

CAT II NON-POWER REACTOR LICENSEE HOLDINGS AS OF JANUARY 79

	LICENSE #	>20% U-235	U-233	Pu	>10%<20% U-235
Babcock and Wilcox (Lynchburg)	R-47 CX-10	4500			506,102
General Atomic	R-67 R-38	1000			2,340 2,770
General Electric (Vallecitos)	TR-1 R-33	4900 3834		10	
Union Carbide	R-81	4900			
MIT	R-37	4000			
Georgia Tech	R-97 R-111	4800			700
University of Michigan	R-28	1680			
Rhode Island AEC	R-95	2111		32	
Oregon State University	R-106 R-51	1000g 700g		31.54	
Texas A&M	R-83	3612		101	
University of Wisconsin	R-74	1304		45	
Washington State Univ.	R-76	1900		109	
Univ. of California-LA	R-71	4700		64	
Va. Polytechnic Inst.	R-62	3206		15	
Univ. of Missouri (Rolla)	R79	4300			
Univ. of Washington	R-73	3425		232	
SUNY at Buffalo	R-77			239	318,586
Lowell Technical Inst.	R-125	4185		272	

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CAT II NON-POWER REACTOR LICENSEE HOLDINGS AS OF JANUARY 79
(Continued)

	LICENSE #	>20% U-235	U-233	Pu	>10%<20% U-235
Worcester Polytechnic Inst.	R-61	4051		16	
Ohio State University	R-75	3580			
Manhattan College	R-94	3105		493	
University of Kansas	R-78	2773		32	
Purdue University	R-87	2442		160	
Univ. of California - Santa Barbara	R-124	1211		11	
No. Carolina State Univ.	R-63 R-120	3760			3,639
University of Florida	R-76	3535		15	196
Univ. of Missouri-Columbia	R-103	1100		80	2,000
University of Virginia	R-123 R-66	2227 2415		16 128	
Iowa State University	R-59 R-74	4634		16	
Pennsylvania State Univ.	R-2	2704			

January 16, 1979

CONSENT CALENDAR ITEM

For: The Commissioners

From: Robert B. Minogue, Director
Office of Standards Development

William J. Dircks, Director
Office of Nuclear Material Safety and Safeguards

Thru: Lee V. Gossick, Executive Director for Operations *LVG*

Subject: PHYSICAL PROTECTION OF CATEGORY II AND III MATERIAL

Purpose: To obtain the Commission's approval of revised proposed amendments to 10 CFR Parts 70, 73, and 150 for publication in final form.

Category: This paper covers a major issue requiring Commission action.

Discussion: Background

On May 24, 1978, the Commission issued for public comment proposed amendments to 10 CFR Parts 70, 73, and 150 to require physical protection measures to detect theft of special nuclear material of moderate and low strategic significance. These amendments were primarily to show U.S. endorsement of physical protection procedures recommended by the IAEA in INFCIRC/225. The amendments were to apply to the possession and use of such material at fixed sites and to transportation between sites, including import and export shipments. Interested persons were given thirty days to comment on the proposed amendments.

Enclosure "A" consists of revised proposed amendments to 10 CFR Parts 70, 73, and 150 and a statement of consideration which includes discussion of some of the more significant issues raised by commenters and discussions of changes made. A summary of the comments and staff responses thereto are included as Enclosure "B". There are four proposed substantive changes and several other changes of a less substantive character, such as rewording or addition of definitions.

Changes

The proposed substantive changes are as follows:

Contact:
R. J. Jones, SD
443-5907
C. K. Nulsen, NMSS
427-4043

7908080650
PDR

1. The proposed amendments have been revised to exempt plutonium-beryllium (PuBe) sealed sources from material requiring physical protection. Commenters stated that the cost of providing the required physical protection for PuBe sealed sources would be prohibitive from the point of view of the limited budgets available at universities, where most of the sources are now located. Imposition of the proposed requirements, it was said, would result in the curtailment of the use of such sources at some sites with a significant impact on the educational and research programs at such institutions. The staff agreed that the threat to the common defense and security was sufficiently low that specific physical security measures should not be required for PuBe sources. The basis for this is the small quantities of plutonium found in PuBe sources (generally from 16 to 161 grams) and the fact that potential adversaries wishing to obtain a 2 kg quantity of plutonium would have to commit separate acts of theft at a large number of widely separated sites without being detected. There is an upper limit of 500 grams of plutonium to which this exemption can be applied because greater than a 500 gram accumulation of plutonium in this form invalidates the basis for this exemption. IAEA guidelines allow for such exceptions in the case of research type facilities.
2. The proposed amendments have been changed to reflect that plutonium with isotopic concentration exceeding 80 percent in plutonium-238 would be exempted from the physical protection requirements. This change corrects an oversight in the initially proposed amendments in which it was intended that such material would be exempted to be consistent with the definitions of Category II and III material in the IAEA document INFCIRC/225/Rev. 1.
3. Package and vehicle search requirements at facilities at which special nuclear material of moderate strategic significance is used or stored have been changed. As revised, random searches are required regarding items leaving controlled access areas, but not of those entering as previously required. The primary objective of entry searches is to detect materials which could be useful in sabotage. Since protection against sabotage was not within the scope of the proposed amendments, an entry search requirement would not be necessary.
4. Several commenters stated that more time would be needed than the sixty days proposed for submission of physical security plans.

The staff agrees that more time may be required, and has changed the submission date to be 120 days following the

effective date of the final amendment. The amendments will become effective 120 days after publication in the Federal Register. The 120 days from the date of publication of the final rule in the Federal Register will provide sufficient time for:

- a. the public and licensees to review and respond to supporting guidance to be published concurrently with the amendment,
- b. the NRC to consider the public comments on the guidance, and
- c. preparation and issuance of the guidance in final form.

Following publication of the final guidance on or before the effective date of the amendments, licensees will have 120 days to submit their physical security plans. This will provide those licensees who have limited managerial and financial resources sufficient time to prepare their security plans. In a December 19, 1978 letter to Chairman Hendrie, Thomas Pickering, Assistant Secretary of State, Oceans and International Environmental and Scientific Affairs, expressed concern about the amount of time for full implementation following publication of this rule. A separate paper has been submitted to the Commission proposing a response to Mr. Pickering's letter. The proposed response does not change the implementation schedule recommended in this paper.

Other comments which resulted in changes for clarity or definition are discussed in Enclosure "B".

Other Comments

There was one area of comment for which no specific changes were made to the proposed amendments but which is of significance. These comments dealt generally with the technical justification of the proposed amendments.

Many of the commenters questioned the technical justification for the proposed amendments for the following reasons: a lack of detailed information regarding the threat, the additional costs of implementation which were perceived to be incommensurate with only marginal improvements in physical protection, and the adverse impacts on the licensees' ongoing educational and research programs. Particular attention was focused by some commenters on the physical protection requirements for low enriched uranium.

The technical justification for the adoption of the proposed amendments has both a domestic and international component, which are

closely interrelated. Current NRC physical protection regulations apply primarily to strategic special nuclear material (uranium enriched in the isotope U-235 to 20% or greater, U-233, and plutonium) in quantities of five formula kilograms or greater. There are no specific physical protection requirements for quantities in lesser amounts. Yet, a 4.9 formula kilogram quantity of SSNM is almost as important a quantity as 5.0 formula kilograms. Multiple thefts of such materials in less than formula quantities could result in the accumulation of more than a formula quantity. The proposed detection requirements are considered to provide sufficient protection with minimum added cost so as not to adversely affect educational and research programs. Since the requirements are of a detection nature rather than prevention, characterizations of the adversary in the regulations was deemed not to be necessary.

In regard to low enriched uranium (LEU) (enrichments less than 20%), clandestine enrichment to higher levels may go beyond the capability of subnational terrorists, but it does not go beyond the capability of other governments. Unless properly safeguarded, LEU could be stolen on behalf of foreign governments and enriched to explosive usable levels after it is smuggled out of the U.S. With respect to the difference between LEU and natural uranium, the separative work necessary to reach reactor grade material, i.e. 3% U-235, is about 50% of that required to reach 93% U-235 enrichment. (Reference: "Nuclear Theft: Risks and Safeguards," Willrich and Taylor, pg. 129.)

