHOWN ON THE PACKING SCHEDULE. THEFT IS NOT SUSPECTED. NO DEFINITE REASON #AS FOUND. IT MAY BE A CLERICAL ERROR. ONE DRUM, NOT IDENTIFIED, #AS DAMAGED DURING LOADING ON BOARD THE SHIP. DURING UNLOADING, SOME MATERIAL SPILLED OUT. RECORDS DID NOT INDICATE #HAT HAPPENED TO THE SPILLED MATERIAL.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, #ASHINGTON, D. C. 20555; (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

SOURCE MATERIAL + SHIPPING CONTAINER + TRANSPORTATION AND HANDLING + URANIUM + FAILURE, ADMINISTRATIVE CONTROL + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + FUEL ELEMENTS + FAILURE

112016
LARSON CE
THE NUCLEAR CONTROVERSY
3 PGS. QUALITY PROGRESS 8(12), PP. 13, 23-24 (DEC. 1975)

LARSON ATTEMPTS TO SHOW THAT THE RISKS OF NUCLEAR POWER GENERATION ARE #ELL OFFSET BY THE BENEFITS TO BE GAINED. HIS RATIONAL FOLLOWS: THE HEALTH AND SAFETY IMPLICATIONS OF ATOMIC ENERGY ARE CAPABLE OF CONTROL. THE REWARDS FOR DOING SO ARE MOMENTOUS. LIGHT #ATER REACTORS CAN FURNISH US ENERGY FOR ONLY 50 YEARS, BUT THE BREEDER REACTOR CAN FURNISH US ELECTRICAL ENERGY FOR 100,000 YEARS. IF #E FOREGO THIS SOURCE OF ENERGY FOR RISKS AND HAZARDS THAT ARE SMALL COMPARED TO THOSE OF OTHER TECHNOLOGIES, #E #ILL ENCOURAGE A DEPRESSION OF OUR STANDARD OF LIVING THAT COULD BE CATASTROPHIC. #E ACCEPT THIS NEW TECHNOLOGY THAT #E CAN BE ASSURED OF ENERGY SUPPLIES FOR ALL TIME.

REACTOR, BREEDER + ACCIDENT, PROBABILITY OF + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + RESOURCE, NATURAL + PROPONENT + POWER PLANT, NUCLEAR + FUEL CYCLE

112615
FRANK FR
AN INTERNATIONAL CONVENTION AGAINST NUCLEAR THEFT
STANFORD UNIVERSITY, CALIFORNIA
1 PG, 2 REFS, BULLETIN OF THE ATOMIC SCIENTISTS, 31(10), PG. 51 (DEC. 1975)

THE AUTHOR SUGGESTS THAT ACTIONS AND AGREEMENTS OF NATIONS TO CURB AIRCRAFT HIJACKING BE USED TO CONTROL THE THEFT OF NUCLEAR MATERIALS - VERIFY THAT TERRORISTS ARE INVOLVED RATHER THAN A CLANDESTINE MILITARY OPERATION; RECOVERY AND RETURN OF THE NUCLEAR DEVICE OR MATERIALS; COMPENSATION OF CITIZENS #HO SUFFER PERSONAL INJURY OR PROPERTY LOSS BECAUSE OF THE INCIDENT; AND PROSECUTION OR EXTRADITION OF INDIVIDUALS UNLAWFULLY INVOLVED.

AIRCRAFT + UNITED NATIONS + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + NUCLEAR DEVICE AND EQUIPMENT + THEFT/DIVERSION

112614
SALISBURY DF
CAN #E SECURE OUR PLUTONIUM?
2 PGS. TECHNOLOGY REVIEW 78(2), PP. 6-7 (DEC. 1975)

DISCUSSES USE OF PLUTONIUM 239 MIXED #ITH URANIUM FOR REACTOR FUEL AND THE RELATED SAFEGUARD PROBLEMS. IN ADDITION TO THE OTHER NUCLEAR FEARS, THERE IS NOW THE FEAR THAT A TERRORIST GROUP COULD STEAL ENOUGH PLUTONIUM TO FABRICATE A CRUDE BOMB. QUESTIONS ON THE POSSIBILITY THAT A BOMB COULD BE MADE ARE RAISED AND THEN THE DESIGN BY AN MIT STUDENT IS MENTIONED TO SHOW THAT SUFFICIENT INFORMATION IS AVAILABLE TO GUIDE THE JOB. AN ATOMIC BOMB THREAT IN ORLANDO, FLORIDA, IS DESCRIBED #HICH #AS MADE BY A 14-YEAR OLD. RISK OF A TERRORIST BOMB IS DISCUSSED AND THE QUESTION RAISED - IS IT #ORTH THE RISK TO HAVE THE ATOMIC-GENERATED ELECTRICITY THAT #ILL BE NEEDED.

PLUTONIUM + SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + THEFT/DIVERSION + SECURITY

112613
EKLUND S
ASPECTS OF INTERNATIONAL SAFEGUARDS OF NUCLEAR MATERIALS
5 PGS. INTERNATIONAL ATOMIC ENERGY AGENCY BULLETIN, 17(6), PP. 2-6 (DEC. 1975)

112013 *CONTINUED*
FOR FIFTEEN YEARS THE INTERNATIONAL ATOMIC ENERGY AGENCY HAS BEEN APPLYING SAFEGUARDS. THE DRAFTERS OF THE AGENCY'S STATUTE WISHED FIRSTLY TO MAKE SURE THAT THE PEACEFUL ACTIVITIES OF THE AGENCY WOULD NOT LEAD TO A SPREAD OF NUCLEAR WEAPONS CAPABILITY. THE AGENCY WAS THEREFORE AUTHORIZED BY STATUTE TO TAKE CONTROL MEASURES - WHICH ARE CALLED 'SAFEGUARDS' - IN CONNECTION WITH ITS PROJECTS TO ENSURE THIS AIM. IT WAS ALSO HOPED THAT, AS MORE INTERNATIONAL COOPERATION IN THE NUCLEAR FIELD WAS CHANNELLED THROUGH THE AGENCY, SAFEGUARDS WOULD EXTEND EVEN FURTHER SO THAT THE AGENCY WOULD BECOME A PRIMARY DETERRENT TO THE PROLIFERATION OF NUCLEAR WEAPONS.

REGULATION, IAEA + SAFEGUARDS, NUCLEAR MATERIAL

112011
ACCORD REPORTED IN NUCLEAR SALES
1 PG, THE NEW YORK TIMES, JAN. 6, 1976

PARIS, JAN. 4 - SEVEN COUNTRIES THAT ARE MAJOR SUPPLIERS OF NUCLEAR MATERIAL ARE NEAR AGREEMENT ON TIGHTER SAFEGUARDS TO PREVENT PURCHASERS OF NUCLEAR TECHNOLOGY FROM DIVERTING IT TO MILITARY USE. A NEW CODE OF CONDUCT FOR EXPORTS WAS EXPECTED TO EMERGE FROM HIGHLY SECRET MEETINGS OF THE LEADING EXPORTERS - THE UNITED STATES, THE SOVIET UNION, FRANCE, WEST GERMANY, BRITAIN, CANADA AND JAPAN-IN LONDON LAST YEAR. CONCERN HAS MOUNTED SINCE INDIA EXPLODED A NUCLEAR DEVICE IN MAY 1974. THE UNITED STATES AND THE SOVIET UNION WERE AMONG THE 90 SIGNERS OF THE TREATY TO PREVENT THE PROLIFERATION OF NUCLEAR WEAPONS. AMONG THOSE STILL TO RATIFY ARE EGYPT, JAPAN AND SWITZERLAND; AMONG THOSE THAT HAVE NOT SIGNED ARE ARGENTINA, BRAZIL, CHILE, CHINA, FRANCE, INDIA, ISRAEL, PAKISTAN, PORTUGAL, SOUTH AFRICA AND SPAIN.

FRANCE + IAEA + INDIA + SAFEGUARDS, NUCLEAR MATERIAL + INDUSTRY, NUCLEAR + TECHNOLOGY

111739
DEFF FL
ILLICIT DIVERSION OF NUCLEAR MATERIALS
AUSTRALIAN ATOMIC ENERGY COMMISSION, LUCASS
AAEC/IP-8 #, 17 PPS, 2 TABS, 1 FIG, AUG. 1975

DISCUSSES THE MEANS OF PREVENTING ILLEGAL USE OF NUCLEAR MATERIAL BY TERRORISTS OR OTHER SUB-NATIONAL GROUPS AND BY GOVERNMENTS. FOR SUB-NATIONAL GROUPS, PREVENTIVE MEASURES OF NATIONAL SAFEGUARDS SYSTEMS, WHEN TAKEN TOGETHER WITH THE PRACTICAL DIFFICULTIES OF USING NUCLEAR MATERIAL, MAKE DIVERSION AND ILLEGAL USE UNATTRACTIVE IN COMPARISON WITH OTHER POSSIBILITIES. CONCERNING ILLEGAL USE BY GOVERNMENTS, THE PAPER DESCRIBES THE ROLE OF INTERNATIONAL SAFEGUARDS, AND THE DETERRENT EFFECT OF THESE SAFEGUARDS. THE PAPER MAKES THE POINT THAT AUSTRALIA WOULD NOT CONSIDER SUPPLYING NUCLEAR MATERIAL UNLESS IT WERE SUBJECT TO INTERNATIONAL SAFEGUARDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22151

TRANSPORTATION AND HANDLING + AUSTRALIA + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE

111131
FELD BT
NUCLEAR PROLIFERATION - THIRTY YEARS AFTER HIROSHIMA
MASSACHUSETTS INST. OF TECHNOLOGY, CAMBRIDGE
7 PPS, PHYSICS TODAY, 28(7), PP. 23-29 (JULY 1975)

PROBLEMS ARISING FROM THE SPREAD OF NUCLEAR POWER WORLDWIDE AND THE DANGER OF DIVERSION OF FISSIONABLE MATERIALS TO WEAPONS ARE REVIEWED. CONTROL OVER MATERIALS THAT HAVE ANY PROSPECTS OF WORKING ARE CUSTODIAL CONTROLS, AND PHYSICAL POSSESSION, AT ALL STAGES, OF PLUTONIUM AND HIGHLY ENRICHED URANIUM SHOULD BE BY AN INTERNATIONAL AGENCY. PLUTONIUM PROCESSING SHOULD BE DONE IN ONE SINGLE HEAVILY GUARDED FACILITY. THE BREEDER REACTOR WILL MAGNIFY THE PROBLEM BECAUSE OF ITS PRODUCTION OF PLUTONIUM. REACTORS SHOULD BE DESIGNED TO PRODUCE MORE PLUTONIUM 240 BECAUSE OF ITS CHARACTERISTIC OF BEING DIFFICULT TO DETONATE.

REACTOR, BREEDER + PLUTONIUM + URANIUM + *FUEL REPROCESSING + *SPECIAL NUCLEAR MATERIAL + SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + SECURITY

109105
SAGAN LA
PLUTONIUM - SOME POLITICAL AND SOCIAL CONSIDERATIONS
PALO ALTO MEDICAL CLINIC
5 PPS, PRESENTED AT THE ANS TOPICAL MEETING ON NUCLEAR SAFETY, TUSCON, ARIZON, OCT. 5-8, 1975

WE IN THE NUCLEAR COMMUNITY HAVE A SPECIFIC AND CRUCIAL ROLE TO PLAY IN CREATING THE POLITICAL AND LEGAL MACHINERY NECESSARY TO THE SAFE AND PEACEFUL USE OF NUCLEAR ENERGY. MY PLEA IS THAT YOU NOT DISSIPATE YOUR ENERGIES IN PAROCHIAL AND TECHNICAL DEBATES WHICH ONLY CONFUSE AND FRIGHTEN THE PUBLIC, BUT WILL DEDICATE YOURSELVES TO THOSE LARGER ISSUES WHERE YOUR KNOWLEDGE AND WISDOM CAN LEAD THE PUBLIC TO THE TRULY SAFE USE OF NUCLEAR ENERGY. THERE WILL BE SOME WHO WILL URGE YOU TO AVOID ANY DISCUSSION OF SAFEGUARDS OR DIVERSION OF NUCLEAR MATERIALS LEST THAT LEAD TO REACTION AGAINST ALL USES OF NUCLEAR ENERGY. THAT RISK EXISTS, BUT IF YOU BELIEVE, AS I DO, THAT THE PUBLIC CAN MAKE MATURE JUDGEMENTS, THEN THAT RISK IS VERY SMALL.

AVAILABILITY - L.A. SAGAN, M.D., PALO ALTO MEDICAL CLINIC, PALO ALTO, CALIF.

CHEMICAL TOXICITY + PLUTONIUM + HAZARD, RELATIVE + MILITARY CONSIDERATION + REACTOR, LMFBR + FUEL MANAGEMENT +

199195 *CONTINUED*
SAFEGUARDS, NUCLEAR MATERIAL * TOXICITY * SOCIO/PHILOSOPHICAL CONSIDERATION * FUEL CYCLE

199389
HOMEFSCH R
INTERNATIONAL FUEL CYCLE ACCOUNTANCY FOR SAFEGUARDS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
11 PPS, PRESENTED AT ANS TOPICAL MEETING ON NUCLEAR SAFETY, TUCSON, ARIZONA, OCT. 5-8, 1975

THE DIVERSIFICATION OF THE NUCLEAR MATERIALS SUPPLY POSSIBILITIES CALLS FOR A BROAD POLITICAL BASIS INSTEAD OF COMMERCIAL CONDITIONS TO ENSURE THAT NUCLEAR ACTIVITIES ARE TO BE CONFINED *ITHIN THE FIELD OF PEACEFUL APPLICATION. THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR *EAPONS PROVIDES SUCH A POLITICAL BASIS. NON-NUCLEAR-*EAPON STATES PARTY TO THIS TREATY UNDERTAKE NOT TO RECEIVE, MANUFACTURE OR OTHER*ISE ACQUIRE NUCLEAR *EAPONS OR OTHER NUCLEAR EXPLOSIVE DEVICES. ON THE BASIS OF THE TREATY, FIFTY STATES HAVE NEGOTIATED AGREEMENTS AND THE APPLICATION OF SAFEGUARDS BY THE IAEA HAS UNDERGONE VERY IMPORTANT DEVELOPMENTS.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY, 244 E. OGDEN AVE., HINSDALE, ILLINOIS 60521

INTERNATIONAL * SAFEGUARDS, NUCLEAR MATERIAL * ORGANIZATION, INTERNATIONAL * FUEL CYCLE

198735
MASON EA
THE SAFEGUARDS PROBLEM -- A REGULATORY PERSPECTIVE
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
NRC NE*S RELEASE S-13-75 *, 2 PPS, AUG. 26, 1975

AS THE DEBATE OVER THE SAFETY OF NUCLEAR POWER PLANTS SLOWLY RECEDES, A NEW DEBATE HAS EMERGED OVER KEY ELEMENTS OF THE FUEL CYCLE, INCLUDING THOSE PARTS RELATING TO DISPOSAL OF RADIOACTIVE *ASTES AND SAFEGUARDS. IN THE U.S., THE TERM SAFEGUARDS BROADLY COVERS ALL ACTIVITIES NECESSARY TO DETER AND/OR DETECT BOTH THE DIVERSION OR THEFT OF FISSIONABLE MATERIAL AND THE SABOTAGE OF NUCLEAR FACILITIES. IN SHORT, NOWADAYS SAFEGUARDS ENCOMPASSES THE PROTECTION OF BOTH NUCLEAR MATERIALS AND FACILITIES. IN THE RECENT HARRIS POLL SURVEYING PUBLIC ATTITUDES ON NUCLEAR POWER, 39% OF THE PEOPLE QUESTIONED NAMED THREAT OF SABOTAGE AS A MAJOR PROBLEM *HILE AN ALMOST EQUAL NUMBER - 34% - SEE *EGARDED THE POSSIBLE THEFT OF PLUTONIUM BY TERRORISTS. THESE FIGURES ARE EMBLEMATIC OF THE EXTENT OF ANXIETY AMONG THE PUBLIC OVER SAFEGUARDS AND THEY *OULD DISCUSS THE PRUDENT POLICYMAKER EVEN IF HE EXPECTED THE DISCUSSION TO LEVEL OFF.

AVAILABILITY - U.S. NUCLEAR REGULATORY COMMISSION, OFFICE OF MANAGEMENT INFORMATION & PROGRAM CONTROL, *ASHINGTON, D.C.

*ASTE DISPOSAL * *SPECIAL NUCLEAR MATERIAL * *SABOTAGE * *SAFEGUARDS, NUCLEAR MATERIAL * FUEL CYCLE * AGENCY, NRC

198754
NRC PROPOSES REGULATION CHANGES ON CONTROL OF SPECIAL NUCLEAR MATERIAL
U.S. NUCLEAR REGULATORY COMMISSION, *ASHINGTON
NRC NE*S RELEASE 75-172 *, 1 PG, JULY 17, 1975

THE NUCLEAR REGULATORY COMMISSION HAS UNDER CONSIDERATION PROPOSED AMENDMENTS TO ITS REGULATIONS ON SPECIAL NUCLEAR MATERIAL *HICH *OULD INCLUDE EXPLICIT LIMITS FOR MATERIAL UNACCOUNTED FOR (MUF) AND EXPLICIT REQUIREMENTS FOR ACTION *HEN SPECIFIED LIMITS ARE EXCEEDED. IN NOVEMBER 1973, PART 70 OF THE REGULATIONS *AS AMENDED TO REVISE THE MATERIALS CONTROL AND ACCOUNTING REQUIREMENTS FOR SPECIAL NUCLEAR MATERIAL. THE NEW RULES REQUIRE GREATER LICENSEE KNOWLEDGE OF THE AMOUNT OF MATERIAL IN HIS POSSESSION IN ORDER TO PROTECT AGAINST POSSIBLE DIVERSION OR THEFT. MORE FREQUENT INVENTORIES OF NUCLEAR MATERIALS, BETTER CONTROL OF PLANT INVENTORY AND IMPROVEMENT IN THE QUALITY OF INVENTORIES ARE REQUIRED.

AVAILABILITY - U.S. NUCLEAR REGULATORY COMMISSION, OFFICE OF MANAGEMENT INFORMATION & PROGRAM CONTROL, *ASHINGTON, D.C.

*SPECIAL NUCLEAR MATERIAL * SAFEGUARDS, NUCLEAR MATERIAL * *REGULATION, NRC * AGENCY, NRC

198621
LAPP RE
THE SAFETY OF NUCLEAR FISSION POWER
6 PPS, 12 REFS, A*ARE, NO. 54, PP. 2-7 (MARCH 1975)

DR. RALPH LAPP PRESENTED THIS PAPER BEFORE THE DEBATE ON NUCLEAR POWER IN JANUARY 1975. PART OF *HAT HE SAID FOLLOWS: CONSERVATION OF PETROLEUM IS ONLY A SHORT TERM ALTERNATE - UTILITIES HAVE A LIMITED CHOICE OF FUELS (COAL AND NUCLEAR) AND PROBABLY ENOUGH COAL FOR TOTAL ELECTRICAL PRODUCTION CANNOT BE MINED - ROUTINE RADIOACTIVE EFFLUENTS ARE NOT A SERIES SAFETY FACTOR AND EVERY CORE MELTDOWN IS NOT CATASTROPHIC - RE*ARDS FOR USE OF NUCLEAR GENERATION OF POWER FAR EXCEEDS THE RISK - *E MUST HAVE PROPER SAFEGUARDS AGAINST ILLEGAL ACQUISITION OF NUCLEAR MATERIALS - IT IS ESSENTIAL THAT THE NUCLEAR BUSINESS BE OPEN TO THE PUBLIC.

ECONOMICS * ELECTRIC POWER * SAFEGUARDS, NUCLEAR MATERIAL * *INDUSTRY, NUCLEAR * BENEFIT VS RISK * *INDUSTRY, UTILITY * *N-POWER, SAFETY OF

107133
BETHE HA
TESTIMONY TO THE SUBCOMMITTEE TO REVIEW THE NATIONAL BREEDER REACTOR PROGRAM OF THE JOINT COMMITTEE ON ATOMIC ENERGY - JUNE 24, 1975
CORNELL UNIVERSITY
18 PPS. FROM HEARINGS BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, JUNE 24, 1975

PRESENTS THE STATEMENT OF DR. HANS BETHE FOLLOWED BY THE ORAL QUESTIONS AND ANSWERS OF BETHE. TOPICS DISCUSSED INCLUDE NEED FOR THE BREEDER, ADVANTAGES OF THE BREEDER, OBJECTIONS TO THE BREEDER, HAZARD OF DIVERSION OF PLUTONIUM, AND NUCLEAR ACCIDENTS.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

ACCIDENT + PLUTONIUM + REVIEW + *REACTOR, LMFBR + SAFEGUARDS, NUCLEAR MATERIAL + ORAL + JAEC85

107992
LDC NUCLEAR POWER PROSPECTS, 1975-1990 COMMERCIAL, ECONOMIC, AND SECURITY IMPLICATIONS
RICHARD J. BARBER ASSOCIATES INC., WASHINGTON, D.C. + U.S. ERDA
ERDA-52 *, 450 PPS, FIGS, OCT, 1975

OBJECTIVES OF THIS STUDY ARE TO EVALUATE AND ESTIMATE THE POTENTIAL MARKET FOR PRODUCTS OF THE U.S. NUCLEAR INDUSTRY IN THE LESSER DEVELOPED COUNTRIES (LDC'S) AND TO ANALYZE THE POLITICAL, ECONOMIC AND SECURITY IMPLICATIONS OF U.S. NUCLEAR TECHNOLOGY EXPORTS TO THESE COUNTRIES. 'NUCLEAR PRODUCTS' AND 'NUCLEAR EXPORTS' ARE DEFINED AS ENERGY-RELATED NUCLEAR PRODUCTS AND SERVICES ONLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + COMPONENTS + *DEVELOPING COUNTRIES + SAFEGUARDS, NUCLEAR MATERIAL + *N-POWER FORECAST + POWER PLANT, NUCLEAR + JAEC35

107509
SPECIAL NUCLEAR MATERIAL LOST AT DRESDEN 3
COMMONWEALTH EDISON, CHICAGO, ILL.
3 PGS, RPT TO NRC DIRECTORATE OF REGULATORY OPERATION, REGION III, OCT. 17, 1975, DOCKET 50-249, TYPE--BWR, MFG--G.E., AE--SGT & LUNDY

CAUSE - LACK OF PROPER STORAGE. FIVE PORTABLE FUEL LOADING CHAMBERS, EACH CONTAINING 2 GRAMS OF 93.35% ENRICHED URANIUM-235, WERE RECEIVED PACKAGED IN 2 55-GALLON DRUMS. FOUR FLC'S HAD CABLES ATTACHED TO THEM. THE OTHER WAS A SPARE. IT WAS IN A PLASTIC BAG, WRAPPED IN RAGS, AND PLACED IN THE BOTTOM OF A DRUM. THE 4 WITH CABLES WERE INSTALLED IN THE REACTOR. THE 2 DRUMS, ONE WITH THE SPARE INSIDE, WERE STORED ON THE REFUELING FLOOR FOR OVER 3 MONTHS DURING FEEDWATER SPARGER REPLACEMENT AND OTHER WORK. THE DRUMS WERE MOVED AT TIMES UNKNOWN. THE FLC CANNOT BE LOCATED. A PROPER STORAGE AREA WILL BE PROVIDED FOR FLC'S AND MOVEMENT WILL BE CONTROLLED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR + *CHAMBER + FAILURE + TRANSPORTATION AND HANDLING + DRESDEN 3 (BWR) + REFUELING + SOURCE, RADIATION, LOST + FAILURE, ADMINISTRATIVE CONTROL + URANIUM-235 + *SPECIAL NUCLEAR MATERIAL + SAFEGUARDS, NUCLEAR MATERIAL

107395
THE NUCLEAR AGE
STOCKHOLM INTERNATIONAL PEACE RESEARCH INST.
150 PPS, PUBLISHED BY THE MIT PRESS, CAMBRIDGE AND LONDON, 1974

TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS STATES THAT FIVE YEARS AFTER ENTRY INTO THIS TREATY, A CONFERENCE SHALL BE HELD TO REVIEW OPERATION OF THIS TREATY TO ASSURE THAT PROVISIONS OF THE TREATY ARE BEING REALIZED. REVIEW CONFERENCE WAS HELD IN MAY 1975. PURPOSE OF THIS BOOK IS TO PROVIDE INFORMATION ON USE OF NUCLEAR POWER AS AN ENERGY SOURCE, SPREAD OF NUCLEAR POWER, THE NUCLEAR FUEL CYCLE, NUCLEAR SAFEGUARDS AND PEACEFUL NUCLEAR EXPLOSIONS, IN THE HOPE THAT THIS INFORMATION WILL BE USEFUL BACKGROUND MATERIAL FOR THOSE INTERESTED IN THE REVIEW CONFERENCE. A SECOND PURPOSE IS TO PRESENT SOME PROPOSALS FOR THE CONFERENCE.

ENERGY SOURCE + *TEST, WEAPONS + *SURVEY + SAFEGUARDS, NUCLEAR MATERIAL + N-POWER FORECAST + FUEL CYCLE

104006
ORDER IMPOSING CIVIL PENALITIES AT TRANSNUCLEAR
U.S. NUCLEAR REGULATORY COMMISSION
6 PAGES, LETTER WITH ATTACH TO TRANSNUCLEAR, INCORPORATED, FEB. 6, 1975

CAUSE - SECURITY VIOLATION. TRANSMITS AN ORDER IMPOSING CIVIL MONETARY PENALTY OF $2100 FOR FAILURE TO PROVIDE A GUARD AT DESIGNATED MATERIAL TRANSFER POINTS FOR SPECIAL NUCLEAR MATERIAL. THE GUARD CONTRACTED FOR THIS FAILED TO SHOW AND AN ALTERNATE HAD NOT BEEN PROVIDED.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

104006 *CONTINUED*
ECONOMICS + FAILURE + *TRANSPORTATION AND HANDLING + FAILURE, ADMINISTRATIVE CONTROL + *SPECIAL NUCLEAR MATERIAL + *SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + AGENCY, NRC + SECURITY

103916
LAPP RE
NADER'S NUCLEAR ISSUES! A CRITIQUE BY DR. RALPH LAPP OF RALPH NADER'S CHARGE THAT 'NUCLEAR FISSION POWER IS UNSAFE, UNNECESSARY AND UNRELIABLE'
118 PAGES, FIGURES, 1975

PRESENTS 33 ANTI-NUCLEAR STATEMENTS BY NADER AND DR. LAPP'S COMMENTS. SUBJECTS COVERED INCLUDE NUCLEAR SUBSIDY; NUCLEAR RISK, SECRECY, SUPPRESSION OF INFORMATION, PLUTONIUM HAZARDS, RADIOACTIVITY, WASTE DISPOSAL, RELIABILITY, INSURANCE, GEOLOGIC FAULTS, SABOTAGE, AND SAFEGUARDS.

AVAILABILITY - FACT SYSTEMS INC., 537 STEAMBOAT ROAD, GREENWICH, CONN. 06830

GEOLOGY + INSURANCE + PLUTONIUM + *WASTE DISPOSAL + SAFETY PRINCIPLES AND PHILOSOPHY + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + INDUSTRY, NUCLEAR + *OPPONENT + SPOKESMAN, ACADEMIC + SPOKESMAN, INDUSTRY + JACOBS

103939
MASON EA
THE NUCLEAR REGULATORY COMMISSION AND INTERNATIONAL COOPERATION
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NRC NEWS RELEASE S-75-7 +, 2 PAGES, APRIL 23, 1975

DISCUSSES THE ORGANIZATION OF THE NEW NUCLEAR REGULATORY COMMISSION (NRC), THE ISSUES CONFRONTING NRC, THE SAFETY RESEARCH PROGRAM, SAFEGUARDS, PLUTONIUM RECYCLE, AND INTERNATIONAL COOPERATION.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

PLUTONIUM + SAFETY PROGRAM + *SPOKESMAN, NRC + INTERNATIONAL + SAFEGUARDS, NUCLEAR MATERIAL + *REGULATION, NRC + FUEL RECYCLE

103980
EKLUND S + LARSSON A + BITTENCOURT HFS
TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
51 PAGES, IAEA BULLETIN, 17(2), PP. 2-53 (APRIL 1975)

CONTAINS NINE ARTICLES ON NUCLEAR SAFEGUARDS. THE TITLES ARE AS FOLLOWS: (1) HOW TO STRENGTHEN THE NUCLEAR NON-PROLIFERATION TREATY, (2) NUCLEAR POWER GROWTH AND SAFEGUARDS 1975-1985, (3) THE TECHNICAL OBJECTIVE OF SAFEGUARDS, (4) SYSTEM OF ACCOUNTING FOR AND CONTROL OF NUCLEAR MATERIAL, (5) A NATIONAL CONTROL SYSTEM, (6) PHYSICAL PROTECTION OF NUCLEAR MATERIAL, (7) PHYSICAL PROTECTION OF RADIOACTIVE MATERIAL IN TRANSPORT, (8) TECHNICAL ASSISTANCE AND ARTICLE IV OF THE NPT, AND (9) PEACEFUL NUCLEAR EXPLOSIONS.

*IAEA + RADIOLOGICAL ASSISTANCE + REVIEW + *SAFEGUARDS, NUCLEAR MATERIAL + GROWTH/DEVELOPMENT + TRANSPORT + INDUSTRY, NUCLEAR + SECURITY

099941
SPETH JG
THE HAZARDS OF PLUTONIUM
9 PAGES, NATURAL HISTORY, 84(1), PP. 74-82 (JANUARY 1975)

THE RECYCLING OF THIS ELEMENT-THE STUFF OF NUCLEAR BOMBS AND ONE OF THE MOST TOXIC SUBSTANCES KNOWN-IS HIGHLY CONTROVERSIAL. THE AUTHOR STATES: THE ATOMIC ENERGY COMMISSION, IF UNCHECKED, IS ABOUT TO SOW THE SEEDS OF A NATIONAL CRISIS. THE COMMISSION PROPOSES TO LAUNCH WHAT IT CALLS THE PLUTONIUM ECONOMY, WHICH WOULD AUTHORIZE THE NUCLEAR POWER INDUSTRY TO USE RECYCLED PLUTONIUM AS FUEL IN COMMERCIAL NUCLEAR REACTORS AROUND THE COUNTRY. THE RESULT OF SUCH A DECISION WOULD BE THE CREATION OF A LARGE CIVILIAN PLUTONIUM INDUSTRY AND A DRAMATIC ESCALATION IN THE RISKS POSED BY NUCLEAR POWER.

PLUTONIUM + HAZARD, RELATIVE + POPULATION EXPOSURE + SAFEGUARDS, NUCLEAR MATERIAL + FUEL, NUCLEAR + OPPONENT + FUEL CYCLE

SECTION 21 ALTERNATE FUEL CYCLES AND ENERGY CENTERS

140102
CAMPBELL JD * GIFT EP
PROLIFERATION - RESISTANT NUCLEAR FUEL CYCLES
OAK RIDGE NATIONAL LAB., TENN.
ORNL/TM-6392 *. 17 PPS, 5 TABS, 2 FIGS, 5 REFS, JUNE 1978

PROPERTIES OF PLUTONIUM CONTAINING LARGE PROPORTIONS OF 238 PU ARE CONSIDERED IN RELATION TO RESISTANCE TO NUCLEAR PROLIFERATION. SEVERAL FUEL CYCLE MODIFICATIONS FOR LWRS ARE EVALUATED. IT IS SHOWN THAT 238 PU ISOTOPIC CONCENTRATION CAN BE INCREASED SUBSTANTIALLY FROM APPROXIMATELY 1.5% IN CURRENT DISCHARGED FUEL. CONCENTRATIONS OF 8 TO 12% ARE READILY ACHIEVABLE, AND 20% MAY BE PRACTICAL. INCREASED 238PU CONTENT IS ACCOMPLISHED BY INCREASING PRODUCTION BY RECYCLING 236U AND 237NP, AND BY DECREASING PRODUCTION OF ISOTOPES HEAVIER THAN MASS 238 BY SUBSTITUTING THORIUM FOR 238U. PROPERTIES OF SUCH PLUTONIUM, PARTICULARLY HEAT GENERATION, MAY OFFER A DETERRENT TO WEAPONS USE OF THE MATERIAL BY ORGANIZATIONS WITHOUT APPROPRIATE EXPERIENCE AND TECHNOLOGY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL * *PLUTONIUM * *PROLIFERATION * *FUEL CYCLE * REACTOR, LWR * *SPENT FUEL * *FUEL RECYCLE

139339
NUCLEAR FUEL REPROCESSING AND HIGH LEVEL WASTE DISPOSAL: INFORMATION HEARINGS. VOLUME XV. NUCLEAR SAFEGUARDS, PROLIFERATION, AND ALTERNATE FUEL CYCLES, PART 3
CALIF. ENERGY RESOURCE CONSERVATION & DEVELOPMENT COMMISSION, SACRAMENTO, CALIF.
NP-22631/1573 *. 711 PPS, JUNE 16, 1977

THE FOLLOWING TOPICS ARE ADDRESSED IN PROCEEDINGS OF JUNE 16, 1977 OF HEARINGS BEFORE THE CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION: 1. AVAILABLE FUEL CYCLE ALTERNATIVES; 2. RESOURCE AND ECONOMIC IMPLICATIONS OF A NO-REPROCESSING DECISION; 3. NUCLEAR FUEL CYCLES AND WASTE MANAGEMENT; 4. BREEDER REACTOR TECHNOLOGY; 5. MYTH OF URANIUM SCARCITY; AND 6. BENEFIT ANALYSIS OF REPROCESSING AND RECYCLING LWR FUEL.

AVAILABILITY - CALIF. ENERGY RESOURCE CONSERVATION & DEVELOPMENT COMMISSION, SACRAMENTO, CALIF.

*SAFEGUARDS, NUCLEAR MATERIAL * INTERNATIONAL * *REACTOR, BREEDER * *FUEL REPROCESSING * *WASTE DISPOSAL * *PROLIFERATION * *FUEL CYCLE

139097
HEARINGS ON NUCLEAR SAFEGUARDS, PROLIFERATION, AND ALTERNATE FUEL CYCLES
CALIF. ENERGY RESOURCES CONSERVATION & DEVELOPMENT COMMISSION, SACRAMENTO, CALIF.
NP-22652 *. 251 PPS, JUNE 17, 1977

THE FOLLOWING TOPICS ARE ADDRESSED IN THE PROCEEDINGS OF JUNE 17, 1977 OF HEARINGS BEFORE THE CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION: 1. A GOA OVERVIEW OF PROLIFERATION IMPLICATIONS OF ALTERNATE FUEL CYCLES; 2. NONPROLIFERATION ALTERNATIVES; 3. NONPROLIFERATION AND SAFEGUARDS IMPROVEMENTS IN FUEL CYCLES; 4. VULNERABILITY OF NUCLEAR FUEL CYCLES TO MALEVOLENCE; AND 5. STATUS OF FEDERAL SCHEDULES AND PLANS IN THE BACK END OF THE FUEL CYCLE.

AVAILABILITY - CALIF. ENERGY RESOURCES CONSERVATION & DEVELOPMENT COMMISSION, SACRAMENTO, CALIF.

*SAFEGUARDS, NUCLEAR MATERIAL * INTERNATIONAL * *SPECIAL NUCLEAR MATERIAL * *PROLIFERATION * *SABOTAGE * *THEFT/DIVERSION * *FUEL CYCLE

138153
GHANIAN MJ * WEINBERG AM
SUMMARY INTERIM REPORT AN ACCEPTABLE NUCLEAR FISSION FUTURE
INST. FOR ENERGY ANALYSIS, OAK RIDGE, TENN.
ORAU/IEA(M)77-29 *. 32 PPS, DEC. 1977

AN ACCEPTABLE NUCLEAR FUTURE MUST BE BASED ON ACHIEVING A CONSENSUS BETWEEN THOSE IN FAVOR AND THOSE OPPOSED. WITHIN THIS CONTEXT, AN ACCEPTABLE NUCLEAR FUTURE MUST BE EXAMINED FROM THE VIEWPOINT OF THE THREE INTERSECTING CONCERNS OF SAFETY, PROLIFERATION, AND SYSTEM RESILIENCY. THE MAIN PRELIMINARY FINDING OF THE STUDY IS THAT NUCLEAR ENERGY OUGHT TO BE CONFINED TO RELATIVELY FEW SITES, WITH EXISTING NUCLEAR SITES SERVING AS THE BASIS FOR SUCH A POLICY. THE KEY ELEMENTS OF A HIGHLY COLLOCATED SYSTEM ARE DESCRIBED WITH EMPHASIS ON STRENGTHENED SECURITY, PROFESSIONALISM OF NUCLEAR PERSONNEL, ESTABLISHMENT OF GENERATING CONSORTIA, INSTITUTIONAL LONGEVITY, AND THE TRANSITION FROM THE LWR-BASED SYSTEM TO THE ASYMPTOTIC BREEDER-BASED SYSTEM.

AVAILABILITY - INST. FOR ENERGY ANALYSIS, P.O. BOX 117, OAK RIDGE, TENN. 37830

NUCLEAR DEBATE * ENERGY CENTER * LEGISLATION * SITING * PROLIFERATION * WASTE MANAGEMENT * REGULATION * SAFEGUARDS, NUCLEAR MATERIAL

137461
REPORT TO THE APS BY THE STUDY GROUP ON NUCLEAR FUEL CYCLES AND WASTE MANAGEMENT
AMERICAN PHYSICAL SOCIETY
186 PPS, TABS, FIGS, REFS, REVIEWS OF MODERN PHYSICS, S0(1), PART II, PP. S1-S186 (JAN. 1978)

137461 *CONTINUED*
UNDER THE AUSPICES OF THE AMERICAN PHYSICAL SOCIETY, THIS STUDY *AS UNDERTAKEN AS AN INDEPENDENT EVALUATION OF TECHNICAL ISSUES IN THE USE OF FISSIONABLE MATERIALS IN NUCLEAR FUEL CYCLES, TOGETHER *ITH THEIR PRINCIPAL ECONOMIC, ENVIRONMENTAL, HEALTH AND SAFETY IMPLICATIONS. REPROCESSING AND RECYCLING IN LIGHT *ATER REACTORS *ERE EXAMINED, ALONG *ITH TECHNICAL MEASURES PROPOSED AS POSSIBLE SAFEGUARDS; ADVANCED REACTOR FUEL CYCLES *ERE ALSO STUDIED FOR THEIR RESOURCE AND SAFEGUARDS IMPLICATIONS. MUCH OF THE *ORK OF THE GROUP CENTERED ON THE PRINCIPAL ALTERNATIVES FOR DISPOSAL OF RADIOACTIVE *ASTES AND CONTROL OF EFFLUENTS.

*REACTOR, LMR * *FUEL CYCLE * FUEL RECYCLE * FUEL REPROCESSING * *WASTE MANAGEMENT * SAFETY ANALYSIS * RADIATION SAFETY AND CONTROL * ECONOMICS * SAFEGUARDS, NUCLEAR M*TERIAL

137438
BAYLOR KJ * JOSEPH *R * NAGEL MZ
GCFR FUEL CYCLE INFORMATION FOR THE ORNL NONPROLIFERATION STUDY
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A14793 *, 150 PPS, 17 TABS, 6 FIGS, JAN, 1978

AT THE REQUEST OF THE OAK RIDGE NATIONAL LABORATORY (ORNL) A SHORT STUDY (OF *O MONTHS' DURATION) *AS CARRIED OUT AT GENERAL ATOMIC (GA) TO PROVIDE INFORMATION FOR ORNL'S NONPROLIFERATION FUEL CYCLE STUDY. ACCORDINGLY, SIX ALTERNATIVE GCFR FUEL CYCLES, SELECTED BY ORNL, *ERE STUDIED TO PROVIDE FUEL CYCLE DATA AND MASS FLO* INFORMATION FOR A TYPICAL LARGE GCFR OPERATING ON THE PROPOSED FUEL CYCLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL * INTERNATIONAL * *PROLIFERATION * SPECIAL NUCLEAR MATERIAL * *REACTOR, GCFR * *FUEL CYCLE * DATA COLLECTION * JACOBS

137415
*ILLIAMS DC * ROSENSTRUCH B
A REVIE* OF NUCLEAR FUEL CYCLE ALTERNATIVES INCLUDING CERTAIN FEATURES PERTAINING TO *EAPON PROLIFERATION
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1727 *, 51 PPS, 3 FIGS, 25 REFS, JAN, 1978

THIS REPORT OFFERS AN INFORMAL REVIE* OF THE VARIOUS NUCLEAR FUEL CYCLE OPTIONS INCLUDING ASPECTS RELEVANT TO *EAPON PROLIFERATION, ALTHOUGH NO COMPLETE REVIE* OF THE LATTER SUBJECT IS ATTEMPTED. BASIC PRINCIPLES GOVERNING BREEDING, REACTOR SAFETY, AND EFFICIENT UTILIZATION OF FISSION ENERGY RESOURCES (THORIUM AND URANIUM) ARE DISCUSSED. THE CONTROVERSIAL PROBLEMS OF *EAPON PROLIFERATION AND ITS RELATION TO FUEL REPROCESSING ARE REVIE*ED AND A NUMBER OF PROPOSED APPROACHES TO REDUCING PROLIFERATION RISKS ARE NOTED. SOME REPRESENTATIVE SPECIFIC REACTOR CONCEPTS ARE DESCRIBED, *ITH EMPHASIS ON THEIR DEVELOPMENT STATUS, THEIR POTENTIALS FOR RESOURCE UTILIZATION, AND THEIR IMPLICATIONS FOR PROLIFERATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL * INTERNATIONAL * *SPECIAL NUCLEAR MATERIAL * *PROLIFERATION * *FUEL REPROCESSING * *FUEL CYCLE

137093
EXECUTIVE CONFERENCE ON ENERGY PARK
AMERICAN NUCLEAR SOCIETY, LA GRANGE PARK, ILL.
133 PPS, FROM EXECUTIVE CONFERENCE ON ENERGY PARKS; ARLINGTON, VA., APRIL 24-27, 1977

PRESENTS PAPERS FROM THE AMERICAN NUCLEAR SOCIETY CONFERENCE ON ENERGY PARKS HELD AT ARLINGTON, VIRGINIA, ON APRIL 24-27, 1977. TOPIC SESSIONS *ERE ENTITLED SAFEGUARDS AND PROLIFERATION; ECONOMICS OF ENERGY CENTERS; COMMUNITY INFLUENCES AND POLITICAL ASPECTS; AND CENTERS IN-BEING AND PLANNED.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY PUBLICATIONS, 555 N. KENSINGTON AVE., LA GRANGE PARK, ILL. 60525

*POWER PLANT, NUCLEAR * *SITING, MULTIPLE * SAFEGUARDS, NUCLEAR MATERIAL * PROLIFERATION * ECONOMICS * LEGISLATION * SOCIO/PHILOSOPHICAL CONSIDERATION

136582
IRVINE AR * NICHOLSON EL
IMPACT OF PROLIFERATION-RESISTANT FUEL CYCLES ON HOT EXPERIMENTAL FACILITY DESIGN AND OBJECTIVES
OAK RIDGE NATIONAL LAB., TENN.
ORNL/TM-6117 *, 28 PPS, 6 FIGS, 22 REFS, JAN, 1978

THE EFFECTS OF PROVIDING FOR THE DEVELOPMENT OF REPROCESSING TECHNIQUES FOR PROLIFERATION-RESISTANT FUELS IN A HOT EXPERIMENT FACILITY ON FACILITY DESIGN AND OBJECTIVES ARE EXAMINED. THE NEW FUEL TYPES BEING CONSIDERED AS FEED MATERIALS INCLUDE THOSE USING THORIUM AS A FERTILE MATERIAL AND THOSE *HICH UTILIZE A REACTOR FEED MATERIAL THAT IS QUITE GAMMA ACTIVE. THE REPROCESSING SYSTEM IS TO HAVE THE CAPACITY TO REPROCESS FUEL *ITHOUT ISOLATING FISSILE MATERIAL FROM DILUENT FERTILE MATERIAL AND TO YIELD A PRODUCT *HICH IS CONTAMINATED *ITH GAMMA-RAY EMITTERS. THE THORIUM-BASED FUELS BEING CONSIDERED INCLUDE THOSE FOR LIGHT-*ATER REACTORS (L*R) AS *ELL AS FOR BREEDER REACTORS. THE REQUIREMENT TO PROVIDE CAPABILITY TO ACCOMMODATE THESE FUEL CYCLES *ILL NECESSITATE AN INCREASED AMOUNT OF FLEXIBILITY IN THE MECHANICAL PROCESSING AREA AND FOR THE PURIFICATION FACILITIES, PLUS ADDITIONAL SHIELDED SPACE FOR PRODUCT CONVERSION TO OXID.

130382 *CONTINUED*
AVAILABILITY - LIMITATIONS ON DISTRIBUTION; SEND REQUESTS TO DOE TECHNICAL INFORMATION CENTER, P.O. BOX 62, OAK RIDGE, TENN. 37830

FUEL REPROCESSING + FUEL RECYCLE + HOT CELL + DESIGN CRITERIA + SAFEGUARDS, NUCLEAR MATERIAL + REACTOR, BREEDER + REACTOR, HTGR + THORIUM + JACOBS

134872
LEVENSON M + ZEDROSKI E
A FAST BREEDER SYSTEM CONCEPT - A DIVERSION RESISTANT FUEL CYCLE
ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.
30 PPS. PAPER PRESENTED AT THE 5TH ENERGY TECHNOLOGY CONFERENCE; WASHINGTON, D.C., FEB. 27, 1978

THE CONCEPT OF TAILORING A REPROCESSING SYSTEM FOR A BREEDER REACTOR FUEL CYCLE THAT WOULD BE PROOF AGAINST TERRORIST THEFT AND RESISTANT TO SUBNATIONAL GROUP DIVERSION IS DISCUSSED. SEVEN OBJECTIVE CRITERIA ARE PRESENTED: (1) NO PURE PU IN STORAGE. (2) NO PURE PU AT INTERMEDIATE POINT. (3) NO WAY TO PRODUCE PURE PU BY SIMPLE PROCESS ADJUSTMENT. (4) NO WAY TO PRODUCE PURE PU WITHOUT EQUIPMENT MODIFICATIONS. (5) NO WAY TO CARRY OUT MODIFICATIONS WITH ON SITE EQUIPMENT. (6) DECONTAMINATION NECESSARY FOR MODIFICATIONS. (7) LONG TIME REQUIRED FOR SUCCESSFUL DIVERSION. THESE CRITERIA ARE APPLIED TO THE PUREX AND CIVEX FLOW SHEETS.

AVAILABILITY - EDWIN ZEDROSKI, DIRECTOR, SYSTEMS & MATERIALS DEPT., NUCLEAR POWER DIV., ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.

*SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + SPECIAL NUCLEAR MATERIAL + *REACTOR, BREEDER + FUEL CYCLE + *FUEL REPROCESSING + MODIFICATION

134871
CULLER F.
PRECEDENTS FOR DIVERSION-RESISTANT NUCLEAR FUEL CYCLES
ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.
14 PPS. PRESENTED AT 5TH ENERGY TECHNOLOGY CONFERENCE; WASHINGTON, D.C., FEB. 27, 1978

A HISTORICAL OVERVIEW IS PRESENTED CONCERNING THE PROBLEMS OF NUCLEAR DIVERSION AND PROLIFERATION. THE CIVEX PROCESS FOR FUEL REPROCESSING IS PRESENTED AS A MEANS OF IMPROVING DIVERSION RESISTANCE OF THE BACKEND OF THE FUEL CYCLE. CHARACTERISTICS OF CIVEX ARE DISCUSSED ALONG WITH THE POLITICAL CONTEXT IN WHICH SUCH A FACILITY WOULD HAVE TO OPERATE. IT IS NOTED THAT CIVEX IS DERIVED FROM A COMBINATION OF SEVERAL SEPARATIONS PROCESSES. THESE PROCESSES ARE DESCRIBED BRIEFLY. THEY INCLUDE BISMUTH PHOSPHATE, PUREX, THOREX, FLUORIDE VOLATILITY, AND PYROMETALLURGY.

AVAILABILITY - FLOYD L. CULLER, JR., EXECUTIVE VICE PRESIDENT, ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + *PROLIFERATION + SPECIAL NUCLEAR MATERIAL + *FUEL REPROCESSING + MODIFICATION

134870
STARR C
THE SEPARATION OF NUCLEAR POWER FROM NUCLEAR PROLIFERATION
ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.
14 PPS. PRESENTED AT 5TH ENERGY TECHNOLOGY CONFERENCE; WASHINGTON, D.C., FEB. 27, 1978

AN OVERVIEW OF PROBLEMS CONCERNING NUCLEAR PROLIFERATION AND DIVERSION IS PRESENTED AND REASONS ARE CITED TO FIND BREEDER NUCLEAR FUEL CYCLES THAT ARE DIVERSION PROOF. A HYPOTHETICAL IDEALIZED BREEDER FUEL CYCLE WHICH AT ALL POINTS HAS A PLUTONIUM-URANIUM MIXTURE THAT DOES NOT EXCEED 15-20 PERCENT PU NECESSARY FOR FRESH FUEL AND IS ONLY PARTIALLY DECONTAMINATED FROM FISSION PRODUCTS IS DISCUSSED. SEVERAL ADVANTAGES OF THIS CYCLE (NAMED CIVEX) IN REGARDS TO DIVERSION RESISTANCE AND ECONOMICS ARE DISCUSSED.

AVAILABILITY - CHAUNCEY STARR, PRESIDENT, ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *PROLIFERATION + SPECIAL NUCLEAR MATERIAL + *REACTOR, BREEDER + *FUEL REPROCESSING + MODIFICATION

134868
BAXTER AM
A REVIEW AND EVALUATION OF AVAILABLE CRITICAL EXPERIMENT DATA FOR HTGR NON-PROLIFERATION FUEL CYCLES
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A14593 +, 40 PPS, 3 TABS, 14 FIGS, REFS, DEC. 1977

AS PART OF THE EFFORT TO RESOLVE ISSUES OF NUCLEAR MATERIALS DIVERSION AND WEAPONS PROLIFERATION, STUDY ON THE EFFECTIVE UTILIZATION ON LOW ENRICHMENT URANIUM (LEU) FUEL CYCLES IN THE HTGR IS PRESENTED. IN THE AREA OF CORE DESIGN, THIS WORK INVOLVED THOROUGH EVALUATION OF THE FEASIBILITY OF POSSIBLE LEU FUEL CYCLES INCLUDING DEFINITION OF POTENTIAL PROBLEMS. AMONG ITEMS CONSIDERED WERE CALCULATIONAL METHODS FOR LEU FUEL IN HTGRS. A REVIEW WAS UNDERTAKEN OF AVAILABLE EXPERIMENTAL DATA FROM CRITICAL FACILITIES USING LEU FUEL IN HTGR OR HTGR-LIKE ASSEMBLIES, WHICH COULD BE USED TO VALIDATE PHYSICS DESIGN CODES USED AT GA FOR NON-PROLIFERATION DESIGN WORK.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + SPECIAL NUCLEAR MATERIAL + *PROLIFERATION +

134868 *CONTINUED*
*REACTOR, HIGH + FUEL CYCLE + MATHEMATICAL STUDY

134695
REGIONAL NUCLEAR FUEL CYCLE CENTRES (RFCC) VOL II - BASIC STUDIES
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB-449(VOL. 2) +, 309 PPS, TABS, FIGS, REFS, APRIL 1977

THE RFCC CONCEPT COULD BE ESTABLISHED BY ANY GROUP OF MEMBER STATES HAVING MUTUAL ECONOMIC, GEOGRAPHICAL AND/OR SOCIO-POLITICAL INTERESTS ON THE BASIS OF ECONOMIC, NON-PROLIFERATION AND ENVIRONMENTAL CONSIDERATIONS. VOLUME II PRESENTS THE COMPLETE REPORTS OF THE BASIC STUDIES PERTINENT TO THE EVALUATION OF THE RFCC CONCEPT. THESE STUDIES ALSO PROVIDED THE CHARACTERISTIC OPERATIONS AND COST DATA AND OTHER INFORMATION ON THE BACK-END OF THE FUEL CYCLE. VOLUME I PRESENTS A SUMMARY OF THE STUDIES APPEARING IN VOLUME II, AND ALSO PRESENTS INTRODUCTORY AND BACKGROUND CONSIDERATIONS, EVALUATION OF THE RESULTS FROM THE VARIOUS STUDIES, AND CONCLUSIONS REGARDING THE OVERALL MERITS OF RFCCS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

FUEL REPROCESSING + EUROPE + IAEA + SECURITY + PROLIFERATION + ACCOUNTABILITY + SAFEGUARDS, NUCLEAR MATERIAL

132540
NUCLEAR FUEL CYCLE
35 PPS, ANS TRANSACTIONS, VOL. 24, PP. 212-47, FROM 1976 *WINTER MEETING, WASHINGTON, D.C., NOV. 14-19, 1976

PAPERS PRESENTED AT THIS SESSION OF THE ANS 1976 *WINTER MEETING WERE CONCERNED WITH: FUEL CYCLE ANALYSIS, MANAGEMENT, AND ECONOMICS; PLUTONIUM RECYCLE; INTERNATIONAL SAFEGUARDS IN THE NUCLEAR FUEL CYCLE; FUEL REPROCESSING, SPENT FUEL STORAGE; *WASTE MANAGEMENT; AND *WASTE TRANSPORT, TAILINGS, AND ENRICHMENT.

*FUEL CYCLE + *FUEL MANAGEMENT + FUEL RECYCLE + FUEL STORAGE + ECONOMICS + *WASTE MANAGEMENT + PLUTONIUM + *FUEL REPROCESSING + TRANSPORTATION AND HANDLING + SAFEGUARDS, NUCLEAR MATERIAL + SHIPPING CONTAINER

131756
HAMILTON CJ
A PRELIMINARY STUDY OF ALTERNATE FUEL CYCLES FOR THE GAS-COOLED FAST BREEDER REACTOR
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
GA-A14536 +, 34 PPS, 7 TABS, 7 FIGS, AUG. 1977

A PROGRAM THAT *WILL QUANTIFY THE CAPABILITY OF THE GCFR ON ANY FUEL CYCLE THAT APPEARS TO BE POLITICALLY REALISTIC IS OUTLINED. PRELIMINARY CALCULATIONS ARE PERFORMED AND THE APPROXIMATE BREEDING RATIO, SPECIFIC POWER, AND MASS FLOWS ARE DETERMINED. SOME SENSITIVITY STUDIES ARE MADE TO ESTIMATE THE VALUE OF IMPROVED FUEL AND STRUCTURAL MATERIALS. A NUMBER OF POSSIBLE FUEL STRATEGIES *WHICH CONSIDER SYSTEMS OF REACTORS ARE SUPERFICIALLY REVIEWED AND RELATED TO FUTURE ENERGY NEEDS. FUEL CYCLE STRATEGIES THAT ATTEMPT TO MEET FUTURE ENERGY NEEDS *WHILE NOT INCREASING THE POTENTIAL FOR *WEAPONS PROLIFERATION ARE SUGGESTED, AND THE ADVANTAGES OF THE GCFR IN SUCH STRATEGIES ARE DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, GCFR + FUEL CYCLE + SAFEGUARDS, NUCLEAR MATERIAL + PROLIFERATION + PLUTONIUM + THORIUM + JACOBS

131039
MURAK JA + MAINEY RH + CARTER ML + JOHNSON DR
PRELIMINARY ANALYSIS OF ALTERNATIVE FUEL CYCLES FOR PROLIFERATION EVALUATION
OAK RIDGE NATIONAL LAB., TENN.
ORNL/TM-6036 +, 238 PPS, TABS, FIGS, REFS, OCT. 1977

A PRELIMINARY ANALYSIS IS PRESENTED OF 67 NUCLEAR FUEL CYCLES PROPOSED BY ERDA-NRA FOR ASSESSMENT AS TO THEIR NONPROLIFERATION POTENTIAL. THE OBJECT OF THE ASSESSMENT IS TO DETERMINE *WHICH FUEL CYCLES POSE INHERENTLY LOW RISK FOR NUCLEAR *WEAPON PROLIFERATION *WHILE RETAINING BENEFITS OF NUCLEAR ENERGY. ECONOMICS, RESOURCE USE, AND TIMELINESS ARE ALSO CONSIDERED. THIS IS A PRELIMINARY ANALYSIS OF THESE FUEL CYCLES TO DEVELOP THE FUEL RECYCLE DATA THAT *WILL COMPLEMENT REACTOR DATA, ENVIRONMENTAL DATA, AND POLITICAL CONSIDERATION *WHICH MUST BE INCLUDED IN THE OVERALL EVALUATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PROLIFERATION + *SPECIAL NUCLEAR MATERIAL + *SAFEGUARDS, NUCLEAR MATERIAL + *FUEL CYCLE + DATA COLLECTION + COMPARISON

131030
SPIEWAK I + BARTINE DE
THORIUM ASSESSMENT STUDY QUARTERLY PROGRESS REPORT FOR THIRD QUARTER FISCAL 1977
OAK RIDGE NATIONAL LAB., TENN.
ORNL/TM-6025 +, 52 PPS, 24 TABS, 8 FIGS, 15 REFS, OCT. 1977

REPORTS PROGRESS ON THE PROGRAM AIMED AT ASSESSING THE POTENTIAL ROLE OF THORIUM FUEL CYCLES FOR ALLEVIATING SAFEGUARDS CONCERNS. SCENARIOS INCLUDE (1) NO FUEL RECYCLE PERMITTED, (2) FUEL

131230 *CONTINUED*
RECYCLE PERMITTED ONLY IN SECURE REGIONS ("ENERGY PARKS") WITH DENATURED (CHEMICALLY NON-SEPARABLE) FUELS ONLY OUTSIDE THESE REGIONS, AND (3) NO LIMITS ON FUEL RECYCLES. A FURTHER OBJECTIVE IS TO PROVIDE NUCLEAR MASS BALANCE DATA ON HTGRS REQUIRED BY ERDA CONTRACTORS FOR COMPARATIVE COST-BENEFIT STUDIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*THORIUM + *FUEL CYCLE + SAFEGUARDS, NUCLEAR MATERIAL + FUEL RECYCLE + REACTOR, HTGR + COST BENEFIT + REACTOR, FAST + REACTOR, LMFBR

130953
NUCLEAR FUEL CYCLE - ANS 1977 WINTER MEETING
69 PPS, ANS TRANSACTIONS, VOL. 27, PP. 426-495 (DEC. 1977)

THESE PAPERS WERE PRESENTED AT THE 1977 ANS WINTER MEETING AT SAN FRANCISCO IN NOV-DEC CONCERNING NUCLEAR FUEL CYCLE. TOPICS INCLUDE EXTRACTION OF ENERGY FROM NUCLEAR FUELS WITHOUT REPROCESSING TO SEPARATE PLUTONIUM; WASTE ISOLATION IN A WASTE ISOLATION PILOT PLANT (WIPP); WASTE MANAGEMENT; EVALUATION OF ALTERNATIVE FUEL CYCLES; FUEL MANAGEMENT IN WATER-COOLED REACTORS; ADVANCED ENRICHMENT TECHNOLOGY; REPROCESSING AND SPENT FUEL STORAGE; AND IAEA SAFEGUARDS.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY, 244 E. OGDEN AVE., HINSDALE, ILL. 60521

*FUEL CYCLE + *FUEL REPROCESSING + PLUTONIUM + *WASTE MANAGEMENT + SPENT FUEL POOL + FUEL MANAGEMENT + SPENT FUEL + ENRICHMENT, CENTRIFUGE + IAEA + SAFEGUARDS, NUCLEAR MATERIAL + FUEL STORAGE

130377
COMPLETING THE NUCLEAR FUEL CYCLE
6 PPS, COMBUSTION, 48(12), PP. 34-39 (JUNE 1977)

THE TECHNOLOGY IS IN PLACE TODAY TO GET THE MAXIMUM ENERGY FROM NUCLEAR FUEL BY RECYCLING IT (AT LEAST IN LWR'S, IF NOT ALSO IN BREEDERS - BUT THAT IS ANOTHER QUESTION). THERE ARE NO SIGNIFICANT TECHNICAL PROBLEMS BLOCKING THE MAINSTREAM OF A CLOSED FUEL CYCLE, ONLY THE PERIPHERAL ONES THAT MIGHT ARISE IN THE COURSE OF SCALE-UP OR IN THE WAKE OF ADMINISTRATIVE-POLITICAL RESTRICTIONS.

FUEL CYCLE + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + TRANSPORTATION AND HANDLING + WASTE MANAGEMENT

129262
BURNS TJ + CLEVELAND JC + THOMAS WE
THORIUM ASSESSMENT STUDY QUARTERLY PROGRESS REPORT FOR SECOND QUARTER FISCAL 1977
OAK RIDGE NATIONAL LAB., TENN.
ORNL/TM-5949 +, 42 PPS, TABS, FIGS, 19 REFS, JUNE 1977

THE OBJECTIVE OF THIS PROGRAM IS TO CONTRIBUTE TO THE ONGOING ASSESSMENT OF THE POTENTIAL ROLE OF THORIUM FUEL CYCLES FOR ALLEVIATING SAFEGUARDS CONCERNS. SCENARIOS INCLUDE (1) NO FUEL RECYCLE PERMITTED, (2) FUEL RECYCLE PERMITTED ONLY IN SECURE REGIONS ("ENERGY PARKS") WITH DENATURED (CHEMICALLY NON-SEPARABLE) FUELS ONLY OUTSIDE THESE REGIONS, AND (3) NO LIMITS ON FUEL RECYCLE. A FURTHER OBJECTIVE IS TO PROVIDE NUCLEAR MASS BALANCE DATA ON HTGRS REQUIRED BY ERDA CONTRACTORS FOR COMPARATIVE COST-BENEFIT STUDIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCOUNTABILITY + FUEL CYCLE + FUEL RECYCLE + COST BENEFIT + THORIUM + SAFEGUARDS, NUCLEAR MATERIAL

124508
MECKONI V + CATLIN RJ + MENNETT LL
REGIONAL NUCLEAR FUEL CYCLE CENTRES IAEA STUDY PROJECT
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
IAEA-CN-36/487 +, 24 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

SPECIFIC FEATURES OF LARGE REGIONAL FUEL CYCLE CENTRE ESTABLISHED ON A MULTINATIONAL BASIS VIS-A-VIS SMALLER FUEL CYCLE FACILITIES SET UP ON A NATIONAL BASIS HAVE BEEN EVALUATED. METHODOLOGY FOR ASSESSMENT OF ALTERNATIVE STRATEGIES FOR FUEL STORAGE, REPROCESSING, AND RECYCLING OF PLUTONIUM HAS BEEN DEVELOPED. CHARACTERISTIC DATA ON MATERIAL FLOWS AND COST FACTORS HAVE BEEN GENERATED, AND AN ANALYTIC SYSTEM HAS BEEN DEVELOPED TO CARRY OUT SUCH EVALUATIONS INCLUDING APPROPRIATE SENSITIVITY ANALYSIS. STUDIES HAVE ALSO BEEN MADE ON INSTITUTIONAL AND LEGAL, ORGANIZATIONAL, ENVIRONMENTAL, NON-PROLIFERATION AND SAFEGUARDS, PHYSICAL SECURITY AND OTHER ESSENTIAL ASPECTS RELATED TO THE DEVELOPMENT OF THE RFCC CONCEPT.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*FUEL CYCLE + FEED MATERIALS PRODUCTION CENTER + *IAEA + FUEL STORAGE + FUEL REPROCESSING + FUEL RECYCLE + PLUTONIUM + ECONOMICS + COST ANALYSIS + SAFEGUARDS, NUCLEAR MATERIAL

119425
PEIVESON HA + TAYLOR TJ
SECURITY IMPLICATIONS OF ALTERNATIVE FISSION FUTURES

119425 *CONTINUED*
(PRINCETON UNIVERSITY
8 PPS, BULLETIN OF THE ATOMIC SCIENTISTS, 32(1), PP. 14-18, 46-48 (DEC. 1976)

DISCUSSES RISKS ASSOCIATED WITH THE ADVENT OF A PLUTONIUM ECONOMY FOR THE NUCLEAR INDUSTRY AND THE DIFFICULTIES INVOLVED IN COPING WITH THESE RISKS. ONCE PUT INTO COMMERCIAL CIRCULATION, THE AUTHORS SUGGEST THAT PLUTONIUM WOULD BECOME VULNERABLE TO DIVERSION FOR NUCLEAR WEAPONS PURPOSES THROUGH THEFT BY TERRORIST AND CRIMINAL GROUPS, OR THROUGH APPROPRIATIONS BY GOVERNMENTS OF NATIONS NOT CURRENTLY IN THE NUCLEAR CLUB. THE AUTHORS ARGUE THAT THERE MAY BE ALTERNATIVES TO THE PRESENT COURSE OF NUCLEAR POWER DEVELOPMENT WHICH ARE LESS VULNERABLE TO DIVERSION SUCH AS THE SUBSTITION OF THORIUM-232 FOR URANIUM-238 AS THE PRINCIPAL FERTILE ISOTOPE TO BE USED FOR BREEDING PURPOSES.

REACTOR, BREEDER + PLUTONIUM + SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + SECURITY + FUEL RECYCLE + PROLIFERATION

116921
AGNEW HM
ATOMS FOR LEASE: AN ALTERNATE TO ASSURED NUCLEAR PROLIFERATION
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
2 PPS, BULLETIN OF THE ATOMIC SCIENTISTS, 32(5), PP. 22-23 (MAY 1976)

THE PROPOSAL IS FOR THE LEASING OF FUEL FOR NUCLEAR POWER PLANTS RATHER THAN SELLING IT. THEN THERE WOULD BE NO NEED FOR SMALL COUNTRIES TO REPROCESS. SPENT FUEL WOULD BE RETURNED TO THE SUPPLIER WHICH WOULD ALSO HELP TO PROMOTE FUEL REPROCESSING CENTERS.

FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL

116416
SMILEY ST + ERNST ML + SEGE G + JASKE RT
THE NRC NUCLEAR ENERGY CENTER STUDY
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
31 PPS, FROM 38TH AMERICAN POWER CONFERENCE; CHICAGO, ILLINOIS, APRIL 20-22, 1976

SAFEGUARDS--WITH RESPECT TO FUEL-CYCLE NEEDS, COLLOCATION OF SPENT-FUEL REPROCESSING AND MIXED-OXIDE FUEL FABRICATION FACILITIES MIGHT BE ADVANTAGEOUS FROM THE SAFEGUARDS STANDPOINT, BY REDUCING THE ROUTINE SHIPMENT OF PLUTONIUM COMPOUNDS BETWEEN THE FUEL REPROCESSING AND FUEL FABRICATION PLANTS. NEVERTHELESS, BASED ON THE ONGOING SPECIAL SAFEGUARDS STUDY, ANALYSIS TO DATE INDICATES THAT EFFECTIVE SAFEGUARDS CAN CONTINUE TO BE ACHIEVED WITHOUT ELIMINATING THE SHIPMENT OF THESE PLUTONIUM MATERIALS.

AVAILABILITY - MALCOLM L. ERNST, PROJECT DIRECTOR, NUCLEAR ENERGY CENTER SITE SURVEY, U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC

ECONOMICS + PLUTONIUM + RELIABILITY ANALYSIS + SITING + WASTE HANDLING + ENVIRONMENT + COST ANALYSIS + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + ENERGY CENTER + WASTE HEAT + POWER TRANSMISSION + FUEL CYCLE + FUEL RECYCLE

115780
LOTTS AL + KASTEN PR
GAS-COOLED REACTOR PROGRAMS - THORIUM UTILIZATION PROGRAM PROGRESS REPORT, JAN. 1, 1974 THROUGH JUNE 30, 1975
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-5128 +, 335 PPS, FIGS, REFS, MAY 1976

OVERALL HTGR FUEL RECYCLE INVOLVES SHIPMENT AND STORAGE, REPROCESSING, REFABRICATION, AND WASTE DISPOSAL. REPROCESSING DEALS WITH THE CHEMICAL REPROCESSING OF SPENT FUEL TO RECOVER USEFUL FUEL VALUES - BOTH RESIDUAL U-235 AND U-233 CONVERTED FROM TH-232 - AND ALSO TO ISOLATE AND CONVERT THE FISSION PRODUCTS AND OTHER WASTES INTO FORMS SUITABLE FOR DISPOSAL. THESE CHEMICAL PROCESSING STEPS ARE CONVENIENTLY GROUPED INTO FOUR AREAS: HEAD END, SOLVENT EXTRACTION, OFF-GAS CLEANUP, AND WASTE PROCESSING AND ISOLATION. FOR HTGR RECYCLE, THE PRODUCT IS IN THE FORM OF URANYL NITRATE SOLUTION, WHICH WILL BE THE FEED FOR A REFABRICATION PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, BREEDER + CARBON + COATED PARTICLE + ECONOMICS + HOT CELL + THORIUM + WASTE HANDLING + DESIGN STUDY + ENVIRONMENT + OFF GAS + RESIN + SOLVENT EXTRACTION PROCESS + FUEL REPROCESSING + REACTOR, HTGR + SAFEGUARDS, NUCLEAR MATERIAL + FUEL RECYCLE + JACOBS + BLANKET

110836
NUCLEAR ENERGY CENTER SITE SURVEY - 1975. SUMMARY AND CONCLUSIONS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NUREG-0001(PART 1 OF VI) +, 215 PPS, 13 TABS, 13 FIGS, JAN. 1976

THIS SURVEY WAS PERFORMED AT THE REQUEST OF THE U.S. CONGRESS. POWER PLANT, FUEL CYCLE, AND COMBINED CENTERS WERE EVALUATED AND COMPARED WITH DISPOSED SITING PRACTICES. THE SURVEY CONCLUDED THAT DEPENDING ON LOCATION, IT IS FEASIBLE AND PRACTICAL TO CONSTRUCT CENTERS OF UP TO 20 NUCLEAR POWER PLANTS, FUEL CYCLE PLANTS, AND COMBINED OPERATIONS. HOWEVER, NO GREAT OR UNEQUIVOCAL ADVANTAGE OF COMPELLING NEED FOR SUCH CENTERS WAS IDENTIFIED. DISPERSED SITING OF NUCLEAR FACILITIES REMAINS A FEASIBLE AND PRACTICAL, AND EVEN DESIRABLE, OPTIMUM FOR MANY LOCATIONS. THE SURVEY FOUND THAT A 15 TO 20 UNIT POWER PLANT CENTER COULD ACHIEVE, THROUGH THE

113936 *CONTINUED*
USE OF SPECIALIZED ON-SITE CONSTRUCTION TECHNIQUES. A REDUCTION IN UNIT COSTS OF ABOUT 10% OVER THOSE FOR SITES CONTAINING 4 UNITS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + SITING, MULTIPLE + RADIOACTIVITY RELEASE + FUEL REPROCESSING + THERMAL POLLUTION + FORECAST + SAFEGUARDS, NUCLEAR MATERIAL + ENVIRONMENTAL QUALITY + *ENERGY CENTER + POWER TRANSMISSION + PLANNING, LAND + *POWER PLANT, NUCLEAR + *FUEL CYCLE + JACOBS

113935
NUCLEAR ENERGY CENTER SITE SURVEY - 1975. EXECUTIVE SUMMARY
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NUREG-0001-ES +, 13 PPS, JAN. 1976

CONTAINS A SUMMARY OF THE MAIN REPORT WHICH IS COVERED BY NUREG-0001 (PART 1).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + SITING, MULTIPLE + RADIOACTIVITY RELEASE + FUEL REPROCESSING + THERMAL POLLUTION + FORECAST + SAFEGUARDS, NUCLEAR MATERIAL + ENVIRONMENTAL QUALITY + *ENERGY CENTER + POWER TRANSMISSION + N-POWER FORECAST + PLANNING, LAND + *POWER PLANT, NUCLEAR + RADIOLOGICAL IMPACT + FUEL CYCLE + JACOBS

113931
NUCLEAR ENERGY CENTER SITE SURVEY - 1975. PRACTICAL ISSUES OF IMPLEMENTATION
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NUREG-0001(PART IV OF V) +, APPROX. 600 PPS, 48 TABS, 19 FIGS, JAN. 1976

THE MAIN PART OF THE SITING SURVEY IS COVERED BY PART 1. THIS PART ON IMPLEMENTATION DISCUSSES ASSUMPTIONS AND BASES, JURISDICTIONAL AND INSTITUTIONAL CONSIDERATIONS, ECONOMIC CONSIDERATIONS, SOCIAL AND POLITICAL CONSIDERATIONS, ACCIDENT RISK AND NATIONAL SECURITY, AND SAFEGUARDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ECONOMICS + INSURANCE + LAW + SITING, MULTIPLE + ACCIDENT, PROBABILITY OF + SAFEGUARDS, NUCLEAR MATERIAL + *ENERGY CENTER + POWER TRANSMISSION + LEGALISTICS + SOCIO/PHILOSOPHICAL CONSIDERATION + POWER PLANT, NUCLEAR + SECURITY + JACOBS

SECTION 3: MATERIAL CONTROL AND ACCOUNTING

139322
REPORT OF THE MATERIAL CONTROL AND MATERIAL ACCOUNTING TASK FORCE
U.S. NUCLEAR REGULATORY COMMISSION
NUREG-0450(VOL. 1-4, EX. SUMMARY) +. APPROX. 900 PPS. FIGS. REFS. APRIL 1978

RESULTS OF AN NRC TASK FORCE ESTABLISHED TO STUDY THE ROLES OF MATERIAL CONTROL AND ACCOUNTING IN THE SAFEGUARDS PROGRAM ARE PRESENTED. THE FOLLOWING TOPICS ARE DISCUSSED: 1. ROLES AND OBJECTIVES OF MATERIAL CONTROL AND MATERIAL ACCOUNTING IN THE NRC SAFEGUARDS PROGRAM; 2. GOALS FOR MATERIAL CONTROL AND MATERIAL ACCOUNTING SYSTEMS BASED ON THEIR ROLES AND OBJECTIVES; 3. EXTENT TO WHICH THE EXISTING REGULATORY BASE MEETS OR PROVIDES THE CAPABILITY TO MEET THE RECOMMENDED GOALS; AND 4. DIRECTION FOR MATERIAL CONTROL AND MATERIAL ACCOUNTING DEVELOPMENT, INCLUDING BOTH NEAR-TERM AND LONG-TERM UPGRADES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + CONTROL + *ACCOUNTABILITY + *THEFT/DIVERSION + *REGULATION, NRC + *NRC DESIGN CRITERIA + JALOBS

138734
ATERMAN MG + LOWE V
RECONSTRUCTION OF AN ACCOUNT'S PAST
LOS ALAMOS SCIENTIFIC LAB., N.M.
3 PPS. NUCLEAR MATERIALS MANAGEMENT, VI(4), PP. 55-57 (*INTER 1977-1978)

HISTORICAL RECORDS AND DATA FREQUENTLY HAVE BEEN REDUCED BY COMBINATION OF ACCOUNTS. THE PROBLEM OF FINDING ALL *AYS A GIVEN SET OF ACCOUNTS COULD HAVE BEEN COMBINED TO GIVE SOME GIVEN SET OF REDUCED ACCOUNTS IS ADDRESSED. AN ALGORITHM HAS BEEN DEVELOPED TO ACCOMPLISH THIS TASK AND A COMPUTER CODE IN FORTRAN IS GIVEN. AN EXAMPLE WITH SOME MUF DATA IS ALSO PRESENTED.

*SAFEGUARDS, NUCLEAR MATERIAL + *MATERIAL UNACCOUNTED FOR + *SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + *MATHEMATICAL TREATMENT + *THEFT/DIVERSION + *STATISTICAL ANALYSIS

137662
OLTERMANN HA + SEAGALAN R + ROGERS DR + FUSHIMI FC
NUCLEAR POWER: NEW TECHNIQUE FOR SAFEGUARDS SPECIAL NUCLEAR MATERIAL
MOUND LAB., MIAMISBURG, OHIO
MLM-2474(UP) + CONF-771125-1 +. 9 PPS. FROM 3RD INTERNATIONAL CONFERENCE OF ENVIRONMENTAL PROBLEMS OF THE EXTRACTIVE INDUSTRIES-MATERIALS, ENERGY, AND ENVIRONMENT; DAYTON, OHIO, NOV. 29, 1977

THIS STUDY DESCRIBES CUA WHICH, AS AN ALTERNATIVE TO MUF/LEMUF, IS A MATERIAL CONTROL AND ACCOUNTABILITY METHODOLOGY OF A PLANT PROCESS THROUGH THE FORMULATION OF CLOSURE EQUATIONS. THE METHODOLOGY IS ADAPTABLE TO PLANT PROCESSES OF VARYING DEGREES OF DESIGN AND OPERATIONAL COMPLEXITY. APPLICATION DOES NOT REQUIRE ALTERATION OR MODIFICATION OF AN APPLICANT'S PROCESS. CUA METHODOLOGY ITERATIVELY COMPARES THE ACTUAL SITUATION TO THE NEED. THE PERFORMANCE OF THE PROPOSED OR EXISTING MEASUREMENT SYSTEM IS COMPARED TO THE MATERIAL CONTROL CRITERION. THEN ADDITIONS OR REFINEMENTS TO THE MEASUREMENT SYSTEM OR PROCESS ARE ITERATIVELY COMPARED TO THE CRITERION UNTIL THE CRITERION HAS BEEN MET. THIS SYSTEMATIC COMPARISON CAN EFFICIENTLY ENSURE THAT A COMPLICATED PROCESS MEASUREMENT SYSTEM WILL PERFORM TO THE LEVEL AS SPECIFIED BY THE NEED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *ACCOUNTABILITY + *THEFT/DIVERSION + *ANALYTICAL MODEL + *MATERIAL UNACCOUNTED FOR

137000
FRICK H
GAME THEORETICAL TREATMENT OF MATERIAL ACCOUNTABILITY PROBLEMS (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2504 +. 101 PPS. 18 REFS. DEC. 1977

THIS KFK REPORT BREAKS DOWN INTO TWO PARTS. THEY ARE INDEPENDENT IN PRESENTATION ALTHOUGH RELATED TO EACH OTHER AS REGARDS THE PROBLEM TREATED. THE FIRST PART EXTENSIVELY DEALS WITH MATERIAL BALANCING PROBLEMS AND THE ASSUMPTION IS MADE THAT THE CORRESPONDING MEASUREMENTS, TAKEN AS RANDOM VARIABLES WITH NORMAL DISTRIBUTION, ARE STOCHASTICALLY INDEPENDENT. THIS ASSUMPTION IS ABANDONED IN THE SECOND PART AND THE RESULTING MATHEMATICAL DIFFICULTIES ARE DISCUSSED.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *ACCOUNTABILITY + *MATHEMATICAL TREATMENT + *STATISTICAL ANALYSIS + *THEFT/DIVERSION + *THEORETICAL INVESTIGATION

137659
BROUNS RJ + ROBERTS FP + UPSON UL
CONSIDERATIONS FOR SAMPLING NUCLEAR MATERIALS FOR SNM ACCOUNTING MEASUREMENTS
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
NUREG/CR-0087 +. 37 PPS. 2 TABS. 39 REFS. MAY 1978

THIS REPORT PRESENTS PRINCIPLES AND GUIDELINES FOR SAMPLING NUCLEAR MATERIALS TO MEASURE CHEMICAL AND ISOTOPIC CONTENT OF THE MATERIAL. DEVELOPMENT OF SAMPLING PLANS AND PROCEDURES THAT MAINTAIN

137659 *CONTINUED*
THE RANDOM AND SYSTEMATIC ERRORS OF SAMPLING *ITHIN ACCEPTABLE LIMITS FOR SNM ACCOUNTING PURPOSES ARE EMPHASIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *ACCOUNTABILITY + *STATISTICAL ANALYSIS + *SAMPLING + QUALITY ASSURANCE + JACOBS

137416
JENKINS JD + ALLEN EJ + BLAKEMAN ED
MATERIAL CONTROL AND ACCOUNTABILITY PROCEDURES FOR A *ASTE ISOLATION REPOSITORY
OAK RIDGE NATIONAL LAB., TENN.
ORNL/TM-5162 +. 28 PPS, 9 TABS, 13 REFS, MAY 1978

THE MATERIAL CONTROL AND ACCOUNTABILITY NEEDS OF A *ASTE ISOLATION REPOSITORY ARE EXAMINED. THREE LEVELS OF CONTROL ARE DISCUSSED: (1) ITEM IDENTIFICATION AND CONTROL, (2) TAMPER INDICATION, AND (3) QUANTITATIVE MATERIAL ASSAY. A SUMMARY OF *ASTE CHARACTERISTICS IS PRESENTED AND, BASED ON THESE, PLUS A CONSIDERATION OF THE ACCESSIBILITY OF THE VARIOUS TYPES OF *ASTE, MATERIAL CONTROL BY ITEM IDENTIFICATION AND ACCOUNTABILITY (*HERE THE INDIVIDUAL *ASTE CONTAINER IS THE BASIC UNIT) IS RECOMMENDED. TAMPER INDICATING PROCEDURES ARE ALSO RECOMMENDED FOR THE INTERMEDIATE AND LO* LEVEL *ASTE CATEGORIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + *THEFT/DIVERSION + **ASTE STORAGE + **ASTE DISPOSAL, SALT + JACOBS

136879
DO*DY EJ + HENRY CN + HASTINGS RD + FRANCE S*
NEUTRON DETECTOR SUITCASE FOR THE NUCLEAR EMERGENCY SEARCH TEAM
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-7198 +. 6 PPS, 5 FIGS, 2 REFS, FEB. 1978

A PORTABLE HIGH-EFFICIENCY NEUTRON DETECTION SYSTEM HAS BEEN CONSTRUCTED FOR THE NUCLEAR EMERGENCY SEARCH TEAM. IT INCLUDES AN ALARM SYSTEM BASED ON TIME INTERVAL MEASUREMENTS OF THE INCOMING NEUTRON DETECTION PULSES. THE SYSTEM IS DESIGNED FOR TRANSPORTATION BY VEHICLE IN SEARCHING FOR NEUTRON-EMITTING RADIOACTIVE MATERIALS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *INSTRUMENT, NUCLEAR + INSTRUMENT, SURVEILLANCE + INSTRUMENT, ALARM + *ASSAY, NONDESTRUCTIVE + NEUTRON + *EQUIPMENT DEVELOPMENT + SAFEGUARDS, NUCLEAR MATERIAL

136771
AUGUSTSON RH
DYMAC DEMONSTRATION PROGRAM: PHASE I EXPERIENCE
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-7126-MS +. 112 PPS, REFS, DEC. 1978

THE DYMAC PROJECT TESTED A PROTOTYPE SYSTEM AT THE DP SITE LASL PLUTONIUM FACILITY, *HICH CONSISTED OF A COMPUTERIZED ACCOUNTING SYSTEM BASED ON MATERIAL BALANCING BY UNIT PROCESS. A COMPUTER PROGRAM HANDLED TRANSACTIONS THAT OPERATORS ENTERED INTO THE SYSTEM VIA A TERMINAL. TRANSACTIONS CONTAINED THE SAME INFORMATION USED IN THE PRESENT LASL PAPER ACCOUNTING SYSTEM. DURING A 6-*EEK PERIOD DYMAC OPERATED IN PARALLEL *ITH THE PAPER SYSTEM. RESULTS SHO*ED DYMAC *AS ABLE TO KEEP AN ACCURATE AND TIMELY INVENTORY. CONCURRENTLY THE PROJECT OPERATED SEVERAL NDA INSTRUMENTS IN A GLOVEBOX ENVIRONMENT. FROM INSTRUMENT OPERATION LOGS, PERSONNEL IDENTIFIED OPERATIONAL PROBLEMS AND INCORPORATED DESIGN CHANGES IN INSTRUMENTATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + PLUTONIUM + *ASSAY, NONDESTRUCTIVE + *ACCOUNTABILITY + COMPUTER CONTROL

136770
BROONS RJ + ROBERTS FP
PROCEDURES FOR ROUNDING MEASUREMENT RESULTS IN NUCLEAR MATERIALS CONTROL AND ACCOUNTING
BATTELLE PACIFIC NORTH*EST LABS., RICHLAND, *ASH.
NUREG/CR-0033 +. 20 PPS, 1 TAB, 7 REFS, MARCH 1978

PROCEDURES FOR ROUNDING MEASUREMENT RESULTS FOR NUCLEAR MATERIAL CONTROL AND ACCOUNTING ARE DEFINED. EXCESSIVE ROUNDING CAN INCREASE OR DECREASE THE VARIANCE OF RESULTS AND CAN CAUSE A BIAS. CONSEQUENCES OF ROUNDING CAN AFFECT DECISIONS REQUIRED OF SNM LICENSES IN ACCORDANCE *ITH 10 CFR PART 70 AND 73. CONSIDERATIONS FOR MINIMIZING ROUNDING ERRORS ARE PRESENTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + *STATISTICAL ANALYSIS + *DATA PROCESSING

136768
COBB DD * SAPIR JL
PRELIMINARY CONCEPTS FOR MATERIALS MEASUREMENT AND ACCOUNTING IN CRITICAL FACILITIES
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-7328-MS *, 44 PPS, 2 TABS, 12 FIGS, 23 REFS, JAN, 1978

PRELIMINARY CONCEPTS ARE PRESENTED FOR IMPROVED MATERIALS MEASUREMENT AND ACCOUNTING IN LARGE CRITICAL FACILITIES. THESE WILL BE DEVELOPED AS PART OF A STUDY THAT WILL EMPHASIZE INTERNATIONAL SAFEGUARDING. THE MAJOR PROBLEM IS TIMELY VERIFICATION OF IN-REACTOR INVENTORY DURING REACTOR OPERATION. THIS WILL REQUIRE A COMBINATION OF MEASUREMENT, STATISTICAL SAMPLING, AND DATA ANALYSIS TECHNIQUES. PROMISING TECHNIQUES INCLUDE MEASUREMENTS OF REACTOR PARAMETERS SENSITIVE TO TOTAL FISSILE INVENTORY, AND NONDESTRUCTIVE ASSAY MEASUREMENTS OF FISSILE MATERIAL IN REACTOR FUEL DRAWERS AND VAULT STORAGE CANISTERS COUPLED WITH STATISTICAL SAMPLING PLANS. EFFECTIVENESS OF PROPOSED STRATEGIES WILL BE EVALUATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA, 22161

JACOBS * *SAFEGUARDS, NUCLEAR MATERIAL * INTERNATIONAL * *SPECIAL NUCLEAR MATERIAL * ACCOUNTABILITY * *CRITICAL ASSEMBLY * *ASSAY, NONDESTRUCTIVE * *MEASUREMENT, REACTIVITY

136591
BLUMKIN S * VON HALLE E
A METHOD FOR ESTIMATING THE INVENTORY OF AN ISOTOPE SEPARATION CASCADE BY THE USE OF MINOR ISOTOPE TRANSIENT CONCENTRATION DATA
OAK RIDGE GASEOUS DIFFUSION PLANT, TENN.
K-1892 *, 28 PPS, 6 TABS, JAN, 13, 1978

AN INDIRECT METHOD FOR ESTIMATING THE INVENTORY OF A URANIUM ENRICHMENT CASCADE WHICH PRESUMABLY CAN BE PERFORMED BY THE INTERNATIONAL ATOMIC ENERGY AGENCY WITHIN THE NON-PROLIFERATION TREATY LIMITATIONS ON ITS SAFEGUARDS ACTIVITIES HAS BEEN DEVELOPED AND TESTED AT THE OAK RIDGE GASEOUS DIFFUSION PLANT (ORGDP). THIS METHOD INVOLVES THE FEEDING TO A CASCADE WITH URANIUM THAT IS SIGNIFICANTLY RICHER IN ONE COMPONENT THAN THE NORMAL CASCADE FEED FOR A SHORT PERIOD OF TIME, AND THE MEASUREMENT OF THE SUBSEQUENT TRANSIENT CONCENTRATIONS OF THIS COMPONENT IN THE CASCADE WITHDRAWAL STREAMS. THE INVENTORY ESTIMATE IS THEN OBTAINED FROM A COMPARISON OF THE OBSERVED DATA WITH PARALLEL DATA CALCULATED FOR AN APPROPRIATE BUT NON-IDENTICAL CASCADE MODEL. THE VALIDITY OF THE METHOD IS DEMONSTRATED NUMERICALLY BY PARALLEL CALCULATIONS MADE FOR TWO NEARLY IDEAL HYPOTHETICAL CASCADE MODELS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

ENRICHMENT FACILITY * ANALYTICAL TECHNIQUE * DIFFUSION * PROLIFERATION * SAFEGUARDS, NUCLEAR MATERIAL

136505
ANALYTICAL CHEMISTRY NEEDS FOR NUCLEAR SAFEGUARDS IN NUCLEAR FUEL REPROCESSING
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-UR-77-2067 * CONF-771031-2 *, 9 PPS, FROM 21ST CONFERENCE ON ANALYTICAL CHEMISTRY IN NUCLEAR TECHNOLOGY; GATLINBURG, TENN., OCT. 4, 1977

A FUEL REPROCESSING PLANT DESIGNED TO PROCESS 1500 TONNES OF LIGHT WATER REACTOR FUEL PER YEAR WILL RECOVER 15 TONS OF PU DURING THAT TIME, OR APPROXIMATELY 40 TO 50 KG OF PU PER DAY. CONVENTIONAL NUCLEAR SAFEGUARDS ACCOUNTABILITY HAS RELIED ON BATCH ACCOUNTING AT THE HEAD AND TAIL ENDS OF THE REPROCESSING PLANT WITH SEMI-ANNUAL PLANT CLEANOUT TO DETERMINE IN-PROCESS HOLDUP. AN ALTERNATIVE PROPOSED SAFEGUARDS SYSTEM RELIES ON DYNAMIC MATERIAL ACCOUNTING WHEREBY IN-LINE NDA AND CONVENTIONAL ANALYTICAL TECHNIQUES PROVIDE INDICATIONS ON A DAILY BASIS OF SNM TRANSFERS INTO THE SYSTEM AND INFORMATION OF PU HOLDUP WITHIN THE SYSTEM. THIS PAPER WILL ATTEMPT TO DESCRIBE SOME OF THE ANALYTICAL REQUIREMENTS AND PROBLEMS FOR DYNAMIC MATERIALS ACCOUNTING IN A NUCLEAR FUEL REPROCESSING PLANT. SOME SUGGESTIONS FOR FURTHER DEVELOPMENT WILL BE PROPOSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL * FUEL REPROCESSING * WASTE TREATMENT * ANALYTICAL TECHNIQUE * PLUTONIUM * URANIUM

135700
SAFEGUARDING NUCLEAR MATERIALS, VOL. II - NON-DESTRUCTIVE MEASUREMENTS OF REACTORS AND REACTOR FUELS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL. 2) *, 44 PPS, PP. 613-57 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS, VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: DETERMINATION OF BURNUP AND PLUTONIUM CONTENT IN IRRADIATED FUELS BY GAMMA-SPECTROMETRY MEASUREMENTS OF RADIOACTIVE FISSION PRODUCTS, ISOTOPIC ASSAY IN IRRADIATED FUEL BY NEUTRON RESONANCE ANALYSIS, COOLING-TIME DETERMINATION OF THE NUCLEAR FUEL FOR A VVR-S REACTOR, APPLICATION OF NEUTRON ACTIVIATION ANALYSIS, GAMMA SPECTROMETRY AND NUCLEAR TRACK DETECTORS FOR REACTOR FUEL ASSAY, A METHOD - AND ITS APPLICATION - FOR NON-DESTRUCTIVE DETERMINATION OF NUCLEAR MATERIAL QUANTITIES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL * IAEA * SPECIAL NUCLEAR MATERIAL * TEST, NONDESTRUCTIVE * FUEL, NUCLEAR * FUEL BURNUP * SPECTROMETRY, GAMMA

135699
SAFEGUARDING NUCLEAR MATERIALS, VOL. II - MIXED-OXIDE FUELS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 69 PPS, PP. 549-610 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: FAST-RESPONSE FUEL-ROD CALORIMETER, NON-DESTRUCTIVE ASSAY EQUIPMENT FOR QUANTITATIVE DETERMINATION OF NUCLEAR MATERIAL IN A PLUTONIUM FUEL FABRICATION FACILITY, NON-DESTRUCTIVE ANALYSIS OF PLUTONIUM FUEL PLATES FOR PHYSICAL INVENTORY VERIFICATION AT A FAST CRITICAL ASSEMBLY, SAFEGUARDS SYSTEM FOR THE LMFBR PROTOTYPE POWER PLANT SNR-300 (KKN KALKAR), NON-DESTRUCTIVE MEASUREMENT OF PLUTONIUM AND URANIUM IN PROCESS WASTES AND RESIDUES, AND FAST FLUX TEST FACILITY (FFTF) FUEL-PIN NON-DESTRUCTIVE ASSAY MEASUREMENTS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + MIXED OXIDE + MEASUREMENT + FABRICATION FACILITY + TEST, NONDESTRUCTIVE + FFTF (TH)

135648
SAFEGUARDING NUCLEAR MATERIALS, VOL. II - HIGH-TEMPERATURE GAS REACTORS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 36 PPS, PP. 501-37 OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: IN-PLANT NON-DESTRUCTIVE ASSAY OF HTGR FUEL MATERIALS, VERIFICATION OF THE U235 FLOW AT THE OUTPUT OF THE THTR FUEL FABRICATION PLANT, AND NON-DESTRUCTIVE MEASUREMENT OF U235 AND U233 CONTENT IN HGR FUEL ELEMENTS BY DELAYED NEUTRON ANALYSIS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + REACTOR, HTGR + FUEL ELEMENTS + MEASUREMENT

135697
SAFEGUARDING NUCLEAR MATERIALS, VOL. II - MEASUREMENTS IN REPROCESSING FACILITIES
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 136 PPS, PP. 361-497 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 21-24, 1975

TITLES OF PAPERS PRESENTED IN THIS SESSION ARE: EURATOM EXPERIENCE OF VERIFICATION METHODS IN REPROCESSING FACILITIES, SUMMARY OF EXPERIENCE WITH HEAVY-ELEMENT ISOTOPIC CORRELATIONS, REPROCESSING PLANT TEMPORAL RESPONSE ANALYSIS AS THE BASIS FOR DYNAMIC INVENTORY OF IN-PROCESS NUCLEAR MATERIAL, DATA TREATMENT FOR THE ISOTOPIC CORRELATION TECHNIQUE, ISOTOPE CORRELATIONS BASED ON FISSION-PRODUCT NUCLIDES IN LWR IRRADIATED FUELS: A THEORETICAL EVALUATION, IAEA BANK OF CORRELATED ISOTOPIC COMPOSITION DATA, IMPROVEMENTS AND EXPERIENCE IN THE ANALYSIS OF REPROCESSING SAMPLES, A SIMPLIFIED METHOD FOR PREPARING MICRO-SAMPLES FOR THE SIMULTANEOUS ISOTOPIC ANALYSIS OF URANIUM AND PLUTONIUM, NON-DESTRUCTIVE CONTROL OF FISSILE MATERIAL IN SOLID AND LIQUID SAMPLES ARISING FROM A REACTOR AND FUEL REPROCESSING PLANT, AN INDEPENDENT METHOD FOR INPUT ACCOUNTABILITY IN REPROCESSING PLANTS (MAGNAP), AND AN ACCURATE PROCEDURE TO SAFEGUARD THE FISSILE MATERIAL CONTENT OF INPUT AND OUTPUT SOLUTIONS OF REPROCESSING PLANTS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + FUEL REPROCESSING + MEASUREMENT + FUEL, NUCLEAR + ACCOUNTABILITY

135696
SAFEGUARDING NUCLEAR MATERIALS VOL. II - NON-DESTRUCTIVE MEASUREMENTS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 16 PPS, PP. 341-57 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF THE TWO PAPERS IN THIS SESSION ARE: OPERATIONAL EXPERIENCE IN THE NON-DESTRUCTIVE ASSAY OF FISSILE MATERIAL IN GENERAL ELECTRIC'S NUCLEAR FUEL FABRICATION FACILITY, AND SOME TECHNIQUES AND INSTRUMENTS DEVELOPED IN BULGARIA FOR THE NON-DESTRUCTIVE ANALYSIS OF NUCLEAR MATERIALS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + TEST, NONDESTRUCTIVE + FABRICATION FACILITY + BULGARIA

135695
SAFEGUARDING NUCLEAR MATERIALS, VOL. II - CONTAINMENT AND SURVEILLANCE
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 73 PPS, PP. 265-338 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

DEVELOPMENT OF A SAFEGUARDS SYSTEM FOR CONTAINMENT AND SURVEILLANCE AT URANIUM ENRICHMENT PLANTS.