The Nuclear Non-Proliferation Act of 1978 specifies that NRC shall promulgate regulations which assure that physical security measures are provided to special nuclear materials exported from the United States, without specifying whether the materials are LEU or HEU. Pursuant to this legislation, the Commission has promulgated 10 CFR Part 110.43 which provides among other things that:

"(b) Commission determinations on the adequacy of physical security programs in recipient countries for Category II and III quantities of material will be based on available relevant information and written assurances from the recipient country or group of countries that physical security measures providing as a minimum protection comparable to that set forth in INFCIRC/225 will be maintained."

Physical protection measures similar to those proposed, which are based on the recommendations of the IAEA Information Circular INFCIRC/225/Rev. 1, have already been adopted by several countries.

Another area of comment dealt with employee screening. Some of the licensees interpreted the screening requirement to call for a full field background investigation of all personnel entering the controlled access areas where the material is used or stored.

The wording of the rule has been revised to more clearly indicate that the requirement is merely one requiring a screening based on knowledge of persons permitted access rather than a formal security investigation. The guidance to be issued with the rule explains more fully the intent of this requirement.

Sabotage at Non-power Reactors

The proposed amendments, that are the subject of this paper, are limited to consideration of theft of SNM and do not include sabotage protection. The NRR staff is currently examining the necessity to require additional physical protection measures at non-power reactors that have the potential for exceeding Part 100 release limits as a result of sabotage. If this proves to be necessary, NRR plans to propose a new separate section of Part 73 to deal with this issue. Preliminary investigation indicates that these added requirements, if necessary, would be applicable to a very small number of non-power reactors. For that reason, the staff recommends that Commission approval of the proposed new Section 73.47 not be delayed pending resolution of this issue.

Guidance

A regulatory guide entitled "Standard Format and Content for the Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance" (Enclosure "C") will be published for public comment at the time the rule is published. The guidance included in this document provides for a much lower level of physical security than that required for formula quantities of strategic special nuclear material. The emphasis of this guide is on a detection and response system rather than a prevention system.

Value/Impact

The Value Impact Assessment has been revised to better reflect the impacts of the revised proposed amendments. In addition, a new set of lower cost estimates has been provided to take into account the options available to licensees as described in the guidance document which is now available in draft form.

The revised Value Impact Assessment now shows that there will be only about 61 licensees for SNM of low strategic significance, as opposed to approximately 500 licensees as reported previously, due to the exemption from physical protection requirements of PuBe sealed sources. The number of licensees for SNM of moderate strategic significance is 37.

Total incremental industry costs for physical protection requirements imposed by the proposed amendments, based upon the lower cost estimates provided in the revised value impact assessment, are summarized in the table below:

	<u>Capital Costs</u>	<u>Annual Costs</u>
<u>Fixed Sites</u>	\$ 125,154	\$ 202,904
Moderate Only	69,708	184,076
Low Only	55,446	18,828
<u>Transportation</u>	\$ 12,574	\$ 1,430
Moderate Only	7,566	926
Low Only	5,008	504
<u>AVERAGE COST/FACILITY</u>		
<u>Fixed Sites</u>	\$ 1,277	\$ 2,070
Moderate	1,884	4,975
Low	910	309
<u>Transportation</u>	\$ 629	\$ 72
Moderate	630	77
Low	626	63

In addition to the costs stated above, some licensees will be required to pay a licensing fee to have their security plans reviewed. Those licensees required to pay a licensing fee are identified in Table XII of Annex 2 of Enclosure D along with the estimated amount they must pay. The total fee impact is approximately \$190,000 which would be collected initially--approximately \$125,000 for Category II and \$65,000 for Category III. Fees listed that are \$2,000 and greater, however, are subject to manpower cost review, (e.g., when review of the plan is complete, the expenditures for professional manpower and support services will be determined and the resultant fee assessed, but in no event will the fee exceed that shown in the schedule,) and because of the possibility of refunds, the net effect of the fee impact may be less than \$190,000. Colleges and Universities required to file plans for research reactors and special nuclear material licenses under the rule would not be subject to fees.

NRC Resources

The amendments proposed in this paper would impact NRC resources as follows:

1. Amendments to existing physical security plans for 50 non-power reactor licensees would need to be reviewed. This would require an estimated 3.5 man-years of effort in the Office of Nuclear Reactor Regulation. This effort would be completed by the end of FY 1980. New plans and plan maintenance during the period FY 1981 through 1984 is estimated to require 3.5 man-years of effort in NRR.
2. Fuel cycle physical security plans for 8 Category II facilities, 7 Category III facilities, and 20 transportation security plans would need to be reviewed. This would require an estimated 6.3 man-years of effort in the Office of Nuclear

Material Safety and Safeguards. This effort would be completed by the end of FY 1980. The 35 plans referred to are completely new plans whereas the nonpower reactor plans, referred to in 1. above would be modifications of current plans already reviewed and approved by NRR pursuant to § 73.40. New fuel cycle plans and plan maintenance during the period FY 1981 through FY 1984 is estimated to require a total of 3.2 man-years of effort in NMSS.

3. Inspection of these physical security requirements will be included in the currently programmed efforts for the material control and accounting inspectors and health physics inspectors to minimize the impact on IE resources. For those fixed sites not currently covered by any inspection program, one additional man-year and \$25,000 in travel funds would be required. This would provide inspections of Category II facilities once every 2 years and Category III facilities once every 3 years. Three additional man-years and \$75,000 in travel funds would be required to inspect 20 percent of Category II shipments and 10 percent of Category III shipments. One additional man-year would be required to administer the program.

Recommendation:

That the Commission:

1. Approve the amendments set forth in Enclosure "A" for publication in final form in the Federal Register.
2. Note that upon publication of the amendments, the proposed guidance set forth in Enclosure "C" (Standard Format and Content Guide) would be published for a public comment period of 60 days. Another 60 days will be needed to incorporate the comments into a revised guide. At this time (i.e., 120 days after publication in the Federal Register) the amendment would become effective. The licensees would be given a period of 120 days after the amendments become effective (240 days after publication in the Federal Register) to submit their plans. Plans would have to be implemented and followed by the licensee within 30 days after approval by the Commission or 120 days after submittal of plans (360 days after publication in the Federal Register), whichever is later.
3. Note that the appropriate Congressional Committees will be notified of this Commission action.
4. Note that a summary of the comments on the proposed amendments and the responses thereto are attached as Enclosure "B".

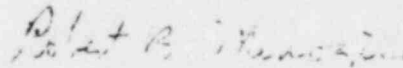
5. Note that a Report Justification Analysis contained in Enclosure "D" will be submitted to the Comptroller General for such review as may be appropriate under the Federal Reports Act.
6. Note that a value/impact assessment has been prepared as Enclosure "D" and will be placed in the Public Document Room.
7. Note that neither an Environmental Impact Statement nor a Negative Declaration is required in accordance with 10 CFR 51.5(d)(3) because the proposed amendments are not significant from the standpoint of environmental impact.
8. Note a public announcement such as Enclosure "E" will be issued when the amendments are filed with the Office of the Federal Register.

Coordination:


The Offices of International Programs, Nuclear Reactor Regulation, State Programs, and Inspection and Enforcement concur in the recommendation of this paper. The Office of the Executive Legal Director and OGC have no legal objection. The Office of Public Affairs prepared the draft Public Announcement, Enclosure "E".

Scheduling:

For affirmation at an early policy session.