135075 *CONTINUED*
TESTING OF TECHNIQUES FOR THE SURVEILLANCE OF SPENT FUEL FLUX AND REACTOR POWER AT PICKERING GENERATING STATION, TAMPER-INDICATING RADIATION SURVEILLANCE INSTRUMENTATION, AND APPLICATION OF TAMPER-RESISTANT IDENTIFICATION AND SEALING TECHNIQUES FOR SAFEGUARDS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + CONTAINMENT + INSTRUMENT, SURVEILLANCE + ENRICHMENT FACILITY

135094
SAFEGUARDING NUCLEAR MATERIALS, VOL. II - INSTRUMENTATION AND MEASUREMENT METHODS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 38 PPS, PP. 3-61 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF THE PAPERS PRESENTED AT THIS SESSION INCLUDED: THE AGENCY PROGRAMME FOR THE DEVELOPMENT OF SAFEGUARDS TECHNIQUES AND INSTRUMENTATION, ACTIVITIES OF THE EUROPEAN SAFEGUARDS RESEARCH AND DEVELOPMENT ASSOCIATION, SOME AGENCY CONTRIBUTIONS TO THE DEVELOPMENT OF INSTRUMENTAL TECHNIQUES IN SAFEGUARDS, PHYSICAL STANDARDS AND VALID CALIBRATION, ANALYTICAL SERVICES FOR AGENCY SAFEGUARDS, RECENT DEVELOPMENTS IN THE DISSOLUTION AND AUTOMATED ANALYSIS OF PLUTONIUM AND URANIUM FOR SAFEGUARDS MEASUREMENTS, METHODS OF SAMPLE PREPARATION AND ANALYSIS FOR WIDE VARIATIONS IN MATERIAL TYPES - A REQUIREMENT FOR A NATIONAL OR AN INTERNATIONAL SAFEGUARDS LABORATORY, AND EXPERIENCE OF THE CENTRAL CONTROL LABORATORY (CCL) IN ACCOUNTING FOR AND CONTROLLING NUCLEAR MATERIAL IN CZECHOSLOVAKIA.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + MEASUREMENT + INSTRUMENT, SURVEILLANCE + ANALYTICAL TECHNIQUE

135093
SAFEGUARDING NUCLEAR MATERIALS - VOL. II
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.2) +, 681 PPS, PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

THE YEAR 1975 MARKS THE FIFTH ANNIVERSARY OF THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS, AND THE FIFTH ANNIVERSARY SINCE THE LAST MAJOR IAEA SYMPOSIUM ON SAFEGUARDS TECHNIQUES, PUBLISHED BY THE IAEA IN 1970. ACCORDINGLY, THE IAEA CONVENED IN VIENNA AN INTERNATIONAL SYMPOSIUM ON THE SAFEGUARDING OF NUCLEAR MATERIALS, 20 TO 24 OCTOBER 1975, WHICH WAS ATTENDED BY 220 PARTICIPANTS, REPRESENTING 34 COUNTRIES AND THREE INTERNATIONAL ORGANIZATIONS, WITH A TOTAL OF 95 PAPERS. VOL. II PRESENTS 52 PAPERS ON INSTRUMENTATION AND MEASUREMENT, CONTAINMENT, NONDESTRUCTIVE TESTING HTGR'S, AND MIXED OXIDE FUELS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + MEASUREMENT + INSTRUMENT, SURVEILLANCE + CONTAINMENT + TEST, NONDESTRUCTIVE + REACTOR, HTGR + MIXED OXIDE

135092
SAFEGUARDING NUCLEAR MATERIALS, VOL. I - PROBABILITY AND SAFEGUARDS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.1) +, 100 PPS, PP. 517-617 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED IN THIS SESSION ARE: VERIFICATION OF PLUTONIUM INVENTORIES, THE APPLICATION OF PROBABILITY METHODS FOR SAFEGUARDS PURPOSES, CASE STUDIES ON THE STATISTICAL ANALYSIS OF SAFEGUARDS DATA, STATISTICAL METHODS FOR THE PLANNING OF INSPECTIONS, EFFICIENCY OF MATERIAL ACCOUNTABILITY VERIFICATION PROCEDURES: A CASE STUDY, SAFEGUARDS PROCEDURES FOR INTERNATIONAL TRANSFERS OF NUCLEAR MATERIALS, AND SOME TECHNICAL ASPECTS OF THE APPLICATION OF IAEA SAFEGUARDS TO ENRICHMENT FACILITIES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + PLUTONIUM + PROBABILITY + STATISTICAL ANALYSIS + ACCOUNTABILITY + ENRICHMENT FACILITY

135091
SAFEGUARDING NUCLEAR MATERIALS, VOL. I - SAFEGUARDS AND MATERIAL CONTROL EXPERIENCE
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.1) +, 135 PPS, PP. 379-514 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLE OF PAPERS PRESENTED AT THIS SESSION ARE: EXPERIENCE IN THE APPLICATION OF AGENCY INSPECTION PRACTICES, EURATOM EXPERIENCE OF VERIFICATION METHODS IN FUEL FABRICATION FACILITIES, VERIFICATION OF NUCLEAR MATERIAL ACCOUNTS AS A MANAGEMENT FUNCTION, PRACTICAL PROBLEMS IN THE VERIFICATION OF A FAMILY OF INVENTORY ITEMS, MATERIAL SURVEILLANCE AND VERIFICATION PROGRAMME AT A URANIUM ENRICHING PLANT, COMPTABILITE INTERNE DES MATIERES DE BASE AU COMPLEXE DE FABRICATION DES ELEMENTS COMBUSTIBLES AU PLUTONIUM DE CADARACHE, BILAN GENERAL D'UTILISATION DU PLUTONIUM MIS

135691 *CONTINUED*
EN OEUVRE DANS LA FABRICATION DES ELEMENTS COMBUSTIBLES RAPSODIE. NUCLEAR MATERIALS ACCOUNTING AT SPRINGFIELDS. PROCEDURES USED FOR THE ACCOUNTANCY OF URANIUM-235 IN THE FABRICATION OF HIGHLY ENRICHED URANIUM FUELS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

IAEA + SPECIAL NUCLEAR MATERIAL + INSERVICE INSPECTION + EURATOM + FABRICATION FACILITY + ENRICHMENT FACILITY + ACCOUNTABILITY + URANIUM + SAFEGUARDS, NUCLEAR MATERIAL

135690
SAFEGUARDING NUCLEAR MATERIALS, VOL. 1 - INFORMATION SYSTEMS AND REAL-TIME MATERIAL CONTROL
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.1) +. 125 PPS. PP. 251-376 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: THE IAEA SAFEGUARDS INFORMATION SYSTEM, SOME ASPECTS OF IAEA MATERIALS ACCOUNTANCY IN RELATION TO THE FUTURE EURATOM SYSTEM, CONTINUOUS INVENTORY IN SPECIAL NUCLEAR MATERIALS (SNM) STORAGE FACILITIES, A REAL-TIME MATERIAL CONTROL CONCEPT FOR SAFEGUARDING SPECIAL NUCLEAR MATERIAL IN UNITED STATES LICENSED PROCESSING FACILITIES, NON-DESTRUCTIVE ASSAY TECHNOLOGY AND IN-PLANT DYNAMIC MATERIALS CONTROL - "DYNAC", COMSAC: COMPUTERIZED MEASUREMENTS FOR SAFEGUARDS AND ACCOUNTABILITY, A COMPUTER SYSTEM FOR ACCOUNTING AND CONTROL OF NUCLEAR MATERIAL, EXPERIENCE IN NUCLEAR MATERIALS ACCOUNTANCY INCLUDING THE USE OF COMPUTERS IN THE UKAEA, POTENTIALITY OF AN ACCOUNTING SYSTEM FOR NUCLEAR MATERIALS IN THE PNC PLUTONIUM FUEL FACILITIES, AND COMPUTERIZED INFORMATION SYSTEM FOR INVENTORY-TAKING AND VERIFICATION AT A NUCLEAR FUEL FABRICATION PLANT WITH CLOSED PRODUCTION LINES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + INFORMATION RETRIEVAL + EURATOM + UNITED STATES + UKAEA

135688
SAFEGUARDING NUCLEAR MATERIALS, VOL. 1 - STATE SYSTEMS OF ACCOUNTING AND CONTROL
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.1) +. 136 PPS. PP. 59-195 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: EXPERIENCE IN THE APPLICATION OF THE EURATOM SAFEGUARDS SYSTEM IN VIEW OF THE INTRODUCTION OF THE VERIFICATION AGREEMENT, GERMAN DEMOCRATIC REPUBLIC STATE SYSTEM OF ACCOUNTING FOR AND CONTROL OF NUCLEAR MATERIAL, FEATURES OF THE DANISH SYSTEM OF NUCLEAR MATERIAL CONTROL IN COMPLIANCE WITH IAEA-NPT SAFEGUARDS REQUIREMENTS, ITALIAN EXPERIENCE WITH THE EXISTING SAFEGUARDS SYSTEM, SYSTEM DESIGN AND EVALUATION FOR NATIONAL SAFEGUARDS SYSTEMS, CONCEPTUAL DESIGN OF A SYSTEM FOR NUCLEAR MATERIAL CONTROL IN A RESEARCH CENTRE ACCORDING TO THE IAEA SAFEGUARDS REQUIREMENTS, ACCOUNTING AND SAFEGUARDS SYSTEM FOR NUCLEAR MATERIALS AT THE ROSSENDORF CENTRAL NUCLEAR RESEARCH INSTITUTE (DRESDEN), INSTRUMENTED SAFEGUARDS AT NUCLEAR POWER STATIONS, NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL AT THE A-1 BOHUNICE NUCLEAR POWER PLANT, EXPERIENCE IN SAFEGUARDING NUCLEAR MATERIAL AT THE RHEINSBERG NUCLEAR POWER STATION, AND SAFEGUARDING NUCLEAR MATERIAL AT A NUCLEAR POWER STATION WITH A WATER MODERATED AND COOLED REACTOR.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + GERMANY + DENMARK + ITALY + DESIGN STUDY

138649
ADAMS RW + SPOGEN LR
A MATERIAL CONTROL ASSESSMENT PROCEDURE
LAWRENCE LIVERMORE LAB., CALIF.
UCRL-79214(REV.1) + CONF-770656-4 +. 10 PPS. FROM ANNUAL MEETING OF INST. OF NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 29, 1977

THE MATERIAL CONTROL SYSTEM ASSESSMENT PROCEDURE BEING DEVELOPED BY THE LAWRENCE LIVERMORE LABORATORY FOR THE U.S. NUCLEAR REGULATORY COMMISSION IS REVIEWED. IT CONSISTS OF FIVE MAJOR SECTIONS: TARGET IDENTIFICATION, ADVERSARY SEQUENCE AND SIMULI GENERATION, MATERIAL CONTROL SYSTEM RESPONSE DETERMINATION, SAFEGUARD SYSTEM OUTCOME DETERMINATION, AND SAFEGUARD SYSTEM UTILITY DETERMINATION. WHEN ADOPTED, THIS PROCEDURE WILL REDUCE SAFEGUARDS LICENSING PROBLEMS BY PROVIDING COMPATIBILITY WITH FUTURE PERFORMANCE BASED REGULATIONS, EXPLICIT EVALUATION RULES AND REQUIREMENTS, WELL-DEFINED TRADE-OFF STRUCTURES, AND USER ORIENTED AND SYSTEMATIC EVALUATION AND DESIGN TOOLS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + MATERIAL BALANCE + CONTROL + ACCOUNTABILITY + *THEFT/DIVERSION

134599
GEGUSCH M
COMPUTER PROGRAMS KEMAKO (IN GERMAN)

134599 *CONTINUED*
STAATLICHES AMT FUR ATOMSICHERHEIT UND STRAHLENSCHUTZ
SAAS-223 *. 13 PPS, 4 FIGS, 3 REFS, 1977

THE GDR HAS TO PROVIDE THE IAEA WITH INFORMATION CONCERNING THE TRANSFER OF NUCLEAR MATERIAL INTO OR OUT OF EACH MATERIAL BALANCE AREA AS WELL AS THE INVENTORY OF NUCLEAR MATERIAL TO BE DETERMINED YEARLY. KEMAKO 1 AND 2 PROCESS THE DATA OF FRESH FUEL ASSEMBLIES INTRODUCED INTO, AND IRRADIATED ASSEMBLIES TRANSPORTED OUT OF, NUCLEAR POWER PLANTS RESPECTIVELY. KEMAKO 3 PRINTS THE INVENTORY LISTS GIVING THE ACCOUNTANCY DATA SEPARATELY FOR EACH BATCH OF NUCLEAR MATERIAL.

AVAILABILITY - PRASIDENT DES STAATLICHEN AMTES FUR ATOMSICHERHEIT UND STRAHLENSCHUTZ DER DEUTSCHEN DEMOKRATISCHEN REPUBLIK, DDR - 1157 BERLIN-KARLSHORST, WALDOWALLEE 117 GERMAN DEMOCRATIC REPUBLIC

IAEA + REGULATION, IAEA + GERMANY + COMPUTER PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + PROLIFERATION

134133
DUNN DR
DYNAMIC MODELS, ESTIMATION AND DETECTION CONCEPTS FOR SAFEGUARDING PU(NO3)4 STORAGE TANKS
LAWRENCE LIVERMORE LAB., CALIF.
UCRL-79216 + CONF-770650-2 *. 12 PPS, FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 29, 1977

THE APPLICABILITY OF MODERN SIGNAL PROCESSING TECHNIQUES TO THE SAFEGUARDS PROBLEM FOR A PLUTONIUM NITRATE STORAGE TANK IS ADDRESSED. THE TECHNIQUES INVOLVE MATHEMATICAL MODELING, OPTIMAL ESTIMATION OF PROCESS VARIABLES AND THE DETECTION OF ABNORMAL CHANGES IN THESE VARIABLES DUE TO ADVERSARY DIVERSION. AN EXAMPLE IS GIVEN WHICH SHOWS OVERALL PERFORMANCE IN TERMS OF PROBABILITIES OF DETECTION VERSUS FALSE ALARM PROBABILITIES FOR LEVELS OF DIVERSION OF 150, 250 AND 500 GMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *ANALYTICAL MODEL + *SIMULATION + *STORAGE CONTAINER + PLUTONIUM + NITRATE

134110
MCSWEENEY TI + JOHNSTON JW + SCHNEIDER RA
IMPROVED MATERIAL ACCOUNTING FOR PLUTONIUM PROCESSING FACILITIES AND A 233U-HTGR FUEL FABRICATION FACILITY
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-2098 *. 170 PPS, TABS, 8 FIGS, 14 REFS, OCT, 1975

THIS REPORT WAS PREPARED AS PART OF THE SPECIAL SAFEGUARDS STUDY. THE MAJOR OBJECTIVE OF THE STUDY WAS TO: "PROVIDE A SYSTEMATIC ASSESSMENT OF THE SAFEGUARDS MEASURES IDENTIFIED IN THE DRAFT GENERIC ENVIRONMENTAL STATEMENT ON MIXED OXIDE (GESMO) AND DEVELOP A SAFEGUARDS PLAN FOR PROTECTION OF PLANTS AND MATERIALS IN THE PLUTONIUM RECYCLE AND HIGH-ENRICHED URANIUM CYCLE." STUDIES WERE INITIATED TO INVESTIGATE POTENTIAL GAINS FROM THE APPLICATION OF NEW TECHNOLOGIES SUCH AS REAL-TIME MATERIAL CONTROL. SIMULTANEOUSLY, STUDIES WERE INITIATED TO EVALUATE THE POTENTIAL GAINS FROM CARRYING OUT EXISTING SAFEGUARDS MEASURES. THIS STUDY, TITLED "IMPROVED MATERIAL ACCOUNTING," DEALS WITH THE LATTER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL REPROCESSING + FUEL RECYCLE + ANALYTICAL MODEL + ACCOUNTABILITY + LICENSING PROCESS + REACTOR, HTGR + PLUTONIUM + SAFEGUARDS, NUCLEAR MATERIAL

132674
BERNARD EA + MIYOSHI DS + GUTTIERREZ FD
SANDIA LABORATORIES PLUTONIUM PROTECTION SYSTEM
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0538C + CONF-770656-6 *. 7 PPS, FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 29, 1977

SANDIA LABORATORIES IS DEVELOPING AN IMPROVED PLUTONIUM PROTECTION SYSTEM (PPS) TO DEMONSTRATE NEW CONCEPTS FOR ENHANCING SPECIAL NUCLEAR MATERIALS SAFEGUARDS. PPS CONCEPTS INCLUDE SEPARATION OF FUNCTIONS, REAL-TIME ITEM ACCOUNTABILITY AND IMPROVED MEANS FOR CONTROL OF MATERIALS, ACTIVITIES AND PERSONNEL ACCESS. PHYSICAL BARRIERS AND A SECURE COMMUNICATIONS NETWORK ARE DESIGNED INTO THE SYSTEM TO OFFER GREATER PROTECTION AGAINST SABOTAGE, DIVERSION AND THEFT ATTEMPTS. PROTOTYPE SYSTEMS ARE BEING CONSTRUCTED AT HANFORD, WASHINGTON AND ALBUQUERQUE, NEW MEXICO AND WILL BE SUBJECTED TO A COMPREHENSIVE TESTING AND EVALUATION PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *PLUTONIUM + *THEFT/DIVERSION + *SABOTAGE

132654
SONNIER CS
CLOSED-LOOP SAFEGUARDS CONTROL OF PLUTONIUM TRANSFER AND SAMPLING OPERATIONS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0863C + CONF-770656-12 *. 20 PPS, FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 29, 1977

132694 *CONTINUED*
A SAFEGUARDS CONTROL SYSTEM FOR PLUTONIUM NITRATE TRANSFER AND SAMPLING, CURRENTLY BEING DEVELOPED BY SANDIA LABORATORIES, ASSURES THAT OPERATIONAL STEPS ARE PERFORMED IN A PREDEFINED SEQUENCE AND BY PROPERLY AUTHORIZED INDIVIDUALS. A VARIETY OF PROTECTIVE ELEMENTS ARE USED IN CONJUNCTION WITH COMPUTER CONTROLS AND CHECKS TO RAPIDLY DETECT UNAUTHORIZED ACTIVITIES AND ACTIVATE CONTROLS, DELAYS, OR REQUEST RESPONSE FORCE ACTIONS. IN-DEPTH PROTECTION IS PROVIDED AGAINST THEFT AND DIVERSION, PARTICULARLY BY INDIVIDUALS WITH AUTHORIZED PLANT ACCESS. BASIC CONCEPTS ARE ALSO APPLICABLE TO THEFT AND SABOTAGE PROTECTION OF OTHER OPERATIONS INVOLVING SNM AS WELL AS FACILITY VITAL SYSTEMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *PLUTONIUM + TRANSPORT + SAMPLING + *THEFT/DIVERSION + *SABOTAGE

132515
BRUMBACH SB + PERRY RE
AUTORADIOGRAPHIC TECHNIQUE FOR RAPID INVENTORY OF PLUTONIUM-CONTAINING FAST CRITICAL ASSEMBLY FUEL
ARGONNE NATIONAL LAB., ILL.
ANL-77-67 +. 20 PPS, 7 FIGS, 4 REFS, DEC. 1977

A NONDESTRUCTIVE AUTORADIOGRAPHIC TECHNIQUE IS DESCRIBED WHICH CAN PROVIDE A VERIFICATION OF THE PIECE COUNT AND THE PLUTONIUM CONTENT OF PLUTONIUM-CONTAINING FUEL ELEMENTS. THIS TECHNIQUE USES THE SPONTANEOUSLY EMITTED GAMMA RAYS FROM PLUTONIUM TO FORM IMAGES OF FUEL ELEMENTS ON PHOTOGRAPHIC FILM. AUTORADIOGRAPHY HAS THE ADVANTAGE OF PROVIDING AN INVENTORY VERIFICATION WITHOUT THE OPENING OF CONTAINERS OR THE HANDLING OF FUEL ELEMENTS. MISSING FUEL ELEMENTS, SUBSTITUTION OF NONRADIOACTIVE MATERIAL, AND SUBSTITUTION OF ELEMENTS OF DIFFERENT SIZE ARE DETECTABLE. RESULTS ARE PRESENTED FOR FUEL ELEMENTS IN VARIOUS STORAGE CONFIGURATIONS AND FOR FUEL ELEMENTS CONTAINED IN A FAST CRITICAL ASSEMBLY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MEASUREMENT + PLUTONIUM + *RADIOGRAPHY + TEST, NONDESTRUCTIVE + FUEL STORAGE + *SAFEGUARDS, NUCLEAR MATERIAL + FUEL ELEMENTS

131828
AYERS AL
THE USE OF FUEL REPROCESSING PLANT INSTRUMENTATION FOR INTERNATIONAL SAFEGUARDS
ALLIED-GENERAL NUCLEAR SERVICES, BARNWELL, S.C.
4 PPS, NUCLEAR TECHNOLOGY, 36(2), PP. 167-70 (DEC. 1977)

THE IAEA HAS A PROGRAM FOR DEVELOPING INSTRUMENTATION TO BE USED BY SAFEGUARDS INSPECTORS AT REPROCESSING FACILITIES. THESE INSTRUMENTS HAVE GENERALLY BEEN INDIVIDUAL PIECES OF EQUIPMENT FOR IMPROVING THE ACCURACY OF EXISTING MEASUREMENT INSTRUMENTATION OR EQUIPMENT TO PERFORM NONDESTRUCTIVE ASSAY ON A SELECTED BASIS. IT IS PROPOSED THAT GREATER USE BE MADE OF REDUNDANT PLANT INSTRUMENTATION AND DATA RECOVERY SYSTEMS THAT COULD AUGMENT PLANT INSTRUMENTATION TO VERIFY THE VALIDITY OF PLANT MEASUREMENTS. USE OF THESE METHODS FOR VERIFICATION MUST BE PROVEN AS PART OF AN OPERATING PLANT BEFORE THEY CAN BE RELIED UPON FOR SAFEGUARDS SURVEILLANCE.

*SAFEGUARDS, NUCLEAR MATERIAL + FUEL REPROCESSING + RADIATION MONITORS + INSTRUMENT, NUCLEAR + TEST, NONDESTRUCTIVE + *INSTRUMENT, SURVEILLANCE

131943
MARTZ JW
APPLICATION OF MODAL TESTING TECHNIQUES TO SOLVE VIBRATION PROBLEMS IN MACHINERY SUPPORTING STRUCTURES
12 PPS, ASME PAPER 77-DE-16, MAY 9-12, 1977

THIS PAPER DESCRIBES THE USE OF STATE-OF-THE-ART TESTING TECHNIQUES TO SOLVE VIBRATION PROBLEMS THAT RESULT FROM DESIGN INCOMPATIBILITY BETWEEN MACHINERY AND THE MACHINERY SUPPORTING STRUCTURES. WITHIN THE PAST FEW YEARS, MINI-COMPUTER-BASED TEST SYSTEMS, WITH SUPPORTING SOFTWARE, HAVE ENABLED THE TEST ENGINEER TO APPLY MODAL TESTING TECHNIQUES TO STRUCTURES OF UNLIMITED SIZE AND COMPLEXITY.

AVAILABILITY - AMERICAN SOCIETY OF MECHANICAL ENGINEERS, ASME ORDER DEPT., UNITED ENGINEERING CENTER, 345 E. 47TH ST., NEW YORK, NY 10017

VIBRATION + *SUPPORT STRUCTURE + *MODEL TESTING + SIMULATION

131036
NUCLEAR SAFEGUARDS RESEARCH - PROGRESS STATUS REPORT JANUARY-APRIL 1976
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6530-PR +. 31 PPS, 10 TABS, 25 FIGS, 17 REFS, OCT. 1976

THIS REPORT PRESENTS THE STATUS OF TWO NONDESTRUCTIVE ASSAY R AND D PROGRAMS PURSUED BY THE LASL NUCLEAR SAFEGUARDS RESEARCH GROUP R-1. ONE PROGRAM IS SUMMARIZED BY THE FOLLOWING: HOLDUP MEASUREMENTS AT THE KERR MCGEE FACILITY, TOTAL ROOM HOLDUP OF PU MEASURED WITH A LARGE-AREA NEUTRON DETECTOR, ASSAY OF U-TH MIXTURES AND LOW-LEVEL U SAMPLES WITH THE VAN DE GRAAFF SMALL-SAMPLE ASSAY STATION, MEASUREMENT OF LOW LEVEL WASTE, AND USE OF THE SEGMENTED GAMMA SCANNER FOR 241-AM MEASUREMENT. THE SECOND PROGRAM DISCUSSES THE DEVELOPMENT AND DEMONSTRATION OF THE DYNAMIC MATERIALS CONTROL - DYNAC PROGRAM.

131230 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *ASSAY + TEST, NONDESTRUCTIVE + *SPECIAL NUCLEAR MATERIAL

130575
PIKE DH + MORRISON GW + BESTLEY GW
APPLICATIONS OF KALMAN FILTERING TO NUCLEAR MATERIAL CONTROL
OAK RIDGE NATIONAL LAB., TENN.
ORNL/NUREG/CSD-1 *, 111 PPS, REFS, OCT. 1977

THE FOLLOWING TOPICS ARE ADDRESSED REGARDING APPLICATION OF KALMAN FILTERING STATE ESTIMATION TECHNIQUES FOR CONTROL OF SNM: (1) DEVELOPMENT OF MATHEMATICAL THEORY, (2) A FIXED-INTERVAL SMOOTHER TO ENHANCE THEFT DETECTION, (3) INVESTIGATION OF STATE ESTIMATION TECHNIQUES ON A SIMULATED MBA, (4) A FORTRAN-IV KALMAN FILTER CODE, (5) DISCUSSION OF PRELIMINARY WORK ON IMPLEMENTING THE BOX-JENKINS TECHNIQUE, AND (6) RESULTS OF ANALYSIS OF DATA FROM THE UNION CARBIDE 2030 REPROCESSING PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + *SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + *MATHEMATICAL TREATMENT + *MATHEMATICAL STUDY + *COMPUTER PROGRAM, DIGITAL

130574
DOLAN CA + NIESCHMIDT CG + WEGURS SH
URANIUM ACCOUNTABILITY FOR ATR FUEL FABRICATION: PART II. A COMPUTER SIMULATION
IDAHO NATIONAL ENGINEERING LAB., IDAHO FALLS
TREE-1196 *, 180 PPS, AUG. 1977

A STOCHASTIC COMPUTER MODEL WAS DESIGNED TO SIMULATE THE MATERIAL CONTROL SYSTEM USED BY ATOMICS INTERNATIONAL (AI) DURING PRODUCTION OF FUEL PLATES FOR THE ADVANCED TEST REACTOR. MANUFACTURING PROCESS AND MEASUREMENT PARAMETERS ARE USED AS INPUT. INDIVIDUAL PLANT OPERATIONS ARE DESCRIBED BY PROGRAM SUBROUTINES. BY VARYING CALLING SEQUENCE OF THESE SUBROUTINES, VARIATIONS IN THE MANUFACTURING PROCESS MAY BE SIMULATED. MUF AND LEMUF MAY BE CALCULATED FOR PREDETERMINED OPERATING CONDITIONS. THE EFFECT ON MUF AND LEMUF PRODUCED BY CHANGING OPERATING PROCEDURES AND MEASUREMENT TECHNIQUES MAY ALSO BE EXAMINED. A SAMPLE CALCULATION SIMULATING ONE INVENTORY PERIOD OF PLANT OPERATION IS INCLUDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*JACOBS + *ANALYTICAL MODEL + *FABRICATION FACILITY + FUEL, NUCLEAR + *SIMULATION + COMPUTER PROGRAM, DIGITAL + *SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY

130570
REPORT ON STRATEGIC SPECIAL NUCLEAR MATERIAL INVENTORY DIFFERENCES
U.S. ERDA, WASHINGTON
ERDA-77-68 *, 230 PPS, AUG. 1977

THE FIRST ERDA REPORT OF INFORMATION CONCERNING ACCOUNTING FOR SIGNIFICANT QUANTITIES OF STRATEGIC SPECIAL NUCLEAR MATERIAL (SSNM) IN ERDA (AEC) FACILITIES IS PRESENTED. INVENTORY DIFFERENCE (ID) DATA, FOR FISCAL YEAR 1976 IS PROVIDED. DIFFUSION PLANT CASCADE DATA ARE NOT INCLUDED FOR REASONS NOTED IN THE PLANT FACILITY FUNCTIONAL STATEMENT DISCUSSION OF THE TOTAL CASCADE ID. DATA FOR ROCKY FLATS AND Y-12 NUCLEAR WEAPON PRODUCTION FACILITIES ARE NOT INCLUDED TO PROTECT CLASSIFIED NUCLEAR WEAPONS INFORMATION. APPENDICES CONTAIN HISTORICAL DATA FOR ERDA (AND AEC) AND ERDA (AEC) CONTRACTOR FACILITIES THROUGH FISCAL YEAR 1975 AND FOR AEC LICENSEES THROUGH 1967. THE NRC REPORT ON INVENTORY DIFFERENCES CONTAINS DATA FOR LICENSED FACILITIES AFTER 1967.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + MATERIAL UNACCOUNTED FOR

129486
SAPIR JL
NUCLEAR SAFEGUARDS RESEARCH PROGRAMS STATUS REPORT SEPTEMBER-DECEMBER 1976
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6788-PR *, 58 PPS, REFS, JUNE 1977

PRESENTS THE STATUS OF 2 NONDESTRUCTIVE ASSAY RESEARCH AND DEVELOPMENT PROGRAMS PURSUED BY LASL SAFEGUARDS RESEARCH GROUP A-1. MAJOR TOPICS PRESENTED ARE NONDESTRUCTIVE ASSAY APPLICATIONS AND RESULTS, INSTRUMENT DEVELOPMENT AND MEASUREMENT CONTROLS, AND DEVELOPMENT OF DYNAMIC MATERIALS CONTROL (DYMAC) - DATA ACQUISITION AND DATA BASE MANAGEMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *R AND D PROGRAM + TEST, NONDESTRUCTIVE + ASSAY + PLUTONIUM + SPECTROMETRY, NEUTRON + SPECTROMETRY, GAMMA + DATA COLLECTION + DATA PROCESSING + MATERIAL + CONTROL

128959
STANCHI L

128459 *CONTINUED*
EFFLUENT MONITORING FOR NUCLEAR SAFEGUARDS
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-UR-76-2283 + CONF-761036-13 +. 11 PPS. FROM NUCLEAR SCIENCE SCINTILLATION & SEMICONDUCTER COUNTER SYMPOSIUM, NEW ORLEANS, LA., OCT. 29, 1976

A MICROPROCESSOR-BASED INSTRUMENT OPERATES A CONTINUOUS SURVEILLANCE ON EFFLUENTS FROM A NUCLEAR FACILITY. IT RECEIVES AND EVALUATES PULSES FROM TWO NAI DETECTORS AND A SET OF SINGLE-CHANNEL ANALYZERS. IT HAS SELF-DIAGNOSING CAPABILITY SO THAT IT TAKES ACTIONS NOT ONLY WHEN IT RECOGNIZES EXCESSIVE RADIOACTIVITY BUT ALSO WHEN IT ASCERTAINS SOME ABNORMAL BEHAVIOR. POWER FAILURE PROCEDURE AND AUTOMATIC RESTART ARE PROVIDED. OPERATIVE CONSTANTS SUCH AS ALARM THRESHOLDS, TIMES, AND NUMBER OF SUCCESSIVE MEASUREMENTS ARE PERMANENTLY STORED IN A READ/WRITE BATTERY OPERATED C-MOS MEMORY. THE PROGRAM ALLOWS AUTOMATIC SUCCESSION OF PHASES IN A PECULIAR WAY AND HAS A FEATURE FOR LOADING AN AUXILIARY PROGRAM INTO RAMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MONITOR + EFFLUENT + INSTRUMENT, CONTROL + *INSTRUMENT, SURVEILLANCE + EQUIPMENT DESIGN + *SAFEGUARDS, NUCLEAR MATERIAL

128839
HARTMANN G
THE OVERALL PROBABILITY OF DETECTION IN CONNECTION WITH THE OPTIMIZATION OF SAFEGUARDS EFFORT
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
7 PPS, 3 TABS, 0 FIGS, 4 REFS, NUCLEAR TECHNOLOGY, 32(3), PP. 293-96 (MARCH 1977)

A MODEL FOR INSPECTION, AND ITS APPLICATION TO A REPROCESSING PLANT OF THE NUCLEAR FUEL SERVICES TYPE, HAVE BEEN DEVELOPED. TWO POSSIBLE MEANS OF DIVERTING MATERIAL ARE (A) DIVERTING MATERIAL WITHIN THE UNCERTAINTY OF THE MATERIAL BALANCE AND (B) FALSIFYING DATA. STATISTIC TESTS ARE PERFORMED BY THE INSPECTING AUTHORITY: IN THE FIRST CASE, THE INSPECTE COMPARES MATERIAL UNACCOUNTED FOR (MUF) WITH A SIGNIFICANCE THRESHOLD, WHILE IN THE SECOND CASE, A SAMPLE OF THE REPORTED DATA IS COMPARED WITH HIS OWN REMEASUREMENTS. BOTH METHODS ARE COMBINED, AND THE OPTIMAL CONTROL AND DIVERSION STRATEGIES ARE COMPUTED (FOR AN ASSUMED PROBABILITY OF A FAST ALARM AND THE AMOUNT TO BE DIVERTED).

FUEL REPROCESSING + PROBABILITY + SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + OPTIMIZATION + STATISTICAL ANALYSIS

128490
MARSH SF + SPALL WD + ABERNATHEY RM + REIN JE
URANIUM DAUGHTER GROWTH MUST NOT BE NEGLECTED WHEN ADJUSTING PLUTONIUM MATERIALS FOR ASSAY AND ISOTOPIC CONTENTS
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6444 +. 19 PPS, 2 TABS, 2 REFS, NOV. 1976

RELATIONSHIPS ARE PROVIDED TO COMPUTE THE DECREASING PLUTONIUM CONTENT AND CHANGING ISOTOPIC DISTRIBUTION OF PLUTONIUM MATERIALS FOR THE RADIOACTIVE DECAY OF 238PU, 239PU, 240PU, AND 242PU TO LONG-LIVED URANIUM DAUGHTERS AND OF 241PU TO 241AM. THIS COMPUTATION IS IMPORTANT TO THE USE OF PLUTONIUM REFERENCE MATERIALS TO CALIBRATE DESTRUCTIVE AND NONDESTRUCTIVE METHODS FOR ASSAY AND ISOTOPIC MEASUREMENTS, AS WELL AS TO ACCOUNTABILITY INVENTORY CALCULATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MEASUREMENT + *PLUTONIUM + ANALYTICAL TECHNIQUE + SAFEGUARDS, NUCLEAR MATERIAL + TEST, NONDESTRUCTIVE + *ACCOUNTABILITY + *URANIUM + COMPUTER PROGRAM + ISOTOPIC FRACTIONATION

128819
RUNDQUIST D + GRAY G + DONELSON S
MATERIAL CONTROL FOR A REPROCESSING PLANT
SCIENCE APPLICATIONS INC., LA JOLLA, CALIF.
UCRL-13098 +. 163 PPS, 27 TABS, 16 FIGS, 66 REFS, AUG. 1976

DESCRIBES THE PRIMARY PROCESS STREAMS CONTAINING PLUTONIUM THAT ARE HANDLED ROUTINELY WITHIN A SPENT FUEL REPROCESSING PLANT AND CONVERSION FACILITY. THESE STREAMS AND MEASUREMENT SYSTEMS HAVE BEEN DESCRIBED IN SUFFICIENT DETAIL TO PERMIT A PRELIMINARY ASSESSMENT OF THE CAPABILITY OF MEASUREMENT SYSTEMS TO DETERMINE THE INVENTORY STATUS WITHIN THE FACILITIES. AS AN AID IN IMPLEMENTING THE OBJECTIVES OF THE ACCOUNTABILITY SYSTEM IN A REALISTIC SITUATION, THE ALLIED GENERAL NUCLEAR SERVICES (AGNS) REPROCESSING PLANT NOW UNDER CONSTRUCTION NEAR BARNWELL, SOUTH CAROLINA, WAS CHOSEN AS THE STUDY MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

ACCOUNTABILITY + PLUTONIUM + SPECIAL NUCLEAR MATERIAL + SAFEGUARDS, NUCLEAR MATERIAL + FUEL REPROCESSING + BARNWELL (FRP)

128896
GUPTA D
ISOTOPIC CORRELATION FOR ACCOUNTING AND CONTROL OF NUCLEAR MATERIALS IN A FUEL CYCLE
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2400 +. 47 PPS, 6 TABS, 23 FIGS, 49 REFS, SEPT. 1976

128396 *CONTINUED*
THE ISOTOPIC CORRELATION TECHNIQUES (ICT) ARE EMERGING AS AN IMPORTANT SUPPORTING MEASURE FOR THE ACCOUNTING AND CONTROL OF NUCLEAR MATERIALS WHICH PASS THROUGH COMMERCIAL FUEL CYCLE FOR THE PRODUCTION OF NUCLEAR ENERGY. THE PRESENT PAPER GIVES AN OVERVIEW ON THE DEVELOPMENT OF THE ICT AND DISCUSSES THEIR POSSIBLE USES IN VARIOUS PARTS OF A COMMERCIAL FUEL CYCLE. IT IS SHOWN THAT ICT CAN BE USED ADVANTAGEOUSLY BOTH FOR THE PURPOSES OF PLANT OPERATION AND SAFEGUARDS. THE PAPER ENDS WITH THE CONCLUSION THAT ICT MAY BE PARTICULARLY USEFUL FOR THE FUEL CYCLE OF THE 1980'S AND THAT THEY CAN BE UTILIZED TO THE FULLEST ADVANTAGE FOR SAFEGUARDS WHEN FULL CYCLE IS CONSIDERED AS A WHOLE.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

ACCOUNTABILITY + SPECIAL NUCLEAR MATERIAL + FUEL CYCLE + SAFEGUARDS, NUCLEAR MATERIAL

128382
MUF FIGURE PUBLISHED BY UKAEA, UNFL
2 PPS, 2 TABS, NUCLEAR NEWS, 20(11), PP. 88 (SEPT. 1977)

THE U.K. ATOMIC ENERGY AUTHORITY AND BRITISH NUCLEAR FUELS LIMITED HAVE PUBLISHED FIGURES OF "MATERIAL UNACCOUNTED FOR" (MUF) OVER THE PAST SEVEN YEARS AT THEIR VARIOUS ESTABLISHMENTS IN THE UNITED KINGDOM. MOST NEWSPAPER REPORTS ADDED UP THE TOTAL AMOUNTS OF MUF, DIVIDED BY THE POSTULATED AMOUNT OF MATERIAL NEEDED TO MAKE A BOMB AND REACHED ALARMING CONCLUSIONS ABOUT WHAT MIGHT HAVE HAPPENED TO THE "LOST" MATERIAL. ALL THAT WAS POSSIBLE WAS A GENERAL ASSURANCE THAT: "NONE OF THE FIGURES QUOTED, NOR THE UNCERTAINTIES IN THEM, NEED GIVE CONCERN OVER EITHER SAFETY OR SECURITY".

SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + UNITED KINGDOM

127522
HATAY RP
PROGRESS REPORT FOR THE DIVISION OF SAFEGUARDS AND SECURITY: JULY-DECEMBER 1976
MOUND LAB., MIAMISBURG, OHIO
MLM-2429 +. 16 PPS, REFS, JUNE 29, 1977

FOR THE PREDICTION OF CALORIMETER EQUILIBRIUM, A NEWLY DERIVED SINGLE-EXPONENTIAL PREDICTION EQUATION HAS BEEN SHOWN TO YIELD RESULTS EQUAL TO THOSE FROM PREVIOUSLY REPORTED WORK, BUT ALLOWS FOR MORE VERSATILITY IN THE INSTRUMENTATION SELECTION. ENGINEERING REFINEMENTS HAVE BEEN INCORPORATED IN THE AUTOMATED PLUTONIUM ASSAY SYSTEM TO PROVIDE FOR IMPROVEMENTS IN THE GAMMA-RAY SPECTROSCOPY SYSTEM AND THE CONTAINER PICKUP DEVICE. THE HALF-LIFE EVALUATION COMMITTEE HAS COMPLETED MEASUREMENTS OF THE HALF-LIFE OF PLUTONIUM-239. CALORIMETRIC ASSAY HAS BEEN USED TO PREPARE PLUTONIUM REFERENCE STANDARDS FOR USE IN VERIFYING OTHER NDA MEASUREMENT SYSTEMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + *ASSAY + *PLUTONIUM + JACOBS + TEST, NONDESTRUCTIVE + HALF-LIFE, EFFECTIVE

127516
DOLAN CA + NIESCHMIDT SB + VEGORS SH + WAGNER EP
URANIUM ACCOUNTABILITY FOR ATR FUEL FABRICATION: PART I. A DESCRIPTION OF THE EXISTING SYSTEM
IDAHO NATIONAL ENGINEERING LAB., IDAHO FALLS
TREE-1145 +. 76 PPS, 3 TABS, 10 FIGS, JUNE 1977

AN EVALUATION OF THE MATERIALS ACCOUNTABILITY AT THE AI FUEL FABRICATION FACILITY IN CANOGA PARK, CALIFORNIA, WITH REGARD TO THE FABRICATION OF HIGHLY ENRICHED URANIUM FUEL FOR THE ADVANCED TEST REACTOR IS PRESENTED. AN ANALYSIS IS GIVEN OF THE EXISTING STATISTICAL ANALYSIS PROCEDURES. IN ADDITION, A SHORT DISCUSSION IS GIVEN OF THE EVALUATION OF THE SAFEGUARDS PROCEDURES AT AI TOGETHER WITH SUGGESTIONS FOR POSSIBLE MODIFICATIONS AND IMPROVEMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ACCOUNTABILITY + ATR (TR) + URANIUM + *FABRICATION FACILITY + FUEL ELEMENTS + *SYSTEM DESCRIPTION + SAFEGUARDS, NUCLEAR MATERIAL + JACOBS

127328
SIRI ME + GOZANI T + MALY J
A STUDY OF NUCLEAR MATERIAL ACCOUNTING FINAL REPORT JULY 1, 1976-APRIL 1, 1977
LAWRENCE BERKELEY LAB., CALIF. + SCIENCE APPPLICATIONS INC., LA JOLLA, CALIF.
NUREG-0290(VOL.3) +. 131 PPS, 20 TABS, JUNE 1977

VOL. 3 DISCUSSES HIERARCHY OF ACCOUNTABILITY MEASUREMENTS, SURVEY OF ANALYTICAL METHODS, CATALOGUE OF ANALYTICAL METHODS, ACCURACIES OF ANALYTICAL METHODS FOR MATERIAL ACCOUNTABILITY, AND VULNERABILITY OF ACCOUNTABILITY MEASUREMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SPECIAL NUCLEAR MATERIAL + *SAFEGUARDS, NUCLEAR MATERIAL + *ACCOUNTABILITY + NUMERICAL METHOD + THEFT/DIVERSION + ECONOMICS + JACOBS

127327
DONELSON S * CLANCY J * GUZANI T * MARTENAU D * MALY J * *IMPEY F * SIKI *E
A STUDY OF NUCLEAR MATERIAL ACCOUNTING FINAL REPORT, JULY 1, 1975-APRIL 1, 1977
LAWRENCE BERKELEY LAB., CALIF. * SCIENCE APPLICATIONS, LA JOLLA, CALIF.
NUREG-0290(VOL. 2) *., 219 PPS, 48 TABS, 35 FIGS, 21 REFS, JUNE 1977

VOLUME 2 DISCUSSES IMPROVED DETECTION SENSITIVITY FOR PERIODIC ACCOUNTING; SIMULATION OF MUF AND LEMUF; VULNERABILITY OF NUCLEAR MATERIAL ACCOUNTING TO TAMPERING; DESCRIPTION OF ACCOUNTING SYSTEMS; DETAILS OF MUF/LEMUF SIMULATION; SUMMARY OF NRC REQUIREMENTS FOR MATERIAL CONTROL AND ACCOUNTING; AND DESCRIPTION OF A SMALL MIXED-OXIDE FABRICATION PLANT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SPECIAL NUCLEAR MATERIAL * *SAFEGUARDS, NUCLEAR MATERIAL * *ACCOUNTABILITY * NUMERICAL METHOD * THEFT/DIVERSION * ECONOMICS * JACOBS

127326
RUDERMAN H * *INSEN J * DRESHER M
A STUDY OF NUCLEAR MATERIAL ACCOUNTING FINAL REPORT, JULY 1, 1976-APRIL 1, 1977
LAWRENCE BERKELEY LAB., CALIF.
NUREG-0290(VOL. 1) *., 119 PPS, 6 FIGS, 6 REFS, JUNE 1977

VOLUME 1 DISCUSSES: THE APPROACH TO THE PROBLEM, STATISTICAL ACCEPTANCE SAMPLING OF SAFEGUARDS, THE GAME THEORETIC APPROACH, DESCRIPTION OF THE MODEL, EVALUATION, LIMITATIONS OF THE EVALUATION, MATHEMATICAL SOLUTION FOR THE MUF GAME, AND THE FINANCIAL EFFECTS OF CHANGING PERIODIC INVENTORY FREQUENCY IN NUCLEAR MATERIAL PROCESSING PLANTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SPECIAL NUCLEAR MATERIAL * *SAFEGUARDS, NUCLEAR MATERIAL * *ACCOUNTABILITY * NUMERICAL METHOD * THEFT/DIVERSION * ECONOMICS * JACOBS

126926
REIN JE * MARSH SF * S*ANSON GC
PREPARATION OF *ORKING CALIBRATION AND TEST MATERIALS: PLUTONIUM NITRATE SOLUTION
LOS ALAMOS SCIENTIFIC LAB., N.M.
NUREG-0118 * LA-NUREG-6348 *., 44 PPS, 4 TABS, 5 FIGS, 19 REFS, JAN. 1977

PROCEDURES ARE PRESENTED FOR PREPARING PLUTONIUM NITRATE SOLUTIONS WITH ASSIGNED VALUES OF PLUTONIUM CONCENTRATION AND ISOTOPIC DISTRIBUTION. THESE SOLUTIONS ARE USED TO CALIBRATE AND MAINTAIN QUALITY CONTROL SURVEILLANCE OF CHEMICAL METHODS FOR THE ANALYSIS OF NUCLEAR FUEL CYCLE PLUTONIUM NITRATE. DETAILED STATISTICAL TREATMENTS ARE INCLUDED THAT ESTABLISH THE RELIABILITY OF THE PREPARED MATERIALS WHEN APPLIED TO NUCLEAR MATERIAL ACCOUNTABILITY AND SAFEGUARDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM * SAFEGUARDS, NUCLEAR MATERIAL * PLUTONIUM * *ACCOUNTABILITY * NITRATE * FUEL CYCLE * ASSAY * NRC-13 * HJCK

125236
SHIPLEY JP * COBB DD * DIETZ RJ * EVANS ML * SCHELONKA EP * SMITH DB * *ALTON RB
COORDINATED SAFEGUARDS FOR MATERIALS MANAGEMENT IN A MIXED-OXIDE FUEL FACILITY
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
LA-6536 *., 333 PPS, TABS, FEB. 1977

A COORDINATED SAFEGUARDS SYSTEM IS DESCRIBED FOR SAFEGUARDING STRATEGIC QUANTITIES OF SPECIAL NUCLEAR MATERIALS IN MIXED-OXIDE RECYCLE FUEL FABRICATION FACILITIES. THE SAFEGUARDS SYSTEM IS COMPATIBLE WITH INDUSTRIAL PROCESS REQUIREMENTS AND COMBINES MAXIMUM EFFECTIVENESS CONSISTENT WITH MODEST COST AND MINIMAL PROCESS INTERFERENCE. IT IS BASED ON UNIT PROCESS ACCOUNTING USING A COMBINATION OF CONVENTIONAL AND STATE-OF-THE-ART NDA MEASUREMENT TECHNIQUES. THE EFFECTIVENESS OF THE SYSTEM AGAINST SINGLE AND MULTIPLE THEFTS IS EVALUATED USING COMPUTER MODELING AND SIMULATION TECHNIQUES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS * *SAFEGUARDS, NUCLEAR MATERIAL * FUEL CYCLE * ADMINISTRATIVE CONTROL * MIXED OXIDE * FUEL, NUCLEAR * *FABRICATION FACILITY * THEFT/DIVERSION

125234
REILLY TD * EVANS ML
MEASUREMENT RELIABILITY FOR NUCLEAR MATERIAL ASSAY
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
LA-6574 *., 147 PPS, JAN. 1977

THIS REPORT DISCUSSES THE RELIABILITY OF NUCLEAR MATERIAL ASSAY (INCLUDING ANALYTICAL CHEMISTRY, CALORIMETRY, AND NONDESTRUCTIVE NUCLEAR METHODS). THE ASSAY OF FEED, PRODUCT, SCRAP, AND WASTE IS CONSIDERED. RANGES OF ACCURACY AND PRECISION ARE GIVEN.

125234 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS S *SAFEGUARDS, NUCLEAR MATERIAL + MEASUREMENT + *RELIABILITY, SYSTEM + TEST, NONDESTRUCTIVE + INSTRUMENT CALIBRATION + *ANALYTICAL TECHNIQUE

123667
KRIVANEK M + KRTIL J + MURAVEC J
DESTRUCTIVE AND NONDESTRUCTIVE METHODS FOR CONTROLLING NUCLEAR MATERIALS FOR THE PURPOSE OF SAFEGUARDS IN THE CSSR
NUCLEAR RESEARCH INST., REZ, CSSR
IAEA-CN-36/472 +. 11 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE, SALZBURG, AUSTRIA, MAY 2-13, 1977

CENTRAL CONTROL LABORATORY OF THE NUCLEAR RESEARCH INSTITUTE, CHARGED WITH THE CONTROL OF NUCLEAR MATERIALS IN CSSR, HAS BEEN DIRECTED BY THE DEPARTMENT OF NUCLEAR SAFETY AND SAFEGUARDS OF THE CSAEC ACCORDING TO A LONG-TERM PLAN. THE CCL HAS MAINLY BEEN PERFORMING INDEPENDENT, RAPID, ACCURATE AND RELIABLE ANALYSES OF NUCLEAR MATERIALS USING DESTRUCTIVE AS WELL AS NONDESTRUCTIVE METHODS. THE EXPERIENCE IS GIVEN, OBTAINED AT THE CCL DURING A ROUTINE USE OF THE METHODS FOR SAMPLING, SAMPLE TREATMENT BEFORE THE ANALYSIS, HIGHLY PRECISE DETERMINATION OF U, PU AND TH CONTENT, AND MASS SPECTROMETRIC DETERMINATION OF ISOTOPIC COMPOSITION OF U AND PU.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

TEST, DESTRUCTIVE + TEST, NONDESTRUCTIVE + *SAFEGUARDS, NUCLEAR MATERIAL + CZECHOSLOVAKIA + INSTRUMENT, SURVEILLANCE + ANALYTICAL TECHNIQUE + RELIABILITY ANALYSIS

124657
GUPTA D + HEIL J
INTERNATIONAL SAFEGUARDS IN LARGE SCALE NUCLEAR FACILITIES
KARLSRUHE NUCLEAR RESEARCH CENTER, F.R. GERMANY + MINISTRY OF RESEARCH & TECHNOLOGY, BONN
IAEA-CN-36/88 +. 14 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THE PRESENT PAPER MAKES AN ATTEMPT TO ANALYZE THE INFLUENCE OF LARGE SCALE NUCLEAR FACILITIES ON INTERNATIONAL SAFEGUARDS, DISCUSSES THE CHARACTERISTICS OF SOME LARGE SCALE PLANTS FOR BULK NUCLEAR MATERIALS, AND DELINEATES SOME AREAS IN WHICH PROBLEMS MAY ALSO ARISE IN CONNECTION WITH THE IMPLEMENTATION OF INTERNATIONAL SAFEGUARDS AND REALISATION OF ITS OBJECTIVES. THE PAPER DISCUSSES SOME POSSIBLE SOLUTIONS TAKING INTO ACCOUNT WELL-KNOWN SAFEGUARDS MEASURES AS WELL AS SOME NEW DEVELOPMENTS AND IDEAS ON MINIMIZING UNKNOWN INVENTORIES IN A PLANT. THE PAPER ENDS WITH SOME GENERALIZED CONCLUSIONS.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + *INTERNATIONAL + FUEL CYCLE + THEFT/DIVERSION

124654
KEEPIN GR
NONDESTRUCTIVE ASSAY TECHNOLOGY AND AUTOMATED 'REAL-TIME' MATERIALS CONTROL
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
IAEA-CN-42 +. 20 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

SIGNIFICANT ADVANCES IN NONDESTRUCTIVE ASSAY TECHNIQUES AND INSTRUMENTATION NOW ENABLE RAPID, ACCURATE AND DIRECT IN-PLANT MEASUREMENT OF NUCLEAR MATERIAL ON A CONTINUOUS OR 'REAL-TIME' BASIS AS IT PROGRESSES THROUGH A NUCLEAR FACILITY. A VARIETY OF PASSIVE AND ACTIVE ASSAY INSTRUMENTS ARE REQUIRED FOR THE BROAD RANGE OF MATERIALS MEASUREMENT PROBLEMS ENCOUNTERED BY SAFEGUARDS INSPECTORS AND FACILITY OPERATORS TECHNIQUES AND INSTRUMENTS WILL BE PRESENTED AND REVIEWED WITH SPECIAL ATTENTION TO THEIR ASSAY CAPABILITIES AND AREAS OF APPLICABILITY IN THE NUCLEAR FUEL CYCLE.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

TEST, NONDESTRUCTIVE + CONTROL SYSTEM + *INSTRUMENT, SURVEILLANCE + *SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE

124650
MILLER DA + KURCHATOV IV + CHLOPIN VG
SOME TECHNICAL ASPECTS OF THE NUCLEAR MATERIAL ACCOUNTING AND CONTROL AT THE NUCLEAR FUEL CYCLE FACILITIES
USSR INSTITUTE OF ATOMIC ENERGY, MOSCOW
IAEA-CN-36/528 +. 23 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THE POSSIBILITIES OF NUCLEAR MATERIAL ACCOUNTING AND CONTROL ARE DISCUSSED AT NUCLEAR FACILITIES OF FUEL CYCLE (POWER-TYPE REACTOR, FUEL FABRICATION PLANT, REPROCESSING PLANT AND URANIUM ENRICHMENT FACILITY) AND ZERO ENERGY FAST REACTOR FACILITY. IT IS SHOWN THAT FOR NUCLEAR MATERIAL CONTROL THE MAIN METHOD IS THE ACCOUNTING.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*FUEL CYCLE + USSR + *SAFEGUARDS, NUCLEAR MATERIAL + FABRICATION FACILITY + FUEL REPROCESSING

123933
NUCLEAR SAFEGUARDS RESEARCH PROGRAM STATUS REPORT, MAY-AUGUST 1976
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
LA-6675-PR +, 58 PPS, JAN, 1977

PRESENTS THE STATUS OF 2 NONDESTRUCTIVE ASSAY RESEARCH AND DEVELOPMENT PROGRAMS PURSUED BY LASL SAFEGUARDS RESEARCH GROUP M-1. MAJOR TOPICS PRESENTED ARE NONDESTRUCTIVE ASSAY APPLICATIONS AND RESULTS, INSTRUMENT DEVELOPMENT AND MEASUREMENT CONTROLS, AND DEVELOPMENT OF DYNAMIC MATERIALS CONTROL (DYMAC) - DATA ACQUISITION AND DATA BASE MANAGEMENT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *R AND D PROGRAM + TEST, NONDESTRUCTIVE + ASSAY + PLUTONIUM + SPECTROMETRY, NEUTRON + SPECTROMETRY, GAMMA + DATA COLLECTION + DATA PROCESSING + MATERIAL + CONTROL

123877
PIKE JH + MORRISON GW
A NEW APPROACH TO SAFEGUARDS ACCOUNTING
OAK RIDGE NATIONAL LAB., TENN.
ORNL/CSD/TM-25 +, 60 PPS, 14 FIGS, 12 REFS, MARCH 1977

SHOWS THE FEASIBILITY OF USING LINEAR STATE ESTIMATION THEORY IN NUCLEAR MATERIAL ACCOUNTABILITY. THE KALMAN FILTER IS USED AS THE STATE ESTIMATION TECHNIQUE. THE STATE VECTOR WHICH CONSISTS OF ON-HAND INVENTORY AND MATERIAL LOSSES IS ESTIMATED RECURSIVELY. THE KALMAN FILTER APPROACH IS COMPARED TO THE CURRENT STATISTICAL PRACTICES OF MUF-LEMUF CONTROL CHARTS AND CUSUM CHARTS. THE SIMULATED RESULTS SHOW THAT IN ASCENDING ORDER OF SENSITIVITY TO MATERIAL LOSSES THE TECHNIQUES WOULD BE RANKED AS (1) MUF-LEMUF CONTROL CHARTS, (2) CUSUM CHARTS AND (3) KALMAN FILTER. NOT ONLY IS THE KALMAN FILTER SHOWN TO BE MORE SENSITIVE TO MATERIAL LOSSES, IT IS ALSO SHOWN TO BE A VERY ACCURATE ESTIMATOR OF ON-HAND INVENTORY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + SIMULATION + MATHEMATICAL TREATMENT + JACOBS

123891
ORDER REQUIRING SPECIAL RECONCILIATION OF HIGHLY ENRICHED URANIUM INVENTORY
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC
6 PGS, LTR W/ENC, TO BABCOCK & WILCOX, FEB. 28, 1977, DOCKETS 70-1393/394

NRC INSPECTIONS OF BABCOCK & WILCOX LEECHBURG AND APELLO FACILITIES SHOW A FAILURE TO IMPLEMENT FULLY THE FUNDAMENTAL NUCLEAR MATERIAL CONTROL PLAN AND TO ACHIEVE ADEQUATE ACCOUNTING CONTROL OF HIGHLY ENRICHED URANIUM. THIS ORDER REQUIRES (1) PROCESSING OF SCRAP MATERIAL THROUGH RECOVERY AND VERIFICATION OF OFF-SPEC INTERMEDIATE PRODUCTS, (2) RECONCILIATION OF FEB. 1977 INVENTORY WITH THE RECOVERED OR VERIFIED MATERIAL, AND (3) NOT RESUMING ROUTINE OPERATION FOLLOWING THE APRIL 1977 INVENTORY UNTIL THE ABOVE ACTIONS ARE COMPLETED AND OFFICE OF INSPECTION AND ENFORCEMENT HAS DETERMINED COMPLIANCE.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

*FABRICATION FACILITY + SPECIAL NUCLEAR MATERIAL + *ACCOUNTABILITY + SAFEGUARDS, NUCLEAR MATERIAL + COMPLIANCE + AGENCY, NRC + LEGALISTICS + URANIUM + RECOVERY + WASTE TREATMENT + FAILURE, ADMINISTRATIVE CONTROL + FUEL ELEMENTS + FABRICATION

123397
GLANCY JE
SAFEGUARDS IMPLEMENTATION PRACTICES FOR A MODEL MIXED OXIDE RECYCLE FUEL FABRICATION FACILITY
SCIENCE APPLICATIONS INC., LA JOLLA, CALIF.
UNL-21409 +, 109 PPS, 6 TABS, FIGS, 15 REFS, MAY 1976

PURPOSE OF THIS REPORT IS TO INVESTIGATE THE MAGNITUDE OF THE EFFORT IN APPLYING PRESENT IAEA INSPECTION PROCEDURES TO A NEXT GENERATION MIXED URANIUM AND PLUTONIUM OXIDE RECYCLE FUEL FABRICATION PLANT AND TO EVALUATE THE EFFECTIVENESS. THE PROBLEM OF DETECTING DIVERSION OF WEAPONS QUANTITIES OF PLUTONIUM FROM A LARGE FUEL FABRICATION OR REPROCESSING PLANT IS A DIFFICULT ONE, FOR WHICH A SOLUTION HAS NOT BEEN DEMONSTRATED. DETECTION OF REMOVAL OF THE SMALL QUANTITIES OF PLUTONIUM REQUIRED FOR WEAPONS FABRICATION IS 8 KILOGRAMS. THE DETECTION GOAL QUANTITY FOR A 95% DETECTION PROBABILITY IS 40 KILOGRAMS OF PLUTONIUM. THE PROBABILITY FOR DETECTING 8 KILOGRAMS IS LESS THAN 20%.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL + PROBABILITY + MIXED OXIDE + PLUTONIUM + FUEL RECYCLE + FABRICATION FACILITY

123091
CHRISTOPHERSON E
PNL NUCLEAR MATERIAL SAFEGUARDS STUDIES 1968-1975
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-2082 +, 31 PPS, 6 TABS, 1 FIG, SEPT, 1976

123001 *CONTINUED*
SUMMARIZES NUCLEAR MATERIALS SAFEGUARDS STUDIES AT PACIFIC NORTHWEST LABORATORY SINCE 1968. THE SCOPE OF THE STUDIES INCLUDES AN INVESTIGATION OF THE SOURCES OF ERROR IN MUF UNCERTAINTY, IN THE DISPARITY BETWEEN SHIPPER AND RECEIVER MEASUREMENTS, AND IN INVENTORY VERIFICATION. PRIMARY AND SECONDARY VERIFICATION POINTS HAVE BEEN DIFFERENTIATED, WITH EMPHASIS ON THE ADDITIONAL MEASUREMENTS NECESSARY TO VERIFY BOTH INVENTORIES AND FLOWS. STUDIES ALSO ADDRESS THE PROBLEMS OF VERIFYING THE PLUTONIUM INPUT TO THE FUEL CYCLE AND DETERMINING THE COMPOSITION OF VARIOUS TYPES OF MEASUREMENT BIAS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY

122372
CLELAND LL + SPOGEN LR
EXECUTIVE SUMMARY: PROGRAM PLAN FOR MATERIAL CONTROL AT LICENSED NUCLEAR FACILITIES
LAWRENCE LIVERMORE LAB., CALIFORNIA (PREPARED FOR NRC)
NUREG-0169 + LLL-NUREG-1001 +, 36 PPS, OCT. 1, 1976

THIS PROGRAM HAS TWO OBJECTIVES: (1) THE DEVELOPMENT OF METHODOLOGIES AND TOOLS FOR ASSESSING THE EFFECTIVENESS OF GENERAL MATERIAL CONTROL STRATEGIES OF SPECIFIC LICENSEE SUBMITTALS AND THE OPERATIONAL STATUS OF LICENSEE SYSTEMS AND (2) THE DESIGN OF EXEMPLARY MATERIAL CONTROL SYSTEMS FOR GENERIC PROCESSING ACTIVITIES. THESE TOOLS WILL ALSO BE OF VALUE TO THE LICENSEE IN THE DESIGN PREPARATION OF LICENSE SUBMITTALS. THE PLANNED APPROACH TO MEET THESE PROGRAM OBJECTIVES IS THE DEVELOPMENT OF A MULTI-LEVEL MODEL HIERARCHY THAT PROVIDES A RELATIONSHIP BETWEEN MATERIAL CONTROL PROCEDURES AND ACTIONS AND MATERIAL CONTROL OBJECTIVES. FUNDING OF $3.27 MILLION FROM JANUARY 1, 1976 THROUGH OCTOBER 1, 1977 WITH A 35% EXPANSION IN FISCAL YEAR 1978 AND BEYOND IS PROJECTED TO MEET THIS SCHEDULE AND TO COVER SUBSEQUENT REQUIREMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + R AND D PROGRAM + *MATERIAL + *CONTROL + LICENSING PROCESS + THEFT/DIVERSION + INDUSTRY, NUCLEAR + NRC + NRC-13 + JACOBS

122064
NUCLEAR SAFEGUARDS RESEARCH PROGRAM STATUS REPORT, JANUARY-APRIL 1976
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6530-PR +, 35 PPS, OCT. 1976

TOPICS COVERED BY THE RESEARCH PROGRAM ARE AS FOLLOWS: NONDESTRUCTIVE ASSAY APPLICATIONS AND RESULTS, INSTRUMENT DEVELOPMENT AND MEASUREMENT CONTROLS, AND DEVELOPMENT AND DEMONSTRATION OF DYNAMIC MATERIALS CONTROL--DYMAC PROGRAM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + *TEST, NONDESTRUCTIVE + ASSAY + PLUTONIUM + AMERICIUM + SPECTROMETRY, NEUTRON + SPECTROMETRY, GAMMA + MATERIAL + CONTROL + JACOBS

122063
RATAY RP
NUCLEAR SAFEGUARDS PROGRESS REPORT: JANUARY-JUNE 1976
MOUND LAB., MIAMISBURG, OHIO
MLM-2380 +, 27 PPS, JAN. 14, 1977

A 1-CM PLANAR GE(LI) DETECTOR HAS BEEN USED TO ACQUIRE SPECTRA FROM 100-G ASH SAMPLES OF HIGH-FISSILE, FBR, AND LWR MATERIALS. RELATIVE ISOTOPIC ABUNDANCES FOR THE PLUTONIUM ISOTOPES HAVE BEEN CALCULATED FROM PEAKS IN THE ENERGY REGION FROM 148 TO 208 KEV. THE X,Y,Z TRANSPORTER SYSTEM HAS BEEN INSTALLED IN THE GLOVEBOX LINE. HANDLERS FOR OPERATING THE SYSTEM UNDER COMPUTER CONTROL HAVE BEEN COMPLETED AND ARE PRESENTLY IN USE. THE HOMOGENEITY OF THE PLUTONIUM-239 METAL SAMPLE USED BY THE HALF-LIFE EVALUATION COMMITTEE FOR HALF-LIFE MEASUREMENTS WAS DETERMINED FROM CALORIMETRIC MEASUREMENTS OF THE EFFECTIVE SPECIFIC POWER (IN MICROWATTS PER GRAM) OF SEVERAL ALIQUOTS OF THE METAL SAMPLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + *TEST, NONDESTRUCTIVE + CHEMICAL ANALYSIS + SPECTROMETRY, GAMMA + *ASSAY + PLUTONIUM + JACOBS

119717
KAWASHIMA Y
INTRODUCTION OF SAFEGUARDS OF NUCLEAR MATERIALS (IN JAPANESE)
NUCLEAR MATERIAL CONTROL CENTER, TOKYO, JAPAN
8 PPS, NIPPON GENSHIRYOKU GAKKAI-SHI, 17(3), PP. 93-100 (MARCH 1975)

ON THE SAFEGUARD OF IAEA, THE MAJOR POINTS OF THE MODEL AGREEMENT *IAEA: INFCIRC/153 (1971)* ARE DESCRIBED IN COMPARISON WITH THE PRESENT SYSTEM. IN U.S., THOUGH NUCLEAR MATERIAL BALANCE HAS BEEN EMPHASIZED, THE PHYSICAL PROTECTION OF NUCLEAR MATERIALS IS GOING TO BE TIGHTENED DUE TO THE MENACE OF TERRORISTS. NEXT THE PRESENT STATUS OF THAT IN JAPAN IS INTRODUCED, AND THE ACTUAL EXAMPLE OF INSPECTION BY IAEA IS REPORTED. IT WILL BE NECESSARY TO ARRANGE THE RATIONAL SYSTEM FOR NUCLEAR MATERIAL CONTROL IN JAPAN AS A WHOLE. FINALLY, THE TECHNOLOGICAL SYSTEM OF

119717 *CONTINUED*
SAFEGUARDS. THE TECHNICS RELATED TO MEASUREMENT CONTROL, AND NUCLEAR MATERIAL CONTAINMENT ARE DESCRIBED.

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + PROLIFERATION + THEFT/DIVERSION + ACCOUNTABILITY

119374
LEMMING JF + HAAS FX + JARVIS JY
GAMMA-RAY ISOTOPIC RATIO MEASUREMENTS FOR THE PLUTONIUM INVENTORY VERIFICATION PROGRAM
MOUND LAB., MIAA SBURG, OHIO
MLM-2312 +, 12 PPS, 7 TABS, 21 REFS, AUG, 26, 1976

THE PLUTONIUM INVENTORY VERIFICATION PROGRAM PROVIDES A NONDESTRUCTIVE MEANS OF ASSAYING BULK PLUTONIUM-BEARING MATERIAL. THE ASSAY IS PERFORMED BY COMBINING THE CALORIMETRICALLY DETERMINED HEAT OUTPUT OF THE SAMPLE AND THE RELATIVE ABUNDANCES OF THE HEAT-PRODUCING ISOTOPES. THIS REPORT DESCRIBES THE METHOD USED FOR THE NONDESTRUCTIVE DETERMINATION OF PLUTONIUM-238, -240, -241 AND AMERICIUM-241 RELATIVE TO PLUTONIUM-239 USING GAMMA-RAY SPECTROSCOPY FOR U.S. PLUTONIUM-239 MATERIAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + TEST, NONDESTRUCTIVE + SAFEGUARDS, NUCLEAR MATERIAL + ASSAY + JACOBS

119142
SANDBORN RH
MO200: A MODEL FOR EVALUATING SAFEGUARDS THROUGH ACCOUNTABILITY FOR A 200 TONNE PER YEAR MIXED-OXIDE FUEL-ROD FABRICATION PLANT
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
UCRL-77495 + CONF-760733-3 +, 6 PPS, FROM SUMMER COMPUTER CONFERENCE, WASHINGTON, D.C., JUNE 12, 1976

MO200 IS A COMPUTER SIMULATION MODEL OF A PROPOSED 200 TONNE PER YEAR MIXED-OXIDE FUEL-ROD FABRICATION PLANT THAT HAS BEEN USED TO INVESTIGATE THE SAFEGUARDING OF PLUTONIUM DIOXIDE THROUGH MATERIAL ACCOUNTABILITY. THE COMPUTER PROGRAM OPERATING THE MODEL WAS CONSTRUCTED SO THAT REPLICATE RUNS COULD PROVIDE DATA FOR STATISTICAL ANALYSIS OF THE DISTRIBUTIONS OF THE RANDOMIZED VARIABLES. THE PLANT MODEL WAS DIVIDED INTO MATERIAL BALANCE AREAS ASSOCIATED WITH DEFINABLE UNIT PROCESSES. INDICATORS OF PLANT OPERATIONS STUDIED WERE ACCIDENTS-OF-SHIFT MATERIAL BALANCES, END-OF-BLEND ERRORS FORMED BY CLOSING MATERIAL BALANCES BETWEEN BLENDS, AND CUMULATIVE SUMS OF THE DIFFERENCES BETWEEN ACTUAL AND EXPECTED PERFORMANCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + SIMULATION + MIXED OXIDE + FUEL ROD + FABRICATION + SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + PLUTONIUM DIOXIDE

116885
LILLOP JW
INNOVATIVE AUDIT PROGRAM FOR T. ...'S SAFEGUARDS
GENERAL ELECTRIC CO., PLEASANTON, CALIF.
10 PPS, NUCL. MATER. MANAG., 4(3), PP. 431-40 (JUNE 18, 1975)

AN INTERNAL SAFEGUARDS AUDIT PROGRAM WAS DEVELOPED AND IMPLEMENTED AT GE FACILITIES TO MEET THE NEED FOR EFFECTIVE AUDIT AND ACCURATE, TIMELY REPORTING TO MANAGEMENT. THE CONCEPT FROM WHICH THE PROGRAM WAS EVOLVED ARE SUMMARIZED. THE DOCUMENTATION AND REPORTING MECHANISM HAS WORKED WELL FOR BOTH THE AUDITEE AND MANAGEMENT.

SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY

117517
TAYLOR TB
TESTIMONY (PRESENTED 10 DECEMBER 1975) ON THE CALIFORNIA NUCLEAR INITIATIVE
INTERNATIONAL RESEARCH AND TECHNOLOGY CORP., ARLINGTON, VA.
5 PPS, 13 REFS, ENERGY, 1(2), PP. 217-21 (JUNE 1976)

DISCUSSES THE SAFEGUARDING OF NUCLEAR FACILITIES AND NUCLEAR MATERIALS AGAINST PURPOSEFUL ABUSE FOR DESTRUCTIVE PURPOSES, WHETHER BY TERRORISTS OR BY NATIONAL GOVERNMENTS. LISTS SIX SPECIFIC SECURITY MEASURES THAT MIGHT BE USED IN APPLYING THE PRINCIPLE OF CONTAINMENT.

*SAFEGUARDS, NUCLEAR MATERIAL + FUEL, FOSSIL + FUEL, NUCLEAR + *N-POWER, SAFETY OF + THEFT/DIVERSION + SECURITY

116732
DE CAROLIS M + DRAGNEV T + *ALIGURA A
IAEA EXPERIENCE IN THE DEVELOPMENT AND USE OF COTE GAMMA SPECTROMETRIC SYSTEMS FOR SAFEGUARDS APPLICATION
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
5 PPS, 8 FIGS, 10 REFS, IEEE TRANS. ON NUCLEAR SCIENCE, NS-23(1), PP. 70-74 (FEB. 1976)

DEVELOPMENT OF COTE DETECTORS AND RELATED ELECTRONICS HAS HIGH PRIORITY IN THE IAEA SAFEGUARDS RESEARCH AND DEVELOPMENT PROGRAMME. THE PAPER SUMMARIZES IAEA EXPERIENCE WITH COTE DETECTORS OF DIFFERENT ORIGIN (USA, FRANCE, CZECHOSLOVAKIA, JAPAN) COMMERCIALLY AVAILABLE AND SPECIALLY DEVELOPED MINIATURIZED PRE-AMPLIFIERS AS WELL AS THE EXPERIENCE OF ASSAY MEASUREMENTS OF NUCLEAR

116732 *CONTINUED*
MATERIALS WITH THEM.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

*IAEA + INSTRUMENT, NUCLEAR + INSTRUMENT, COMPONENT + *R AND D PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + EQUIPMENT DEVELOPMENT

116436
ISOTOPIC AND RADIATION NUCLEAR MATERIALS SAFEGUARDS: ASSAY TECHNIQUES
3 PPS., FIGS., REFS., TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, VOL. 23, PP. 94-96 (JUNE 14-18, 1976) (ABSTRACTS ONLY)

ASSAY TECHNIQUES OF FISSILE MATERIAL ARE PRESENTED: QUANTIFICATION METHODOLOGY FOR SPECIAL NUCLEAR MATERIALS (SNM) SAFEGUARDS SYSTEMS; AND SYSTEM FOR ASSAY OF FISSILE CONTENT OF SPENT LMFBR FUEL SUBASSEMBLIES.

ACTIVATION + FUEL BURNUP + PLUTONIUM + URANIUM + ANALYTICAL TECHNIQUE + REACTOR, LMFBR + SAFEGUARDS, NUCLEAR MATERIAL

115831
NUCLEAR ANALYSIS RESEARCH AND DEVELOPMENT PROGRAM STATUS REPORT MAY-AUGUST 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6142-PR +, 41 PPS, 10 TABS, 41 FIGS, 46 REFS, DEC. 1975

ONE OF A SERIES OF REPORTS ON NONDESTRUCTIVE ASSAY FOR SAFEGUARDS CONTROL. COVERS THE FOLLOWING TOPICS: (1) NEUTRON INTERROGATION (ACTIVE) ASSAY APPLICATIONS AND RESULTS, (2) PASSIVE ASSAY APPLICATIONS AND RESULTS, (3) INSTRUMENT DEVELOPMENT AND MEASUREMENT CONTROLS, (4) IN-PLANT DYNAMIC MATERIALS CONTROL (DYMAC), AND (5) ERDA SAFEGUARDS BRIEFING AND DEMONSTRATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + RADIATION DAMAGE + URANIUM + *TEST, NONDESTRUCTIVE + R AND D PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + ASSAY + JACOBS + INSTRUMENTS, MISC.

114860
CAMPBELL JW + TODD JL
IRRADIATED FUEL BUNDLE COUNTER
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-75-0390 + CONF-753608-1, +, 11 PPS, FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; NEW ORLEANS, LA., JUNE 18, 1975

THE DESIGN OF A PROTOTYPE SAFEGUARDS INSTRUMENT FOR DETERMINING THE NUMBER OF IRRADIATED FUEL ASSEMBLIES LEAVING AN ON-POWER REFUELED REACTOR IS DESCRIBED. DESIGN DETAILS INCLUDE RADIATION DETECTION TECHNIQUES, DATA PROCESSING AND DISPLAY, UNATTENDED OPERATION CAPABILITIES AND DATA SECURITY METHODS. DEVELOPMENT AND OPERATING HISTORY OF THE BUNDLE COUNTER IS REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER + INSTRUMENT, NUCLEAR + *INSTRUMENT, SURVEILLANCE + FUEL ROD + *SAFEGUARDS, NUCLEAR MATERIAL + EQUIPMENT DEVELOPMENT

113951
RATAY RP
NUCLEAR SAFEGUARDS PROGRESS REPORT: JULY-DECEMBER 1975
MOUND LABS., MIAMISBURG, OHIO
MLM-2302 +, 28 PPS, 11 TABS, 12 FIGS, 8 REFS, APRIL 2, 1976

REPORT COVERS 3 AREAS OF DEVELOPMENT: NONDESTRUCTIVE ASSAY TECHNIQUES, SYSTEMS DEVELOPMENT, AND APPLICATIONS. IN ALL CASES, THE WORK IS WITH PLUTONIUM FOR SAFEGUARDS ACCOUNTABILITY AND INVENTORY CONTROL. AREAS OF DEVELOPMENT INCLUDE PLUTONIUM ISOTOPIC MEASUREMENTS BY GAMMA-RAY SPECTROMETRY, PREDICTION OF CALORIMETER EQUILIBRIUM, AUTOMATED PLUTONIUM ASSAY SYSTEM FOR WHICH PRELIMINARY RESULTS ARE GIVEN, A COMPUTER PROGRAM FOR PLUTONIUM INVENTORY VERIFICATION, AND MEASUREMENT OF ISOTOPIC RATIOS FOR ZPPR FUEL PINS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + *PLUTONIUM + *RADIOCHEMICAL ANALYSIS + TEST, NONDESTRUCTIVE + SPECTROMETRY, GAMMA + *SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + JACOBS

113328
RESPONSE TO QUESTION 8 - INSTRUMENT ACCURACY FOR ACCOUNTABILITY
ALLIED-GENERAL NUCLEAR SERVICES, BARNWELL, SC
DOCKET 50332-49 +, 1 PG, P. 17 OF AMENDMENT 10 TO BARNWELL LICENSE APPLICATION, APRIL 30, 1975, DOCKET 50-332, FUEL REPROCESSING PLANT

SAFETY RELATED INSTRUMENTS AND THE CRITICALITY REPORT (ADDENDUM 1 TO APPENDIX L) IDENTIFY THOSE INSTRUMENTS THAT MONITOR AND CONTROL SAFETY RELATED PROCESS PARAMETERS IN THE SEPARATIONS

113328 *CONTINUED*
FACILITY. THE RANGES AND/OR SENSITIVITIES OF THESE INSTRUMENTS ARE PROVIDED IN EACH DETECTION/CONTROL POINT. THE INSTRUMENTS INCORPORATE THE LATEST STATE OF THE ART AND WILL PROVIDE THE NECESSARY ACCURACY FOR ADEQUATE CONTROL OF INVENTORY OF FISSIONABLE MATERIALS.

AVAILABILITY - MAGNAGARD, INC., P.O. BOX 3501, OAK RIDGE, TENN. 37830

INSTRUMENT CALIBRATION + RESPONSE TO NRC QUESTION + FUEL REPROCESSING + BARNWELL (FRP) + SAFEGUARDS, NUCLEAR MATERIAL

112402
PIKE JH + MORRISON GW + HOLLAND CW
LINEAR FILTERING APPLIED TO SAFEGUARDS OF NUCLEAR MATERIAL
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-751101-2 +. 4 PP., FROM JOINT MEETING OF THE AMERICAN NUCLEAR SOCIETY & THE ATOMIC INDUSTRIAL FORUM, SAN FRANCISCO, CALIF., NOV. 16, 1975

RECENTLY THERE HAS BEEN WIDESPREAD PUBLICITY ON THE PROBLEMS OF NUCLEAR MATERIALS THEFT OR DIVERSION. DUE TO THE PROLIFERATION OF NUCLEAR REACTORS THROUGHOUT THE WORLD, THE CONCERN ABOUT THEFT OR DIVERSION OF NUCLEAR MATERIALS AT VARIOUS POINTS IN THE FUEL CYCLE HAS GREATLY INCREASED. STEPS ARE BEING TAKEN TO IMPROVE THE ACCOUNTABILITY SYSTEMS; HOWEVER, THERE IS STILL A NEED FOR MORE POWERFUL STATISTICAL TECHNIQUES TO RAPIDLY DETECT THEFT OR DIVERSION. OF PARTICULAR CONCERN, IS THE PROBLEM OF DETECTING CONTINUAL THEFTS OF RELATIVELY SMALL AMOUNTS OF MATERIAL. THIS PAPER SUGGESTS USING KALMAN FILTERING TECHNIQUES AS A POWERFUL METHOD OF DETECTING THIS PROBLEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

MATHEMATICAL TREATMENT + *SAFEGUARDS, NUCLEAR MATERIAL + POWER PLANT, NUCLEAR + *ACCOUNTABILITY + THEFT/DIVERSION + FUEL CYCLE

112426
SPENCER WF + AFFEL RG + STOUTT BH
COMPUTERIZED REAL-TIME MATERIALS ACCOUNTABILITY SYSTEM FOR SAFEGUARDS MATERIAL CONTROL
UNION CARBIDE CORP., COMPUTER SCIENCES DIV., OAK RIDGE, TENN.
CONF-751017-1 +. 9 PPS. FROM SYMPOSIUM ON SAFEGUARDS OF NUCLEAR MATERIALS, VIENNA, AUSTRIA, OCT. 20, 1975

A REAL-TIME, COMPUTER-BASED SYSTEM IS DESCRIBED WHICH PROVIDES SAFEGUARDS MATERIAL CONTROL AT THE OAK RIDGE NATIONAL LABORATORY. ORIGINALLY INSTALLED IN 1972 TO PROVIDE COMPUTERIZED REAL-TIME FISSILE MATERIALS ACCOUNTABILITY FOR CRITICALITY CONTROL PURPOSES, THE SYSTEM HAS BEEN EXPANDED TO PROVIDE ACCOUNTABILITY OF ALL SOURCE AND NUCLEAR MATERIALS (SNM) AND TO UTILIZE THE ON-LINE INVENTORY FILES IN SUPPORT OF THE LABORATORY PHYSICAL PROTECTION AND SURVEILLANCE PROCEDURES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL BURNUP + COMPUTER CONTROL + SAFEGUARDS, NUCLEAR MATERIAL + *ACCOUNTABILITY

112287
REILLY TD + STIEFF LR + WOLTZ FE
ON-LINE MEASUREMENT OF THE ISOTOPIC COMPOSITIONS OF URANIUM IN UF6
LOS ALAMOS SCIENTIFIC LAB., N.M. + U.S. ARMS CONTROL & DISARMAMENT, WASHINGTON, D.C. + GOODYEAR ATOMIC CORP., PIKETON, OH
3 PPS, 6 REFS. IEEE TRANS. NUCL. SCIENCE, NS-22(1), PP. 731-33 (FEB. 1975)

AN IN-LINE MONITOR USED INITIALLY TO CONTINUOUSLY MEASURE THE 235U ENRICHMENT IN LIQUID UF6 AT THE PORTSMOUTH GASEOUS DIFFUSION PLANT HAS RECENTLY BEEN RECALIBRATED TO PROVIDE CONTINUOUS MEASUREMENTS OF BOTH U234 AND U235. THE INSTRUMENT USING BOTH A GAMMA-RAY DETECTOR FOR U235 AND A NEUTRON DETECTOR FOR U234 HAS PRODUCED DATA THAT IS IN GOOD AGREEMENT WITH PRECISION MASS SPECTROMETRIC MEASUREMENTS MADE ON RELATED SAMPLES OF UF6. THE PRELIMINARY RESULTS INDICATE THAT AN INSTRUMENT ORIGINALLY DEVELOPED TO MEET THE OPERATIONAL PROBLEMS OF THE PLANT CAN ALSO MAKE A SIGNIFICANT CONTRIBUTION TO THE DIFFICULT PROBLEMS OF PROVIDING EFFECTIVE SAFEGUARDS FOR AN ENRICHMENT PLANT.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

ELEMENTS AND ISOTOPES + *INSTRUMENT, NUCLEAR + MEASUREMENT + URANIUM + INSTRUMENT CALIBRATION + INSTRUMENT, COMPONENT + MONITOR + GAMMA + NEUTRON + URANIUM HEXAFLUORIDE + ENRICHMENT FACILITY + *SAFEGUARDS, NUCLEAR MATERIAL + SPECTROMETRY, MASS

112132
RATAY RP
NUCLEAR SAFEGUARDS PROGRESS REPORT: JULY 1974 - JUNE 1975
MOUND LAB., MIAMISBURG, OHIO
MLM-2286 +. 25 PPS, 9 FIGS, 5 REFS. DEC. 1975

A NONDESTRUCTIVE TECHNIQUE FOR THE DETERMINATION OF ATOMIC RATIOS OF PLUTONIUM-238, -240, -241 AND AMERICIUM-241 RELATIVE TO PLUTONIUM-239 USING HIGH-RESOLUTION GAMMA-RAY SPECTROSCOPY HAS BEEN DEVELOPED. RESULTS OF THESE TECHNIQUES ARE DISCUSSED AS THEY APPLY TO VARIOUS COMPOSITIONS OF PLUTONIUM-239 MATERIAL. PROGRESS ON AN AUTOMATED PLUTONIUM ASSAY SYSTEM IS DESCRIBED, WHICH

112132 *CONTINUED*
UTILIZES CALORIMETRY AND HIGH-RESOLUTION GAMMA-RAY SPECTROSCOPY. IT ALSO FEATURES A COMPUTER CONTROLLED X, Y, Z SAMPLE-HANDLING SYSTEM AS WELL AS AUTOMATED DATA ACQUISITION AND REDUCTION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + MEASUREMENT + *PLUTONIUM + AMERICIUM + *TEST, NONDESTRUCTIVE + GAMMA + SPECTROMETRY, GAMMA + *SAFEGUARDS, NUCLEAR MATERIAL + SPECTROMETRY + COMPOSITION

111840
WATERBURY GR
ANALYTICAL METHODS FOR FISSIONABLE MATERIALS IN THE NUCLEAR FUEL CYCLE. COVERING JUNE 1974-JUNE 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6045-SR +. 14 PPS, 3 TABS, 14 REFS, OCT. 1975

PROGRESS CONTINUED ON METHOD DEVELOPMENT FOR THE DISSOLUTION OF DIFFICULT-TO-DISSOLVE MATERIALS, THE AUTOMATED ANALYSIS OF PLUTONIUM AND URANIUM, THE PREPARATION OF PLUTONIUM MATERIALS FOR THE SAFEGUARD ANALYTICAL LABORATORY EVALUATION (SALE) PROGRAM, AND THE ANALYSIS OF HIGH FUEL AND SALE OF URANIUM MATERIALS. THE PREVIOUSLY DEVELOPED TEFLON-CONTAINER, METAL-SHELL APPARATUS WAS APPLIED TO THE DISSOLUTION OF VARIOUS NUCLEAR MATERIALS. GAS-SOLID REACTIONS, MAINLY USING CHLORINE AT ELEVATED TEMPERATURES, ARE PROMISING FOR SEPARATING URANIUM FROM REFRACTORY COMPOUNDS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + ANALYTICAL TECHNIQUE + REACTOR, HTGR + FUEL MANAGEMENT + SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE

111845
BLUMKIN S + VON HALLE E
THE BEHAVIOR OF THE MINOR URANIUM ISOTOPES IN SEPARATION CASCADES PART VI REVIEW AND APPRAISAL
OAK RIDGE GASEOUS DIFFUSION PLANT, TENNESSEE
K-1938 (PART VI) +. 35 PPS, 8 FIGS, 9 REFS, JAN. 19, 1976

BASED ON THE FACT THAT THE U-234 AND U-236 CONCENTRATIONS RELATIVE TO THAT OF U-235 IN CASCADE WITHDRAWAL STREAMS REFLECT THE CASCADE FLOWSHEET, THE AUTHORS DRAW THE CONCLUSION THAT THE USE OF THE MINOR ISOTOPE CONCENTRATION MEASUREMENTS IN CASCADE WITHDRAWAL STREAMS, WHICH IS USUALLY REFERRED TO BY THE ACRONYM, MIST, IS A POTENTIALLY VALUABLE ADJUNCT TO MATERIAL ACCOUNTING FOR SAFEGUARDING A U-235 ENRICHMENT CASCADE. AN ENUMERATION IS MADE OF THE CAPABILITIES THAT A SAFEGUARDS INSPECTION TEAM WOULD HAVE TO POSSESS IN ORDER TO APPLY MIST.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA 22161

URANIUM + *RADIOISOTOPE + ENRICHMENT FACILITY + *SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + JACOBS

111897
CHAMBERS WH
CONTINUOUS INVENTORY IN SNM FACILITIES
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-UR-75-1524 + CONF-751017-6 +. 9 PPS, FROM SYMPOSIUM ON SAFEGUARDS OF NUCLEAR MATERIALS, VIENNA, AUSTRIA, OCT. 20, 1975

TRANSFERS OF SNM INTO THE STORAGE AREA ARE ACCOMPANIED BY AN AUTOMATED VERIFICATION OF THE CONTAINER IDENTITY, WEIGHT, AND THE RADIATION SIGNATURE OF THE CONTENTS. THIS INFORMATION IS COMPUTER-PROCESSED AND STORED FOR COMPARISON AT SUBSEQUENT TRANSFERS AND ALSO PROVIDES THE DATA BASE FOR RECORD PURPOSES. PHYSICAL MOVEMENT OF CONTAINERS ACROSS THE BOUNDARY OF THE STORAGE AREA IS PRESENTLY ACCOMPLISHED BY OPERATING PERSONNEL IN ORDER TO MINIMIZE EXPENSIVE MODIFICATIONS TO EXISTING STORAGE FACILITIES. PERSONNEL ENTERING AND LEAVING THE STORAGE AREA ARE UNIQUELY IDENTIFIED AND ALSO PASS THROUGH PORTAL MONITORS CAPABLE OF DETECTING SMALL QUANTITIES OF SNM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FUEL STORAGE + COMPUTER CONTROL + SAFEGUARDS, NUCLEAR MATERIAL + RADIATION PROFILE

111249
BOHNEL K
ASSAY OF NUCLEAR MATERIAL FOR PLUTONIUM BY THE NEUTRON COINCIDENCE TECHNIQUE
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2203 +. 148 PPS, FIGS, SEPT. 1975

IN ASSAYS FOR PLUTONIUM THE NEUTRON COINCIDENCE TECHNIQUE IS OFTEN USED. THIS METHOD WHICH IS BASED ON MEASURING SPONTANEOUS FISSION RATES IS EXAMINED BOTH EXPERIMENTALLY AND THEORETICALLY. A NOVEL COINCIDENCE UNIT IS DESCRIBED WHICH WORKS IN EFFECT WITHOUT DEADTIME AND WHICH THEREFORE HAS ADVANTAGES OVER THE CURRENTLY USED DESIGN. FOR WASTE SAMPLES A PRINCIPLE FOR MEASUREMENT IS DESCRIBED WHICH AVOIDS SPACE DEPENDENCE EFFECTS BY ROTATING THE PROBE IN AN ASYMMETRIC DETECTOR. FORMULAE ARE DEVELOPED FOR THE STATISTICAL ERROR AND VARIOUS EFFECTS OF DEADTIMES ARE DISCUSSED. FURTHER IT IS SHOWN THAT NEUTRON MULTIPLICATION IN THE SAMPLE IS AN IMPORTANT SOURCE OF ERRORS, ESPECIALLY WHEN THE (ALPHA, N)-BACKGROUND IS NEGLECTED.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