Robert B. Minogue, Director
Office of Standards Development



William J. Dircks, Director
Office of Nuclear Material Safety
and Safeguards

Enclosures: See next page

Enclosures:

- "A" - Federal Register Notice
- "B" - Summary of Comments
- "C" - Standard Format and Content for the
Licensee Physical Security Plan for
the Protection of Special Nuclear
Material of Moderate or Low Strategic
Significance
- "D" - Value/Impact
- "E" - Public Announcement

Commissioners' comments or consent should be provided directly to the Office of the Secretary by close of business Tuesday, January 30, 1979.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT January 24, 1979, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

This paper is tentatively scheduled for consideration at an Open/Closed Meeting during the Week of February 5, 1979. Please refer to the appropriate Weekly Commission Schedule, when published, for a specific date and time.

DISTRIBUTION:

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ENCLOSURE A

Title 10 - Energy

CHAPTER I - NUCLEAR REGULATORY COMMISSION

PART 70 - DOMESTIC LICENSING OF SPECIAL NUCLEAR MATERIAL

PART 73 - PHYSICAL PROTECTION OF PLANTS AND MATERIALS

PART 150 - EXEMPTIONS AND CONTINUED REGULATORY AUTHORITY IN
AGREEMENT STATES UNDER SECTION 274

Safeguard Requirements for Special Nuclear Material of
Moderate and Low Strategic Significance

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission is amending its regulations for physical protection of plants and materials, including nonpower reactors, to require physical protection measures to detect theft of special nuclear material of moderate and low strategic significance. The amendments are being made in the interest of common defense and security. The measures are designed to provide a level of protection equivalent to that recommended in Information Circular/225/Rev. 1 (INFCIRC/225) published by the International Atomic Energy Agency (IAEA). The amendments specify protection

*expand on extent
of equivalency
in Supplemental
Info (Pg. 3-)*
Enclosure "A"

requirements for special nuclear material at fixed sites, including nonpower reactors, and for special nuclear material in transit.

Physical protection requirements for independent spent fuel storage installations and nuclear power reactors are presently covered under 10 CFR § 73.40, § 73.50, and § 73.55 and therefore are not included in these amendments:

Concurrent with the publication of the amendments, the NRC is publishing a regulatory guide entitled, "Standard Format and Content for the Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance." This document has been prepared as an aid to uniformity and completeness in the preparation and review of the physical security plan for special nuclear material of moderate and low strategic significance. In addition, a value/impact assessment of these amendments has been prepared and placed in the Commission's Public Document Room at 1717 H Street, NW., Washington, D.C.

EFFECTIVE DATE: (Insert date 120 days after publication in FR).

NOTE: The Nuclear Regulatory Commission has submitted this rule to the Comptroller General for review of its reporting requirement under the Federal Reports Act, as amended, 44 U.S.C. 3512. The date on which the reporting requirement of the rule becomes effective, unless advised to the contrary, includes a 45-day period which that statute allows for Comptroller General review (44 U.S.C. 3512(c)(2)).

FOR FURTHER INFORMATION CONTACT: Mr. R. J. Jones, Chief, Safeguards Standards Branch, Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 (301) 443-5907 or Mr. C. K. Nulsen, Requirements Analysis Branch, Division of Safeguards, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 (301) 427-4043.

SUPPLEMENTARY INFORMATION: On May 24, 1978 the Nuclear Regulatory Commission published in the FEDERAL REGISTER (43 FR 22216) proposed amendments to 10 CFR Parts 70, 73, and 150 of its regulations. Interested persons were invited to submit written comments and suggestions on the proposed amendments within thirty days after publication in the FEDERAL REGISTER. Based on the public comments and other considerations, the Commission has adopted the proposed amendments, with modifications as set forth below.

*no sabotage
mostly detection
rather than
prevention*

Significant differences from the proposed rule published for comment on May 24, 1978 are: (1) Plutonium-Beryllium (PuBe) sealed sources would be exempted from the physical protection requirements; (2) Plutonium with isotopic concentration exceeding 80 percent in plutonium-238 would be exempted from the physical protection requirements; (3) package and vehicle Search requirements at facilities where special nuclear material of moderate strategic significance is used or stored have been changed; (4) The period of time allotted for submittal of a licensee plan to implement these requirements has been changed from 60 days to 120 days after the

effective date of the amendment. In addition, editorial and clarifying changes were made and some definitions added to clarify the intent of the regulations.

The following discussion pertains to items (1) through (4) above.

(1) PuBe sealed sources - Commenters stated that the cost of providing the required physical protection for PuBe sealed sources would be prohibitive from the point of view of the limited budgets available at universities where most of the sources are now located. Imposition of the proposed requirements, it was said, would result in the curtailment of the use of PuBe sources at some sites with a significant impact on the educational and research programs at those institutions. In view of the very small quantities of plutonium found in PuBe sealed sources (generally, from 16 to 161 grams) and the fact that potential adversaries wishing to obtain a 5 kg formula quantity of plutonium would have to commit separate acts of theft at a large number of widely separated sites without being detected, the Commission has decided that the threat to the common defense and security of this country was sufficiently low that physical security measures should not be required for PuBe sealed sources. There is an upper limit of 500 grams of plutonium to which this exemption can be applied because greater than a 500 gram accumulation of plutonium in this form invalidates the basis for this exemption. IAEA guidelines allows for such exceptions in the case of research type facilities.

(2) More than 80 percent Pu-238 - The proposed rule has been amended to reflect that plutonium with isotopic concentration exceeding 80 percent in plutonium-238 would be exempted from the physical

protection requirements. This change corrects an oversight in the initially proposed amendments in which it was intended that such material would be exempted to be consistent with the definitions of Category II and III material in the IAEA document INFCIRC/225/Rev. 1.

(3) Search requirements - Package and vehicle search requirements at facilities at which special nuclear material of moderate strategic significance is used or stored have been changed. As revised, random searches are only required regarding items leaving controlled access areas, and not of those entering. The primary objective of entry searches is to detect materials which could be useful in sabotage. Since protection against sabotage is not within the scope of the proposed amendments, an entry search requirement is not necessary.

(4) Submission and Implementation of Plans - Several commenters stated that more time would be needed than the sixty days allowed for submission of physical security plans, or amendments to them, following the date the proposed amendments become effective.

The Commission agrees that more time may be required, especially in the case of licensees who have limited managerial and financial resources, and has changed the submission date to be 120 days following the effective date of the amendment. In addition, the licensee is now required to implement the approved security plan within 240 days following the effective date of the amendment or within 30 days after the plan is approved, whichever is later.

Concurrent with the publication of the amendments, the NRC is publishing a guide entitled "Standard Format and Content for the

Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance." The guide is being published for a sixty-day comment period and will be reissued with comments taken into consideration. The amendments to 10 CFR Parts 70, 73 and 150 would become effective at this time (120 days after publication). Licensees would therefore have 240 days after publication of the amendments to submit their plans. The plan would have to be implemented 30 days after approval by the Commission or 360 days after (date of publication in the FEDERAL REGISTER).

Another area of comment dealt with employee screening. Some of the licensees interpreted the screening requirement to call for a full field background investigation of all personnel entering the controlled access areas where the material is used or stored. The wording of the rule has been revised to more clearly indicate that the requirement is merely one requiring a screening based on knowledge of persons permitted access rather than a formal security investigation. The guidance package being issued with the rule explains more fully the intent of this requirement.

There was one other area of comment for which no specific changes were made to the amendments but which is of significance. These comments dealt generally with the technical justification for the proposed amendments.

Many of the commenters questioned the technical justification for the proposed amendments on the basis of the lack of detailed

information regarding the threat; the additional costs of implementation they perceived to be incommensurate with only marginal improvements in physical protection; and the impacts on the licensees' ongoing educational and research programs. Particular attention was focused by some commenters on the physical protection requirements for low enriched uranium.

The technical justification for the U.S. adoption of the proposed amendments is contingent on both domestic and international factors, which are closely interrelated. Current NRC physical protection regulations apply primarily to strategic special nuclear material (uranium enriched in the isotope U-235 to 20% or greater, U-233, and plutonium) in quantities of five formula kilograms or greater. There are no specific physical protection requirements for quantities in lesser amounts. Yet, it can be properly argued that a 4.9 formula kilogram quantity of SNM is about as important a quantity as 5.0 formula kilograms. Multiple thefts of such materials in close to formula quantities could result in the accumulation of more than a formula quantity. The proposed detection requirements are considered to provide sufficient protection with minimum added cost so as not to affect educational and research programs. Since the requirements are of a detection nature rather than prevention, characterization of the adversary in the regulations was deemed not to be necessary.

In regard to low enriched uranium (LEU) (enrichments less than 20%), clandestine enrichment to higher levels may go beyond the

capability of subnational terrorists, but it does not go beyond the capability of other governments. Unless properly safeguarded, low enriched uranium could be stolen on behalf of foreign governments and enriched to explosive useable levels after it is smuggled out of the U.S.

The Nuclear Non-Proliferation Act of 1978 specifies that NRC shall promulgate regulations which assure that physical security measures are provided to special nuclear materials exported from the United States without specifying whether the materials are low enriched uranium or high enriched uranium. Pursuant to this legislation, the Commission has promulgated 10 CFR Part 110.43 which provides among other things that:

"(b) Commission determinations on the adequacy of physical security programs in recipient countries for Category II and III quantities of material will be based on available relevant information and written assurances from the recipient country or group of countries that physical security measures providing as a minimum protection comparable to that set forth in INFCIRC/225 will be maintained."

While the proposed amendments would provide a needed extension of domestic physical protection to special nuclear materials for which the level of physical protection required was not previously specified, the full value of such protection could not be realized until similar protection is afforded all such material among the nations utilizing such materials. Physical protection measures similar to those proposed, which are based on the recommendations of

the IAEA Information Circular INFCIRC/225/Rev. 1, have already been adopted by several countries.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and sections 552 and 553 of title 5 of the United States Code, the following amendments to Title 10, Chapter I, Code of Federal Regulations, Parts 70, 73, and 150 are published as a document subject to codification.

1. Paragraph 70.22(g) of 10 CFR Part 70 is revised to read as follows:

§70.22 Contents of Applications

* * * * *

(g) Each application for a license that would authorize the transport or delivery to a carrier for transport of special nuclear material in an amount specified in § 73.1(b)(2) of this chapter shall include (1) a description of the plan for physical protection of special nuclear material in transit in accordance with §§ 73.30 through 73.36, 73.47(a) and (e), 73.47(g) for 10 kg or more of special nuclear material of low strategic significance,* and 73.70(g) of this chapter including, as appropriate, a plan for the selection, qualification and training of armed escorts, or the specification and design of a specially designed truck or trailer [~~as appropriate~~], and (2) a licensee safeguards contingency plan for dealing with threats, thefts, and

or response procedures, as appropriate

* Comparative text to published effective regulations. Deletions are lined through and additions are underscored.

industrial sabotage relating to the special nuclear material in transit. Each application for such a license ^{involving formula quantities of strategic special nuclear material} shall include the first four categories of information contained in the applicant's safeguards contingency plan. (The first four categories of information, as set forth in Appendix C to 10 CFR Part 73, are Background, Generic Planning Base, Licensee Planning Base, and Responsibility Matrix. The fifth category of information, Procedures, does not have to be submitted for approval.)

2. Paragraph 70.22(h) of 10 CFR Part 70 is revised to read as follows:

* * * * *

(h) Each application for a license to possess or use at any site or contiguous sites subject to control by the licensee uranium-235 (contained in uranium enriched to 20 percent or more in the uranium-235 isotope), uranium-233, or plutonium alone or in any combination in a quantity of 5,000 grams or more computed by the formula, $\text{grams} = (\text{grams contained U-235}) + 2.5 (\text{grams U-233} + \text{grams plutonium})$, other than a license for possession or use of such material in the operation of a nuclear reactor licensed pursuant to Part 50 of this chapter, shall include a physical security plan, consisting of two parts. Part I shall address vital equipment, vital areas, and isolation zones, and shall demonstrate how the applicant plans to meet the requirements of [Part-73-] §§ 73.40, 73.50, 73.60, 73.70, and 73.71 of this chapter in the conduct of the activity to be licensed. Part II shall list tests, inspections, and other means to demonstrate compliance with such requirements.

3. Section 70.22 is amended to add a new paragraph (k) to read as follows:

* * * * *

(k)~~(fj)~~* Each application for a license to possess or use at any site or contiguous sites subject to control by the licensee special nuclear material of moderate strategic significance or 10 kg or more of special nuclear material of low strategic significance as defined under paragraphs 73.2~~(z)~~ (x) and ~~(aa)~~ (y) of this chapter, other than a license for possession or use of such material in the operation of a nuclear power reactor licensed pursuant to Part 50 of this chapter, shall include a physical security plan which shall demonstrate how the applicant plans to meet the requirements of paragraphs ~~[73:47(c)-and-(d)]~~* 73.47(d), (e), (f) and (g), as appropriate, of Part 73 of this chapter.

4. Paragraph 73.1(b) of 10 CFR Part 73 is revised to read as follows:

§ 73.1 Purpose and Scope

* * * * *

(b) Scope

(1) This part prescribes requirements for (i) the physical protection of production and utilization facilities licensed pursuant to Part 50 of this chapter; (ii) the physical protection of plants in which activities licensed pursuant to Part 70 of this chapter are conducted, and (iii) the physical protection of special nuclear

* Comparative text to the regulations published for public comment. Deletions are lined through and additions are underscored.

material by any person who, pursuant to the regulations in Part 70 of this chapter, possesses or uses at any site or contiguous sites subject to the control by the license, formula quantities of strategic special nuclear material or special nuclear material of moderate strategic significance or special nuclear material of low strategic significance.

(2) This part prescribes requirements for the physical protection of special nuclear material in transportation by any person who is licensed pursuant to the regulations in Part 70 and Part 110 of this chapter who imports, exports, transports, delivers to a carrier for transport in a single shipment, or takes delivery of a single shipment free on board (f.o.b) where it is delivered to a carrier, formula quantities of strategic special nuclear material or special nuclear material of moderate strategic significance or special nuclear material of low strategic significance.

5. Section 73.2 of 10 CFR Part 73 is amended by revising paragraph (b) and adding new paragraphs [(z)-(aa)-and-(bb)] (x), (y), (z), (aa) and (bb) to read as follows:

§ 73.2 Definitions

* * * * *

(b) "Authorized individual" means any individual, including an employee, a student, a consultant, or an agent of a licensee who has been designated in writing by a licensee to have responsibility for surveillance of or control over special nuclear material or to have

unescorted access to areas where special nuclear material is used or stored.

* * * * *

(x) [(z)] "special nuclear material of moderate strategic significance" means:

(1) less than a formula quantity of strategic special nuclear material, but more than 1000 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or more than 500 grams of uranium-233 or plutonium or in a combined quantity of more than 1000 grams when computed by the equation, grams = (grams contained U-235) + 2 (grams U-233 + grams plutonium), or

(2) 10,000 grams or more of uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope).

(y) [(aa)] "special nuclear material of low strategic significance" means:

(1) less than an amount of strategic special nuclear material of moderate strategic significance, as defined in § 73.2(x)(1) [73-2(z)(+)], but more than 15 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or 15 grams of uranium-233 or 15 grams of plutonium or the combination of 15 grams when computed by the equation, grams = grams contained U-235 + grams plutonium + grams U-233, or

(2) less than 10,000 grams but more than 1000 grams of uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope), or

(3) 10,000 grams or more of uranium-235 contained in uranium enriched above natural but less than 10 percent in the U-235 isotope.

(z) "Controlled access area" means any temporarily or permanently established area which is clearly demarcated, access to which is controlled and which affords isolation of the material or persons within it.

(aa) "Strategic special nuclear material" means uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope), uranium-233, or plutonium.

(bb) "Formula quantity" means strategic special nuclear material in any combination in a quantity of 5,000 grams or more computed by the formula, grams = (grams contained U-235) + 2.5 (grams U-233 + grams plutonium).

6. A new § 73.47 is added to 10 CFR Part 73 to read as follows:

§ 73.47 LICENSEE FIXED SITE AND IN-TRANSIT REQUIREMENTS FOR THE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF MODERATE AND LOW STRATEGIC SIGNIFICANCE.