111249 *CONTINUED*
PLUTONIUM + ANALYTICAL TECHNIQUE + RADIOCHEMICAL ANALYSIS + NEUTRON + NEUTRON INTERACTION + SPECTROMETRY, NEUTRON + FUEL MANAGEMENT + SAFEGUARDS, NUCLEAR MATERIAL

111914
GAMMILL TF
NEW EMPHASIS ON MATERIAL ACCOUNTABILITY'S ROLE IN SPECIAL NUCLEAR MATERIALS SECURITY
OAK RIDGE Y-12 PLANT, TENN.
Y-SS-17180 + CONF-750638-9 +. 5 PPS. FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT, NEW ORLEANS, LA, JUNE 18, 1975

AN EVALUATION OF THE PLANT SNM ACCOUNTABILITY SYSTEM DETERMINED THAT SOME CHANGES COULD BE MADE TO UPGRADE SNM SECURITY. A SYSTEM HAS BEEN DEVISED TO SUPPLEMENT REGULAR MONTHLY ENRICHED URANIUM INVENTORIES WITH VERIFICATION INVENTORIES OF SELECTED BATCHES. THE REVISED SYSTEM WILL ALSO PERMIT EMERGENCY INVENTORIES WITHIN SIX HOURS. THE SYSTEM CHANGES ARE PRIMARILY IN DATA HANDLING AND WILL COST VERY LITTLE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DATA PROCESSING + COMPUTER CONTROL + *SPECIAL NUCLEAR MATERIAL + SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY + SECURITY

110913
SARICH JP
REAL-TIME PLUTONIUM ACCOUNTABILITY AND INVENTORY CONTROL SYSTEM
ATLANTIC RICHFIELD HANFORD CO., RICHLAND, WASH
ARH-SA-220 + CONF-750638-2 +. 6 PPS. FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT, NEW ORLEANS, LA., JUNE 18, 1975

AN ON-LINE INVENTORY SYSTEM FOR A LARGE STORAGE AND PROCESSING FACILITY IS PLANNED. A TERMINAL SYSTEM WILL PROVIDE FOR INTERACTIVE UPDATING AND INFORMATION RETRIEVAL. THE DATA BASE WILL CONTAIN INFORMATION ON INVENTORY ITEMS AND TRANSACTIONS, AS WELL AS PROCESS MONITORING INFORMATION AND LABORATORY BOOKKEEPING DATA. ACCESS TO THE TERMINALS, AS WELL AS THE STORAGE VAULTS, WILL BE CONTROLLED BY FINGERPRINT COMPARISON WITH A PERSONNEL IDENTIFICATION DATA BASE. BAR CODE LABELS ATTACHED TO EACH INVENTORY ITEM WILL BE READ BY A LIGHT PEN DURING PHYSICAL INVENTORIES AND WHEN MATERIALS ARE TRANSFERRED. THE USE OF DEVICES TO CONTINUOUSLY MONITOR AND CONTROL STORAGE LOCATIONS WITHIN THE VAULTS IS PLANNED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*PLUTONIUM + DATA PROCESSING + INFORMATION RETRIEVAL + *COMPUTER CONTROL + *SAFEGUARDS, NUCLEAR MATERIAL + ACCOUNTABILITY

109422
KEPHART GR + MARAMAN WJ
NONDESTRUCTIVE ASSAY TECHNOLOGY AND IN-PLANT DYNAMIC MATERIALS CONTROL: *DYMAC*
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-UR-75-1817 + CONF-751017-9 +. 24 PPS. FROM SYMPOSIUM ON SAFEGUARDS OF NUCLEAR MATERIALS, VIENNA AUSTRIA, OCT. 20, 1975

AN ADVANCED SYSTEM OF IN-PLANT MATERIALS CONTROL KNOWN AS DYMAC--DYNAMIC MATERIALS CONTROL--IS BEING DEVELOPED FOR THE UNITED STATES ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION BY THE LOS ALAMOS SCIENTIFIC LABORATORY. THIS MAJOR SAFEGUARDS R&D EFFORT MERGES STATE-OF-THE-ART NONDESTRUCTIVE ASSAY INSTRUMENTATION AND COMPUTER TECHNOLOGY, WITH THE CLEAR OBJECTIVE OF DEMONSTRATING A WORKABLE, COST-EFFECTIVE SYSTEM OF STRINGENT, 'REAL TIME' CONTROL OF NUCLEAR MATERIALS IN A MODERN PLUTONIUM PROCESSING FACILITY. EMPHASIS IS PLACED ON DEVELOPING PRACTICAL SOLUTIONS TO GENERIC PROBLEMS OF MATERIALS MEASUREMENT AND CONTROL, SO THAT RESULTING SAFEGUARDS TECHNIQUES AND INSTRUMENTATION WILL HAVE WIDESPREAD APPLICABILITY THROUGHOUT THE NUCLEAR COMMUNITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + PLUTONIUM + R AND D PROGRAM + SURVEILLANCE PROGRAM + SPECIAL NUCLEAR MATERIAL + *SAFEGUARDS, NUCLEAR MATERIAL + SECURITY

109170
ARMANTROUT G + MCGIBBON A + SWIERKOWSKI S
ADVANCED INSTRUMENTATION FOR NUCLEAR MONITORING
LAWRENCE LIVERMORE LABORATORY, CALIFORNIA
URL-76693 + CONF-751017-11 +. 13 PPS. FROM SYMPOSIUM ON SAFEGUARDS OF NUCLEAR MATERIALS, VIENNA, AUSTRIA OCT. 20, 1975

RESEARCH ON SEMICONDUCTOR RADIATION DETECTORS IS DESCRIBED. DEVELOPS COMPUTATIONAL MODELS TO CALCULATE THE ENERGY BAND STRUCTURE, CARRIER MOBILITY, AND CARRIER LIFETIME OF PROPOSED DETECTOR MATERIALS, AND A COMPUTER SPECTRUM SIMULATION THAT ACCURATELY PREDICTS THE POTENTIAL PERFORMANCE OF THE MATERIALS AS DETECTORS. REPORTS ON A SELF CONTAINED, FIELD-PORTABLE SPECTROMETER FOR LABORATORY-GRADE PULSE-HEATING ANALYSIS OF GAMMA-RAY SPECTRA SUITABLE FOR USE UNDER EXTREME ENVIRONMENTAL CONDITIONS AND ISOLATED LOCATIONS BY PERSONNEL NOT TRAINED IN ELECTRONICS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

109170 *CONTINUED*
SOLID STATE DEVICE + INSTRUMENT, COMPONENT + MATERIAL + SPECTROMETRY, GAMMA + INSTRUMENT, PULSE + *R AND D PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + *RADIATION MONITORS

109778
UNTERMYER S
NONDESTRUCTIVE ASSAY OF FISSIONABLE MATERIALS
NATIONAL NUCLEAR CORP., REDWOOD CITY, CALIF.
6 PPS, 10 FIGS, RESEARCH/DEVELOPMENT, 26(8), PP [illegible]-31 (AUG, 1975)

DISCUSSES THE ACTIVE AND PASSIVE NONDESTRUCTIVE ASSAY PROCEDURES. A TABLE IS GIVEN LISTING THE TECHNIQUES AVAILABLE, BOTH PASSIVE AND ACTI[illegible] THE [illegible] AND APPLICABILITY TO EITHER PLUTONIUM OR URANIUM-235. PERFORMANCE OF SEVERAL [illegible] DESCRIBED.

MEASUREMENT + PLUTONIUM + URANIUM + *TEST, NONDESTRUCTIVE + MONITORING SYSTEM, RADIATION + *SPECIAL NUCLEAR MATERIAL + SAFEGUARDS, NUCLEAR MATERIAL + SPECTROMETRY + SCINTILLATION

107469
CAMPBELL JW + TODD JL
IRRADIATED FUEL BUNDLE COUNTER
SANDIA LABS., ALBUQUERQUE, N. MEX.
SAND-75-5588 + CONF-751007-21 +, 8 PPS, FROM AMERICAN NUCLEAR SOCIETY MEETING, NEW ORLEANS, JUNE 8, 1975

THE DESIGN OF A PROTOTYPE SAFEGUARDS INSTRUMENT FOR DETERMINING THE NUMBER OF IRRADIATED FUEL ASSEMBLIES LEAVING AN ON-POWER REFUELED REACTOR IS DESCRIBED. DESIGN DETAILS INCLUDE RADIATION DETECTION TECHNIQUES, DATA PROCESSING AND DISPLAY, UNATTENDED OPERATION CAPABILITIES AND DATA SECURITY METHODS. DEVELOPMENT AND OPERATING HISTORY OF THE BUNDLE COUNTER IS REPORTED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COUNTER + DATA PROCESSING + *INSTRUMENT, SURVEILLANCE + MONITOR + EQUIPMENT DESIGN + FUEL ELEMENT CLUSTER + FUEL ROD + *SAFEGUARDS, NUCLEAR MATERIAL + *EQUIPMENT DEVELOPMENT

103624
SHEA TE
INSTRUMENTATION FOR REAL-TIME MATERIALS CONTROL
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
7 PAGES, 5 FIGURES, IEEE TRANS. NUCLEAR SCI., NS-22(1), PP. 752-58 (FEB. 1975)

UNDER CURRENT RULES, MAJOR LICENSED PROCESSORS OF STRATEGIC SPECIAL NUCLEAR MATERIAL COMPUTE A MATERIAL BALANCE AT 60-DAY INTERVALS, BASED UPON A MEASURED PHYSICAL INVENTORY. WHEN THE MATERIAL OUTPUT DOES NOT MATCH THE MATERIAL INPUT, THE REMAINING QUANTITY IS IDENTIFIED AS MATERIAL-UNACCOUNTED-FOR (MUF). TO TEST FOR UNDETECTED THEFTS OF SPECIAL NUCLEAR MATERIAL, THE COMPUTED MUF IS COMPARED TO A CURRENT ESTIMATE OF THE COMBINED MEASUREMENT ERRORS ASSOCIATED WITH EACH MATERIAL BALANCE. WHEN THE MATERIAL-UNACCOUNTED FOR EXCEEDS ITS LIMIT OF ERROR, A THEFT MAY HAVE OCCURED. A NUMBER OF INVESTIGATIVE ACTIONS ARE THEN INITIATED.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

ADMINISTRATIVE CONTROL + INSTRUMENT, SURVEILLANCE + MATERIAL + *EXAMINATION + *SAFEGUARDS, NUCLEAR MATERIAL

103613
EAST LV + MARTIN ER + ATWELL TL
AUTOMATED NONDESTRUCTIVE ASSAY INSTRUMENTATION FOR NUCLEAR MATERIALS SAFEGUARDS
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO
5 PAGES, 7 FIGURES, IEEE TRANS. NUCLEAR SCI., NS-22(1), PP. 739-43 (FEB. 1975)

FOUR SYSTEMS DEVELOPED AT THE LOS ALAMOS SCIENTIFIC LABORATORY FOR NONDESTRUCTIVE ANALYSIS OF NUCLEAR FUEL MATERIALS WILL BE DESCRIBED. THESE SYSTEMS UTILIZE EITHER MINICOMPUTERS OF A PROGRAMMABLE CALCULATOR FOR MEASUREMENT CONTROL AND DATA ANALYSIS, AND ARE TYPICAL OF A VARIETY OF AUTOMATED MEASUREMENT SYSTEMS DEVELOPED FOR NUCLEAR MATERIALS SAFEGUARDS APPLICATIONS.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

CONTROL SYSTEM + DATA PROCESSING + INSTRUMENT, CONTROL + TEST, NONDESTRUCTIVE + *SYSTEM DESCRIPTION + *SAFEGUARDS, NUCLEAR MATERIAL + EQUIPMENT DEVELOPMENT

103612
BRAMBLETT RL
FUEL ROD SCANNER FOR QUALITY CONTROL AND SAFEGUARDS
IRT CORP., SAN DIEGO, CALIF.
4 PAGES, 8 FIGURES, IEEE TRANS. NUCLEAR SCI., NS-22(1), PP. 744-47 (FEB. 1975)

AN AUTOMATED FUEL ROD SCANNER WHICH USES ACTIVATION BY 252CF NEUTRONS IS DESCRIBED. THIS SCANNER IS BEING USED TO MEASURE THE UNIFORMITY OF FUEL LOADING AND THE TOTAL FISSILE CONTENT OF BOTH UO2 AND MIXED OXIDE FUEL RODS. MULTIPLE DETECTORS WITH HIGH SENSITIVITY ARE USED TO REDUCE THE 252 CF SOURCE STRENGTH REQUIREMENT. EXCELLENT ELECTRONIC STABILITY IS ATTAINED BY THE USE OF

103612 *CONTINUED*
CURRENT, RATHER THAN PULSE ELECTRONICS. AN IMPORTANT FEATURE OF THE SCANNER IS ITS ON-LINE MINICOMPUTER, WHICH ALLOWS A HIGH THROUGH-PUT OF FUEL RODS USING A SMALL OPERATING STAFF.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

INSTRUMENT, CONTROL + INSTRUMENT, SURVEILLANCE + *FUEL ROD + *SAFEGUARDS, NUCLEAR MATERIAL

103611
WALKER AC
NONDESTRUCTIVE ASSAY INSTRUMENTATION FOR USE BY INSPECTORS
AEC RICHLAND OPERATIONS, WASHINGTON
4 PAGES, 3 REFERENCES, IEEE TRANS. NUCLEAR SCI., NS-22(1), PP. 748-51 (FEB. 1975)

THE APPLICATION OF NONDESTRUCTIVE ASSAY (NDA) INSTRUMENTATION DURING NUCLEAR MATERIAL SAFEGUARDS INSPECTIONS BY THE USAEC RICHLAND OPERATIONS OFFICE (HANFORD) IS DESCRIBED. THE PROBLEMS AND CONSTRAINTS OF NDA INSTRUMENT USE ARE DISCUSSED FROM AN INSPECTOR'S VIEWPOINT. NEW AND MODIFIED NDA INSTRUMENTATION IS SUGGESTED WHICH WOULD PROVIDE IMPROVED MEASUREMENT VERIFICATION DURING SAFEGUARDS INSPECTIONS.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

*INSTRUMENT, SURVEILLANCE + TEST, NONDESTRUCTIVE + EXAMINATION + *SAFEGUARDS, NUCLEAR MATERIAL

103595
BRENNER LM + BARTELS WC
SAFEGUARDING OF NUCLEAR FUELS
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON
3 PAGES, 3 FIGURES, IEEE TRANS. NUCLEAR SCI., NS-22(1), PP. 35-37 (FEB. 1975)

WITH THE RAPID EXPANSION OF THE NUCLEAR INDUSTRY, SAFEGUARDING OF NUCLEAR MATERIALS AGAINST DIVERSION AND OF NUCLEAR FACILITIES AGAINST SABOTAGE BECOMES INCREASINGLY IMPORTANT BOTH DOMESTICALLY AND INTERNATIONALLY. THE USA SAFEGUARDS RESEARCH AND DEVELOPMENT PROGRAM WILL BE REVIEWED WITH SPECIAL EMPHASIS ON NONDESTRUCTIVE MEASUREMENT TECHNIQUES FOR MATERIAL ACCOUNTABILITY.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

TEST, NONDESTRUCTIVE + R AND D PROGRAM + SPECIAL NUCLEAR MATERIAL + SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL

098733
DESIGN CONSIDERATIONS FOR MINIMIZING RESIDUAL HOLDUP OF SPECIAL NUCLEAR MATERIAL IN EQUIPMENT FOR DRY PROCESS OPERATION
AEC, WASHINGTON, D.C.
REGULATORY GUIDE 5.42, JANUARY 1974

THIS GUIDE DESCRIBES FEATURES ACCEPTABLE TO THE REGULATORY STAFF FOR MINIMIZING THE RESIDUAL HOLDUP OF SNM AFTER DRAINDOWN OR CLEANOUT OF EQUIPMENT USED IN DRY PROCESS OPERATIONS. THE DESIGN FEATURES NOTED WILL FACILITATE PHYSICAL INVENTORY MEASUREMENTS AND REDUCE MATERIAL BALANCE UNCERTAINTIES. THEY ARE NOT EXPECTED TO INTERFERE EXCESSIVELY WITH PROCESS OPERATIONS.

AVAILABILITY - DIRECTOR OF REGULATORY STANDARDS, U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C. 20545

DESIGN CRITERIA + FABRICATION FACILITY + DESIGN STUDY + EQUIPMENT + FUEL REPROCESSING + SPECIAL NUCLEAR MATERIAL + SYSTEM CAPACITY + SAFEGUARDS, NUCLEAR MATERIAL + NRC REGULATORY GUIDE

140370
MCDUFFEE WT + HAMEL WR
VALUE IMPACT OF VAULT AUTOMATION IN SPECIAL NUCLEAR MATERIAL STORAGECORP: OAK RIDGE NATIONAL LAB., TENN.
NUREG/CR-0019 + ORNL/NUREG-33 +. 97 PPS. TABS. FIGS. AUG. 1978

COST/BENEFIT STUDIES INDICATE THAT AUTOMATION OF STORAGE SYSTEMS IS THE MOST FAVORABLE APPROACH TO GAINING SAFEGUARDS BENEFITS IN SPECIAL NUCLEAR MATERIAL (SNM) STORAGE VAULTS. STUDIES ARE BASED ON THE SNM STORAGE VAULT OF A CONCEPTUAL 200-METRIC TONS (MT)/YEAR MIXED-OXIDE FUEL FABRICATION FACILITY. TWO ALTERNATIVE NONAUTOMATED VAULT CONCEPTS ARE DEVELOPED AND EVALUATED. ONE EMPHASIZES THE USE OF ADDITIONAL SECURITY/SURVEILLANCE PERSONNEL IN VAULT OPERATION; THE OTHER EMPHASIZES STRUCTURAL AND PROCEDURAL BARRIERS TO ACHIEVE ISOLATION OF SNM FROM OPERATING PERSONNEL. COSTS OF EACH ALTERNATIVE ARE ESTIMATED AND THE COST/BENEFITS COMPARED WITH THOSE OF THE CONCEPTUAL FULLY AUTOMATED VAULT DEVELOPED IN THE EARLIER DESIRABILITY AND FEASIBILITY STUDY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE: U. S. DEPARTMENT OF COMMERCE. SPRINGFIELD. VA. 22161

*SAFEGUARDS. NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *FUEL STORAGE + *FABRICATION FACILITY + *THEFT/DIVERSION + *SECURITY

140093
GALLAGHER RJ + STIMMELL KJ + KEETON SC + DELAQUIL P
THE EVALUATION OF ROAD-TRANSMIT PHYSICAL PROTECTION SYSTEMS
SANDIA LABS., LIVERMORE, CALIF.
NUREG/CR-0094 +(4). 13 PPS. 7 FIGS. 7 REFS. AUG. 1978

COMPUTER CODES WHICH SIMULATE ARMED ATTACKS HAVE BEEN DEVELOPED AND ARE BEING USED TO EXAMINE ISSUES ASSOCIATED WITH ROAD TRANSPORTATION SYSTEMS. THE PAPER DISCUSSES THREE CODES--SCORCE (SIMULATES INITIAL AMBUSH), SABRES I (COVERS THE BATTLE) AND BARS (TREATS PENETRATION OF PROTECTIVE CARGO BARRIERS). USE OF THESE METHODOLOGIES TO EVALUATE ADDITIONAL VEHICLES, GUARDS, ARMOR AND ALTERNATIVE TACTICS OR EQUIPMENT AS A MEANS OF IMPROVING CONVOY SECURITY HAS BEEN COMPLETED. RESULTS DEMONSTRATED THAT PROTECTION OFFERED BY PRESENT COMMERCIAL REGULATIONS IS MARGINAL. THIS COULD BE INCREASED BY ADDITION OF ARMOR TO CLOSE ESCORT VEHICLES INSTEAD OF JUST THE TRANSPORTER, AND USE OF APPROPRIATE TACTICS. AGAINST BASELINE THREAT OF ADVERSARIES ARMED WITH M-16'S, OBSERVATION AND HARASSMENT FROM MODEST DISTANCE UNTIL RE-ENFORCEMENTS ARRIVE APPEARS PREFERABLE TO AGGRESSIVE ASSAULT BY AMBUSHED GUARD FORCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *SABOTAGE + *TRANSPORTATION AND HANDLING + *SIMULATION + *COMPUTER PROGRAM, DIGITAL + HJCK + NRC-RS

140069
VERRIGLER KP
ESTIMATES OF LLEA OFFICER AVAILABILITY
SANDIA LABS., LIVERMORE, CALIF.
NUREG/CR-0100 + SAND 78-8651 +. 16 PPS. 8 FIGS. 4 REFS. 2011 1978

ONE ELEMENT IN THE PHYSICAL PROTECTION OF NUCLEAR MATERIAL IN TRANSIT PROGRAM IS A DETERMINATION OF THE NUMBER OF LOCAL LAW ENFORCEMENT AGENCY OFFICERS AVAILABLE TO RESPOND TO AN ATTACK UPON A SPECIAL NUCLEAR MATERIAL (SNM) CARRYING CONVOY. A COMPUTER MODEL, CCPS, HAS BEEN DEVELOPED AT SANDIA LABORATORIES TO ADDRESS THIS PROBLEM. ITS PURPOSES ARE TO HELP IDENTIFY AREAS ALONG A ROUTE WHICH MAY HAVE RELATIVELY LOW POLICE COVERAGE AND TO AID IN THE COMPARISON OF ALTERNATE ROUTES TO THE SAME LOCATION. RESULTS ILLUSTRATING THE MODEL'S CAPABILITIES ARE PRESENTED FOR SAMPLE ROUTES. AN EXAMPLE DEMONSTRATING EFFECTS OFJURISDICTIONAL RESTRICTIONS ON THE SIZE OF THE RESPONSE FORCE IS GIVEN. ALTERNATE ROUTES BETWEEN TWO LOCATIONS ARE COMPARED USING CUMULATIVE PLOTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *TRANSPORTATION AND HANDLING + *COMPUTER PROGRAM, DIGITAL + HJCK + NRC-RS

140367
CADWELL JJ
THE USE OF DEADLY FORCE BY A NUCLEAR FACILITY GUARD
BROOKHAVEN NATIONAL LAB., UPTON, N.Y.
2 PPS. NUCLEAR MATERIALS MANAGEMENT. VI(4). PP. 28-29 (WINTER 1977-1978)

A SUMMARY OF THE GENERAL LEGAL THEORIES WHICH MAY BE USED TO JUSTIFY THE USE OF DEADLY FORCE AND PREVENT CRIMINAL LIABILITY BY THE GUARD AND HIS EMPLOYER IS PRESENTED AND DISCUSSED. THESE THEORIES INCLUDE: SELF-DEFENSE OF ANOTHER, DEFENSE OF PROPERTY, LAW ENFORCEMENT, AND NECESSITY.

*SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + SPECIAL NUCLEAR MATERIAL + *SABOTAGE + *LEGALISTICS

137085
MACKETT JM + JACOBI LW + RAPCZINSKI LA + ZENLEA S
AN EVALUATION OF COST ESTIMATES OF PHYSICAL SECURITY SYSTEMS FOR RECYCLED NUCLEAR FUEL
MITRE CORP., BEDFORD, MASS.
NUREG/CR-0040 +. 157 PPS. TABS. FIGS. MAY 1978

137685 *CONTINUED*
THIS REPORT IS AN EVALUATION OF THE COST ESTIMATES AND UNDERLYING ECONOMIC ASSUMPTIONS OF PHYSICAL SECURITY SYSTEMS DESCRIBED IN THE DRAFT SAFEGUARDS SUPPLEMENT TO THE GENERIC ENVIRONMENTAL STATEMENT ON THE USE OF MIXED OXIDE FUEL IN LIGHT WATER COOLED REACTORS - NUREG 0002, AUGUST 1976 (GESMO). IT WAS PREPARED BY THE MITRE CORPORATION UNDER A CONTRACT WITH THE NUCLEAR REGULATORY COMMISSION (NRC).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *MIXED OXIDE + *SECURITY + *COST ANALYSIS + *COST, OPERATING + MUCK + NRC-13 + JACOBS

137665
ADAMS KG + TROJILLO AA
CONSIDERATIONS IN THE EVALUATION OF THE HUMAN ELEMENT OF A SAFEGUARDS SYSTEM
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1083-C +. 3 PPS, 1 REF, 1977

THE EFFECT OF THE HUMAN COMPONENT IN A SAFEGUARDS SYSTEM IS BRIEFLY DISCUSSED. STEPS SUGGESTED ARE REQUIREMENTS FOR THE DEVELOPMENT OF A SYSTEM STRUCTURE WITHIN WHICH SECURITY OFFICER EVALUATION COULD BE EFFECTIVELY CONDUCTED. THESE STEPS RELATE TO JOB ANALYSIS, QUALIFICATIONS ESTABLISHMENT, TRAINING AND RETRAINING, AND CAREER CONSIDERATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SECURITY + TRAINING + QUALIFICATION + ADMINISTRATIVE CONTROL

137664
A MONTE CARLO APPROACH TO THE GENERATION OF ADVERSARY PATHS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1084C + CONF-771109-30 +. 5 PPS, 1 TAB, 1 FIG, 7 REFS, 1977

A DISCRETE-EVENT, MONTE-CARLO SIMULATION PROGRAMMED IN THE GASP IV SIMULATION LANGUAGE IS PRESENTED. THE MODEL RELIES ON A NUMBER OF REPLICATIONS OF DIJKSTRA SEARCHES. THE SEARCH PROVIDES THE OPTIMAL PATH ON A PER RUN BASIS. FOR EACH REPLICATION, RANDOM DRAWS ARE MADE FOR THE ARC WEIGHTS AND THE SEARCH IS REPEATED. STATISTICS ARE COLLECTED OVER ALL REPLICATIONS AND ESTIMATES ARE MADE FOR PROBABILITY MEASURES.***THE MODEL HAS BEEN TESTED FOR HYPOTHETICAL FACILITIES AND RESULTS ARE PROMISING. ALTHOUGH CURRENT VERSIONS ADDRESS ONLY DETECTION PROBABILITIES AND TRANSIT TIMES, THE MODEL IS SUFFICIENTLY FLEXIBLE TO ALLOW FOR COMBINATIONS OF THESE MEASURES AND INCLUSION OF OTHER MEASURES. FUTURE EMBELLISHMENTS WILL INCLUDE THESE CONSIDERATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *MATHEMATICAL TREATMENT + *COMPUTER PROGRAM + *ANALYTICAL MODEL + *MONTE CARLO

137480
A SYSTEMATIC APPROACH TO THE CONCEPTUAL DESIGN OF PHYSICAL PROTECTION SYSTEMS FOR NUCLEAR FACILITIES
SANDIA LABS., ALBUQUERQUE, N.M.
HCP/D0789-01 +. 81 PPS, 17 FIGS, REFS, MAY 1978

THIS REPORT DESCRIBES A SYSTEMATIC APPROACH THAT HAS BEEN USED BY THE DEPARTMENT OF ENERGY'S SANDIA LABORATORIES IN THE COURSE OF DEVELOPING PHYSICAL PROTECTION SYSTEM CONCEPTUAL DESIGNS FOR NUCLEAR FACILITIES. A THREE-STEP APPROACH IS DESCRIBED WHICH INCLUDES (1) FACILITY CHARACTERIZATION, (2) DEVELOPMENT AND EVALUATION OF HARDWARE-BASED SAFEGUARDS SYSTEMS CONFIGURATIONS, AND (3) HARDWARE AND RESPONSE FORCE TRADE-OFF ANALYSIS. THE PURPOSE OF THIS REPORT IS TO ESTABLISH A VEHICLE FOR INITIAL EXAMINATION AND DISCUSSION BY POTENTIAL INDUSTRY AND GOVERNMENT USERS OF A FORMAL SEQUENCE OF ACTIVITIES FOR THE CONCEPTUAL DESIGN OF PHYSICAL PROTECTION SYSTEMS AND TO IDENTIFY CURRENTLY AVAILABLE DESIGN TOOLS, SUCH AS APPLICATION REPORTS, HANDBOOKS, AND COMPUTER CODES WHICH MIGHT SUPPORT THESE ACTIVITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + SAFEGUARDS, NUCLEAR MATERIAL + SABOTAGE + THEFT/DIVERSION + PROTECTION SYSTEM + ANALYTICAL MODEL + SECURITY + PHYSICAL PROTECTION SYSTEM

137437
AUTOMATED APPROACH TO NUCLEAR FACILITY SAFEGUARDS EFFECTIVENESS EVALUATION
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1040C + CONF-771109-20 +. 4 PPS, FROM ANS WINTER MEETING; SAN FRANCISCO, CALIF., NOV. 27, 1977

AN AUTOMATED APPROACH TO FACILITY SAFEGUARDS EFFECTIVENESS EVALUATION HAS BEEN DEVELOPED. THIS PROCEDURE CONSISTS OF A COLLECTION OF FUNCTIONAL MODULES FOR FACILITY CHARACTERIZATION, CRITICAL PATH GENERATION, AND PATH EVALUATION COMBINED INTO A CONTINUOUS STREAM OF OPERATIONS. THE TECHNIQUE HAS BEEN IMPLEMENTED ON AN INTERACTIVE COMPUTER-TIMESHARING SYSTEM AND MAKES USE OF COMPUTER GRAPHICS FOR THE HANDLING AND PRESENTATION OF INFORMATION. USING THIS TECHNIQUE A THOROUGH FACILITY EVALUATION CAN BE MADE BY SYSTEMATICALLY VARYING PARAMETERS THAT CHARACTERIZE THE PHYSICAL PROTECTION COMPONENTS OF A FACILITY ACCORDING TO CHANGES IN PERCEIVED ADVERSARY ATTRIBUTES AND STRATEGY, ENVIRONMENTAL CONDITIONS, AND SITE STATUS.

137437 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + ACCOUNTABILITY + *THEFT/DIVERSION + *SABOTAGE + *ANALYTICAL MODEL

139706
SASSER DW
USERS GUIDE FOR EASI GRAPHICS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-78-0112 *, 108 PPS, 4 TABS, 13 FIGS, 3 REFS, MARCH 1978

EASI (ESTIMATE OF ADVERSARY SEQUENCE INTERRUPTION) IS AN ANALYTICAL TECHNIQUE FOR MEASURING THE EFFECTIVENESS OF PHYSICAL PROTECTION SYSTEMS. EASI GRAPHICS IS A COMPUTER GRAPHICS EXTENSION OF EASI WHICH PROVIDES A CAPABILITY FOR PERFORMING SENSITIVITY AND TRADE-OFF ANALYSES OF THE PARAMETERS OF A PHYSICAL PROTECTION SYSTEM. THIS DOCUMENT REPORTS ON THE IMPLEMENTATION OF EASI GRAPHICS AND ILLUSTRATES ITS APPLICATION WITH SOME EXAMPLES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *ANALYTICAL MODEL + *PROTECTION SYSTEM

139705
CHAPMAN LD + KINEMOND JA + SASSER DW
USERS GUIDE FOR EVALUATING ALTERNATIVE FIXED-SITE PHYSICAL PROTECTION SYSTEMS USING "FESEM"
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1367 *, 292 PPS, 32 TABS, 40 FIGS, 8 REFS, NOV, 1977

THE FORCIBLE ENTRY SAFEGUARDS EFFECTIVENESS MODEL (FESEM) WAS DEVELOPED FOR EVALUATION OF ALTERNATIVE FIXED-SITE SECURITY SYSTEMS. ANALYSIS USING FESEM INCLUDES TRADE-OFFS INVOLVING RESPONSE FORCES AND RESPONSE TIMES, ALARM SYSTEMS, BARRIER CONFIGURATIONS, AND VARIOUS LEVELS OF FORCIBLE ATTACKS BY AN ADVERSARY. THE FESEM OUTPUT PROVIDES A BASIS FOR EVALUATING AND DESIGNING FIXED-SITE SECURITY SYSTEMS. THE OBJECTIVE OF THIS MANUAL IS TO PROVIDE A GUIDE FOR EVALUATING PHYSICAL PROTECTION SYSTEMS. IT IS INTENDED FOR USE BY PERSONNEL INVOLVED IN EVALUATING FIXED-SITE SECURITY SYSTEMS, OR MANAGERS INVOLVED IN MAKING DECISIONS RELATED TO MODIFICATION OF EXISTING PROTECTION SYSTEMS OR IMPLEMENTATION OF NEW SYSTEMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *ANALYTICAL MODEL + *PROTECTION SYSTEM + STATISTICAL ANALYSIS + *THEFT/DIVERSION + *SABOTAGE + *SECURITY

136939
CHERICO P
SECURITY REQUIREMENTS AND STANDARDS FOR NUCLEAR POWER PLANTS
3 PPS, SECURITY MANAGEMENT, 18(6), PP. 22-24 (JAN. 1975)

THIS IS A REVIEW OF PRESENT AND PROPOSED SECURITY REQUIREMENTS TO PROTECT AGAINST ACTS OF SABOTAGE AND AGAINST THE DIVERSION AND MISUSE OF SPECIAL NUCLEAR MATERIALS. REQUIREMENTS OF THE AEC AND ANSI ARE EXAMINED. AMONG THE AREAS COVERED IN THESE STANDARDS ARE THE USE OF A PHYSICAL SECURITY PLAN, SECURITY GUARDS, ALARM SYSTEMS, AND GENERAL SECURITY SYSTEMS. PROJECTED REQUIREMENTS IN THE AREAS OF MATERIALS AND PLANT PROTECTION, PERSONNEL SELECTION, TRAINING, AND ACCESS CONTROL ARE ALSO DISCUSSED.

*SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *SECURITY + POWER PLANT, NUCLEAR + *SPECIAL NUCLEAR MATERIAL

135801
ENGI O + BOOZER GD
NUCLEAR FACILITY SAFEGUARDS MODELING USING DISCRETE EVENT SIMULATION
SANDIA LABS., ALBUQUERQUE, N.M.
CONF-770438-2 *, 5 PPS, 1977

THE THREAT OF THEFT OR DISPERSAL OF SPECIAL NUCLEAR MATERIAL AT A NUCLEAR FACILITY IS TREATED BY STUDYING TEMPORAL RELATIONSHIPS BETWEEN ADVERSARIES HAVING AUTHORIZED ACCESS AND SAFEGUARDS SYSTEM EVENTS BY USING A GASP IV DISCRETE EVENT SIMULATION. SAFEGUARDS SYSTEM EVENTS - DETECTION, ASSESSMENT, DELAY, COMMUNICATIONS, AND NEUTRALIZATION - ARE MODELED FOR THE GENERAL INSIDER ADVERSARY STRATEGY WHICH INCLUDES DEGRADATION OF SAFEGUARDS SYSTEM ELEMENTS FOLLOWED BY AN ATTEMPT TO STEAL OR DISPERSE MATERIAL. THE PERFORMANCE MEASURE USED IS THE ESTIMATED PROBABILITY OF SAFEGUARDS SYSTEM SUCCESS BASED UPON A PREDETERMINED SET OF ADVERSARY ACTIONS. AN EXEMPLARY PROBLEM IS PRESENTED FOR A HYPOTHETICAL FACILITY. RESULTS ILLUSTRATE REPRESENTATIVE INFORMATION THAT COULD BE UTILIZED BY SAFEGUARDS DECISION-MAKERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *FUEL REPROCESSING + *COMPUTER PROGRAM, DIGITAL + *ANALYTICAL MODEL

135860
CHAPMAN LD
PHYSICAL PROTECTION OF NUCLEAR FACILITIES QUARTERLY PROGRESS REPORT JULY-SEPTEMBER 1977
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-2137 #, 37 PPS, 2 TABS, 1 FIG, MARCH 1978

ACTIVITIES FOR FOURTH QUARTER FY 77 INCLUDED PRESENTATION OF THE ANNUAL REVIEW OF PHYSICAL PROTECTION METHODOLOGY DEVELOPMENT TO THE NRC. AN OVERVIEW OF NRC-SPONSORED WORK RELATED TO PHYSICAL PROTECTION OF NUCLEAR FACILITIES AND TO DEVELOPMENT OF SAFEGUARDS AUTOMATED FACILITY EVALUATION (SAFE) METHODOLOGY WAS PRESENTED. WORK CONTINUED ON DEVELOPMENT OF FACILITY CHARACTERIZATION METHODOLOGY, REFINEMENT OF PATH GENERATION SUBROUTINES, AND EVALUATION OF SECURITY OFFICER PERFORMANCE. ACTIVITIES RELATED TO DEVELOPMENT OF EVALUATION METHODOLOGIES HAVE FOCUSED ON DOCUMENTATION OF THE SAFE PROCESS AND FURTHER REFINEMENT OF THE ESTIMATE OF ADVERSARY SEQUENCE INTERRUPTION (ASSET) GRAPHICS AND FORCIBLE ENTRY SAFEGUARDS EFFECTIVENESS MODEL (FESEM) COMPUTER CODES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *COMPUTER PROGRAM, DIGITAL + *ANALYTICAL MODEL + HUCK + NRC-13 + JACOBS

135859
BARNES IL + DITMARS DA + BEAN VE + GARNETT CA
MEASUREMENTS AND STANDARDS FOR NUCLEAR MATERIAL SAFEGUARDS, QUARTERLY REPORT
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
NUREG/CR-0007 #,6 PPS, FEB, 1978

THIS REPORT IS A REVIEW OF THE FIRST QUARTER, START-UP PHASE OF A LONG-TERM NBS PROGRAM SPONSORED BY NRC TO UP-GRADE NATIONAL MEASUREMENTS AND STANDARDS CAPABILITY FOR NUCLEAR MATERIALS SAFEGUARDS. THE OVERALL APPROACH THAT NBS IS UTILIZING TO PROVIDE FOR DEVELOPMENT AND DISSEMINATION OF A CONSISTENT SET OF NATIONAL MEASUREMENT STANDARDS FOR NUCLEAR MATERIALS SAFEGUARDS IS PRESENTED. A SUMMARY OF THE INITIAL START-UP PROGRESS FOR EACH OF THE FIVE TASKS IN THE PROJECT IS THEN GIVEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *CODES AND STANDARDS + MEASUREMENT + *ASSAY, NONDESTRUCTIVE + HUCK + NRC-13 + JACOBS

135699
SAFEGUARDING NUCLEAR MATERIALS, VOL. I - PHYSICAL PROTECTION OF NUCLEAR MATERIAL
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.I) #, 49 PPS, PP. 199-248 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS, VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: A DECISION STRUCTURE FOR A STATE SAFEGUARDS SYSTEM, ADVANCED PHYSICAL PROTECTION SYSTEMS FOR NUCLEAR MATERIALS, AND PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL AT UNITED STATES NUCLEAR REGULATORY COMMISSION LICENSED FIXED SITES.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 1001

SAFEGUARDS, NUCLEAR MATERIAL + IAEA + SPECIAL NUCLEAR MATERIAL + AGENCY, NRC + UNITED STATES

135345
BOOZER DD + ENGI D
SIMULATION OF PERSONNEL CONTROL SYSTEMS WITH THE INSIDER SAFEGUARDS EFFECTIVENESS MODEL (ISEM)
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-0682 #, 23 PPS, 10 FIGS, REFS, APRIL 1977

INSIDE SAFEGUARDS EFFECTIVENESS MODEL (ISEM) USES SIMULATION TECHNIQUES TO ANALYZE THE EFFECTIVENESS OF A NUCLEAR FACILITY'S SAFEGUARDS SYSTEM IN COPING WITH A GROUP OF INSIDERS WHO USE CERTAIN STRATEGIES TO ACHIEVE THEFT OF SNM OR THE SABOTAGE OF THE FACILITY. ISEM'S PRIMARY CONTRIBUTION TO THE EVALUATION OF PERSONNEL CONTROL SYSTEMS, AS WELL AS MORE GENERAL SAFEGUARDS SYSTEMS, IS ITS ABILITY TO SIMULATE THE RESPONSE OF THE SAFEGUARDS SYSTEM TO ALARMS GENERATED BY SOURCES SUCH AS SENSORS, PERSONNEL, OR PROCEDURES. ISEM ALSO ADDRESSES THE TAMPERING OF SENSOR SYSTEM ELEMENTS BY INSIDERS. BY STUDYING THE CHARACTERISTICS OF THE SAFEGUARDS SYSTEM RESPONSE (USUALLY GUARDS) TO A RANGE OF INSIDER SCENARIOS, EFFECTIVE OPERATIONAL PROCEDURES CAN BE DEVELOPED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL + ANALYTICAL MODEL + SIMULATION + THEFT/DIVERSION + SABOTAGE

135344
FINE AM
PHYSICAL ATTRIBUTES OF POTENTIAL ADVERSARIES TO U.S. NUCLEAR PROGRAMS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0436C + CONF-770320-1 #, 20 PPS, FROM 2ND ANNUAL SYMPOSIUM ON ROLE OF BEHAVIORAL SCIENCES IN PHYSICAL SECURITY; GAITHERSBURG, MARYLAND, MARCH 23, 1977

135344 *CONTINUED*
SANDIA LABORATORIES HAS BEEN HEAVILY INVOLVED IN THE RESEARCH AND DEVELOPMENT OF PHYSICAL PROTECTION ELEMENTS AND SYSTEMS APPLICABLE TO THE PROTECTION OF NUCLEAR FACILITIES AND MATERIALS. A PART OF THIS EFFORT HAS INVOLVED THE CHARACTERIZATION OF POTENTIAL THREATS TO U.S. NUCLEAR PROGRAMS. THE RAND CORPORATION, UNDER CONTRACT TO SANDIA LABORATORIES, HAS INVESTIGATED SEVERAL HUNDRED INCIDENTS WHICH INVOLVED ACTIVITIES OF A TYPE WHICH CAN SERVE AS ANALOGS OF POTENTIAL THREATS TO U.S. NUCLEAR PROGRAMS. THIS PAPER SUMMARIZES THE DATA USED BY RAND AND PROVIDES A LISTING OF POTENTIAL ADVERSARY ATTRIBUTES DERIVED FROM A HISTORICAL-INCIDENT DATA BASE. THE ATTRIBUTES ARE EXPRESSED IN TERMS OF THE PHYSICAL CAPABILITIES OF A COMPOSITE ADVERSARY GROUP.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + THEFT/DIVERSION

134633
CHAPMAN LD
PHYSICAL PROTECTION OF NUCLEAR FACILITIES QUARTERLY PROGRESS REPORT APRIL-JUNE 1977
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1622 +. 28 PPS, 2 TABS, OCT. 1977

THE PHYSICAL PROTECTION OF NUCLEAR FACILITIES PROGRAM CONSISTS OF FOUR MAJOR AREAS--FACILITY CHARACTERIZATION METHODOLOGY, PATH-GENERATION/SELECTION METHODOLOGY, COMPONENT FUNCTIONAL PERFORMANCE CHARACTERIZATION, AND EVALUATION METHODOLOGY. ACTIVITIES IN EACH OF THESE AREAS FOR THE THIRD QUARTER OF FY 77 ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *ANALYTICAL MODEL + *COMPUTER PROGRAM, DIGITAL + HUCK + NRC-13 + JACOBS

134632
PWELL JA
INTERIOR INTRUSION ALARM SYSTEMS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NUREG-0320 +. 41 PPS, 3 FIGS, 10 REFS, FEB. 1978

INFORMATION IS PROVIDED ON THE VARIOUS TYPES, COMPONENTS, AND PERFORMANCE CAPABILITIES OF INTERIOR INTRUSION ALARM SYSTEMS TO ENABLE THE POTENTIAL USER TO DESIGN AND INSTALL OPTIMUM ALARM SYSTEMS. MAINTENANCE AND TESTING PROCEDURES ARE ALSO DISCUSSED. DETECTOR UNITS DISCUSSED INCLUDE VOLUMETRIC UNITS (ULTRASONIC AND MICROWAVE MOTION DETECTOR, PASSIVE INFRARED DETECTORS, AND CCTV) AND SURFACE PROTECTION DEVICES (BALANCED MAGNETIC SWITCH, INFRARED BEAM, CAPACITANCE DETECTOR, ELECTRIC-FIELD SENSOR, AND BREAK-WIRE).

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *MONITOR, PERSONNEL + *INSTRUMENT, ALARM + JACOBS

134631
ROEHRIG SC
AUTOMATIC DURESS ALARMS THROUGH PHYSIOLOGICAL RESPONSE MONITORING
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0191 +. 41 PPS, FIGS, 7 REFS, JULY 1977

PHYSIOLOGICAL RESPONSE MONITORING EQUIPMENT FOR AUTOMATIC DURESS DETECTION IS BEING DEVELOPED AND EVALUATED IN AN ATTEMPT TO IMPROVE THE RELIABILITY OF THE HUMAN ELEMENT IN SECURITY SYSTEMS. THIS PAPER DESCRIBES AN INITIAL STUDY WHICH WAS DESIGNED TO DETERMINE THE APPLICABILITY OF THE BASIC CONCEPT TO SECURITY PROBLEMS AND TO PROVIDE A SUBJECTIVE OVERVIEW OF PROBLEM AREAS PERTINENT TO CONTINUED MONITOR DEVELOPMENT. EXPERIMENTAL RESULTS INDICATED THAT UNDER CONTROLLED CONDITIONS, RESPONSE MONITORING MAY PROVIDE AN EFFECTIVE MEANS FOR PASSIVE DETERMINATION OF MODERATE TO SEVERE STRESS LEVELS IN PERSONNEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *MONITOR + STRESS + *MONITOR, PERSONNEL + *HUMAN FACTORS

134650
CRAVENS MN + *WINBLAD AE
SAFEGUARDS SYSTEM DESIGN METHODOLOGY
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0890C + CONF-770656-13 +. 20 PPS, FROM ANNUAL MEETING OF INST. OF NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 29, 1977

SANDIA LABORATORIES IS DEVELOPING METHODS FOR THE DESIGN OF PHYSICAL PROTECTION SYSTEMS TO SAFEGUARD SPECIAL NUCLEAR MATERIAL AND VITAL EQUIPMENT AT FIXED SITES. ONE METHOD IS OUTLINED AND ILLUSTRATED WITH SIMPLIFIED EXAMPLES DRAWN FROM CURRENT PROGRAMS. THE USE OF AN ADVERSARY SEQUENCE DIAGRAM AS AN ANALYSIS TOOL IS DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

134639 *CONTINUED*
*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + CONTROL + ACCOUNTABILITY + *SABOTAGE + *THEFT/DIVERSION

134648
HULME JL
MINOPT: A CODE FOR MINIMIZING DETECTION PROBABILITY UP TO A GIVEN TIME AWAY FROM A SABOTAGE TARGET
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-2039 +. 31 PP., 1 TAB, 1 FIG, 9 REFS, DEC. 1977

THIS REPORT DOCUMENTS A SUBROUTINE FOR USE BY SAFEGUARDS ANALYSTS IN DETERMINING GOOD PHYSICAL ROUTES FOR A SABOTEUR TO FOLLOW IN A FIXED-SITE FACILITY. A SABOTEUR SHOULD MINIMIZE HIS PROBABILITY OF DETECTION UNTIL HE IS SO CLOSE TO THE TARGET THAT IT IS TOO LATE FOR DEFENSIVE FORCES TO RESPOND TO AN ALARM. DIJKSTRA'S ALGORITHM FOR SHORTEST PATHS IS APPLIED TO A GRAPH WEIGHTED WITH DELAY TIMES AND DETECTION PROBABILITIES. PATHS OBTAINED BY MINOPT MINIMIZE DETECTION PROBABILITY FROM OFF-SITE UP TO A LOCUS OF POINTS A GIVEN TIME AWAY FROM A TARGET AND MINIMIZE TIME FROM THE LOCUS TO THE TARGET. BY VARYING GUARD-RESPONSE TIME THE ANALYST CAN DETERMINE A SPECTRUM OF PATHS TO A TARGET.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *COMPUTER PROGRAM, DIGITAL + SIMULATION + *ANALYTICAL MODEL + MUCK + NRC-13 + JACOBS

134647
BOOZER JD + ENGI D
INSIDER SAFEGUARDS EFFECTIVENESS MODEL (ISEM) USERS GUIDE
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0043 +. 185 PPS, 2 TABS, 25 FIGS, 10 REFS, NOV. 1977

THIS REPORT PROVIDES A COMPREHENSIVE PRESENTATION OF THE ISEM COMPUTER PROGRAM. ISEM WAS DESIGNED TO EVALUATE THE EFFECTIVENESS OF A FIXED-SITE FACILITY SAFEGUARDS SYSTEM IN COPING WITH THE THEFT, SABOTAGE, OR DISPERSAL OF RADIOLOGICAL MATERIAL BY A SINGLE PERSON WHO HAS AUTHORIZED ACCESS TO THE FACILITY. THIS INSIDER MAY BE AIDED BY A GROUP OF INSIDERS WHO COVERTLY DEGRADE SENSOR SYSTEMS. EACH ISEM RUN EVALUATES SAFEGUARDS SYSTEM PERFORMANCE FOR A PARTICULAR SCENARIO SPECIFIED BY THE USER. THE DISPATCHING OF GUARDS FOLLOWING ALARMS AND THEIR INTERACTION WITH THE INSIDER ARE EXPLICITLY TREATED BY THE MODEL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *COMPUTER PROGRAM, DIGITAL + *ANALYTICAL MODEL + SIMULATION + JACOBS

134646
CAPABILITY FOR INTRUSION DETECTION AT NUCLEAR FUEL SITES
U.S. ARMY MOBILITY EQUIPMENT RESEARCH & DEVELOPMENT COMMAND
NUREG/CR-0027 +. 90 PPS, 2 TABS, 30 FIGS, MARCH 1978

THE SAFEGUARDS VULNERABILITY ANALYSIS OF A HYPOTHETICAL NUCLEAR PROCESSING FACILITY IS DESCRIBED. THE ANALYSIS IS BASED ON OBSERVATIONS DURING FIELD EVALUATION ASSESSMENTS MADE AT THREE OPERATING NUCLEAR PROCESSING FACILITIES. VULNERABILITY ASSESSMENTS WERE TO ANALYZE EFFECTIVENESS OF SAFEGUARDS TO COMBAT THE THREAT FROM AN INSIDER; HOWEVER, THE EXTERNAL THREAT WAS ALSO CONSIDERED AND EVALUATED. **IN ADDITION, THE REPORT DESCRIBES OPERATION AND APPLICATION OF VARIOUS TYPES OF INTRUSION DETECTION SENSORS, CCTV SURVEILLANCE SYSTEMS AND ANCILLARY SECURITY EQUIPMENT OTHER THAN EQUIPMENT DESCRIBED FOR THE HYPOTHETICAL NUCLEAR PLANT. ***ANALYSES WERE CONDUCTED BY THE INTRUSION DETECTION DIVISION OF MERADCOM, FORT BELVOIR, VIRGINIA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*THEFT/DIVERSION + *SABOTAGE + *MONITOR, PERSONNEL + *INSTRUMENT, ALARM + *SAFEGUARDS, NUCLEAR MATERIAL

134162
THE MODELING OF ADVERSARY ACTION FOR SAFEGUARDS EFFECTIVENESS ASSESSMENT
LAWRENCE LIVERMORE LAB., CALIF.
UCRL-79217 (REV.1) + CONF-770656-5. 14 PPS, FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 29, 1977

DEVELOPMENT OF EVALUATIVE TOOLS BY WHICH NRC CAN ASSESS EFFECTIVENESS OF A POTENTIAL LICENSE MATERIAL CONTROL SYSTEM IS DISCUSSED. A MULTI-PHASE PROCEDURE IS BEING DEVELOPED BY LLL TO ASSESS EFFECTIVENESS OF THE MC SYSTEM. THE PROCEDURE ENTAILS GENERATION OF MC TEST INPUT, DETERMINATION OF MC RESPONSES, AND ANALYSIS OF MC RESULTS. ADVERSARY ACTION SEQUENCES AND RESULTING STIMULI ARE GENERATED BY THE PROCEDURE. STIMULI ARE IDENTIFIED BY MINIMAL CUT SETS OBTAINED FROM FAULT TREE ANALYSIS. THE FAULT TREE IS AUTOMATICALLY GENERATED FROM DIRECTED GRAPH MODELS CALLED DIGRAPHS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *ACCOUNTABILITY + *FAULT TREE ANALYSIS

132811
ENGI D
NUCLEAR FACILITY SAFEGUARDS SYSTEMS MODELING USING DISCRETE EVENT SIMULATION
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0075 + CONF-771038-2 *. 9 PPS. FROM 8TH ANNUAL CONFERENCE ON MODELING & SIMULATION, PITTSBURGH, PA., APRIL 21, 1977

THE THREAT OF THEFT OR DISPERSAL OF SPECIAL NUCLEAR MATERIAL AT A NUCLEAR FACILITY IS TREATED BY STUDYING THE TEMPORAL RELATIONSHIPS BETWEEN ADVERSARIES HAVING AUTHORIZED ACCESS TO THE FACILITY (INSIDERS) AND SAFEGUARDS SYSTEM EVENTS BY USING A GASP IV DISCRETE EVENT SIMULATION. THE SAFEGUARDS SYSTEM EVENTS--DETECTION, ASSESSMENT, DELAY, COMMUNICATIONS, AND NEUTRALIZATION--ARE MODELED FOR THE GENERAL INSIDER ADVERSARY STRATEGY, WHICH INCLUDES DEGRADATION OF THE SAFEGUARDS SYSTEM ELEMENTS FOLLOWED BY AN ATTEMPT TO STEAL OR DISPERSE SPECIAL NUCLEAR MATERIAL. THE PERFORMANCE MEASURE USED IN THE ANALYSIS IS THE ESTIMATED PROBABILITY OF SAFEGUARDS SYSTEM SUCCESS IN COUNTERING THE ADVERSARY BASED UPON A PREDETERMINED SET OF ADVERSARY ACTIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + MODEL + *SIMULATION + COMPUTER PROGRAM + HUCK + NRC-13 + JACOBS

132432
JACOBSEN SE
OPTIMAL IMPROVEMENT OF GRAPHS RELATED TO NUCLEAR SAFEGUARDS PROBLEMS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-0435 *. 30 PP., 1 TAB, 1 FIG, 3 REFS, OCT. 1977

DEVELOPS THE METHODOLOGY FOR OPTIMALLY IMPROVING GRAPHS RELATED TO NUCLEAR SAFEGUARDS ISSUES. IN PARTICULAR, GIVEN A FIXED NUMBER OF DOLLARS, THE REPORT PROVIDES A METHOD FOR OPTIMALLY ALLOCATING SUCH DOLLARS OVER THE ARCS OF A WEIGHTED GRAPH (THE WEIGHTS VARY AS A FUNCTION OF DOLLARS SPENT ON ARCS) SO AS TO IMPROVE THE SYSTEM EFFECTIVENESS MEASURE WHICH IS THE SHORTEST OF ALL SHORTEST PATHS TO SEVERAL TARGETS. ARC WEIGHTS CAN BE EITHER CLOCK TIMES OR DETECTION PROBABILITIES AND THE ALGORITHM DOES NOT EXPLICITLY CONSIDER ALL PATHS TO THE TARGETS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + MODEL + *OPTIMIZATION + PROBABILITY + HUCK + NRC-13 + JACOBS

132431
ADAMS KG + TRUJILLO AA
TENTATIVE JOB ANALYSIS FOR A HIGH-LEVEL, FIXED-SITE, NUCLEAR SECURITY OFFICER
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-1400 *. 32 PP., 3 REFS, OCT. 1977

A TENTATIVE JOB ANALYSIS FOR A HIGH-LEVEL, FIXED-SITE, NUCLEAR SECURITY OFFICER IS PRESENTED. THE PRIMARY OBJECTIVE OF THE REPORT IS TO PROVIDE A FRAMEWORK FOR EVALUATING THE FUNCTIONS OF A SECURITY OFFICER IN PHYSICAL PROTECTION SYSTEMS. SEVERAL JOB REQUIREMENTS RELATED TO DUTIES, BASIC SKILLS, PERSONAL CONTACTS, SUPERVISION, WORKING CONDITIONS, AND DECISION MAKING ARE PRESENTED. INDIVIDUAL CHARACTER TRAITS DESIRABLE IN SECURITY OFFICERS ARE DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + *SECURITY + *SYSTEM ANALYSIS + ON SITE + NRC-13 + HUCK + JACOBS

132413
ENGI D + BOOZER DD
THE USE OF ISEM IN STUDYING THE IMPACT OF GUARD TACTICS ON FACILITY SAFEGUARDS SYSTEM EFFECTIVENESS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0410C *. 14 PPS, 2 TABS, 1 FIG, 4 REFS, JULY 1977

THE INSIDER SAFEGUARDS EFFECTIVENESS MODEL (ISEM) IS A STOCHASTIC, DISCRETE EVENT, MONTE-CARLO SIMULATION MODEL USED TO ASSESS THE EFFECTIVENESS OF PHYSICAL PROTECTION SYSTEMS FOR FACILITIES WHICH STORE, PROCESS, OR USE SNM. ISEM SIMULATES INTERACTION OF A GROUP OF INSIDERS WITH THE FACILITY'S SAFEGUARDS SYSTEM. THE SENSITIVITY OF SAFEGUARDS SYSTEM EFFECTIVENESS TO A VARIETY OF GUARD TACTICS IS EXPLORED. THE EVOLUTION OF COMPREHENSIVE GUARD TACTICS FOR PROTECTING A HYPOTHETICAL FACILITY IS DEMONSTRATED. ATTENTION IS FOCUSED ON THE POTENTIAL THREAT POSED BY INSIDERS AND THE NECESSITY OF WELL CONCEIVED GUARD TACTICS IN DEALING WITH THIS THREAT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *MONTE CARLO + *ANALYTICAL MODEL

130732
BALDONADO OC + KEVANY M + RODNEY D + PITTS D + MAZUR M + STEPHENS P + OLCOTT V
SAFEGUARDS SYSTEMS CONCEPTS FOR NUCLEAR MATERIAL TRANSPORTATION
SYSTEM DEVELOPMENT CORP., MCLEAN, VA.

130732 *CONTINUED*
NUREG-0339 *. 222 PPS. TABS. FIGS. REFS. SEPT. 1977

THE NRC OFFICE OF NUCLEAR REGULATORY RESEARCH COMMISSIONED A PROJECT TO DEVELOP INTEGRATED SYSTEM CONCEPTS FOR THE SAFEGUARD OF NUCLEAR MATERIALS AGAINST MALEVOLENT ACTION DURING INTERFACILITY TRANSPORT. THE CONDUCT AND FINDINGS OF THE PROJECT ARE PRESENTED. POTENTIAL THREATS BY TERRORISTS AND OTHERS TO INTERFACE WITH NUCLEAR MATERIALS IN TRANSIT ARE ADDRESSED AND MEASURES WHICH CAN BE TAKEN TO REDUCE BOTH THE LIKELIHOOD OF SUCH THREATS AND THE PROBABILITY OF SUCCESS IF CARRIED OUT ARE RECOMMENDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + DESIGN CRITERIA + *SPECIAL NUCLEAR MATERIAL + TRANSPORTATION AND HANDLING + HJCK + NRC-13 + JACOBS

130577
BALDONADO OC + KEVANY M + RODNEY D + PITTS D + MAJOR M + STEPHENS P + DECUFF V
EXECUTIVE SUMMARY OF SAFEGUARDS SYSTEMS CONCEPTS FOR NUCLEAR MATERIAL TRANSPORTATION
SYSTEM DEVELOPMENT CORP., MCLEAN, VA
NUREG-0334 *. 11 PPS. SEPT. 1977

THE NRC OFFICE OF NUCLEAR REGULATORY RESEARCH CONTRACTED WITH SYSTEM DEVELOPMENT CORPORATION (SDC) TO DEVELOP INTEGRATED SYSTEM CONCEPTS FOR THE SAFEGUARD OF SPECIAL STRATEGIC NUCLEAR MATERIALS (SSNM) AGAINST MALEVOLENT ACTION DURING INTERFACILITY TRANSPORT. THE CONDUCT AND FINDINGS OF THE PROJECT ARE OUTLINED. THE STUDY WAS DIVIDED INTO THREE MAJOR SUBTASKS: THE DEVELOPMENT OF ADVERSARY ACTION SEQUENCES. THE ASSESSMENT OF THE VULNERABILITY OF THE TRANSPORT OF NUCLEAR MATERIALS TO ADVERSARY ACTION. THE DEVELOPMENT OF CONCEPTUAL SAFEGUARDS SYSTEM DESIGN REQUIREMENTS TO REDUCE VULNERABILITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + DESIGN CRITERIA + *SPECIAL NUCLEAR MATERIAL + TRANSPORTATION AND HANDLING + JACOBS + HJCK + NRC-13

130572
SHAPPERT LB + HAMEL WR
DESIRABILITY AND FEASIBILITY OF VAULT AUTOMATION IN SPECIAL NUCLEAR MATERIAL STORAGE
OAK RIDGE NATIONAL LAB., TENN.
NUREG-0318 + ORNL/NUREG-20 *. 97 PPS. REFS. OCT. 1977

ADVANTAGES ARE DISCUSSED OF INCREASING MECHANIZATION AND/OR AUTOMATION OF VAULTS FOR STORING SPECIAL NUCLEAR MATERIAL (SNM) TO IMPROVE SAFEGUARDS EFFECTIVENESS. PERFORMANCE CRITERIA FOR MEASURING SAFEGUARDS EFFECTIVENESS IS ESTABLISHED AND APPLIED TO FOUR SYSTEMS WITH DIFFERENT DEGREES OF MECHANIZATION AND AUTOMATION. RESULTS INDICATE SAFEGUARDS BENEFITS INCREASE WITH MORE AUTOMATION. DESIRABILITY OF AUTOMATING SNM-STORAGE VAULTS DEPENDS ON TYPE OF SYSTEM, DEGREE OF AUTOMATION AND EQUIPMENT RELIABILITY. INCREASE IN COSTS ATTRIBUTABLE TO AUTOMATION IS SMALL COMPARED TO BASIC COSTS OF FUEL FABRICATION AND REPROCESSING PLANTS. VAULT AUTOMATION IS DESIRABLE AND FEASIBLE FROM ECONOMIC AND TECHNICAL VIEWPOINTS AND CAN CONTRIBUTE SUBSTANTIALLY TO SAFEGUARDING OF SNM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + STORAGE CONTAINER + THEFT/DIVERSION

129484
GALLAGHER RJ + STIMMELL KG + WAGNER NR
THE CONFIGURATION OF ROAD CONVOYS: A SIMULATION STUDY
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-8625 *. 23 PPS. FROM 18TH ANNUAL MEETING OF THE INSTITUTE FOR NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 28-30, 1977

AN IMPORTANT ELEMENT IN THE EVALUATION OF TRANSPORTATION SAFEGUARDS SYSTEMS IS THE ANALYSIS OF CONVOY CONFIGURATIONS. THE ANALYSIS SHOULD EXAMINE THE INFLUENCE OF VEHICLE DEPLOYMENT AND TACTICS, COMMUNICATIONS STRATEGIES, VULNERABILITIES, AND ADVERSARY CHARACTERISTICS ON SURVIVABILITY AND EMERGENCY SIGNAL PROBABILITY. A COMPUTERIZED MODEL, SOURCE, HAS BEEN DEVELOPED WHICH SIMULATES THE INITIAL INTERACTION BETWEEN A CONVOY AND AN ADVERSARY FORCE. THIS PAPER BRIEFLY DESCRIBES THE MODEL AND PRESENTS EXAMPLE RESULTS FOR SEVERAL VEHICLE CONVOY CONFIGURATIONS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TRANSPORTATION AND HANDLING + SAFEGUARDS, NUCLEAR MATERIAL + *TRUCK + ANALYTICAL MODEL + COMPUTER PROGRAM + *THEFT/DIVERSION + NRC-13 + HJCK + JACOBS

129482
CHAPMAN LD
PHYSICAL PROTECTION OF NUCLEAR FACILITIES QUARTERLY PROGRESS REPORT JANUARY-MARCH 1977
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0999 *. 31 PPS. 2 TABS. 1 FIG. JULY 1977

129482 RUNTING J*
THE PHYSICAL PROTECTION OF NUCLEAR FACILITIES PROGRAM CONSISTS OF FOUR MAJOR AREAS--EVALUATION METHODOLOGY DEVELOPMENT, PATH GENERATION/SELECTION METHODOLOGY, FACILITY CHARACTERIZATION, AND COMPONENT FUNCTIONAL PERFORMANCE CHARACTERIZATION. ACTIVITIES IN EACH OF THESE AREAS ARE SUMMARIZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + SABOTAGE + *R AND D PROGRAM + SAFETY PROGRAM + SAFETY EVALUATION + NRC-13 + HJCK + JACOBS

129481
KEETON SC + DE LAQUIL P
CONFLICT SIMULATION FOR SURFACE TRANSPORT SYSTEMS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-8624 +. 23 PPS. PRESENTED AT 18TH ANNUAL MEETING OF THE INSTITUTE FOR NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 28-30, 1977

AN IMPORTANT ELEMENT IN THE ANALYSIS OF TRANSPORTATION SAFEGUARDS SYSTEMS IS THE DETERMINATION OF THE OUTCOME OF AN ARMED ATTACK AGAINST THE SYSTEM. SUCH INFORMATION IS NECESSARY TO UNDERSTAND RELATIONSHIPS AMONG THE VARIOUS DEFENDER TACTICS, WEAPONS SYSTEMS, AND ADVERSARY ATTRIBUTES. A BATTLE MODEL, SABRES, WHICH CAN SIMULATE SAFEGUARDS ENGAGEMENTS IS UNDER DEVELOPMENT. THIS PAPER BRIEFLY DESCRIBES THE FIRST PHASE OF SABRES AND PRESENTS SOME EXAMPLES OF ITS CAPABILITIES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*R AND D PROGRAM + SAFETY PROGRAM + *TRANSPORTATION AND HANDLING + *SAFEGUARDS, NUCLEAR MATERIAL + COMPUTER PROGRAM + THEFT/DIVERSION + TRUCK + NRC-13 + HJCK + JACOBS

129480
DERDIGER KP
ESTIMATING THE AVAILABILITY OF LLEA OFFICERS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-8626 +. 21 PPS. PRESENTED AT 18TH ANNUAL MEETING OF THE INSTITUTE FOR NUCLEAR MATERIALS MANAGEMENT; WASHINGTON, D.C., JUNE 28-30, 1977

AN IMPORTANT ELEMENT IN THE ANALYSIS OF TRANSPORTATION SAFEGUARDS SYSTEMS IS THE DETERMINATION OF THE AVAILABILITY OF LOCAL LAW ENFORCEMENT AGENTS. SUCH INFORMATION IS NECESSARY TO IDENTIFY AREAS WHERE THERE ARE FEW OFFICERS AVAILABLE AND TO MAKE COMPARISONS OF ALTERNATIVE ROUTES. A COMPUTERIZED MODEL, COPS, HAS BEEN DEVELOPED WHICH RAPIDLY ESTIMATES THE TOTAL NUMBER OF OFFICERS ALONG A HIGHWAY ROUTE. THIS PAPER BRIEFLY DESCRIBES THE MODEL AND PRESENTS EXAMPLE RESULTS FOR SEVERAL ROUTES IN CALIFORNIA AND NEVADA.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*R AND D PROGRAM + SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + COMPUTER PROGRAM + TRUCK + NRC-13 + HJCK + JACOBS + *TRANSPORTATION AND HANDLING

128855
RINNE RL
THE EVALUATION OF SAFEGUARDS SYSTEMS FOR NUCLEAR MATERIALS IN TRANSIT - THE DEVELOPMENT OF THE PROGRAM PLAN
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-8249 +. 33 PPS, 13 FIGS, JULY 1977

THIS REPORT IS BASED UPON PRESENTATIONS GIVEN TO THE NRC ADMINISTRATION AND STAFF AND TO SANDIA LABORATORIES, LIVERMORE AND ALBUQUERQUE, STAFF IN FEBRUARY 1977. THE PURPOSE OF THESE PRESENTATIONS WAS TO DESCRIBE THE PROGRAM PLAN FOR THE PHYSICAL PROTECTION OF NUCLEAR MATERIAL IN TRANSIT AND TO PRESENT HIGHLIGHTS OF THE CURRENT STATUS FROM SEVERAL OF THE SECURITY STUDY AREAS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*TRANSPORTATION AND HANDLING + *SAFEGUARDS, NUCLEAR MATERIAL + SYSTEM ANALYSIS + PROTECTION SYSTEM + SECURITY + NRC-13 + HJCK + JACOBS

128491
SAMPSON TE + FEHLAU PE
SODIUM IODIDE AND PLASTIC SCINTILLATOR DOORWAY MONITOR RESPONSE TO SHIELDED REACTOR GRADE PLUTONIUM
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6566-MS +. 20 PPS, 9 TABS, 15 FIGS, NOV, 1976

PRESENTS THE RESULTS OF MEASUREMENTS TO DETERMINE THE RESPONSE OF TYPICAL DOORWAY MONITORS TO HEAVILY SHIELDED REACTOR-GRADE PLUTONIUM. THESE MEASUREMENTS WERE MADE TO AID THE BROOKHAVEN NATIONAL LABORATORY IN THEIR STUDY OF THE FEASIBILITY OF SPIKING NUCLEAR FUELS FOR SAFEGUARDS PURPOSES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SCINTILLATION + MONITOR + INSTRUMENT, NUCLEAR + INSTRUMENT, SURVEILLANCE + *SAFEGUARDS, NUCLEAR MATERIAL + *TEST, INSTRUMENT RESPONSE + PLUTONIUM + MEASUREMENT

128334
WAGNER DK
A SURVEY OF THREAT STUDIES RELATED TO THE NUCLEAR POWER INDUSTRY
SANDIA LABS., ALBUQUERQUE, N.M.
SAND77-0054 +. 47 PPS. 2 TABS. 3 FIGS. 27 REFS. AUG. 1977

A CONSIDERABLE EFFORT HAS BEEN DIRECTED TOWARD THE DETERMINATION OF THREAT CHARACTERISTICS, RESULTING IN A VOLUMINOUS COLLECTION OF DOCUMENTS. THIS REPORT SUMMARIZES SEVERAL OF THE MAJOR STUDIES IN ORDER TO MAKE THE INFORMATION MORE ACCESSIBLE. THIS SUMMARY INCLUDES ONLY STUDIES INVOLVING ATTACKS ON NUCLEAR MATERIAL, PLUS THOSE INCIDENTS WHICH BECAUSE OF THEIR OBJECTIVES, RESOURCES, OR MOTIVATIONS MAY LEND INSIGHT INTO POTENTIAL THREAT AGAINST NUCLEAR FACILITIES OR MATERIAL.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SABOTAGE + THEFT/DIVERSION + SAFEGUARDS, NUCLEAR MATERIAL + HUCK + NRC-13 + JACOBS

128318
DONNELLY H + FULWOOD R + GLANCY J + GOZANI T
VISA - A METHOD FOR EVALUATING THE PERFORMANCE OF INTEGRATED SAFEGUARDS SYSTEMS AT NUCLEAR FACILITIES
SCIENCE APPLICATIONS INC., LAJOLLA, CALIF.
NUREG-0317(VOL.2) +. 144 PPS. AUG. 1977

THIS VOLUME CONTAINS FOUR APPENDICES THAT SUPPORT THE DESCRIPTION OF THE VISA CONCEPT. APPENDIX 1 DISCUSSES PATH ANALYSIS METHODOLOGY, APPLIES IT TO A MODEL FUEL FACILITY, AND DESCRIBES THE COMPUTER CODES THAT ARE BEING USED. APPENDIX 2 DEALS WITH DETECTION ANALYSIS, SPECIFICALLY THE SCHEMES USED FOR CLASSIFYING ADVERSARIES. APPENDIX 3 DESCRIBES THE CONTAINMENT ANALYSIS (EVENT-SEGMENT PATH RANKING THE MONTE CARLO ENGAGEMENT MODEL, AND THE RESULTS OF A SENSITIVITY ANALYSIS. APPENDIX 4 PRESENTS GENERAL EQUATIONS USED IN THE INTERRUPTION ANALYSIS FOR COMBINING COVERT-OVERT SEGMENTS AND COMPARES THEM WITH EQUATIONS GIVEN IN VOL 1 CHAPT. 3.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

THEFT/DIVERSION + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + PROTECTION SYSTEM + SECURITY + PERFORMANCE + MONTE CARLO + SENSITIVITY ANALYSIS + JACOBS

128317
DONNELLY H + MELLING P + FULWOOD R + NICASTRO J
VISA - A METHOD FOR EVALUATING THE PERFORMANCE OF INTEGRATED SAFEGUARDS SYSTEMS AT NUCLEAR FACILITIES
SCIENCE APPLICATIONS INC., LAJOLLA, CALIF.
NUREG-0317(VOL.1) +. 122 PPS. 13 TABS. 40 FIGS. REFS. AUG. 1977

DESCRIBES AN EVALUATION METHOD FOR MEASURING THE PERFORMANCE OF AN INTEGRATED SAFEGUARDS SYSTEM DESIGN IN PREVENTING THEFT AND SABOTAGE BY A SPECTRUM OF THREATS. THE METHOD MAY ALSO BE USEFUL IN EVALUATING AN OPERATING INTEGRATED SAFEGUARDS SYSTEM, BOTH WITH REGARD TO MEETING DESIGN CRITERIA AND PERFORMANCE CRITERIA. THE ASSURANCE THAT DESIGN CRITERIA ARE MET CAN BE PROVIDED BY QUALITY ASSURANCE PROGRAMS WHICH INCLUDES INSPECTIONS, TESTS AND AUDITS. THE INDEPENDENT ASSURANCE THAT PERFORMANCE CRITERIA ARE MET CAN BE PROVIDED IN PART BY MATERIAL ACCOUNTING SYSTEMS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

THEFT/DIVERSION + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + PROTECTION SYSTEM + SECURITY + PERFORMANCE + POWER PLANT, NUCLEAR + JACOBS

127323
HARTWAY PL + SHASKEY E J
THE LASL UPGRADED ALARM SYSTEM FUNCTIONAL REQUIREMENTS
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6820-MS +. 24 PPS. JUNE 1977

DEFINES AND DESCRIBES THE FUNCTIONAL REQUIREMENTS TO SUCCESSFULLY PROVIDE LOS ALAMOS SCIENTIFIC LABORATORY WITH A COMBINED SECURITY AND FIRE ALARM SYSTEM THAT WILL SATISFY THE OPERATIONAL NEEDS OF VARIOUS USERS AND PROVIDE COMPLIANCE WITH APPLICABLE CODES AND SECURITY AND FIRE PROTECTION REQUIREMENTS. THE FOUR MAJOR SUBSYSTEMS OF THE UPGRADED LABORATORY ALARM SYSTEM ARE FIELD INSTALLATION, DATA COMMUNICATIONS, CENTRAL STATION, AND REMOTE OPERATION STATION.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *FIRE PROTECTION + PROTECTION SYSTEM + DESIGN CRITERIA + INSTRUMENT, ALARM + LASL + JACOBS

127334
ENGEL D
A SMALL-SCALE ENGAGEMENT MODEL WITH ARRIVALS: ANALYTICAL SOLUTIONS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-0058 + NUREG-0238 +. 27 PPS. 2 TABS. 7 FIGS. APRIL 1977

THIS REPORT PRESENTS AN ANALYTICAL MODEL OF SMALL-SCALE BATTLES. THE IMPETUS WAS PROVIDED BY A

127314 *CONTINUED*
NEED TO CHARACTERIZE HYPOTHETICAL BATTLES BETWEEN GUARDS AT A NUCLEAR FACILITY AND THEIR POTENTIAL ADVERSARIES. THE SELLTEN PROCEDURE CAN BE USED TO FIND MEASURES OF A NUMBER OF CRITICAL PARAMETERS; FOR EXAMPLE, THE *IN PROBABILITIES AND THE EXPECTED DURATION OF THE BATTLE. NUMERICAL SOLUTIONS ARE OBTAINABLE IF THE TOTAL NUMBER OF INDIVIDUAL COMBATANTS ON THE OPPOSING SIDES IS LESS THAN 10. FOR SMALLER FORCE SIZE BATTLES, *ITH ONE OR TWO COMBATANTS ON EACH SIDE, SYMBOLIC SOLUTIONS CAN BE FOUND.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + SYSTEM ANALYSIS + COMPUTER PROGRAM + *MODEL + SENSITIVITY ANALYSIS + HJCK + NRC-13 + THEFT/DIVERSION + JACOBS

126191
HAMM HL + HARLEY JG + PORTLOCK JM
SEISMIC INTRUSION DETECTION SYSTEM
U.S. PATENT 3,984,803 +, OCT. 5, 1976

THIS PATENT CONCERNS A SYSTEM FOR MONITORING MAN-ASSOCIATED SEISMIC MOVEMENTS *ITHIN A CONTROL AREA INCLUDING A GEOPHONE FOR GENERATING AN ELECTRICAL SIGNAL IN RESPONSE TO SEISMIC MOVEMENT, A BANDPASS AMPLIFIER AND THRESHOLD DETECTOR FOR ELIMINATING UNWANTED SIGNALS, PULSE COUNTING SYSTEM FOR COUNTING AND STORING THE NUMBER OF SEISMIC MOVEMENTS *ITHIN THE AREA, AND A MONITORING SYSTEM OPERABLE ON COMMAND HAVING A VARIABLE FREQUENCY OSCILLATOR GENERATING AN AUDIO FREQUENCY SIGNAL PROPORTIONAL TO THE NUMBER OF SAID SEISMIC MOVEMENTS.

AVAILABILITY - THE U.S. PATENT OFFICE, DEPT. OF COMMERCE, *ASHINGTON, D.C.

UNITED STATES + PATENT + MONITOR + *INSTRUMENTS, MISC. + *ACOUSTICS + SEISMIC DESIGN + SAFEGUARDS, NUCLEAR MATERIAL

125960
BENNETT HA
THE *EASI* APPROACH TO PHYSICAL SECURITY EVALUATION
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-0500 + NUREG76J145 +, 35 PPS, 7 TABS, 6 FIGS, 3 REFS, JAN. 1977

A SIMPLE, EASY TO USE METHOD, CALLED ESTIMATE OF ADVERSARY SEQUENCE INTERRUPTION (EASI), HAS BEEN DEVELOPED TO EVALUATE PHYSICAL SECURITY SYSTEM PERFORMANCE UNDER SPECIFIED CONDITIONS OF THREAT AND SYSTEM OPERATION. THE METHOD CONSISTS OF A PROBABILISTIC ANALYSIS OF THE INTERACTIONS OF BASIC SECURITY FUNCTIONS, SUCH AS DETECTION, COMMUNICATIONS, RESPONSE, ETC. THE EVALUATION CAN BE PERFORMED ON A HAND-HELD PROGRAMMABLE CALCULATOR. THE RESULTS OF THE ANALYSIS ARE EXPRESSED IN TERMS OF THE PROBABILITY THAT THE PHYSICAL PROTECTION SYSTEM CAN RESPOND IN TIME TO INTERRUPT SPECIFIC ADVERSARY ACTION SEQUENCES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + SPECIAL NUCLEAR MATERIAL + SABOTAGE + THEFT/DIVERSION + FUEL CYCLE + *RESPONSE TIME + PROBABILITY + NRC-13 + HJCK + JACOBS

125959
BENNETT HA
USER'S GUIDE FOR EVALUATING PHYSICAL SECURITY CAPABILITIES OF NUCLEAR FACILITIES BY THE EASI METHOD
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0082 + NUREG-0184 +, 77 PPS, TABS, FIGS, REFS, JUNE 1977

THE OBJECTIVE OF THIS HANDBOOK IS TO PROVIDE A GUIDE FOR EVALUATING PHYSICAL SECURITY OF NUCLEAR FACILITIES USING THE 'ESTIMATE OF ADVERSARY SEQUENCE INTERRUPTION (EASI)' METHOD AND A HAND-HELD PROGRAMMABLE CALCULATOR. THE HANDBOOK IS INTENDED FOR USE BY PERSONNEL AT FACILITIES *HERE SPECIAL NUCLEAR MATERIALS (SNM) ARE USED, PROCESSED, OR STORED. IT MAY ALSO BE USED AS A DESIGN AID FOR SUCH FACILITIES BY POTENTIAL LICENSEES. THE BASIS FOR THE EASI METHOD IS THAT, FOR RESOLUTE THEFT OR SABOTAGE ATTEMPTS TO BE AVERTED AT NUCLEAR FACILITIES, THE RESPONSE FORCE MUST BE NOTIFIED OF THE ATTEMPT *HILE THERE IS STILL SUFFICIENT TIME REMAINING IN THE ADVERSARY'S ACTION SEQUENCE FOR THE FORCE TO RESPOND AND INTERRUPT THE SEQUENCE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + *GUIDE + SPECIAL NUCLEAR MATERIAL + SABOTAGE + THEFT/DIVERSION + FUEL CYCLE + NRC-13 + HJCK + JACOBS

125239
CHAPMAN LD
PHYSICAL PROTECTION OF NUCLEAR FACILITIES QUARTERLY PROGRESS REPORT, OCTOBER-DECEMBER 1976
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0487 + NUREG-0225 +, 24 PPS, APRIL 1977

ACTIVITIES FOR THE FIRST QUARTER OF FY 77 INCLUDED THE PREPARATION OF PRESENTATIONS ON THE PHYSICAL PROTECTION OF NUCLEAR FACILITIES PROGRAM FOR THE NRC REVIEW COMMITTEE (NOVEMBER 16, 17, 19, 1976) AT SANDIA LABORATORIES, LIVERMORE, CALIFORNIA. ALSO, A DRAFT PROGRAM PLAN ON THE PROTECTION OF NUCLEAR MATERIALS FOR BOTH FIXED FACILITIES AND IN-TRANSIT SYSTEMS *AS SUBMITTED TO THE NRC. OTHER ACTIVITIES HAVE FOCUSED PRIMARILY ON THE DEVELOPMENT OF EVALUATION METHODOLOGIES.

125239 *CONTINUED*
A LARGE EFFORT HAS BEEN EXPENDED IN DEFINING AND INTERFACING WITH POSSIBLE CONTRACTUAL SUPPORT INVOLVEMENTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + PROTECTION SYSTEM + *SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + *ANALYTICAL MODEL + DESIGN STUDY

125233
HASSELTINE EH + DE LAGUIL P + LEARY PL
SPECIAL NUCLEAR MATERIAL FLOW PROJECTIONS FOR THE COMMERCIAL NUCLEAR INDUSTRY
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-8276 + NUREG-0120 +. 54 PPS, MARCH 1977

PROJECTIONS OF THE FLOWS OF SPECIAL NUCLEAR MATERIAL WITHIN THE COMMERCIAL NUCLEAR POWER INDUSTRY ARE PRESENTED. BASED ON POWER LEVELS AND TYPES OF REACTORS, SUBJECT TO ASSUMPTIONS REGARDING PLANT LOAD FACTORS AND RECYCLE OF REACTOR PRODUCTS, TOTAL MONTHLY MATERIAL FLOWS BETWEEN OPERATING FUEL CYCLE FACILITIES FROM 1976 TO 2000 ARE EXAMINED. NUCLEAR POWER PLANT COMMITMENTS AS OF JULY 1, 1976, ARE USED TO PROJECT INDUSTRY GROWTH THROUGH THE EARLY 1980S, AND RECENT NUCLEAR GROWTH PROJECTS ARE ASSUMED BEYOND 1985. THE PROJECTED YEARLY FLOWS OF SPECIAL NUCLEAR MATERIAL ARE PRESENTED, AND FOR EXAMPLE PURPOSES, THE YEARLY NUMBERS OF SINGLE SHIPMENTS ARE CALCULATED ASSUMING CONVENTIONAL TRUCK CARRIERS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + *FUEL CYCLE + N-POWER FORECAST + FORECAST + MATERIAL + FLOW + FUEL RECYCLE + PLUTONIUM + TUCK + NRC-13

124000
*ALIGURA A + KONNOV Y + SMITH RM + HODGKINSON J
SAFEGUARDING ON-POWER FUELLED REACTORS - INSTRUMENTATION AND TECHNIQUES
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA + ATOMIC ENERGY OF CANADA LTD., *WHITESHELL ESTABLISHMENT, MANITOBA + ATOMIC ENERGY CONTROL BOARD, OTTAWA
IAEA-CN-36/185 +. 10 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THERE ARE NOW 10 CANDU NUCLEAR POWER REACTORS OPERATING IN THE WORLD, WITH A FURTHER 16 UNDER CONSTRUCTION. THESE ARE LOCATED IN FIVE COUNTRIES. INTERNATIONAL ATOMIC ENERGY AGENCY SAFEGUARDS ARE BEING APPLIED TO ALL THESE REACTORS UNDER THE TERMS OF THE NON-PROLIFERATION TREATY OR OTHER AGREEMENTS. BETTER EQUIPMENT AND TECHNIQUES FOR THE APPLICATION OF SAFEGUARDS HAVE BEEN DEVELOPED OVER THE PAST TWO YEARS THROUGH AN IAEA RESEARCH AGREEMENT BETWEEN THE IAEA DEPARTMENT OF SAFEGUARDS AND INSPECTION, THE CANADIAN ATOMIC ENERGY CONTROL BOARD AND ATOMIC ENERGY OF CANADA LIMITED. THIS PAPER DESCRIBES THE PROBLEMS ENCOUNTERED, THE TECHNIQUES AND EQUIPMENT DEVELOPED, AND THE PRACTICAL DEMONSTRATION OF THE APPLICATION OF ENHANCED SAFEGUARDS TO THE CANDU REACTOR.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

*SAFEGUARDS, NUCLEAR MATERIAL + REACTOR, H2O + *CANDU (H2O) + IAEA + *EQUIPMENT DEVELOPMENT + THEFT/DIVERSION + INSTRUMENT, SURVEILLANCE + INSTRUMENT, OPTICAL + TELEVISION + REMOTE MANIPULATING AND VIEWING

124042
NUCLEAR SECURITY PERSONNEL - INTERIM QUALIFICATION AND TRAINING REQUIREMENTS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NUREG-0219 +. 53 PPS, MARCH 1977

THESE GENERAL CRITERIA ESTABLISH MINIMUM REQUIREMENTS FOR THE QUALIFYING, TRAINING AND EQUIPPING OF GUARDS/ARMED RESPONSE INDIVIDUALS WHO WILL BE RESPONSIBLE FOR PROTECTING SPECIAL NUCLEAR MATERIALS AND NUCLEAR POWER FACILITIES. PERFORMANCE AND RELIABILITY OF THE GUARD FORCE CAN BE ASSURED BY STRICT ADHERENCE TO PROGRAMS OF PREEMPLOYMENT SCREENING, TRAINING AND QUALIFICATION, AND TESTING AND REQUALIFICATION WHICH ARE DESCRIBED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + TRAINING + QUALIFICATION + SPECIAL NUCLEAR MATERIAL

123725
BENNETT HA + BUDZER DD + CHAPMAN LD
SAFEGUARDS EFFECTIVENESS MODELING
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-5234 + CONF-760613-6 +. 18 PPS, FROM 17TH ANNUAL MEETING OF THE INST. OF NUCLEAR MATERIALS MANAGEMENT; SEATTLE, WASH., JUNE 23, 1976

A GENERAL METHODOLOGY FOR THE COMPARATIVE EVALUATION OF PHYSICAL PROTECTION SYSTEM EFFECTIVENESS AT NUCLEAR FACILITIES IS PRESENTLY UNDER DEVELOPMENT. THE APPROACH IS APPLICABLE TO PROBLEMS OF SABOTAGE OR THEFT AT FUEL CYCLE FACILITIES. IN THIS PAPER, THE OVERALL METHODOLOGY AND THE PRIMARY ANALYTIC TECHNIQUES USED TO ASSESS SYSTEM EFFECTIVENESS ARE BRIEFLY OUTLINED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

122725 *CONTINUED*
SAFEGUARDS, NUCLEAR MATERIAL * SECURITY * SABOTAGE * THEFT/DIVERSION * ANALYTICAL MODEL

123714
SORENSON RJ * STEWART KB * SCHNEIDER RA
THE TECHNICAL OBJECTIVES OF INSPECTION
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-SA-5731 * CONF-760615-13 *. 19 PPS. FROM 17TH ANNUAL MEETING OF THE INST. OF NUCLEAR MATERIALS MANAGEMENT; SEATTLE, WASH., JUNE 23, 1976

THE PURPOSE OF THIS PAPER IS TO DISCUSS IN A VERY GENERAL WAY THE VARIOUS TECHNICAL OBJECTIVES OF INSPECTION. THIS INCLUDES HOW THE INSPECTION FUNCTION IS RELATED TO THE ASSUMED THREAT, THE VARIOUS DEGREES OF ASSURANCE AND RELIANCE ON CRITERIA, AND THE HIERARCHY OF ASSURANCE WHICH IS OBTAINED FROM THE VARIOUS TYPES OR LEVELS OF INSPECTION. THE OBJECTIVES ARE INFLUENCED BY THE ASSUMPTIONS MADE WITH REGARDS TO BOTH THE POTENTIAL ADVERSARY AND THE CAPABILITIES OF THE ADVERSARY. ALSO, THE OBJECTIVES VARY WITH THE HIERARCHY OF INSPECTION AUTHORITY. THIS DISCUSSION SUMMARIZES SOME OF THE IDEAS AND COMMENTS WHICH WERE DEVELOPED BY OTHER AUTHORS AT PNL SINCE 1957.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

INSERVICE INSPECTION * EXAMINATION * SAFEGUARDS, NUCLEAR MATERIAL

123399
CHAPMAN LD * DEMONTMOLLIN JM * DEVENEY JE
DEVELOPMENT OF AN ENGINEERED SAFEGUARDS SYSTEM CONCEPT FOR A MIXED-OXIDE FUEL FABRICATION FACILITY
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-0180 *. 48 PPS, 2 TABS, 19 FIGS, 22 REFS, AUG, 1976

AN INITIAL CONCEPT OF AN ENGINEERED SAFEGUARDS SYSTEM FOR A REPRESENTATIVE COMMERCIAL MIXED-OXIDE FUEL FABRICATION FACILITY IS PRESENTED. COMPUTER SIMULATION TECHNIQUES FOR EVALUATION AND FURTHER DEVELOPMENT OF THE CONCEPT ARE DESCRIBED. AN OUTLINE OF FUTURE ACTIVITY IS INCLUDED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL * MIXED OXIDE * FABRICATION FACILITY * COMPUTER PROGRAM * SIMULATION

123398
BOOZER DD * HULME JL * DANIEL SL * VARNADO GB
SAFEGUARDS SYSTEM EFFECTIVENESS MODELING
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-0428 * CONF-760615-14 *. 13 PPS, FROM 17TH ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; SEATTLE, WASH., JUNE 23, 1976

TO PROVIDE A SYSTEMATIC APPROACH TO THE PROBLEM OF PHYSICAL SECURITY, A METHODOLOGY HAS BEEN DEVELOPED WHICH CONSIDERS THE INTERRELATIONSHIPS OF ELEMENTS WITHIN THE OVERALL SYSTEM AND PROVIDES A FRAMEWORK FOR THE SYSTEM INTEGRATION OF EACH ELEMENT. THE BASIC INPUT INFORMATION REQUIRED INCLUDES: (1) DEFINITION OF WHAT CAN BE DONE TO CAUSE THE UNDESIRED EVENT, (2) PHYSICAL DESCRIPTION OF THE FACILITY, (3) DETAILS OF THE SECURITY SYSTEM, AND (4) CHARACTERISTICS OF THE ADVERSARY. THE APPLICABILITY OF THE OVERALL METHODOLOGY HAS BEEN DEMONSTRATED IN THE ANALYSIS OF A TYPICAL LWR PLANT. RESULTS OF THAT ANALYSIS ARE BEING USED TO GUIDE THE CONCEPTUAL DEVELOPMENT OF A BALANCED LWR SAFEGUARDS SYSTEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SECURITY * SAFEGUARDS, NUCLEAR MATERIAL * ANALYTICAL MODEL * FAULT TREE ANALYSIS * REACTOR, LWR

122055
KUNZ WE * CHAMBERS WF * HENRY CN * FRANCE SW * MILLEGAN DR * HASTINGS RD * WORTH GM
HAND-HELD PERSONNEL AND VEHICLE MONITORS
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LA-6359 *. 8 PPS, 3 FIGS, SEP., 1976

A LIGHT, RUGGED MONITOR HAS BEEN DEVELOPED FOR SPECIAL NUCLEAR MATERIALS SEARCHES AT MATERIAL-ACCESS AND PROTECTION-AREA EXITS. THIS MONITOR ACCEPTS GAMMA-RAY PULSES FROM A NAI(TL) DETECTOR, INTEGRATES FOR A PRESET COUNTING INTERVAL (TYPICALLY 0.3 S), AND PRODUCES AN AUDIBLE ALARM WHENEVER THE COUNTS IN THE INTERVAL EXCEED THE TRIP LEVEL THAT IS A PRESET MULTIPLE OF THE STORED BACKGROUND COUNT. BECAUSE THE MONITOR IS SILENT EXCEPT WHEN THE ALARM IS OPERATING, PERSONNEL WITH LITTLE SPECIAL TRAINING CAN CONDUCT MORE EFFECTIVE SEARCHES IN A NOISY AND DISTRACTING ENVIRONMENT THAN THEY CAN WITH CONVENTIONAL AUDIBLE MONITORING OF INDIVIDUAL RADIATION COUNTS. THE MONITOR IS ALSO MORE SENSITIVE THAN CONVENTIONAL MONITORS THAT PROVIDE AUDIBLE INDICATION OF THE COUNT RATE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS * *RADIATION MONITORS * *SAFEGUARDS, NUCLEAR MATERIAL * INSTRUMENT, NUCLEAR * INSTRUMENT, ALARM * EQUIPMENT DEVELOPMENT

121563

121363 *CONTINUED*
JOINT ERDA-NRC TASK FORCE ON SAFEGUARDS
U.S NUCLEAR REGULATORY COMMISSION + U.S. ERDA. WASHINGTON
NUREG-0095 + ERDA-77-36 +. 77 PPS. FEB. 1977

WITH SOME EXCEPTIONS, THE 13 NRC LICENSEES WHO NOW POSSESS SSNM ARE CURRENTLY JUDGED TO HAVE SAFEGUARDS ADEQUATE AGAINST THEFT OR DIVERSION BY AN ASSUMED INTERNAL THREAT OF ONE EMPLOYEE OCCUPYING ANY POSITION OR AN ASSUMED EXTERNAL THREAT COMPRISED OF THREE WELL-ARMED (LEGALLY OBTAINABLE WEAPONS), WELL-TRAINED INDIVIDUALS, INCLUDING THE POSSIBILITIES OF INSIDE KNOWLEDGE OR ASSISTANCE OF ONE INSIDER. CONCLUSIONS FROM THE COMPARATIVE SAFEGUARDS EVALUATIONS AT THREE REPRESENTATIVE ERDA FACILITIES WERE: (1) PRESENT CAPABILITIES ARE MORE THAN ADEQUATE AGAINST AN UNASSISTED EXTERNAL THREAT LEVEL ASSUMED IN THIS REVIEW. (2) THE FACILITIES COULD NOT, WITH A HIGH DEGREE OF ASSURANCE, PROTECT AGAINST AN EXTERNAL FORCE IN POSSESSION OF INSIDE KNOWLEDGE OR ASSISTANCE. (3) ONE FACILITY COULD NOT, WITH A HIGH DEGREE OF ASSURANCE, PREVENT THE DIVERSION OF SIGNIFICANT QUANTITIES OF SSNM BY AN INSIDER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

REACTOR, ERDA OWNED + *SAFEGUARDS, NUCLEAR MATERIAL + LICENSING PROCESS + *THEFT/DIVERSION + POWER PLANT, NUCLEAR + REVIEW + URANIUM + PLUTONIUM + *SECURITY + JACKOS

120944
JONES DE
ADVANCED PHYSICAL PROTECTION SYSTEMS FOR FACILITIES AND TRANSPORTATION
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-5388 + CONF-760615-8 +. 10 PPS. FROM 17TH ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; SEATTLE, WASH., JUNE 23, 1976

SANDIA LABORATORIES IS DEVELOPING ADVANCED PHYSICAL PROTECTION SAFEGUARDS IN ORDER TO IMPROVE THE SECURITY OF SPECIAL NUCLEAR MATERIALS, FACILITIES, AND TRANSPORTATION. COMPUTER MODELS ARE BEING USED TO ASSESS THE COST-EFFECTIVENESS OF ALTERNATIVE SYSTEMS FOR PROTECTING FACILITIES AGAINST EXTERNAL ATTACK WHICH MAY INCLUDE INTERNAL ASSISTANCE, AND AGAINST INTERNAL THEFT OR SABOTAGE. PHYSICAL PROTECTION ELEMENTS SUCH AS ADMITTANCE CONTROLS, PORTALS AND DETECTORS, PERIMETER AND INTERIOR INTRUSION ALARMS, FIXED AND REMOTELY ACTIVATED BARRIERS, AND SECURE COMMUNICATIONS ARE BEING EVALUATED, ADAPTED, AND WHERE REQUIRED, DEVELOPED. NEW FACILITIES SAFEGUARDS CONCEPTS WHICH INVOLVE 'CONTROL LOOPS' BETWEEN PHYSICAL PROTECTION AND MATERIALS CONTROL ELEMENTS ARE BEING EVOLVED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL + TRANSPORTATION AND HANDLING + POWER PLANT, NUCLEAR + ENRICHMENT FACILITY + FABRICATION FACILITY + FUEL REPROCESSING

120264
KINNE RL
ANALYSIS AND COMPARISON OF TRANSPORTATION SECURITY SYSTEMS
SANDIA LABS., LIVERMORE, CALIF.
SAND-76-8663 + CONF-760548 +. 16 PPS. FROM TRANSPORTATION FOR THE NUCLEAR INDUSTRY; MINNEAPOLIS, MINNESOTA, MAY 25, 1976

THE ROLE OF MODELING IN THE ANALYSIS OF TRANSPORTATION SECURITY SYSTEMS IS DESCRIBED. VARIOUS MODELING APPROACHES ARE OUTLINED. THE CONFLICT MODEL DEVELOPED IN SANDIA LABORATORIES' TRANSPORTATION MODE ANALYSIS FOR THE NRC SPECIAL SAFEGUARDS STUDY IS USED TO DEMONSTRATE THE CAPABILITY OF MODELS TO DETERMINE SYSTEM SENSITIVITIES AND COMPARE ALTERNATIVES.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

TRANSPORTATION AND HANDLING + SECURITY + SAFEGUARDS, NUCLEAR MATERIAL + SHIPPING ANALYSIS

119347
TOBIAS ML
AN ELEMENTARY SURVEY OF NUCLEAR SAFEGUARDS PROBLEMS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
CONF-750733-- +. 12 PPS. PP. 215-26. FROM SYMPOSIUM ON ENERGY SOURCES FOR THE FUTURE; OAK RIDGE, TENN., OCT. 7-25, 1975

THE PROBLEMS OF SAFEGUARDS ARE NOT REALLY THOSE OF TECHNOLOGY - THE CUSTOMARY CENTER OF ATTENTION OF ENGINEERS AND SCIENTISTS - BUT RATHER THOSE OF ABERRANT HUMAN BEHAVIOR. TECHNOLOGY ENTERS ONLY AS A MEANS OF RESPONSE, CONTROL, OR PREVENTION OF UNDESIRABLE HUMAN ACTION. THE DISCUSSION WHICH FOLLOWS WILL BE CONFINED MAINLY TO THE SUBJECT OF SAFEGUARDS FOR FIXED SITES, OMITTING THE VERY VITAL MATTER OF TRANSPORTATION SAFEGUARDS. BRIEFLY OUTLINES THE LEGAL AND QUASI-LEGAL REQUIREMENTS AND POINTS OUT SOME OF THE COST ASPECTS AS WELL. THE MAIN EMPHASIS WILL BE ON PHYSICAL SECURITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SURVEY + *SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + PROTECTION SYSTEM + SABOTAGE

119121
SANDIA DEVELOPS VAULT SECURITY SYSTEM

119121 *CONTINUED*
2 PPS. NUCLEAR NEWS. 17(8). PP. 125-26 (JUNE 1976)

A NEW SECURITY SYSTEM PROVIDES 6 SEPARATE CHECKS BEFORE ALLOWING REMOVAL OF STRATEGIC SPECIAL NUCLEAR MATERIAL (SSNM) FROM THE VAULT. THREE CHECKS ARE MADE ON THE PERSON ENTERING--AND YOU ARE, WHAT YOU SHOULD BE DOING, AND THAT YOU ARE NOT CARRYING WEAPONS OR EXPLOSIVES. SSNM IS STORED IN MODULE TYPE CONTAINERS WHICH MUST BE REMOVED FROM A CARROUSEL INSIDE THE MODULE. THE CONTAINER IS THEN PLACED IN A 'SECURE TRANSFER MODULE' WHICH IS LOCKED TO THE FACILITY. WHEN THE PERSON INSIDE THE VAULT IS CLEARED TO EXIT, DOORS ARE OPENED AND THE PERSON GOES OUT. THEN AFTER PROPER CHECKS ARE MADE, THE TRANSFER MODULE IS RELEASED AND THE CONTAINER IS MADE AVAILABLE OUTSIDE THE VAULT.