(a) General Performance Objectives

(1) Each licensee who possesses, uses or transports [~~strategic~~] special nuclear material of moderate or low strategic significance shall establish and maintain a physical protection system that will achieve the following objectives:

(i) Minimize the possibilities for unauthorized removal of special nuclear material consistent with the potential consequences of such actions; and

(ii) Facilitate the location and recovery of missing special nuclear material.

(2) To achieve these objectives, the physical protection system shall:

(i) ^{Promptly} Detect and assess unauthorized access [~~and materials~~ introduction-into;] or [~~unauthorized~~] activities within the [~~vicinity-of~~] controlled access area containing special nuclear material;

(ii) ^{Promptly} Detect and assess unauthorized removal of special nuclear material;

(iii) Assure proper placement and transfer of custody of special nuclear material; and

(iv) Respond to indications of an unauthorized removal of special nuclear material and then notify the [~~communicate-to~~] appropriate response forces of its removal in order to facilitate its recovery.

(b)(1) A licensee is exempt from the requirements of this section to the extent that he possesses, uses, or transports (i) special nuclear material which is not readily separable from other radioactive material and which has a total external radiation dose rate in excess of 100 rems per hour at a distance of 3 feet from any accessible surface without intervening shielding or (ii) sealed

plutonium-beryllium neutron sources totaling 500 grams or less contained plutonium at any one site or contiguous sites or (iii) plutonium with an isotopic concentration exceeding 80 percent in plutonium-238.

(2) A licensee who has quantities of special nuclear material equivalent to special nuclear material of moderate strategic significance distributed over several buildings may, for each building which contains a quantity of special nuclear material less than or equal to a level of special nuclear material of low strategic significance, protect the material in that building under the lower classification physical security requirements.

(c) Each licensee who possesses, uses, [or] transports or who delivers to a carrier for transport special nuclear material of moderate strategic significance or 10 kg or more of special nuclear material of low strategic significance shall:

(1) submit by [date [60-days] 120 days from effective date of amendment] a security plan or an amended security plan describing how the licensee will comply with all the requirements of Sections 73.47 [(c);-(d);-(e);-and-(f)] (d), (e), (f), and (g), as appropriate, including schedules of implementation; and

(2) Within 240 days after the effective date of these amendments or 30 days after the plan(s) submitted pursuant to paragraph (c)(1) of this section is approved, whichever is later, implement the approved security plan.

(d) FIXED SITE REQUIREMENTS FOR SPECIAL NUCLEAR MATERIAL OF MODERATE STRATEGIC SIGNIFICANCE - Each licensee who possesses, stores, or uses quantities and types of special nuclear material of moderate strategic significance at fixed sites, except those who are licensed to operate a nuclear power reactor pursuant to Part 50, shall:

I 80 (1) [~~store-or-~~] use the [~~such~~] material only within a controlled access area which is illuminated [~~sufficient~~] sufficiently to allow detection and surveillance of unauthorized penetration or activities,

I 6 (2) store [~~such~~] the material only within a controlled access area such as a [~~vault;~~] vault-type room or approved [65A] security cabinet or their equivalent which is illuminated sufficiently to allow detection and surveillance of unauthorized penetration or activities,

0 (3) [~~continuously-monitor~~] monitor with an intrusion alarm or other [~~devices~~] device or procedures the controlled access [~~area~~] areas to detect unauthorized penetration or activities,

0 (4) [~~conduct-preemployment-screening-to-determine-the-trustworthiness-of-employees-having-access-to-the-material;~~] conduct screening prior to granting an individual unescorted access to the controlled access area where the material is used or stored, in order to obtain information on which to base a decision to permit such access,

0 (5) develop and maintain a controlled badging and lock system to identify and limit access to the controlled access [~~area~~] areas to authorized individuals,

(6) limit access to the controlled access [area] areas to authorized or escorted individuals who require such access in order to perform their duties,

(7) assure that all visitors to the controlled access [area] areas are under the constant escort of an individual who has been authorized [unescorted] access to the area,

(8) establish a security organization or modify the current security organization to consist [consisting] of at least one watchman per shift able to assess and respond to any unauthorized penetrations or activities in the controlled access [area] areas,

(9) provide a communication capability between the security organization and appropriate response force,

(10) search on a random basis vehicles and packages [entering or] leaving the controlled access [area] areas, and

(11) establish and maintain [contingency-plans] response procedures for dealing with threats of thefts or thefts of such [material] materials.

(e) IN-TRANSIT REQUIREMENTS FOR SPECIAL NUCLEAR MATERIAL OF MODERATE STRATEGIC SIGNIFICANCE -

(1) Each licensee who transports, exports or delivers to a carrier for transport special nuclear material of moderate strategic significance shall:

(i) provide advance notification to the receiver of any planned shipments specifying the mode of transport, estimated time of arrival,

location of the nuclear material transfer point, name of carrier and [~~flight-number;-if-applicable~~] transport identification,

(ii) receive confirmation from the receiver prior to the commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and acknowledges the specified mode of transport,

(iii) transport the material in a tamper-indicating [~~locked-or~~] sealed container, [~~and~~]

(iv) check the integrity of the containers[~~;-locks~~] and seals prior to shipment, and

(v) arrange for the in-transit physical protection of the material in accordance with the requirements of § 73.47(e)(3) of this part unless the receiver is a licensee and has agreed in writing to arrange for the in-transit physical protection.

(2) Each licensee who receives special nuclear material of moderate strategic significance shall:

(i) check the integrity of the containers[~~;-locks;~~] and seals upon receipt of the shipment, [~~and~~]

(ii) notify the shipper of receipt of the material as required in Section 70.54 of Part 70 of this chapter, and

(iii) arrange for the in-transit physical protection of the material in accordance with the requirements of § 73.47(e)(3) of this part unless the shipper is a licensee and has agreed in writing to arrange for the in-transit physical protection.

(3) Each licensee, either shipper or receiver, who arranges for the physical protection of special nuclear material of moderate strategic significance while in transit or who takes delivery of such material free on board (f.o.b.) the point at which it is delivered to a carrier for transport shall:

(i) arrange for a telephone or radio communications capability, for notification of any delays in the scheduled shipment, between the carrier and the shipper or receiver,

(ii) minimize the time that the material is in transit by reducing the number and duration of nuclear material transfers and by routing the material in the most safe and direct manner,

(iii) [~~conduct preemployment screening; of all licensee employees involved in the transportation of the material to determine the trustworthiness of the individual entrusted with transportation duties;~~] conduct screening of all licensee employees involved in the transportation of the material in order to obtain information on which to base a decision to permit them control over the material,

(iv) establish and maintain [~~contingency plans~~] response procedures for dealing with threats of thefts or thefts of such material,

(v) make arrangements to be notified immediately of the arrival of the shipment at its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination, and

(vi) conduct immediately a trace investigation of any shipment that is lost or unaccounted for after the estimated time and report to the Nuclear Regulatory Commission as specified in § 73.71 and to the shipper or receiver as appropriate. The licensee who made the physical protection arrangements shall also immediately notify the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix A of the action being taken to trace the shipment.

(4) Each licensee who exports special nuclear material of moderate strategic significance shall comply with the requirements specified in § 73.47(c) [and] (e)(1) and (e)(3). [~~up-to-the-first point-where-the-shipment-is-offloaded-outside-the-United-States-~~]

(5) Each licensee who imports special nuclear material of moderate strategic significance shall,

(i) comply with the requirements specified in § 73.47(c) [and], (e)(2) and (e)(3) [~~from-the-first-point-where-the-shipment-is-picked-up inside-the-United-States~~], and

(ii) notify the exporter who delivered the material to a carrier for transport of the arrival of such material.