SPECIAL NUCLEAR MATERIAL + SAFEGUARDS, NUCLEAR MATERIAL + SECURITY

118896
THE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL IN THE COMMERCIAL FUEL CYCLE
SANDIA LABS., ALBUQUERQUE, N.M. AND LIVERMORE, CALIF.
SAND-75-0457 +, 33 PPS, 6 TABS, 4 FIGS, APRIL 1976

A PHYSICAL PROTECTION PLAN FOR SPECIAL NUCLEAR MATERIALS (SNM) WAS DESIGNED BY SANDIA AND IS PRESENTED IN SIX VOLUMES AS FOLLOWS: VOL. 1 IS THE EXECUTIVE SUMMARY; VOL. 2 AND 3 DEAL WITH THE ELEMENTS OF A FIXED-SITE PHYSICAL PROTECTION SYSTEM SUCH AS ALARMS, BARRIERS, GUARDS, PORTAL ACCESS; VOL. 4 AND 5 DEAL WITH TRANSPORTATION EQUIPMENT AND PROTECTION; AND VOL. 6 COVERS RELOCATION AND RECOVERY PROCEDURES FOR SNM IF LOST OR STOLEN.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE + TRANSPORTATION AND HANDLING + INSTRUMENT, ALARM

118894
AUERBACK C + CUSACK J + GREEN L
ISSUES RELATED TO CHOOSING A GUARD FORCE STRUCTURE
BROOKHAVEN NATIONAL LAB., UPTON, N.Y.
9 PPS, NUCL. MATER. MANAGE., 4(3), PP. 210-18 (JUNE 18, 1975)

THE ESTABLISHMENT OF A FEDERAL SECURITY FORCE HAS BEEN SUGGESTED TO PROTECT NUCLEAR MATERIAL. THE FORCE WOULD GUARD NUCLEAR FACILITIES AND SHIPMENTS OF NUCLEAR MATERIALS. THIS PAPER SUMMARIZES A STUDY TO IDENTIFY THE ISSUES BETWEEN THE PRIVATE GUARD FORCES OR A GUARD FORCE UNDER FEDERAL AUTHORITY. THREE TYPES OF SECURITY FORCE STRUCTURES WERE SELECTED FOR COMPARISON: A FEDERAL FORCE UNDER CENTRAL AUTHORITY, A PRIVATE GUARD FORCE, AND A PRIVATE ARRANGEMENT TO EMPLOY LOCAL POLICE OFFICERS. ISSUES WERE DIVIDED INTO SEVEN CATEGORIES: (1) LEGAL CONSIDERATIONS, (2) LIABILITY, (3) STAFFING AND OPERATIONS, (4) COSTS, (5) RELATIONSHIP TO OFFSITE FORCES, (6) MANAGEMENT AND CONTROL, AND (7) TRANSPORTATION.

SECURITY + SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + ECONOMICS + TRANSPORTATION AND HANDLING

118892
MARCUSE W + INDUSI JP
SIMULATING PHYSICAL PROTECTON AGAINST OVERT ATTACKS AT FACILITIES USING PROCESSING OR STORING NUCLEAR MATERIALS
BROOKHAVEN NATIONAL LABORATORY, UPTON, N.Y.
12 PPS, NUCL. MATER. MANAGE., 4(3), PP. 233-45 (JUNE 18, 1975)

A SIMULATION MODEL HAS BEEN FORMULATED WHICH IS UNDERGOING REFINEMENT AND DEVELOPMENT. IT THUS FAR HAS SHOWN PROMISING RESULTS AND SHOULD PROVE USEFUL AS A TOOL IN EVALUATING AND COMPARING VARIOUS PHYSICAL PROTECTION PLANS UNDER A VARIETY OF ATTACKER CONFIGURATIONS. IN ADDITION IT ALLOWS ONE TO ASSESS SYSTEM EFFECTIVENESS USING TRADEOFFS OF GUARDS, PERIMETER BARRIERS, ALARMS, PROCEDURES AND OTHER COMPONENTS IN A TOTAL SECURITY SYSTEM. DATA FROM THE PHYSICAL SECURITY PLANS OF CONTRACTOR AND LICENSEE FACILITIES MAY EASILY BE INPUTTED TO THE MODEL. TESTING OF THESE PLANS AGAINST A SET OF REFERENCE ATTACKS VIA THE MODEL MAY PROVIDE USEFUL INFORMATION RELEVANT TO THE NEEDS OF SAFEGUARDS AND MATERIAL PROTECTION.

SECURITY + SABOTAGE + SIMULATION + SAFEGUARDS, NUCLEAR MATERIAL + COMPUTER PROGRAM

118884
BECKER RC
EFFECTIVE GUARD FORCE
UNIVERSITY OF CALIFORNIA, LIVERMORE
7 PPS, NUCL. MATER. MANAGE., 4(3), PP. 226-32 (JUNE 18, 1975)

ALTHOUGH THE NUMBER OF GUARDS REQUIRED TO PROVIDE ADEQUATE PHYSICAL SECURITY OF NUCLEAR MATERIALS IS OFTEN THE SUBJECT OF DEBATE, THERE ARE MORE CRITICAL FACTORS PERTAINING TO THE EFFECTIVENESS AND EFFICIENCY OF THE PROTECTIVE FORCE. THE QUALITY OF INSTRUCTION AND TRAINING, THE UTILIZATION OF MODERN TECHNOLOGY AND EQUIPMENT, THE CAREFUL ANALYSIS OF GUARD FUNCTIONS, THE PREEMPLOYMENT SCREENING AND SELECTION, AS WELL AS THE COMPETITIVE PAY SCHEDULES ARE THE BASIC QUESTIONS. STUDIES REVEAL THAT A LARGE PERCENTAGE OF THE OVERALL COST OF A SAFEGUARD PROGRAM IS THE SALARY OF THE PROTECTIVE FORCE. THIS PAPER PRESENTS A METHOD WHEREBY THIS COSTLY, YET IMPORTANT, COMMODITY CAN BE MOST BENEFICIAL.

SECURITY + SAFEGUARDS, NUCLEAR MATERIAL + TRAINING + ECONOMICS

116496
NOTICE OF VIOLATION ISSUED AT DRESDEN 1, 2, AND 3
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC
9 PGS; LTR W/ATTACHMENTS TO COMMONWEALTH EDISON CO., AUG. 19, 1976, DOCKETS 50-10/237/249; TYPE--BWR, MFG--G.E., AE--BECHTEL

CAUSE - SECURITY DEFICIENCIES. AN INSPECTION WAS MADE TO EXAMINE ACTIVITIES RELATED TO THE PROTECTION AGAINST INDUSTRIAL SABOTAGE AND SAFEGUARDING SPECIAL NUCLEAR MATERIAL. BASED ON THE RESULTS OF THIS INSPECTION, CERTAIN ACTIVITIES DID NOT APPEAR TO BE CONDUCTED IN FULL COMPLIANCE WITH NRC REGULATIONS AND THE DRESDEN PHYSICAL SECURITY PLAN. A MATTER OF CONCERN WAS THE FAILURE, IN SOME CASES, OF THE INTRUSION ALARM SYSTEM TO ADEQUATELY DETECT ISOLATION ZONE PENETRATION AND THE DISCOVERY OF UNSECURED DOORS LEADING TO VITAL AREAS.

AVAILABILITY - NRC PUBLIC DOCUMENT ROOM, 1717 H STREET, WASHINGTON, D. C. 20555, (08 CENTS/PAGE -- MINIMUM CHARGE $2.00)

REACTOR, BWR + DRESDEN 1 (BWR) + DRESDEN 3 (BWR) + COMPLIANCE + DRESDEN 2 (BWR) + FAILURE, ADMINISTRATIVE CONTROL + INSTRUMENT, ALARM + SAFEGUARDS, NUCLEAR MATERIAL + LEGALISTICS + SECURITY

116731
SMILEY ST
IMPROVEMENT OF SAFEGUARDS IN PLUTONIUM FUEL RECYCLING
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
4 PPS, IEEE TRANS. ON NUCLEAR SCIENCE, NS-23(1), PP. 69-69 (FEB. 1976)

THE NUCLEAR REGULATORY COMMISSION IS PERFORMING TWO IMPORTANT STUDIES DEALING WITH THE PROTECTION AGAINST DIVERSION OF STRATEGIC SPECIAL NUCLEAR MATERIAL AT FIXED SITES AND IN TRANSIT, AND THE PROTECTION OF THE PLANTS AND TRANSPORT VEHICLES THEMSELVES FROM SABOTAGE. THE NRC IS ATTEMPTING TO DETERMINE WHAT MEASURES MUST BE TAKEN TO ASSURE AN ACCEPTABLY SMALL RISK TO THE PUBLIC FROM SUCH MALEVOLENT ACTS IN A NUCLEAR ECONOMY THAT INCLUDES PLUTONIUM RECYCLE AND USE OF HIGH ENRICHED URANIUM. A SYSTEMATIC ANALYSIS IS BEING PERFORMED OF ALL POTENTIALLY ACCEPTABLE METHODS OF PHYSICAL PROTECTION, MATERIAL ACCOUNTABILITY, AND OTHER ASPECTS OF SAFEGUARDS. CONCLUSIONS WILL BE REACHED REGARDING VIABLE ALTERNATIVES BALANCING BOTH MONETARY AND SOCIAL COSTS AND BENEFITS.

AVAILABILITY - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., 345 EAST 47 ST., NEW YORK, N.Y. 10017

PLUTONIUM + *SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE + *AGENCY, NRC

116336
INDUSTRY OUTLINES SECURITY STEPS
3 PPS, NUCLEAR INDUSTRY, 23(4), PP. 4-6 (APRIL 1976)

A FORUM ON SAFEGUARDS WAS HELD IN ORLANDO, FLA. WHERE INDUSTRY DESCRIBED WHAT WAS BEING DONE TO PREVENT DIVERSION OF NUCLEAR MATERIALS. EXXON SAID COMPANY GUARD FORCES SHOULD BE TRAINED BY THE FEDERAL GOVERNMENT TO USE MILITARY WEAPONS. ALLIED GENERAL NUCLEAR SERVICES DESCRIBED THEIR SECURITY NETWORK AT THEIR PROCESSING PLANT AT BARNWELL, SC. THEIR ORIGINAL DESIGN WAS SCRAPPED AFTER A THOROUGH REVIEW BY A TASK FORCE OF PERSONNEL FROM PARENT COMPANIES. THEIR PHYSICAL PROTECTION REQUIREMENTS HAVE NOW COST BETWEEN $4 AND $6 MILLION AND WILL REQUIRE ABOUT 100 PATROLMEN.

PLUTONIUM + FUEL REPROCESSING + BARNWELL (FRP) + SAFEGUARDS, NUCLEAR MATERIAL + INDUSTRY, NUCLEAR

115040
CHAPMAN LD
EFFECTIVENESS EVALUATION OF ALTERNATE FIXED-SITE SAFEGUARDS SECURITY SYSTEMS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-75-6159 +. 16 PPS, 4 TABS, PRESENTED AT SUMMER COMPUTER SIMULATION CONFERENCE, WASHINGTON, D.C., PAPER 23-1, JULY 12-14, 1976

AN EVALUATION OF A FIXED-SITE PHYSICAL PROTECTION SYSTEM MUST CONSIDER THE INTERRELATIONSHIPS OF BARRIERS, ALARMS, ON-SITE AND OFF-SITE GUARDS, AND THEIR EFFECTIVENESS AGAINST A FORCIBLE ADVERSARY ATTACK INTENT ON CREATING AN ACT OF SABOTAGE OF THEFT. A COMPUTER MODEL, FORCIBLE ENTRY SAFEGUARDS EFFECTIVENESS MODEL, HAS BEEN DEVELOPED AT SANDIA LABORATORIES FOR THIS. A HYPOTHETICAL FIXED-SITE PROTECTION SYSTEM IS DEFINED AND RELATIVE EVALUATIONS FROM A COST-EFFECTIVENESS POINT OF VIEW ARE PRESENTED IN ORDER TO DEMONSTRATE HOW THE MODEL CAN BE USED.

AVAILABILITY - LEON D. CHAPMAN, SYSTEMS ANALYSIS DIVISION 1, SANDIA LABS., ALBUQUERQUE, N.M. 87115

COMPUTER PROGRAM + PROTECTION SYSTEM + EXAMINATION + SIMULATION + *SAFEGUARDS, NUCLEAR MATERIAL + PERFORMANCE + THEFT/DIVERSION + SECURITY

114886
JONES OE
SAFEGUARDS FOR THE PHYSICAL PROTECTION OF NUCLEAR MATERIALS AND FACILITIES
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-75-6156 + CONF-751124-1 +. 10 PPS, FROM ASSEMBLY COMMITTEE ON RESOURCES, LAND USE, AND ENERGY; SACRAMENTO, CALIF., NOV. 18, 1975

114886 *CONTINUED*
DR. JONES IN TALKING TO THE CALIFORNIA LEGISLATURE DESCRIBED PRESENT AND PROPOSED SAFEGUARD SYSTEMS. TRANSPORTATION OF NUCLEAR MATERIALS PRESENTS THE MOST DIFFICULT PROTECTION PROBLEMS. SPECIAL SAFE-SECURE TRAILERS ARE BEING USED AND TRACTORS HAVE BEEN BUILT OR MODIFIED TO GIVE PROTECTION TO THE CREW AND VITAL EQUIPMENT IN CASE OF ATTACK. A SPECIAL COMMUNICATION SYSTEM HAS BEEN DEVELOPED FOR SHIPMENT MONITORING. OBJECTIVES OF PROTECTION SYSTEMS ARE: (1) INCREASE TIME REQUIRED FOR MALEFACTOR TO ACHIEVE HIS GOAL, (2) DECREASE TIME REQUIRED FOR DETECTION OF HIS ACTIVITIES, (3) REDUCE TIME FOR RESPONSE FORCE ARRIVAL, (4) INCREASE THE CAPABILITY TO NEUTRALIZE THE MALEFACTOR, AND (5) MAINTAIN NUCLEAR FUEL CYCLE AND REPROCESSING SAFETY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

PLUTONIUM + *TRANSPORTATION AND HANDLING + URANIUM + SIMULATION + SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE

114338
MORA*IECKI *
IAEA'S APPROACHES TO PHYSICAL PROTECTION OF NUCLEAR MATERIALS
4 PPS, INTERNATIONAL ATOMIC ENERGY AGENCY BULLETIN, 18(1), PP. 25-28 (FEB. 1976)

PHYSICAL PROTECTION APPLIES TO MEASURES TO PREVENT UNAUTHORIZED INTERFERENCE WITH NUCLEAR FACILITIES OR USE OF NUCLEAR MATERIALS BY INDIVIDUALS OR NON-GOVERNMENTAL GROUPS, SUCH AS THEFT, HIJACKING, TERRORISM, SABOTAGE AND VANDALISM. SUCH PROTECTION IS PRIMARILY THE DUTY OF THE STATE WHERE FACILITIES OR MATERIALS ARE LOCATED. SINCE MATERIALS COULD BE STOLEN IN ONE STATE AND USED AGAINST ANOTHER STATE, THE PROBLEM BECOMES INTERNATIONAL IN NATURE. THE IAEA WILL HELP MEMBER STATES TO RECOGNIZE PROBLEMS WHICH ARE COMMON TO THEM, AND TO ASSIST THEM IN PROBLEMS THAT ARE OF COMMON INTEREST.

*IAEA + SABOTAGE + *PROTECTIVE ACTION GUIDE + *SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION

114028
SALISBURY DF
QUARANTINING PLUTONIUM
2 PPS, TECHNOLOGY REVIEW, 78(3), PP. 4-5 (JAN. 1976)

ARTICLE DESCRIBES, IN GENERAL, A TRUCK USED FOR TRANSPORTATION OF PLUTONIUM. WALLS OF THE TRAILER UNIT ARE PRACTICALLY IMPENETRABLE; BUT IF PENETRATED, A FOAM PLASTIC IS RELEASED THAT FILLS THE TRAILER ALONG WITH AN ANTI-PERSONNEL GAS. IF THE DRIVER SENSES AN ATTACK, BY PULLING A LEVER, HE CAUSES ALL WHEELS TO LOCK AND REMAIN SO. THEN THE TRUCK COULD NOT BE MOVED TO ANOTHER LOCATION. COMMUNICATION SYSTEMS ARE BEING DEVELOPED FOR ALMOST CONTINUOUS MONITORING OF PLUTONIUM SHIPMENTS. THE GOAL IS TO DEVISE SECURITY SYSTEMS THAT WILL REQUIRE SUCH TIME TO PENETRATE THAT LAW FORCES, OR EVEN THE MILITARY CAN BE SUMMONED AND ARRIVE TO GIVE ASSISTANCE BEFORE NUCLEAR MATERIALS CAN BE STOLEN.

*PLUTONIUM + *TRANSPORTATION AND HANDLING + MILITARY CONSIDERATION + COMMUNICATION SYSTEM + *SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + TRUCK

113427
CHAPMAN LD
FIXED-SITE PHYSICAL PROTECTION SYSTEM MODELING
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-75-6061 + CONF-751203-1 *, 15 PPS, FROM *WINTER COMPUTER SIMULATION CONFERENCE, SACRAMENTO, CALIF., DEC. 18, 1975

AN EVALUATION OF A FIXED-SITE SAFEGUARD SECURITY SYSTEM MUST CONSIDER THE INTERRELATIONSHIPS OF BARRIERS, ALARMS, ON-SITE AND OFF-SITE GUARDS, AND THEIR EFFECTIVENESS AGAINST A FORCIBLE ADVERSARY ATTACK WHOSE INTENTION IS TO CREATE AN ACT OF SABOTAGE OR THEFT. A COMPUTER MODEL HAS BEEN DEVELOPED AT SANDIA LABORATORIES FOR THE EVALUATION OF ALTERNATIVE FIXED-SITE SECURITY SYSTEMS. TRADE-OFFS INVOLVING ON-SITE AND OFF-SITE RESPONSE FORCES AND RESPONSE TIMES, PERIMETER ALARM SYSTEMS, BARRIER CONFIGURATIONS, AND VARYING LEVELS OF THREAT CAN BE ANALYZED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + PROTECTION SYSTEM + INSTRUMENT, SURVEILLANCE + SURVEILLANCE PROGRAM + INSTRUMENT, ALARM + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + SECURITY

112823
NEY JF
PROTECTING PLUTONIUM: PHYSICAL SAFEGUARDS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND 75-6068 + CONF-751055-1 *, 24 PPS, FROM AIF WORKSHOP ON THE NUCLEAR DEBATE: BASIC ISSUES FOR 1976, BOSTON, MASS., OCT. 29, 1975

AN OVERALL SAFEGUARDS APPROACH IS SUGGESTED. A MAJOR STRENGTH OF THIS APPROACH IS THAT MALEFACTORS MUST CARRY OUT A SEQUENCE OF ACTIONS SUCCESSFULLY, WHILE THE SAFEGUARDS SYSTEM NEED ONLY INTERRUPT THE SEQUENCE AT ONE POINT. IN THE DEVELOPMENT OF PHYSICAL PROTECTION SYSTEMS, OBJECTIVES FOR IMPROVING OVERALL PERFORMANCE INCLUDE THE FOLLOWING: (1) INCREASE THE TIME REQUIRED FOR THE MALEFACTOR TO ACHIEVE HIS GOAL; (2) DECREASE THE TIME REQUIRED FOR DETECTION OF MALEVOLENT ACTIVITIES; (3) REDUCE THE TIME FOR ADEQUATE RESPONSE FORCE ARRIVAL; (4) INCREASE THE CAPABILITY TO NEUTRALIZE THE MALEFACTOR; (5) REDUCE THE TOTAL PROTECTION SYSTEM COSTS, WHILE

112823 *CONTINUED*
INCREASING THE LEVEL OF PROTECTION; (6) IMPROVE ACCEPTANCE LEVELS (SOCIAL, ENVIRONMENTAL, LEGAL, AND INSTITUTIONAL); AND (7) INCREASE NUCLEAR FUEL CYCLE SAFETY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFETY PROGRAM + *SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + FUEL CYCLE

112822
HULME JL
GRAPH THEORETIC MODELS OF THEFT PROBLEMS
SANDIA LABS, ALBUQUERQUE, N.M.
SAND-75-0595 +, 28 PPS, 1 TAB, 4 FIGS, 7 REFS, NOV, 1975

THIS REPORT SHOWS HOW WEIGHTED GRAPHS MAY BE USED TO STUDY THE VULNERABILITY OF A FIXED-SITE SECURITY SYSTEM TO THEFT. A GENERAL WAY OF CONSTRUCTING GRAPH THEORETIC MODELS IS PRESENTED TOGETHER WITH VARIATIONS IN THE TYPES OF WEIGHT FUNCTIONS WHICH WILL PRODUCE DIFFERENT SPECIFIC MODELS DESIGNED TO ACCOMMODATE VARIOUS PHYSICAL SITUATIONS. ONE SPECIFIC MODEL IS STUDIED IN DETAIL, THE BASIC THEFT MODEL, IN WHICH THE WEIGHTS ARE CONSTANTS INDEPENDENT OF THE DIRECTION OF TRAVEL. THIS MODEL ADMITS SOLUTION BY A DIJKSTRA-TYPE ALGORITHM, AND HENCE THE RUN TIME IS ROUGHLY PROPORTIONAL TO THE SQUARE OF THE NUMBER OF NODES IN THE GRAPH.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

COMPUTER PROGRAM + SITING + *ANALYTICAL MODEL + *SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION

110916
BENNETT CA + MURPHEY RA + SHERR TS
SOCIETAL RISK APPROACH TO SAFEGUARDS DESIGN AND EVALUATION
U.S. ERDA, WASHINGTON
ERDA-7 +, 60 PPS, 5 TABS, 6 FIGS, JUNE 1975

A THEORETICAL STUDY USING FAULT-TREE TYPE LOGIC IS PRESENTED TO REVIEW UNLAWFUL ACCESS OF NUCLEAR MATERIAL OR DEVICES. REVIEWS THE PREPARATION STAGE, ACQUISITION, UTILIZATION ACTIVITIES, AND THE OCCURRENCE OF THE EVENT WITH CONSEQUENCES. ALSO REVIEWED IN THE SAME MANNER IS SAFEGUARDS PREPARATION TO PREVENT UNLAWFUL SEIZURE. THE REPORT IS DIRECTED AT ESTABLISHING A COMPREHENSIVE RATIONALE FOR SAFEGUARDS DESIGN AND EVALUATION. THE APPROACH OF THE STUDY CONSIDERS EXPECTED FREQUENCY OF SUCCESSFUL OCCURRENCE OF DELIBERATE DESTRUCTIVE ACTS AND THE POTENTIAL MAGNITUDE OF THE EFFECTS ON SOCIETY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

DESIGN CRITERIA + INCIDENT, CONSEQUENCE + THEORETICAL INVESTIGATION + *SAFETY EVALUATION + FAULT TREE ANALYSIS + PROBABILITY + *SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL

109838
BEAN CH
THE APPLICATION OF CRIME COUNTERMEASURES FOR THE PROTECTION OF NUCLEAR MATERIALS
ARGONNE NATIONAL LABORATORY, ILLINOIS
CONF-750414-2 +, 9 PPS, FROM CARNAHAN CONFERENCE ON CRIME COUNTERMEASURES, LEXINGTON, KENTUCKY, MAY 7, 1975

FEDERAL REGULATIONS PUBLISHED IN THE FEDERAL REGISTER REQUIRE LICENSEES TO TAKE APPROPRIATE ACTION TO PROTECT HEALTH AND SAFETY OF THE PUBLIC FROM UNAUTHORIZED USE OF SPECIAL NUCLEAR MATERIAL (SNM), WHICH INCLUDES PLUTONIUM, URANIUM-233, AND HIGHLY ENRICHED URANIUM. CRIME COUNTERMEASURES ARE AN IMPORTANT PART OF THE GUIDANCE THAT IS PROVIDED BY THE NRC. USE OF CRIME COUNTERMEASURES AND PROTECTIVE DEVICES IS INTENDED TO PREVENT UNAUTHORIZED DIVERSION OF MATERIAL AND TO AID IN DETECTION OF DIVERSION SHOULD IT BE ATTEMPTED. THE PROTECTION SYSTEMS INCLUDE PHYSICAL BARRIERS, ACCESS CONTROLS, INTRUSION DETECTION DEVICES, SURVEILLANCE DEVICES, CENTRAL ALARM STATIONS, COMMUNICATIONS, AND RESPONSE CAPABILITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

FABRICATION + PLUTONIUM + TRANSPORTATION AND HANDLING + URANIUM + FUEL REPROCESSING + REGULATION, FEDERAL + SABOTAGE + *PROTECTIVE ACTION GUIDE + *SAFEGUARDS, NUCLEAR MATERIAL + POWER PLANT, NUCLEAR

107818
TODD JL + NICKELL WC
PHYSICAL SECURITY SYSTEM EFFECTIVENESS EVALUATION: A STATUS REPORT
SANDIA LABS., ALBUQUERQUE, NEW MEXICO
SAND75-5587 + CONF-750607-20 +, 10 PPS, FROM AMERICAN NUCLEAR SOCIETY MEETING, NEW ORLEANS, JUNE 8, 1975

A METHOD TO PERMIT OBJECTIVE COMPARISONS OF PHYSICAL SECURITY SYSTEMS IS UNDER DEVELOPMENT AND IS EXPECTED TO BE USEFUL IN OPTIMIZATION OF SYSTEM DESIGN AND IN COST BENEFIT ANALYSIS. PROCEDURE INVOLVES IDENTIFYING THE POSSIBLE OR POTENTIAL CHARACTERISTICS OF A POSTULATED ADVERSARY, COUNTERMEASURES TO DENY OR DIMINISH ADVERSARY SUCCESS AND RESPONSE CAPABILITIES OF THE DEFENDER. THESE, IN CONJUNCTION WITH SYSTEM DEFINITION INFORMATION, ARE EVALUATED BY USE OF ANALYTICAL MODELS WHICH PROVIDE A MEANS OF RANKING SYSTEMS AGAINST THREATS. PAPER DESCRIBES THE STATUS OF THIS EFFORT AND INCLUDES AN OVERVIEW OF THE METHODOLOGY WITH A BRIEF DESCRIPTION OF VARIOUS MODELS BEING CONSIDERED FOR USE IN EFFECTIVENESS EVALUATION.

137818 *CONTINUED*
AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*ANALYTICAL MODEL + THEORETICAL INVESTIGATION + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + OPTIMIZATION + COST BENEFIT + *SECURITY

106487
PHYSICAL PROTECTION OF NUCLEAR MATERIAL
1 PG. INTERNATIONAL ATOMIC ENERGY AGENCY BULLETIN, 17(4), PG. 48 (AUG. 1975)

GROWING CONCERN HAS BEEN EXPRESSED IN MANY COUNTRIES THAT NUCLEAR MATERIAL MAY ONE DAY BE USED FOR ACTS OF SABOTAGE OR TERRORISM. SERIOUS ATTENTION IS THEREFORE BEING GIVEN TO THE NEED FOR STATES TO DEVELOP NATIONAL SYSTEMS FOR THE PHYSICAL PROTECTION OF NUCLEAR MATERIALS DURING USE, STORAGE AND TRANSPORT THROUGHOUT THE NUCLEAR FUEL CYCLE WHICH SHOULD MINIMIZE RISKS OF SABOTAGE OR THEFT. THE REVISED RECOMMENDATIONS FORMULATED BY THE ADVISORY GROUP INCLUDE NEW DEFINITIONS OF THE OBJECTIVES OF NATIONAL SYSTEMS OF PHYSICAL PROTECTION AND PROPOSALS FOR MINIMIZING POSSIBILITIES OF UNAUTHORIZED REMOVAL AND SABOTAGE TO NUCLEAR FACILITIES.

FUEL STORAGE + TRANSPORTATION AND HANDLING + *SAFEGUARDS, NUCLEAR MATERIAL

104853
KRIEGER D
TERRORISTS AND NUCLEAR TECHNOLOGY
SAN FRANCISCO STATE UNIVERSITY
7 PAGES, 21 REFERENCES, BULLETIN OF THE ATOMIC SCIENTISTS, 31(6), PP. 28-34 (JUNE 1975)

EXPLORES THE WAYS IN WHICH TERRORIST GROUPS MAY GAIN POSSESSION OF NUCLEAR MATERIALS, INCLUDING WEAPONS; THE WAY IN WHICH THEY MAY USE NUCLEAR WEAPONS AND OTHER NUCLEAR TECHNOLOGIES TO THEIR BENEFIT; AND VARIOUS COURSES OF ACTION DESIGNED TO MINIMIZE THE POSSIBILITIES OF TERRORISTS UTILIZING NUCLEAR TECHNOLOGY TO THEIR BENEFIT AND SOCIETY'S DETRIMENT.

IAEA + *SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + AGENCY, NRC + SECURITY

098735
PERIMETER INTRUSION ALARM SYSTEMS
AEC, WASHINGTON, D.C.
REGULATORY GUIDE 5.44, JANUARY 1975

THIS GUIDE DESCRIBES FIVE TYPES OF PERIMETER INTRUSION ALARM SYSTEMS AND SETS FORTH CRITERIA FOR THEIR PERFORMANCE AND USE AS A MEANS ACCEPTABLE TO THE REGULATORY STAFF OF MEETING REQUIREMENTS.

AVAILABILITY - DIRECTOR OF REGULATORY STANDARDS, U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C. 20545

FABRICATION FACILITY + INSTRUMENT, PROTECTIVE + SITING + MATERIAL + FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + NRC REGULATORY GUIDE + ANNUNCIATORS

098734
PLANT SECURITY FORCE DUTIES
AEC, WASHINGTON, D.C.
REGULATORY GUIDE 5.43, JANUARY 1975

THIS GUIDE PROVIDES CRITERIA ACCEPTABLE TO THE REGULATORY STAFF RELATIVE TO THE ORGANIZATION OF THE PLANT SECURITY FORCE AND DUTIES OF GUARDS, WATCHMEN, AND OTHER INDIVIDUALS RESPONSIBLE FOR SECURITY.

AVAILABILITY - DIRECTOR OF REGULATORY STANDARDS, U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D.C. 20545

OPERATOR ACTION + STAFFING + SAFEGUARDS, NUCLEAR MATERIAL + SECURITY + NRC REGULATORY GUIDE + ANNUNCIATORS

SECTION 5: GENERAL

137663
SELLERS TA + FILNNING WC + WINGLAU AL
ENGINEERED SAFEGUARDS SYSTEM ACTIVITIES AT SANDIA LABORATORIES FOR BACK-END FUEL CYCLE FACILITIES
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-78-0064C + CONF-780304-1 +. 7 PPS. 2 FIGS. 13 REFS. 1978

AN OVERVIEW IS PRESENTED OF CONTINUING WORK AT SANDIA LABORATORIES TO DEVELOP SAFEGUARDS SYSTEMS FOR SPENT FUEL FACILITIES, LIGHT-WATER REACTORS, ALTERNATIVE FUEL CYCLES, AND IMPROVED TRANSPORTATION SYSTEMS. ADDITIONAL EMPHASIS WILL BE PLACED ON THE PROBLEMS ASSOCIATED WITH NATIONAL DIVERSION OF SPECIAL NUCLEAR MATERIAL. THE IMPACT ON SAFEGUARDS ELEMENT PERFORMANCE CRITERIA FOR SURVEILLANCE AND CONTAINMENT TO PROTECT AGAINST NATIONAL DIVERSION IN VARIOUS ALTERNATIVE FUEL CYCLE COMPLEXES IS ALSO BEING INVESTIGATED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *SABOTAGE + *FUEL REPROCESSING + *REACTOR, LWR + *TRANSPORTATION AND HANDLING

137479
SAPIR JL
NUCLEAR SAFEGUARDS RESEARCH AND DEVELOPMENT PROGRAM STATUS REPORT MAY-AUGUST 1977
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-7031-PR +. 92 PPS. REFS. MARCH 1978

THIS REPORT PRESENTS THE STATUS OF THE NUCLEAR SAFEGUARDS RESEARCH AND DEVELOPMENT PROGRAM PURSUED BY LASL SAFEGUARDS GROUPS G-1, G-2, G-3, AND G-4. TOPICS COVERED INCLUDE NONDESTRUCTIVE ASSAY TECHNOLOGY DEVELOPMENT AND APPLICATIONS, INTERNATIONAL SAFEGUARDS, PERIMETER SAFEGUARDS AND SURVEILLANCE, CONCEPTS AND SUBSYSTEMS DEVELOPMENT (E.G., GYPAC PROGRAM), INTEGRATED SAFEGUARDS SYSTEMS, TRAINING COURSES, AND TECHNOLOGY TRANSFER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + *SAFEGUARDS, NUCLEAR MATERIAL + SPECIAL NUCLEAR MATERIAL + INTERNATIONAL + ACCOUNTABILITY + ASSAY, NONDESTRUCTIVE + SECURITY + PROTECTION SYSTEM

137433
ANNUAL REPORT OF THE NUCLEAR SAFEGUARDS PROJECT, 1976 (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2465 +. APPROX. 200 PPS. FIGS. REFS. JULY 1977

THE PRESENT REPORT DESCRIBES THE MAJOR ACTIVITIES CARRIED OUT IN 1976 IN THE FRAMEWORK OF THE NUCLEAR SAFEGUARDS PROJECT BY THE INSTITUTES OF THE GESELLSCHAFT FUR KERNFORSCHUNG KARLSRUHE, THE EUROPEAN INSTITUTE OF TRANSURANIUM ELEMENTS AND SOME INDUSTRIAL FIRMS.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

*SAFEGUARDS, NUCLEAR MATERIAL + INTERNATIONAL + *SPECIAL NUCLEAR MATERIAL + *THEFT/DIVERSION + *ACCOUNTABILITY + *PROLIFERATION

135987
SAFEGUARDING NUCLEAR MATERIALS, VOL. 1 - GENERAL PAPERS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.1) +. 56 PPS. PP. 1-56 OF PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

TITLES OF PAPERS PRESENTED AT THIS SESSION ARE: SAFEGUARDS - 1975-1985; RISK CLASSIFICATION FOR NUCLEAR FACILITIES IN CONNECTION WITH THE ILLEGAL USE OF NUCLEAR MATERIALS; ACCOUNTANCY, CONTROL AND PROTECTION OF NUCLEAR MATERIAL; AND FEATURES AND REQUIREMENTS OF THE UNITED STATES NUCLEAR MATERIAL CONTROL SYSTEM.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + ACCOUNTABILITY + FABRICATION FACILITY + FUEL REPROCESSING + ENRICHMENT FACILITY + POWER PLANT, NUCLEAR + IAEA + SPECIAL NUCLEAR MATERIAL

135986
SAFEGUARDING NUCLEAR MATERIALS - VOL. 1
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA
STI/PUB/408(VOL.1) +. 616 PPS. PROCEEDINGS OF A SYMPOSIUM ON SAFEGUARDING OF NUCLEAR MATERIALS; VIENNA, AUSTRIA, OCT. 20-24, 1975

THE YEAR 1975 MARKS THE FIFTH ANNIVERSARY OF THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS, AND THE FIFTH ANNIVERSARY SINCE THE LAST GENERAL IAEA SYMPOSIUM ON SAFEGUARDS TECHNIQUES, PUBLISHED BY THE IAEA IN 1970. ACCORDINGLY, THE IAEA CONVENED IN VIENNA AN INTERNATIONAL SYMPOSIUM ON THE SAFEGUARDING OF NUCLEAR MATERIALS, 20 TO 24 OCTOBER 1975, WHICH WAS ATTENDED BY 225 PARTICIPANTS, REPRESENTING 34 COUNTRIES AND THREE INTERNATIONAL ORGANIZATIONS, WITH A TOTAL OF 95 PAPERS. VOL. 1 PRESENTS 43 PAPERS ON ACCOUNTABILITY, PHYSICAL PROTECTION, INFORMATION SYSTEMS, AND PROBABILITY.

135080 *CONTENDED*
AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

SAFEGUARDS, NUCLEAR MATERIAL * ACCOUNTABILITY * POWER PLANT, NUCLEAR - SPECIAL NUCLEAR MATERIAL * IAEA * FABRICATION * PROLIFERATION

133147
TODD JL * HOD KINSON JG
PICKERING SAFEGUARDS - A PRELIMINARY ANALYSIS
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-75-0439 *, 19 PPS, 1 TAB, 3 FIGS, 4 REFS, MAY 1977

THIS REPORT PRESENTS A SUMMARY OF THOUGHTS RELATIVE TO A SYSTEMS APPROACH FOR IMPLEMENTING INTERNATIONAL SAFEGUARDS. INCLUDED IS A PRELIMINARY ANALYSIS OF THE PICKERING GENERATING STATION FOLLOWED BY A SUGGESTED SAFEGUARDS SYSTEM FOR THE FACILITY.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL * SYSTEM ANALYSIS * CANADA * PROLIFERATION * IAEA * POWER PLANT, NUCLEAR

135393
NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM: REPORTS
OAK RIDGE GASEOUS DIFFUSION PLANT, TENN.
K/CSS/TM-10 *, 149 PPS, FEB. 1977

THE INFORMATION PRESENTED IN THE OVERVIEW OF THE NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM GIVES A BROAD PICTURE OF THE SYSTEM AND FORMS A BACKGROUND FOR THE MORE DETAILED INFORMATION AND DESCRIPTIONS IN THE SUBSEQUENT MANUALS. THE OVERVIEW BEGINS WITH A REVIEW OF THE CONCEPTS OF A NATIONAL INFORMATION SUPPORT SYSTEM, AND IT CONCLUDES WITH A SUMMARY OF THE SAFEGUARDS, MANAGEMENT, AND OTHER USES OF THE SYSTEM. THE OVERVIEW DESCRIBES THE APPLICATION OF HUMAN RESOURCES, COMPUTERS, AND COMMUNICATIONS SYSTEMS IN THE DEVELOPMENT AND THE OPERATIONAL PERFORMANCE OF THE SYSTEM. REPORTS ARE IDENTIFIED, DESCRIBED, AND CATALOGUED BY INFORMATION CATEGORY, WITH A CATEGORY NORMALLY REPRESENTING THE DATA SYSTEM THAT IS THE PRIMARY SOURCE OF INFORMATION FOR THE REPORT.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

SAFEGUARDS, NUCLEAR MATERIAL * ENRICHMENT FACILITY * DATA PROCESSING * INFORMATION RETRIEVAL * FUEL MANAGEMENT

135243
SIGNORET JP
AVAILABILITY OF A PERIODICALLY TESTED STANDBY SYSTEM
DEPT. OF NUCLEAR SAFETY, FRANCE
NUREG/TR-0027 *, 46 PPS, MARCH 1978 (TRANSLATION OF JSN 113, SEPT. 1976)

THE AIM OF THIS STUDY IS ASSESSMENT OF NUCLEAR SAFEGUARD SYSTEMS AVAILABILITY. THE RESULTS OBTAINED MAY BE APPLIED TO ANY INDUSTRIAL STANDBY SYSTEM WHICH IS PERIODICALLY TESTED TO REVEAL THE FAILURES THAT HAVE OCCURRED DURING ITS WAITING PERIOD.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*MATHEMATICAL TREATMENT * *RELIABILITY, SYSTEM * TEST, SYSTEM OPERABILITY * SAFEGUARDS, NUCLEAR MATERIAL * PROTECTION SYSTEM * JACOBS

133123
TRANSFER OF NUCLEAR TECHNOLOGY: SELECTED PAPERS OF THE IRAN CONFERENCE, APRIL 10-14, 1977
183 PPS, TABS, FIGS, REFS, ANNALS OF NUCLEAR ENERGY, 4(6-8), PP. 217-400 (1977)

PRESENTS THE TEXT OF 15 SELECTED PAPERS FROM THE CONFERENCE. THE MAJOR TOPICS WERE INDUSTRIALIZATION OF NUCLEAR POWER, SAFEGUARDS AND STANDARDS, EDUCATION, AND ADVANCED CONCEPTS. THE INDIVIDUAL PAPERS SPECIFICALLY DISCUSSED CONSTRUCTION TECHNOLOGY, URANIUM PROCUREMENT, REPROCESSING TECHNOLOGY, USE OF OPERATING EXPERIENCE IN NEW PLANT DESIGNS, NUCLEAR MATERIAL SAFEGUARDS, ON THE JOB TRAINING, AND PROCESS HEAT.