(f) FIXED SITE REQUIREMENTS FOR SPECIAL NUCLEAR MATERIAL OF LOW STRATEGIC SIGNIFICANCE - Each licensee who possesses or uses special nuclear material of low strategic significance at fixed sites, except those who are licensed to operate a nuclear power reactor pursuant to Part 50, shall:

(1) store or use the material only within a controlled access area,

(2) [~~continuously-monitor~~] monitor with an intrusion alarm or other [~~devices~~] device or procedures the controlled access [~~area~~] areas to detect unauthorized penetrations or activities,

(3) assure that a [~~guard;~~] watchman or offsite response force will respond to all unauthorized penetrations or activities, and

(4) establish and maintain [~~contingency-plans~~] response procedures for dealing with threats of thefts or thefts of such material.

(g) IN-TRANSIT REQUIREMENTS FOR SPECIAL NUCLEAR MATERIAL OF LOW STRATEGIC SIGNIFICANCE -

(1) Each licensee who transports or who delivers to a carrier for transport special nuclear material of low strategic significance shall:

(i) provide advance notification to the receiver of any planned shipments specifying the mode of transport, estimated time of arrival, location of the nuclear material transfer point, name of carrier and [~~flight-number;-if-applicable~~] transport identification,

(ii) receive confirmation from the receiver prior to commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and acknowledges the specified mode of transport,

(iii) transport the material in a [~~locked-or~~] tamper indicating sealed [~~containers~~] container, [~~and~~]

(iv) check the integrity of the containers[~~;-locks~~] and seals prior to shipment, and

(v) Arrange for the in-transit physical protection of the material in accordance with the requirements of § 73.47(g)(3) of this part,

unless the receiver is a licensee and has agreed in writing to arrange for the in-transit physical protection.

(2) Each licensee who receives quantities and types of special nuclear material of low strategic significance shall:

(i) check the integrity of the containers[~~;-locks~~] and seals upon receipt of the shipment, [and]

(ii) notify the shipper of receipt of the material as required in § 70.54 of Part 70 of this chapter, and

(iii) arrange for the in-transit physical protection of the material in accordance with the requirements of § 73.47(g)(3) of this part, unless the shipper is a licensee and has agreed in writing to arrange for the in-transit physical protection.

(3) Each licensee, either shipper or receiver, who arranges for the physical protection of special nuclear material of low strategic significance while in transit or who takes delivery of such material free on board (f.o.b.) the point at which it is delivered to a carrier for transport shall:

(i) establish and maintain [~~contingency-plans~~] response procedures for dealing with threats of thefts or thefts of such material,

(ii) make arrangements to be notified immediately of the arrival of the shipment at its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination, and

(iii) conduct immediately a trace investigation of any shipment that is lost or unaccounted for after the estimated arrival time and report to the Nuclear Regulatory Commission as specified in § 73.71 and to the shipper or receiver, as appropriate. The licensee who made the physical protection arrangements shall also immediately notify the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix A of the action being taken to trace the shipment.

(4) Each licensee who exports special nuclear material of low strategic significance shall comply with the appropriate requirements specified in § 73.47(c) [and], (g)(1) and (g)(3) ~~[up-to-the-first point-where-the-shipment-is-offloaded-outside-the-United-States:]~~

(5) Each licensee who imports special nuclear material of low strategic significance shall:

(i) comply with the requirements specified in § 73.47(c) [and], (g)(2) and (g)(3) ~~[from-the-first-point-where-the-shipment-is-picked up-inside-the-United-States]~~, and

(ii) notify the person who delivered the material to a carrier for transport of the arrival of such material.

7. Section 73.71(a) of 10 CFR Part 73 is revised to read as follows:

§ 73.71 Reports of unaccounted for shipments, suspected theft, unlawful diversion, or industrial sabotage

(a) Each licensee who conducts a trace investigation of a lost or unaccounted for shipment pursuant to § 73.36(f), § 73.47(e)(3)(vi), or § 73.47(g)(3)(iii) shall immediately report to the appropriate NRC

Regional Office listed in Appendix A the details and results of his trace investigation and shall file within a period of fifteen (15) days a written report to the appropriate NRC Regional Office setting forth the details and results of the trace investigation. A copy of such written report shall be sent to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

* * * * *

8. Section 73.72 of 10 CFR Part 73 is revised to read as follows:

§ 73.72 Requirement for advance notice of shipment of special nuclear material

Each licensee who plans to import, export, transport, deliver to a carrier for transport in a single shipment, or take delivery at the point where it is delivered to a carrier, [~~quantities-of~~]* formula quantities of strategic special nuclear material [~~as-specified §-73:1(b)(2)~~] or special nuclear material of moderate strategic significance shall notify the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix A by U.S. Mail, postmarked at least 7 days in advance of the shipping date. The following information shall be furnished in the advance notice: shipper, receiver, carrier(s), estimated date and time of departure and arrival, transfer point(s), and mode(s) of shipment. The Director of the appropriate Nuclear Regulatory

* Comparative text to published effective regulations. Deletions are lined through and additions are underscored.

Commission Inspection and Enforcement Regional Office shall also be notified by telephone 7 days in advance of the shipping date that an advance shipping notice has been sent by mail, and of any changes to the shipment itinerary prior to the shipment date. Road shipments or transfers with one-way transit times of 1 hour or less in duration between installations of a licensee are exempt from the requirements of this section.

9. 10 CFR Part 150 is amended to add a new Section 150.14 to read as follows:

§ 150.14 Commission Regulatory Authority for Physical Protection
Persons in Agreement States possessing, using or transporting special nuclear material of low strategic significance in quantities greater than 15 grams of plutonium or uranium-233 or uranium-235 (enriched to 20% or more in the U-235 isotope) or any combination greater than 15 grams when computed by the equation grams = grams uranium-235 + grams plutonium + grams uranium-233 shall meet the physical protection requirements of § 73.47 of 10 CFR Part 73.

EFFECTIVE DATE: (120 days after publication in FR)

(Sec. 53, 161i, Pub. Law 83-703, 68 Stat 948, Pub. Law 93-377, 88 Stat 475; Sec. 201, Pub. Law 93-438, 88 Stat 1242-1243, Pub. Law 94-79, 89 Stat 413 (42 U.S.C 2073, 2201, 5841).)

Dated at Washington, D.C. this _____ day of _____, 1978.

For the Nuclear Regulatory Commission.

Samuel J. Chilk
Secretary of the Commission

ENCLOSURE B

SUMMARY OF COMMENTS

ENCLOSURE "B"

PUBLIC COMMENT SUMMARY AND STAFF RESPONSES

1.0 Introduction

Comments were received from thirty-eight persons and organizations. These comments were categorized and analyzed for response by category. The following discussions provide a summary of the comments in each category and the staff response. Many of the comments were of a general nature and were categorized under the heading of Generic Issues while the remainder have been categorized according to the applicable portion of the proposed amendments. After each Comment Summary is listed in coded form those commenters who had similar questions or comments. Appendix A lists the commenters, their identification code, and the date their comments were received. Also, the commenters individual letters have been coded and cross-referenced and will be made available in the Public Document Room.

2.0 Generic Issues

2.1 Threat and Technical Justification

2.1.1 Comment Summary: Commenters raised a number of arguments relating to the reasonableness of the threat and technical justification statements made by the staff in the Supplementary Information. These views have been summarized as follows:

a. Commenters viewed the threat as not being convincing, especially with regard to the possible theft of low enriched uranium. In this case, they thought it would be more likely for an adversary to seek to obtain natural uranium, which would remain unprotected. (VPI, TAM, PSU, AIF, UMI, EXN, CPL, CMC, WEC, GEV, NFS, BWC, MIT, NUS)

b. Commenters questioned the necessity of adopting the IAEA recommendations since the INFCIRC/225 document was purely advisory in nature and was not part of the currently proposed US/IAEA Agreement for Application of Safeguards. (AIF, UMI, EXN, CMC, WEC, GEV, SUN)

c. A commenter also stated that the proposed requirements were not necessary since existing requirements for reporting missing or stolen special nuclear material are adequate for detecting thefts before an adversary could accumulate a sufficient quantity to fabricate a clandestine fission explosive. (BWC)

2.1.2. Response: a. In regard to low enriched uranium (LEU) (enrichments less than 20%), clandestine enrichment to higher levels may go beyond the capability of subnational terrorists, but it does not go beyond the capability of other governments. Unless properly safeguarded, LEU could be stolen on behalf of foreign governments and enriched to explosive useable levels after it is smuggled out of the U.S. With respect to the difference between LEU and natural uranium, the separation work necessary to reach reactor grade material, i.e., 3% U-235, is about 50% of that required to reach 93% U-235 enrichment. [Reference: "Nuclear Theft: Risks and Safeguards," Willrich and Taylor, pg. 129.]

b. The Nuclear Non-Proliferation Act of 1978 implies that there should be domestic safeguards for this material. The Act specifies that NRC shall promulgate regulations which assure that physical security measures are provided to special nuclear materials exported from the United States, without specifying whether the materials are LEU or HEU. The basis for such regulations is the strategic importance of those materials in the interest of national security. It cannot be assumed that these materials which now require protection when exported are less vulnerable to theft when used domestically. If the Congress deemed it necessary in the interests of common defense and security to protect such materials abroad, then domestic protection is equally necessary.

c. The proposed amendments require a theft detection and deterrence capability which should complement the reporting requirements presently in effect. The existing reporting requirements as stated in 10 CFR Part 73.71(b) require that licensees, "report to NRC any incident in which an attempt has been made, or is believed to have been made, to commit a theft or unlawful diversion of special nuclear material." The proposed amendments provide a basis for early detection of such incidents in addition to a theft deterrent capability. Furthermore, while the proposed amendments affect special nuclear material in quantities as small as 15 g, inventory control requirements in 10 CFR Part 70.51(e) apply only to the possession of material in excess of one formula kilogram, and inventories are required to be taken no more frequently than every two months (six months for uranium, two months

for plutonium). Thus, no redundancy exists between the proposed amendments and 10 CFR Part 73.71.

2.2 Value/Impact of Proposed Amendments

2.2.1 Comment Summary: Commenters stated that the costs of implementation of the proposed amendments were excessive compared to the relatively small increases in protection which would be effected by them. Some commenters said that they as licensees would have to close their doors to students and researchers if the proposed amendments were to be approved since their university budgets could not be extended to meet the high costs of implementation. Specifically, one of the commenters stated that the requirements effectively ruled out the use of some forms of transportation by being over restrictive. (VPI, NBS, UIL, UMO, UVA, BYU, PSU, TAM, AIF, UAZ, NFS, UKA, RIA, HAR)

2.2.2 Response: A Value/Impact Analysis has been prepared and placed in the Public Document Room. This analysis contemplates impacts on educational and nuclear research institutions which are less severe than those suggested by commenters. Examination of the detailed comments revealed that much of the concern regarding the cost of implementation was based upon misinterpretation and lack of information regarding the intent of the proposed rules and the way in which they are to be implemented. This confusion arises from two sources.

First, the proposed amendments were written in a somewhat general manner of language in order to allow the licensees as much flexibility as possible while still meeting the level of protection intended. This

was done to allow each licensee to utilize best the resources at his disposal to keep down capital and operating costs. Secondly, the proposed requirements were written in general terms with the intention that their meaning would be made clear by the guidance document which is to accompany the proposed amendments. Thus, much misinterpretation should be corrected with the publication of the final version of the proposed amendments. In addition, several changes have been made in the proposed rule which will clarify the intent of the rule.

With regard to the portion of the amendments addressing material in transit, it was not intended that these amendments would impose such constraints that exclusive means of transport would be required. The guidance document will make this clear and demonstrate how the physical protection requirements can be satisfied without resorting to exclusive-use vehicles.

2.3 Application to Non-Power Reactor Sites

2.3.1 Comment Summary: A commenter expressed concern regarding the application of the proposed amendments to non-power reactor sites, stating that: the SNM is in the form of bulky fuel elements which make them very difficult to divert; accurate item-by-item accountability is maintained at all times; and current approved security plans required of all reactors provide more than adequate protection. (NBS)

2.3.2 Response: Many of the non-power reactors presently are operating under physical security plans they have filed pursuant to 10 CFR Part 73.40 and under interim guidance issued by NRC in 1974. To a

large extent, these reactor sites already have in place much of the physical protection which would be required under the proposed amendments. The additional protection that would be necessary to bring the level of protection up to that recommended by IAEA, which has been determined by the staff to be reasonable and proper for the categories of material being protected, would be only minimal in cost.

3.0 Specific Issues

3.1 Statement of Considerations

3.1.1 Plutonium in Sealed Sources

3.1.1.1 Comment Summary: Commenters suggest that plutonium in sealed sources of the Pu-Be type would not be of substantial assistance in manufacturing a nuclear weapon and thus should be exempt from the proposed amendments. (UVA, BYU, UCS, PSU, SUN, TAM)

3.1.1.2 Response: The staff agrees that plutonium contained in sealed sources of the Pu-Be type are found in sufficiently small quantities at given sites and that such sites are sufficiently separated that it would be impractical for an adversary to accumulate enough plutonium through individual thefts to manufacture a nuclear weapon. Prudent management practice should be sufficient to assure that such material is not stolen and that possible thefts would be detected in a timely enough manner to prevent the accumulation of formula quantities of plutonium. There is, however, an upper limit of 500 g of plutonium to which this exemption can be applied. (Presently, no one licensee is

known to be authorized to hold more than 500 grams of this form of material.) The staff believes that greater than 500 gram accumulations of plutonium in this form would invalidate the assumptions upon which the exemption has been based.

3.1.2 Standard for Determining Self-Protection Radiation Level

3.1.2.1 Comment Summary: Commenters questioned the level of radiation fixed in the proposed amendments for determining which material is self-protecting and thus exempt from requirements for physical protection. One commenter suggested that the dose rate be determined in proportion to the amount of material available. Another commenter suggested lower dose rates in the absence of technical justification for the rate given in the proposed amendments. (UMO, UKA, UVA, UAZ)

3.1.2.2 Response: The standard for determining the level of radiation at which special nuclear material will be considered self-protecting differs from the level recommended by IAEA to a slight extent.

The standard of 100 rems/hour at three feet differs from the IAEA value of 100 rads/hour at one meter in order to remain consistent with a similar NRC standard, which has been in effect for some time. In addition, the NRC provides for complete exemption rather than lowering the category of protection required as in the IAEA recommendations.

The dose rate levels to qualify for the exemption in the proposed amendments and other NRC regulations are independent of the amount of material because the self-protection is provided by virtue of the external radiation of the material and by the fact that the material is not readily separable from other radioactive materials.

3.1.3 Plutonium with Isotopic Concentration Exceeding 80% in Pu-238

3.1.3.1 Comment Summary: A commenter noted that plutonium with an isotopic concentration exceeding 80% in Pu-238 is exempt under the IAEA recommendations but not under the proposed amendments.
(MRC)

3.1.3.2 Response: This omission was an oversight. This material is now exempted under the final rule.

3.1.4 Applicability to Power Reactor Sites Prior to Operating License Issuance

3.1.4.1 Comment Summary: A commenter was unclear as to whether the proposed amendments would require physical protection for fresh fuel stored at a power reactor site prior to the issuance of a license for operating a power reactor under Part 50. (CMC)

3.1.4.2 Response: The proposed amendments would apply in this case due to licensing under Part 70 prior to issuance of an operating license under Part 50.

3.2 § 70.22(j) Physical Security Plan

3.2.1 Material Control and Accounting Exemption Limit

3.2.1.1 Comment Summary: Some commenters stated that material not exceeding one effective kilogram should be exempted from the

proposed amendments on the basis that such material was currently exempted from material control and accounting requirements.

(GEV, AIF)

3.2.1.2 Response: Material not exceeding one effective kilogram is not exempted from material control and accounting requirements. All special nuclear material is subject to material control and accounting requirements. Quantities exceeding one effective kilogram are subject to certain additional material control and accounting requirements not applied to quantities less than one effective kilogram.