SAFEGUARDS, NUCLEAR MATERIAL * TRAINING * CONSTRUCTION * POWER PLANT, NUCLEAR * URANIUM * FUEL REPROCESSING * PROCESS HEAT

132655
SNIPLEY JP
CONCEPTUAL DESIGN OF INTEGRATED SAFEGUARDS SYSTEMS
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-UR-77-13[illegible] * CONF-770656-15 *, 15 PPS, FROM ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT, WASHINGTON, D.C., JUNE 29, 1977

THE LOS ALAMOS SCIENTIFIC LABORATORY IS CURRENTLY INVOLVED IN THE CONCEPTUAL DESIGN OF SAFEGUARDS FOR GENERIC FACILITIES IN THE BACK-END OF THE NUCLEAR FUEL CYCLE. THESE STUDIES ARE FIRST STEPS AIMED AT EVENTUALLY PROVIDING DETAILED DESIGNS OF INTEGRATED SAFEGUARDS SYSTEMS TO GUIDE SAFEGUARDS-RELATED FACILITY CONSTRUCTION AND/OR MODIFICATION. THIS PRESENTATION DESCRIBES THE CONCEPTUAL DESIGN PROCESS IN TERMS OF ITS DEFINITION, A SYSTEMATIC PROCEDURE FOR [illegible]

132655 *CONTINUED*
IMPLEMENTATION. SOME OF THE TOOLS REQUIRED, AND AN EXAMPLE OF THE RESULTS OF A CONCEPTUAL DESIGN. THE VALUE OF CONCEPTUAL DESIGN AND ITS RELATIONSHIP TO OTHER FACETS OF THE COMPLETE FACILITY DESIGN PROCESS ARE ALSO DISCUSSED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS, NUCLEAR MATERIAL + *SPECIAL NUCLEAR MATERIAL + *DESIGN CRITERIA + *FUEL REPROCESSING + FUEL, NUCLEAR + *THEFT/DIVERSION + *FABRICATION FACILITY

132547
NUCLEAR FUEL CYCLE
67 PPS. ANS TRANSACTIONS, VOL. 26, PP. 246-312, FROM 1977 ANNUAL MEETING, NEW YORK, JUNE 12-16, 1977

TRANSPORTATION OF NUCLEAR MATERIALS - NRC STRUCTURAL PROGRAMS FOR SHIPPING CONTAINERS AND REGULATORY REVISIONS FOR TRANSPORTATION; SPENT FUEL STORAGE- GE, *EST,, AND GE* DESIGNS; SAFETY ANALYSIS IN THE NUCLEAR FUEL CYCLE; FUEL CYCLE ANALYSIS, MANAGEMENT, AND ECONOMICS; *ASTE MANAGEMENT; METHODS FOR SEALED DISPOSAL OF NUCLEAR *ASTES; FUEL FABRICATION, PLUTONIUM RECYCLE, AND SAFEGUARDS; AND FINANCIAL ACCOUNTING FOR NUCLEAR FUEL IN THE RATE BASIS.

FUEL CYCLE + FUEL MANAGEMENT + FUEL RECYCLE + FUEL STORAGE + SPENT FUEL POOL + *ASTE MANAGEMENT + *ASTE DISPOSAL + *ASTE DISPOSAL, OCEAN + TRANSPERTATION AND HANDLING + ECONOMICS + SAFEGUARDS, NUCLEAR MATERIAL

132186
FARMAKES R
PROCEEDINGS OF THE FIRST BASIN CONFERENCE ON NUCLEAR POWER DEVELOPMENT AND THE FUEL CYCLE
AMERICAN NUCLEAR SOCIETY, HINSDALE, ILL.
CONF-761014-- +, 600 PPS, FROM 1ST PACIFIC BASIN TOPICAL CONFERENCE ON NUCLER DEVELOPMENT & THE FUEL CYCLE; HONOLULU, HAWAII, OCT, 11, 1976

TOPICS INCLUDED: DEVELOPING A NATIONAL NUCLEAR POWER PROGRAM; FUEL RESOURCES; TRANSPORT AND SAFEGUARDS; ENVIRONMENTAL ASPECTS OF THE FUEL CYCLE; REGIONAL PLANNING IN THE PACIFIC BASIN; *ASTE MANAGEMENT; AND REPROCESSING.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY, 244 E. OGDEN AVE., HINSDALE, ILL. 60521

*POWER PLANT, NUCLEAR + *GROWTH/DEVELOPMENT + FUEL, NUCLEAR + RESOURCE, NATURAL + SAFEGUARDS, NUCLEAR MATERIAL + *FUEL CYCLE + ENVIRONMENTAL QUALITY + *ASTE MANAGEMENT + FUEL REPROCESSING

130850
ISOTOPES AND RADIATION - ANS 1977 *INTER MEETING
60 PPS, ANS TRANSACTIONS, VOL. 27, PP. 159-219 (DEC. 1977)

THESE PAPERS *ERE PRESENTED AT THE 1977 ANS *INTER MEETING AT SAN FRANCISCO IN NOV-DEC CONCERNING ISOTOPES AND RADIATION. TOPICS INCLUDE NUCLEAR TECHNIQUES IN GEOLOGY; NUCLEAR MEDICINE; NUCLEAR TECHNIQUES IN HYDROLOGY; NUCLEAR SAFEGUARDS TECHNOLOGY; SAFEGUARDS: MEASUREMENTS, ACCOUNTABILITY SYSTEMS ANALYSIS; ADVANCES IN X-RAY FLUORESCENCE ANALYSIS; RADIOGRAPHY; AND RADIATION TECHNIQUES.

AVAILABILITY - AMERICAN NUCLEAR SOCIETY, 244 E. OGDEN AVE., HINSDALE, ILL. 60521

GEOLOGY + ACTIVATION + RADIOPHARMACEUTICAL + X-RAY + HYDROLOGY + SURFACE *ATER, TRACER + SAFEGUARDS, NUCLEAR MATERIAL + TECHNOLOGY + RADIOLOGY + RADIOGRAPHY

130573
LOWRY LL
GAS CORE REACTOR POWER PLANTS DESIGNED FOR LOW PROLIFERATION POTENTIAL
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6930-MS +, 43 PPS, SEPT, 1977

THIS STUDY *AS MADE TO SEE *HETHER GAS CORE NUCLEAR POWER PLANTS COULD PROVIDE ADEQUATE POWER *HILE MAINTAINING LOW INVENTORY AND LOW DIVERTABILITY OF FISSILE MATERIAL. FOUR CONCEPTS *ERE EXAMINED. TWO USED A MIXTURE OF UF6 AND HELIUM IN THE REACTOR CAVITIES, AND T*O USED A URANIUM-ARGON PLASMA. POWER LEVELS VARIED FROM 200 TO 2,500 M*TH. POWER PLANT SUBSYSTEMS *ERE SIZED TO DETERMINE FISSION MATERIAL INVENTORIES. ALL REACTORS RAN *ITH A BREEDING RATIO OF UNITY. THE 2,500-M*TH PLANT CONTAINED 191 KG U233. LESS THAN 4 KG COULD BE DIVERTED BEFORE THE REACTOR SHUT DOWN. THE PLASMA REACTOR POWER PLANTS HAD SMALLER INVENTORIES. IN GENERAL, INVENTORIES *ERE ABOUT A FACTOR OF 10 LESS THAN THOSE IN CURR*NT U.S. POWER REACTORS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERV* U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*JACOBS + *PROLIFERATION + *REACTOR + CORE + THEFT/DIVERSION + *SAFEGUARDS, NUCLEAR MATERIAL + GAS + *URANIUM-233

130571
SAPIR JL
NUCLEAR SAFEGUARDS RESEARCH AND DEVELOPMENT PROGRAM STATUS REPORT, JANUARY-APRIL 1977
LOS ALAMOS SCIENTIFIC LAB., N.M.
LA-6849-PR +, 69 PPS, AUG, 1977

130971 *CONTINUED*
STATUS OF THE NUCLEAR SAFEGUARDS RESEARCH AND DEVELOPMENT PROGRAM PURSUED BY LASL SAFEGUARDS GROUPS G-1, G-2, G-3, AND G-4 IS PRESENTED. TOPICS COVERED INCLUDE NONDESTRUCTIVE ASSAY TECHNOLOGY DEVELOPMENT AND APPLICATIONS; INTERNATIONAL SAFEGUARDS; PERIMETER SAFEGUARDS AND SURVEILLANCE; CONCEPTS AND SUBSYSTEMS DEVELOPMENT (E.G., DYMAC PROGRAM); INTEGRATED SAFEGUARDS SYSTEMS; TRAINING COURSES; AND TECHNOLOGY TRANSFER.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE; U. S. DEPARTMENT OF COMMERCE; SPRINGFIELD, VA. 22161

*JACOBS, *SAFEGUARDS, NUCLEAR MATERIAL, INTERNATIONAL, *SPECIAL NUCLEAR MATERIAL, *ASSAY, ASSAY, NONDESTRUCTIVE

129485
HOGAN WL, CHAPMAN LC
STRUCTURE FOR THE DECOMPOSITION OF SAFEGUARDS RESPONSIBILITIES
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-77-0490, CONF-770642-2, 20 PPS, FROM 3RD INTERNATIONAL CONFERENCE ON ION BEAM ANALYSIS; WASHINGTON, D.C., JUNE 27, 1977

A MAJOR MISSION OF SAFEGUARDS IS TO PROTECT AGAINST THE USE OF NUCLEAR MATERIALS BY ADVERSARIES TO HARM SOCIETY. A HIERARCHICAL STRUCTURE OF SAFEGUARDS RESPONSIBILITIES AND ACTIVITIES TO ASSIST IN THIS MISSION IS DEFINED. THE STRUCTURE BEGINS WITH THE DEFINITION OF INTERNATIONAL OR MULTINATIONAL SAFEGUARDS AND CONTINUES THROUGH DOMESTIC, REGIONAL, AND FACILITY SAFEGUARDS. THE FACILITY SAFEGUARDS IS DECOMPOSED INTO PHYSICAL PROTECTION AND MATERIAL CONTROL RESPONSIBILITIES. IN ADDITION, IN-TRANSIT SAFEGUARDS SYSTEMS ARE CONSIDERED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE; U. S. DEPARTMENT OF COMMERCE; SPRINGFIELD, VA. 22161

R AND D PROGRAM, SAFETY PROGRAM, *SAFEGUARDS, NUCLEAR MATERIAL, TRANSPORTATION AND HANDLING, THEFT/DIVERSION, NRC-13, HUCK, JACOBS

129182
MEYER M, LOYALKA SK, NELSON ME, WILLIAMS R
THE HOMEGRADE NUCLEAR BOMB SYNDROME
UNIV. OF MISSOURI, COLUMBIA, SCIENCE APPLICATIONS INC., N.M., BLACK & VEATCH ENGRS., KANSAS CITY, MO.
12 PPS, 4 TABS, 6 FIGS, 21 REFS, NUCLEAR SAFETY, 18(4), PP. 427-38 (JULY-AUG, 1977)

THE IMPLICATION HAS BEEN CREATED THAT ONE OR SEVERAL RELATIVELY INEXPERIENCED INDIVIDUALS COULD OBTAIN THE MATERIALS NECESSARY AND FABRICATE A LOW-YIELD NUCLEAR EXPLOSIVE. THIS ARTICLE EXAMINES THESE CONTENTIONS IN SOME DETAIL. THE SAFEGUARDS AND CONSIDERATIONAL METHODS PRESENTLY USED IN THE NUCLEAR FUEL CYCLE ARE CONSIDERED, AND THE DIFFICULTIES THEY PRESENT IN OBTAINING SIGNIFICANT AMOUNTS OF STRATEGIC NUCLEAR MATERIALS ARE EXAMINED. THE CHARACTERISTICS OF REACTOR-GRADE PLUTONIUM ARE DISCUSSED, AND THE DIFFICULTIES ASSOCIATED WITH THE ASSEMBLY OF AN EFFICIENT NUCLEAR EXPLOSIVE DEVICE ARE OUTLINED.

*SAFEGUARDS, NUCLEAR MATERIAL, *SABOTAGE, *NUCLEAR DETONATION, PLUTONIUM, THEFT/DIVERSION, DOSE, EXPLOSION

124774
1976 ASME - ANS INTERNATIONAL CONFERENCE ON ADVANCED NUCLEAR ENERGY SYSTEMS
641 PPS, PROCEEDINGS PUBLISHED BY AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 1976

THIS 3 DAY MEETING WHICH WAS HELD IN PITTSBURG, PA, IN MARCH 1976 WAS DEVOTED TO A BROAD REVIEW OF ALL ADVANCED NUCLEAR SYSTEMS. SESSION TOPICS INCLUDED LMFBR CONSTRUCTION AND OPERATING EXPERIENCE; ADVANCED DEVELOPMENT IN THERMAL REACTORS; ENVIRONMENTAL ASPECTS OF ADVANCED REACTOR SYSTEMS; LMFBR COOLANT SYSTEM COMPONENTS; ADVANCED REACTOR SYSTEMS; SAFETY OF BREEDER REACTORS; NONELECTRIC NUCLEAR ENERGY; LMFBR REACTOR SYSTEM COMPONENTS; FUSION REACTOR PROGRAMS; COMMERCIAL LMFBR DESIGNS; GAS-COOLED REACTOR COMPONENTS; SITING, LICENSING AND SAFEGUARDS FOR BREEDER REACTORS.

AVAILABILITY - AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 345 E. 47TH ST., NEW YORK, N.Y. 10017

*REACTOR, LMFBR, CONSTRUCTION, OPERATING EXPERIENCE, COMPONENTS, REACTOR, THERMAL, ENVIRONMENTAL QUALITY, N-POWER, SAFETY OF, *REACTOR, BREEDER, SITING, REACTOR, LICENSING PROCESS, REACTOR, THERMONUCLEAR, REACTOR, GCR, SAFEGUARDS, NUCLEAR MATERIAL

124662
MARZOCCHI A, VENCHIARUTTI R, GATTI S, BERTINI A
EXPERIENCE ON THE APPLICATION OF SAFEGUARD SYSTEMS TO THE ITALIAN NUCLEAR POWER PLANTS
CNEN, ITALY
IAEA-CN-36/315, 22 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

THE SAFEGUARDS SYSTEMS APPLIED IN ITALY TO THE VARIOUS FUEL CYCLE PHASES, INCLUDING NUCLEAR POWER STATIONS, ARE PRESENTED IN THIS PAPER IN VIEW OF THE PRESENT SITUATION RESULTING FROM THE ROME TREATY OBLIGATIONS AND FROM THE OBLIGATIONS TO BE DEFINED IN RELATION TO THE RATIFICATION OF NPT BY ITALY. THIS SHORT SURVEY CONCERNS NOT ONLY THE SYSTEMS USUALLY APPLIED, BUT ALSO THE RESEARCH AND DEVELOPMENT ASPECTS OF NEW SYSTEMS THAT FACILITATE THE ATTAINMENT OF THE AIMS SPECIFIED IN THE TREATIES. MOREOVER, THIS PAPER ILLUSTRATES THE PHILOSOPHY OF NUCLEAR MATERIAL PHYSICAL PROTECTION, AIMING AT SUPPLEMENTING THE EFFICIENCY OF THE SAFEGUARD SYSTEMS.

124002 *CONTINUED*
AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

ITALY + *SAFEGUARDS, NUCLEAR MATERIAL + *FUEL CYCLE + R AND D PROGRAM + SYSTEM DESCRIPTION + INSTRUMENT, SURVEILLANCE + PROTECTION SYSTEM

124005
MATSURE H + HIRATA M + NAJINUYA I
THE PRESENT STATUS AND DEVELOPMENT OF THE STATE'S SYSTEM OF SAFEGUARDS IN JAPAN
JAPAN ATOMIC ENERGY RESEARCH INST., TOKYO + MITSUBISHI METAL CO., LTD., TOKYO
IAEA-CN-36/173 +, 23 PPS, FROM INTERNATIONAL CONFERENCE ON NUCLEAR POWER AND ITS FUEL CYCLE; SALZBURG, AUSTRIA, MAY 2-13, 1977

SUMMARIZES ACTIVITIES FOR AIMING ESTABLISHMENT OF THE STATE'S SYSTEM OF SAFEGUARDS IN JAPAN. THE COMPUTER-BASED DATA-BANK AND DATA-PROCESSING SYSTEM FUNCTIONED TO MAINTAIN THE NATIONAL ACCOUNTANCY OF NUCLEAR MATERIAL IS DESCRIBED. THE NATIONAL INSPECTION PROCEDURES AND EXPERIENCES IN VERIFICATION OF PHYSICAL INVENTORY AT AN LWR FUEL FABRICATION PLANT ARE PRESENTED TO EXAMINE THE PERFORMANCE OF THE NATIONAL SAFEGUARDS SYSTEM. FUTURE WORK IS OUTLINED IN THE CONTEXT OF IMPROVEMENTS DESIRED IN ORDER TO REFINE THE STATE'S SYSTEM.

AVAILABILITY - UNIPUB, INC., P.O. BOX 433, NEW YORK, N.Y. 10016

JAPAN + *SAFEGUARDS, NUCLEAR MATERIAL + DATA PROCESSING + *PROTECTION SYSTEM + PERFORMANCE + FABRICATION + FUEL, NUCLEAR

123934
*REF LG + ROSENGREN JW
AN ASSESSMENT OF SOME SAFEGUARDS EVALUATION TECHNIQUES - FINAL REPORT
R & D ASSOCIATES, ARLINGTON, VA. (PREPARED FOR NRC)
NUREG-0141 + RDA-TR-5030-002 +, 161 PPS, FEB. 1977

REVIEWS THE ELEMENTS, TERMINOLOGY, AND IMPLICATIONS OF PERFORMANCE REQUIREMENTS FOR SAFEGUARDS FUNCTIONS AND ADVERSARY ATTRIBUTES. PRESENTS A SUMMARY DESCRIPTION OF PHYSICAL PROTECTION EVALUATION TECHNIQUES FROM BROOKHAVEN, SCIENCE APPLICATIONS, AND SANDIA LABS. PRESENTS SUMMARY DESCRIPTIONS OF MATERIAL CONTROL EVALUATION TECHNIQUES FROM NATIONAL BUREAU OF STANDARDS, SCIENCE APPLICATIONS, LAWRENCE LIVERMORE LAB, AND BROOKHAVEN. THE VARIOUS EVALUATION TECHNIQUES ARE COMPARED.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

JACOBS + SECURITY + PROTECTION SYSTEM + MATERIAL + CONTROL + *SAFETY ANALYSIS + HUCK + NRC-13 + *SAFEGUARDS, NUCLEAR MATERIAL

122073
EDELHERTZ H + WALSH M
THE WHITE-COLLAR CHALLENGE TO NUCLEAR SAFEGUARDS
BATTELLE HUMAN AFFAIRS RESEARCH CENTERS, SEATTLE, WASH. (PREPARED FOR NRC)
NUREG-0156 +, 80 PPS, JAN. 1977

THE NUCLEAR THREAT ANALOGY TO "WHITE-COLLAR CRIME" WOULD BE: AN ILLEGAL ACT OR SERIES OF ILLEGAL ACTS COMMITTED BY NON-PHYSICAL MEANS AND BY CONCEALMENT OR GUILE, TO STEAL OR DIVERT NUCLEAR MATERIALS OR TO OTHERWISE DEPRIVE THE U.S. NUCLEAR REGULATORY COMMISSION OR LICENSEES OF INFORMATION NECESSARY TO ACHIEVEMENT OF SAFEGUARDS OBJECTIVES. IT IS QUITE CLEAR THAT THE CURRENT SYSTEM OF REGULATION, MONITORING AND INSPECTION IS NOT BLIND TO THE DANGERS OF DIVERSION OR RELATED VIOLATIONS COMMITTED BY NON-PHYSICAL MEANS AND BY GUILE AND DECEPTION. ONE CAN EXAMINE THESE CURRENT SYSTEMS AND COME TO THE CONCLUSION THAT THE MECHANISMS THEY EMPLOY WOULD PREVENT DIVERSION OR OTHER VIOLATIONS COMMITTED BY GUILE AND DECEPTION, OR AT LEAST RING ALARMS BEFORE ANY SUBSTANTIAL HARM RESULTS.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

R AND D PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + *THEFT/DIVERSION + *INDUSTRY, NUCLEAR + *RECORDS + SABOTAGE + HUCK + NRC-13 + JACOBS

120745
DE MONTMOLLIN JM + WALTON RB
DESIGN OF INTEGRATED SAFEGUARDS SYSTEMS FOR NUCLEAR FACILITIES
SANDIA LABS., ALBUQUERQUE, N.M.
SAND-76-5048 + CONF-760615-10 +, 30 PPS, FROM 17TH ANNUAL MEETING OF THE INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT; SEATTLE, WASH., JUNE 23, 1976

SAFEGUARDS SYSTEMS THAT ARE CAPABLE OF COUNTERING POSTULATED THREATS TO NUCLEAR FACILITIES MUST BE CLOSELY INTEGRATED WITH PLANT LAYOUT AND PROCESSES IF THEY ARE TO BE EFFECTIVE AND IF POTENTIALLY SEVERE IMPACTS ON PLANT OPERATIONS ARE TO BE AVERTED. A FACILITIES SAFEGUARDS SYSTEM SUITABLE FOR A PRODUCTION PLANT IS DESCRIBED IN WHICH THE TRADITIONAL ELEMENTS OF PHYSICAL PROTECTION AND PERIODIC MATERIAL-BALANCE ACCOUNTING ARE EXTENDED AND AUGMENTED TO PROVIDE CLOSE CONTROL OF MATERIAL FLOWS. DISCRETE MATERIAL ITEMS ARE SUBJECTED TO DIRECT, OVERRIDING PHYSICAL CONTROL WHERE APPROPRIATE.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

120445 *CONTINUED*
SAFEGUARDS, NUCLEAR MATERIAL * ACCOUNTABILITY * DESIGN CRITERIA * FEED MATERIALS PRODUCTION CENTER * PRODUCTION

120320
SCHMIDT FH * DUDANSKY J * BETHE HA
THE ENERGY CONTROVERSY - THE FIGHT OVER NUCLEAR POWER
UNIV. OF WASHINGTON * CORNELL UNIV.
156 PPS. BOOK PUBLISHED BY ALBION PUBLISHING CO., 1976

THIS BOOK ATTEMPTS TO ANSWER CURRENT QUESTIONS SURROUNDING THE CONTROVERSY OF NUCLEAR POWER. THE LAYMAN IS THE AUDIENCE AT WHOM THE BOOK IS DIRECTED. THE BOOK DISCUSSES NUCLEAR POWER IN A RATIONAL AND UNEMOTIONAL WAY EXPLAINING IMPORTANT TECHNICAL PROBLEMS AND DOES NOT AVOID THE OBJECTIONS RAISED BY NUCLEAR OPPONENTS. TECHNICAL DISCUSSIONS ARE INCLUDED TO THE EXTENT NECESSARY FOR UNDERSTANDING THE ISSUES AND PROBLEMS. IN STUDYING AND RESEARCHING THE ENERGY PROBLEM, THE AUTHORS CONCLUDE THAT NUCLEAR FISSION ENERGY IS THE MOST LOGICAL CHOICE AND IS TO BE PREFERRED OVER FOSSIL FUELS. IT IS INTERESTING NOTE NEITHER AUTHOR IS OR HAS BEEN EMPLOYED BY THE NUCLEAR INDUSTRY OR BY GOVERNMENT AGENCIES RESPONSIBLE FOR NUCLEAR POWER. BOTH AUTHORS ARE PHYSICISTS.

ENERGY * N-POWER, SAFETY OF * INDUSTRY, NUCLEAR * PROPONENT * PLUTONIUM * WASTE HANDLING * PROLIFERATION * SAFEGUARDS, NUCLEAR MATERIAL

119705
SMITH OB * WADDOUPS I
SAFEGUARDING NUCLEAR MATERIALS AND PLANTS
LOS ALAMOS SCIENTIFIC LAB., NEW MEXICO * SANDIA LABS., ALBUQUERQUE, NEW MEXICO
8 PPS, 15 FIGS, POWER ENGINEERING, 80(11), PP. 36-43 (NOV. 1976)

COVERS SAFEGUARDING IN ALL ITS ASPECTS WITH DESCRIPTIVE MATERIAL ON THE FOLLOWING SUBJECTS: SAFEGUARD SYSTEM ELEMENTS, NONDESTRUCTIVE ASSAY, INSTRUMENTATION, DYNAMIC MATERIAL CONTROL AND DYMAC COMPUTER CONTROL, TRANSPORTATION PROTECTION DESCRIBING MOBILE EQUIPMENT AND THE NATIONWIDE COMMUNICATION SYSTEM, PLUTONIUM STORAGE FACILITY, AND ATTACK SIMULATION SYSTEMS.

SAFEGUARDS, NUCLEAR MATERIAL * THEFT/DIVERSION * PLUTONIUM * TRANSPORTATION AND HANDLING

118957
ANNUAL REPORT 1974, NUCLEAR SAFEGUARDS PROJECT (IN GERMAN)
KERNFORSCHUNGSZENTRUM KARLSRUHE, F.R. GERMANY
KFK-2206 +, 200 PPS, FIGS, REFS, DEC. 1975

THIS REPORT IS A DESCRIPTION OF MAJOR ACTIVITIES PERFORMED IN 1974 WITHIN THE FRAMEWORK OF THE NUCLEAR SAFEGUARDS PROJECT BY THE INSTITUTE OF THE GESSELSCHAFT FUR KERNFORSCHUNG KARLSRUHE. ALSO PARTICIPATING IN THIS PROJECT WERE THE EUROPEAN INSTITUTE OF TRANSURANIUM ELEMENTS AND SOME INDUSTRIAL FIRMS.

AVAILABILITY - INIS SECTION, INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 590, A-1011 VIENNA, AUSTRIA

REPORT, OPERATIONS * GERMANY * TRANSURANIUM PROGRAM * SPECIAL NUCLEAR MATERIAL * *SAFEGUARDS, NUCLEAR MATERIAL

118891
MURPHEY WM * SHERR TS * BENNETT CA
SOCIETAL RISK APPROACH TO SAFEGUARDS DESIGN AND EVALUATION
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
18 PPS, NUCL. MATER. MANAGE., 4(3), PP. 588-606 (JUNE 18, 1975)

A COMPREHENSIVE RATIONALE FOR SAFEGUARDS DESIGN AND EVALUATION, AND A FRAMEWORK FOR CONTINUING SYSTEMATIC ASSESSMENT OF THE SYSTEM'S EFFECTIVENESS AND EFFICIENT ALLOCATION OF AVAILABLE SAFEGUARDS RESOURCES FOR BALANCED PROTECTION, WERE DEVELOPED. THE SOCIETAL RISK APPROACH EMPLOYED CONSIDERS THE LIKELIHOOD OF SUCCESSFUL DESTRUCTIVE ACTS INVOLVING NUCLEAR MATERIALS OF FACILITIES AND THE MAGNITUDE OF THE EFFECTS ON SOCIETY. THE SAFEGUARDS PROBLEM IS DESCRIBED IN TERMS OF EVENTS AFFECTING SOCIETAL RISK AND ADVERSARY ACTIONS. STRUCTURE OF THE SAFEGUARDS SYSTEM AND THE EVALUATION OF ITS ADEQUACY ARE DISCUSSED. ADVERSARY CHARACTERISTICS ARE ALSO DISCUSSED.

SAFEGUARDS, NUCLEAR MATERIAL * SABOTAGE * DESIGN CRITERIA * SAFETY EVALUATION * SOCIO/PHILOSOPHICAL CONSIDERATION

118888
AYERS AL
SAFEGUARDS IN REPROCESSING
ALLIED-GENERAL NUCLEAR SERVICES, BARNWELL, S.C.
13 PPS, NUCL. MATER. MANAGE., 4(3), PP. 451-63 (JUNE 18, 1975)

THE RECENT CONCERN OF THE FEDERAL REGULATORY AGENCIES TOWARD COMBATING TERRORIST ATTACK OR SABOTAGE HAS MATERIALLY INCREASED REQUIREMENTS FOR NUCLEAR MATERIALS SAFEGUARDS IN FUEL REPROCESSING FACILITIES. THESE REQUIREMENTS HAVE DRASTICALLY AFFECTED BOTH PHYSICAL PROTECTION AND MATERIALS CONTROL AND ACCOUNTING. SOME OF THE CHANGES REDUCE OPERATING EFFICIENCIES WITH QUESTIONABLE IMPROVEMENT IN SAFEGUARDS AND OTHERS REQUIRE CLARIFICATION BEFORE THEY CAN BE REALISTICALLY AP... THE AREAS OF CONCERN ARE INVENTORY FREQUENCY, MATERIALS CONTROL AND

111868 *CONTINUED*
ACCOUNTING FOR LOW ENRICHED URANIUM, VISUAL MONITORING IN LABORATORIES, EMPLOYEE SEARCH, DOUBLE BARRIERS DURING CONSTRUCTION, AND ASSAY OF FISSION PRODUCT-CONTAMINATED SOLID WASTE.

FUEL REPROCESSING + BARNWELL (FRP) + AGENCY, NRC + SABOTAGE + SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + ACCOUNTABILITY

111887
ECCLES DR
AUTOMATED PERSONAL IDENTIFICATION: A NEW TECHNIQUE FOR CONTROLLING ACCESS TO NUCLEAR MATERIALS AND FACILITIES
CALSPAN TECHNOLOGY PRODUCTS INC., BUFFALO, N.Y.
8 PPS, NUCL. MATER. MANAGE., 4(3), PP. 277-84 (JUNE 18, 1975)

SPECIAL NUCLEAR MATERIALS MUST BE PROTECTED AGAINST THE THREAT OF DIVERSION OR THEFT, AND NUCLEAR FACILITIES AGAINST THE THREAT OF INDUSTRIAL SABOTAGE. IMPLICIT IN THIS PROTECTION IS THE MEANS OF CONTROLLING ACCESS TO PROTECTED AREAS, MATERIAL ACCESS AREAS, AND VITAL AREAS. WITH THE ADVENT OF AUTOMATED PERSONAL IDENTIFICATION TECHNOLOGY, THE PROCESSES OF ACCESS CONTROL CAN BE AUTOMATED TO YIELD BOTH HIGHER SECURITY AND REDUCED COSTS. THIS PAPER FIRST SURVEYS THE CONVENTIONAL METHODS OF ACCESS CONTROL; NEXT, AUTOMATED PERSONAL IDENTIFICATION CONCEPTS ARE PRESENTED AND VARIOUS SYSTEM APPROACHES ARE HIGHLIGHTED; FINALLY, CALSPAN'S FINGERSCAN SUBSYSTEM FOR IDENTITY VERIFICATION IS DESCRIBED.

SECURITY + SAFEGUARDS, NUCLEAR MATERIAL + THEFT/DIVERSION + SABOTAGE

114280
LATHROP KD
REACTOR SAFETY AND TECHNOLOGY QUARTERLY PROGRESS REPORT OCTOBER 1-DECEMBER 31, 1975
LOS ALAMOS SCIENTIFIC LABORATORY, NEW MEXICO
LAPR-NUREG-6233 *, 93 PPS, 23 TABS, 41 FIGS, 104 REFS, MARCH 1976

ON DECEMBER 1, 1975, THE LOS ALAMOS SCIENTIFIC LABORATORY FORMED A DIVISION TO SERVE AS A FOCUS FOR RESEARCH IN NUCLEAR SAFEGUARDS, REACTOR SAFETY AND TECHNOLOGY. THIS PROGRAM INCLUDES HTGR, LWR, AND LMFBR SAFETY RESEARCH.

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ACCIDENT ANALYSIS + REACTOR, BWR + FISSION PRODUCT RELEASE + REACTOR, PWR + ANALYTICAL MODEL + COOLANT CHEMISTRY + HELIUM + REACTOR, HTGR + REACTOR, LMFBR + SEISMIC DESIGN + SAFEGUARDS, NUCLEAR MATERIAL + HUCK + JACOBS

112308
BENNETT CA + MURPHY WN + SHERR TS
SYSTEM DESIGN AND EVALUATION FOR NATIONAL SAFEGUARDS SYSTEMS
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
BNWL-SA-5559 + CONF-751017-14 *, 27 PPS; FROM SYMPOSIUM ON SAFEGUARDS OF NUCLEAR MATERIALS, VIENNA, AUSTRIA, OCT. 29, 1975

DISCUSSES THE PURPOSES OR NEEDS OF A SAFEGUARD SYSTEM DESCRIBING CHANGING NEEDS, ESPECIALLY TO PROTECT AGAINST NUCLEAR MATERIAL THEFT OR DIVERSION FOR CLANDESTINE USE. SOCIETAL RISK CONCEPT IS INTRODUCED AND THE USE OF IT FOR SYSTEM ANALYSIS IS SHOWN TO BE CONSISTENT WITH NATIONAL GOALS FOR SAFEGUARDS. A STRUCTURE OF THE SAFEGUARDS PROBLEM IS PRESENTED WHICH PERMITS ALL FACTORS TO BE TAKEN INTO ACCOUNT IN THE DESIGN AND IMPLEMENTATION OF A COST-EFFECTIVE SYSTEM.

AVAILABILITY - NATIONAL TECHNICAL INFORMATION SERVICE, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VA. 22161

*SAFEGUARDS: NUCLEAR MATERIAL + BENEFIT VS RISK + ACCOUNTABILITY + THEFT/DIVERSION

112806
TAYLOR TB
NUCLEAR SAFEGUARDS
INTERNATIONAL RESEARCH & TECHNOLOGY CORP., ARLINGTON, VA
15 PPS, 4 TABS, 12 REFS, ANNUAL REVIEW OF NUCLEAR SCIENCE, VOL. 25, PP. 406-21 (1975)

DISCUSSES RESOURCES REQUIRED TO MAKE FISSION EXPLOSIVES COVERING THE BASIC REQUIREMENTS, INFORMATION AVAILABILITY, SKILLED PEOPLE, NUCLEAR MATERIALS, AND NEEDED FACILITIES. THE AUTHOR BELIEVES CRUDE WEAPONS CAN BE BUILT BY TERRORIST GROUPS. PRESENT SAFEGUARDS ARE DISCUSSED THAT ARE NOT CLASSIFIED AND FUTURE SAFEGUARDS ARE SUGGESTED. TOTAL CONTAINMENT IS RECOMMENDED WHICH WOULD KEEP THE ENTIRE FUEL CYCLE IN ONE FUEL REPROCESSING IN THE SAME LOCATION, SO TRANSPORTATION ON PUBLIC THOROUGH FARES WOULD NOT BE REQUIRED.

PLUTONIUM + URANIUM + FUEL REPROCESSING + SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE

111334
PERSPECTIVES ON MATERIAL SAFEGUARDS
GENERAL ELECTRIC COMPANY
2 PPS, GE NUCLEAR POWER NEWSLETTER, PP. 2-3 (FALL 1975)

PRESENTS A CURSORY REVIEW OF SAFEGUARDS IN THE FORM OF QUESTIONS AND ANSWERS. TOPICS ADDRESSED INCLUDE THE BASIC CONCERN, RISK, THEFT OF MATERIALS FROM GENERATING PLANTS, THE MILITARY SECTOR,

111334 *CONTINUED*
TRANSPORTATION PROTECTION, AND TESTING A SAFEGUARDS SYSTEM.

AVAILABILITY - EDITOR, M/C 813, GENERAL ELECTRIC CO., 175 CURTNER AVE., SAN JOSE, CALIF. 95125

TRANSPORTATION AND HANDLING + *REVIEW + MILITARY CONSIDERATION + *SAFEGUARDS, NUCLEAR MATERIAL + BENEFIT VS RISK + SECURITY

111156
LIVERMAN JL
FINAL ENVIRONMENTAL STATEMENT - LIQUID METAL FAST BREEDER REACTOR PROGRAM. VOL. 1 - SUMMARY AND SUPPLEMENTAL MATERIAL
U.S. ERDA, WASHINGTON
ERDA-1535 (VOL. 1 OF 3) +, APPROX. 200 PPS, FIGS, REFS, DEC. 1975

THE SECTIONS CONTAINED IN THIS VOLUME CONCERN: PROGRAM OPTIONS AND THEIR COMPATIBILITY WITH MAJOR ISSUES AFFECTING COMMERCIAL DEPLOYMENT; THE PROPOSED FINAL STATEMENT; A DETAILED DISCUSSION OF THE MAJOR ISSUES; A REVIEW OF U RESOURCE AVAILABILITY; AN ANALYSIS OF THE KEY DECISION POINTS IN THE DEVELOPMENT OF ALTERNATIVES TO THE LMFBR; AND SUPPLEMENTAL MATERIAL; AND THE ADMINISTRATION FINDINGS AND EVALUATION (VOLUMES 2 AND 3 CONTAIN 88 COMMENT LETTERS AND ERDA RESPONSES TO EACH).

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CARBON + URANIUM + WASTE MANAGEMENT + REVIEW + SAFETY PROGRAM + R AND D PROGRAM + *REACTOR, LMFBR + SAFEGUARDS, NUCLEAR MATERIAL + RESOURCE, NATURAL + COST BENEFIT + FUEL CYCLE + AGENCY, ERDA + *STATEMENT, ENVIRONMENTAL

110862
NOTZ KJ
AN OVERVIEW OF HTGR FUEL RECYCLE
OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TN
ORNL-TM-4747 +, 56 PPS, 6 TABS, 22 FIGS, JAN. 1976

AN OVERVIEW OF HTGR FUEL RECYCLE IS PRESENTED, WITH EMPHASIS PLACED ON REPROCESSING AND FUEL KERNEL REFABRICATION. OVERALL RECYCLE OPERATIONS INCLUDE (1) SHIPMENT AND STORAGE, (2) REPROCESSING, (3) REFABRICATION, (4) WASTE HANDLING, AND (5) ACCOUNTABILITY AND SAFEGUARDS.

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AIR CLEANING + DECONTAMINATI + WASTE HANDLING + WASTE STORAGE + OFF GAS + SOLVENT EXTRACTION PROCESS + SHIPPING ANALYSIS + FUEL REPROCESSING + REACTOR, HTGR + SAFEGUARDS, NUCLEAR MATERIAL + FUEL RECYCLE + JACOBS

109893
THE NUCLEAR FUEL CYCLE
6 PPS, 7 TABS, 5 FIGS, NUCLEAR ENGINEERING INTERNATIONAL, 20(237), PP. 1015-20 (DEC. 1975)

REVIEWS HIGHLIGHTS OF A CONFERENCE WHICH DEVOTED CONSIDERABLE ATTENTION TO ASPECTS OF SAFEGUARDS AND SECURITY. OTHER SUBJECTS REVIEWED INCLUDE URANIUM RESOURCES, DEVELOPMENT OF WORLD U RESERVES, ENRICHMENT, AND FUEL REPROCESSING.

ECONOMICS + URANIUM + RECOVERY PROCESS + REVIEW + *FUEL REPROCESSING + SAFEGUARDS, NUCLEAR MATERIAL + *FUEL CYCLE + SECURITY

109791
EUROPEAN COMMUNITY LIG T WATER REACTOR SAFETY RESEARCH PROJECTS EXPERIMENTAL ISSUE
COMMISSION OF THE EUROPEAN COMMUNITIES, BRUSSELS, BELGIUM
EUR-5394E +, 550 PPS, FI REFS, APRIL 1975

SUBJECTS REVIEWED INCLUDE BLOWDOWN AND EMERGENCY COOLING, CORE MELTDOWN, EXTERNAL INFLUENCES SUCH AS MISSILES AND EXPLOSIONS, POWER TRANSIENTS, RADIOACTIVITY TRANSPORT AND RELEASE, SAFEGUARDS, QA, AND THE FUEL CYCLE. CONTRIBUTING COUNTRIES ARE BELGIUM, DENMARK, FRANCE, GERMANY, GREAT BRITIAN, ITALY, AND THE NETHERLANDS.

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EXPLOSION + FRANCE + REACTOR TRANSIENT + UNITED KINGDOM + BELGIUM + REACTOR, POWER + CORE MELTDOWN + DENMARK + GERMANY + ITALY + NETHERLANDS + REACTOR, LWR + BLOWDOWN + QUALITY ASSURANCE + EMERGENCY COOLING + *R AND D PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + FUEL CYCLE

108623
GILINSKY V
NUCLEAR SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTO
4 PPS, AWARE, NO. 59, PP. 10-13 (AUG. 1975)

COMMISSIONER VICTOR GILINSKY SPEAKS NUCLEAR MATERIAL ACCOUNTABILITY AND PHYSICAL PROTECTION SYSTEMS FOR NUCLEAR FACILITIES. INCREASING NUMBER OF COUNTRIES ARE AT THE THRESHOLD OF NUCLEAR WEAPONRY --- MATERIAL ACCOUNTABILITY PROVIDES AN EARLY WARNING --- DOMINANT SECURITY

139623 *CONTINUED*
CONCERN IS SABOTAGE INTENDED TO CAUSE CORE MELT-DOWN AND RELEASE OF RADIOACTIVITY --- NUCLEAR PLANTS INHERENTLY RESISTANT TO SABOTAGE --- WE NEED TO TIGHTEN SECURITY CONTROL OVER SOME ASPECTS OF NUCLEAR ENERGY, AND THE BEST APPROACH IS TECHNICAL INGENUITY AND RESILIENCY OF INSTITUTIONS TO DIMINSH VULNERABILITY.

RADIOCHEMICAL PROCESSING + *SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + RECORDS + *POWER PLANT, NUCLEAR

137820
GILINSKY V
NRC SAFEGUARDS AND RELATED ISSUES
U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON
NRC PRESS RELEASE S-13-75 *, 22 PPS, JUNE 18, 1975

SPEAKER DISCUSSES ISSUES RAISED BY THE NEED FOR NUCLEAR SAFEGUARDS WHICH EMBRACE BOTH NUCLEAR MATERIAL ACCOUNTABILITY SYSTEMS AND PHYSICAL PROTECTION SYSTEM FOR NUCLEAR FACILITIES. HE MENTIONS WHAT NRC IS DOING TO CARRYOUT ITS SAFEGUARD RESPONSIBILITIES AS TO UPGRADING EXISTING SYSTEMS, AND DESCRIBES NEW MEASURES AND PROCEDURES BEING CONSIDERED. THE MOST SERIOUS SECURITY RELATED PROBLEM IS ILLICIT MANUFACTURE AND THREATENED USE OF NUCLEAR EXPLOSIVE DEVICES. PROTECTION AGAINST THIS THREAT IS BEST ASSURED BY A SOUND SAFEGUARD SYSTEM. THEFT OF MATERIAL WOULD PROBABLY OCCUR WHEN MATERIALS ARE IN TRANSIT OR FROM PLANTS WHICH FABRICATE PLUTONIUM AND HIGHLY ENRICHED URANIUM.

AVAILABILITY - ERDA, OFFICE OF PUBLIC AFFAIRS, WASHINGTON, D.C 20545

PLUTONIUM + TRANSPORTATION AND HANDLING + URANIUM + SABOTAGE + *SAFEGUARDS, NUCLEAR MATERIAL + REGULATION, NRC

106489
FINZI S
PROBLEMS OF THE FUEL CYCLE
11 PPS, ENERGIA NUCLEARE (MILAN), 22(6), PP, 320-30 (JUNE 1975) (IN ITALIAN)

PRESENTS INFORMATION ON THE RESEARCH PROGRAM AT EURATOM JRC (ISPRA) CONCERNING FISSILE MATERIAL SAFEGUARDS AND RADIOACTIVE WASTE DISPOSAL. THE MOST RELEVANT FEATURES OF THE WASTE PROGRAM IS THE POSSIBILITY OF SEPARATING THE ACTINIDES AND A STUDY OF THE POSSIBILITY OF BURNING THE ACTINIDES IN THE REACTOR.

WASTE DISPOSAL + ITALY + *R AND D PROGRAM + SAFEGUARDS, NUCLEAR MATERIAL + ACTINIDE + FUEL CYCLE

104247
SPECIAL SAFEGUARDS STUDY: SCOPES OF WORK
U.S. NUCLEAR REGULATORY COMMISSION
NUREG-75/060 *, 52 PPS, JUNE 1975

DESCRIBES THE TASKS TO DEFINE SPECIFIC PROTECTION SYSTEMS FOR: DISPERSED SITES; COLOCATED FUEL CYCLE PLANTS; AND MIXED ENERGY PARKS CONSISTING OF REACTORS, REPROCESSING PLANTS AND FUEL FABRICATION PLANTS. ISSUES TO BE ANALYZED ARE: THE SAFEGUARDS OBJECTIVE; QUANTITIES AND TYPES OF NUCLEAR MATERIAL TO BE PROTECTED; PHYSICAL PROTECTION; AND MATERIAL CONTROL AND ACCOUNTING.

AVAILABILITY - SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402

SPECIAL NUCLEAR MATERIAL + *SAFEGUARDS, NUCLEAR MATERIAL + *AGENCY, NRC

102226
COTTRELL WB
PROTECTION OF NUCLEAR POWER PLANTS AGAINST EXTERNAL DISASTERS
OAK RIDGE NATIONAL LABORATORY, TENNESSEE
ORNL-NSIC-117 *, 394 PAGES, FIGURES, REFERENCES, APRIL 1974

THIS REPORT IS BOTH A BIBLIOGRAPHY AND A COMPILATION OF ARTICLES ON THE PROTECTION OF NUCLEAR POWER PLANTS FROM EXTERNAL DISASTERS. THE SUBJECT MATTER INCLUDES TORNADOES AND HIGH WINDS, FLOODS AND HIGH WAVES, EARTHQUAKES, PLANE CRASHES, SABOTAGE AND DIVERSION, ACTS OF WAR, AND OTHER DISASTERS. THE ARTICLES INCLUDED IN THIS COMPILATION ARE PRIMARILY REVIEW ARTICLES ON VARIOUS TOPICS SELECTED FROM NUCLEAR SAFETY. RELEVANT AEC REGULATIONS, RULINGS, AND REGULATORY GUIDES ARE ALSO INCLUDED WHERE APPROPRIATE. THE BIBLIOGRAPHY WITH EACH SECTION INCLUDES ALL RECENT LITERATURE ON EACH TOPIC, EACH WITH ITS OWN KEY-WORD, AUTHOR, AND PERMUTED TITLE INDEX. IN ADDITION, A BRIEF COMMENTARY SERVES AS AN INTRODUCTION TO THE REPORT AS WELL AS TO PLACE ITS VARIED CONTENTS IN PERSPECTIVE. AN OVERALL INDEX TO ALL TEXTURAL MATERIAL IS ALSO PROVIDED.

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KEYWORD INDEX

A COLLECTION OF KEYWORDS IS USED TO DENOTE THE MAIN SAFETY RELATED POINTS COVERED IN EACH ARTICLE. THE FOLLOWING INDEX IS AN ALPHABETICAL LISTING OF THE KEYWORDS GIVING REFERENCES TO EACH ARTICLE WHICH WAS KEYED TO IT.

AUTHOR INDEX

FOLLOWING IS A LIST OF AUTHORS WHOSE DOCUMENTS
HAVE BEEN ABSTRACTED IN THIS PUBLICATION

PERMUTED TITLE INDEX

THIS INDEX IS ONE IN WHICH THE REPORT TITLES ARE PERMUTED AROUND SIGNIFICANT WORDS WHICH APPEAR IN THE TITLE. THE INDEX WORDS ARE ARRANGED ALPHABETICALLY IN A COLUMN IN THE CENTER OF THE PAGE WITH THE TITLE PERMUTED AROUND THEM. (# INDICATES BEGINNING OF TITLE, * INDICATES END OF TITLE.)

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