3.2.2 Facilities Protected under Part 73.50

3.2.2.1 Comment Summary: Some commenters suggested that no physical protection plans need be submitted for facilities presently covered under Part 73.50, and that such a statement should be included in the proposed amendments to assure that redundant plans would not have to be submitted. (GEV, AIF)

3.2.2.2 Response: The coverage of §73.47 and §73.50 are mutually exclusive. Section 73.47 covers facilities having material of moderate and low strategic significance. These materials, by definition, have an upper quantity limit which is the lower quantity limit for the formula quantity of strategic special nuclear material covered by §73.50. No statement is needed in the regulation other than the scope of coverage statements made in the first paragraphs of the respective sections.

3.3 § 73.1 Purpose and Scope

3.3.1 Exemptions of Material Held in Laboratory and Other Facilities

3.3.1.1 Comment Summary: Some commenters suggested that analytical, research, quality control; metallurgical and electronic laboratories which possess or use not greater than 350 grams of HEU, Pu, U-233, or any combination thereof, should be exempted from physical protection requirements under the proposed amendments. The basis for this was stated to be a similar exemption for such material as provided currently under 10 CFR 73.6(c). (BYU, MIT, GEV, AIF)

3.3.1.2 Response: The current requirements for physical protection of nuclear materials at fixed sites apply to facilities possessing formula quantities or greater of SSNM. The exemption appearing in Part 73.6(c) relieves such facilities from applying specific requirements of § 73.60 to analytical, research, quality control, metallurgical or electronic laboratories provided that the total inventory is less than 350 grams of U-235, U-233, or plutonium, or any combination thereof. The provisions of § 73.60 deal primarily with the use or storage of SNM in Material Access Areas (MAAs) to which additional access and egress controls are applied. These same laboratories are not, however, exempt from the general facility protection requirements delineated in § 73.50. Contrary to the claims of certain commenters, the protection applied to such laboratories (i.e., those operated within existing facilities with total plant inventories exceeding 5 formula kilograms) exceeds the level to be provided through implementation of the proposed

requirements for materials of moderate and low strategic significance at locations not presently covered by 10 CFR Part 73.

3.3.2 SNM in a Reactor Core and Irradiated Fuel Elements

3.3.2.1 Comment Summary: Commenters suggested that a specific exemption be provided for SNM residing in a reactor core. This would be consistent with the exemption currently provided in Part 73.50 for such material. (GEV, AIF)

3.3.2.2 Response: SNM residing in a reactor core is considered self-protecting (and thus exempt from requirements of Part 73.47) if it has an external radiation dose rate in excess of 100 rem/hour at a distance of three feet from any accessible surface, without intervening shielding. The same standard applies for material not in a reactor core, but which has been irradiated.

3.4 § 73.2 Definitions

3.4.1 Physical Protection System

3.4.1.1 Comment Summary: The proposed rules were described by one commenter as requiring a physical protection system which is not specifically defined other than through Section 73.50 and 73.60. It was suggested that further information would be required by the licensees before they could begin to meet the objectives and requirements of the proposed amendments. (VPI, AIF, SUN, UCS, CMC)

3.4.1.2 Response: Guidance material is now being prepared and will be made available to licensees at the time the final rule is made effective.

3.4.2 Definitions of Terms

3.4.2.1 Comment Summary: Several terms were found by commenters to be confusing, without definitions, or otherwise in need of clarification. These included the following: "controlled access area", "authorized individual", "enriched above natural", "pre-employment screening", "GSA approved security cabinet", "physical protection system", "missing SNM", "trustworthiness", "in the most safe and direct manner", "appropriate response force", "contingency plans", "vault" and "vault-type room." (VPI, UVA, UMI, BWC, PNL, GEV, NFS, AIF, RIA, SUN, NUS)

3.4.2.2 Response: Four additional terms have been added to Part 73.2 as definitions: "Controlled access area", "authorized individual," "Strategic Special Nuclear Material" and "formula quantity." Other terms will be clarified in the guidance being prepared to accompany the proposed regulations or have been defined in other parts of the regulations. The amendments have been changed to clarify the meaning of terms or the questionable terms have not been used.

3.5 § 73.47 Licensee Fixed Site and In-Transit Requirements for Physical Protection of SNM of Moderate and Low Strategic Significance

3.5.1 General Performance Objectives

3.5.1.1 Comment Summary: Some commenters objected to the imposition of general performance objectives in addition to specific requirements contained in other sections of the proposed amendments.

It was suggested that conformance with the specific design requirements must be considered as fulfilling any general performance objectives. The general performance objectives in the past, it was claimed, have been used to impose additional cumulative requirements not contemplated by the Commission when the rule was published. (CMC, GEV, AIF)

3.5.1.2 Response: The sections of the rule following the general performance objectives (Sections 73.47(d), (e), (f) and (g)) are not specific design objectives. Rather, they prescribe functional requirements for the physical protection of the SNM which may be satisfied by a choice in each case on the part of the licensee of a number of different combinations of devices and procedures. Guidance is to be provided to help the licensee make these choices. The general performance objectives are necessary in order to provide overall guidance to the NRC staff and the licensee as to what the general objectives of the Commission were at the time the rule became effective. These objectives then are used to assist the staff's judgments regarding acceptance criteria in the review of licensee security plans.

3.5.2 Time for Security Plan Submission

3.5.2.1 Comment Summary: Some commenters suggested that a longer period should be allowed following the effective date of the amendments before physical security plans are to be submitted. (AIF, TRN, GEV, CPL)

3.5.2.2 Response: The proposed amendments have been changed to allow plans to be submitted 240 days from publication in the Federal Register or 120 days rather than 60 days from the effective date of the rule. The 120 days from the date of publication of the final rule in the Federal Register and its effective date will provide sufficient time for:

- a. the public and the licensee to review and respond to supporting guidance published concurrently with the amendment,
- b. the NRC to consider the public comments, and
- c. preparation and issuance of the guidance in final form.

Following publication of the final guidance, licensees will be allowed another 120 days to submit their physical security plans. This will provide those licensees who have limited managerial and financial resources sufficient time to prepare their security plans.

3.5.3 Delay Until Action is Taken on Non-Power Reactors

3.5.3.1 Comment Summary: A commenter suggested that the requirement for submission of physical security plans be delayed until action is taken on the issue of a separate rule for non-power

reactors in order to avoid costly duplication of effort in the preparation of such plans. (SUN)

3.5.3.2 Response: Plans submitted under the proposed amendments would provide a base for plans that might be required under a separate non-power reactor regulation. These would not be duplication but rather revision of the plan to cover any additional requirements called for specifically for non-power reactors.

3.5.4 Cost of Background Investigations Excessive

3.5.4.1 Comment Summary: Commenters expressed concern over the excessive costs they might incur if they were required to conduct background investigations of students, researchers, and employees involved with material of moderate strategic significance. (VPI, TAM, UCS, SUN, UMO, MIT, RIA, TRN)

3.5.4.2 Response: Background investigations were never contemplated as the minimum acceptability criterion for satisfaction of the requirement for pre-employment screening. The proposed amendments have been changed to better reflect this intent which is also addressed in the guidance.

3.5.5 Use and Storage Requirements for Controlled Access Areas

3.5.5.1 Comment Summary: Commenters exhibited a degree of confusion over specific requirements for use and storage of SNM in controlled access areas. (UCS, UCC, NBS)

3.5.5.2 Response: Published guidance will take into consideration all the comments received, including those dealing with definitions and acceptability criteria for controlled access areas for the use and storage of SNM.

3.5.6 Physical Security Requirements for Less Strategically Significant Material at Same Site

3.5.6.1 Comment Summary: Low strategically significant and exempt materials may be used or possessed on the same site. Under the proposed rule it would seem that the less strategically significant materials would have to be protected at the same level as the more strategically significant material. It is strongly urged that the rule permit varying levels of security commensurate with the strategic significance of the material involved. (MIT, TAM)

3.5.6.2 Response: The physical protection of different categories of SNM at different levels commensurate with their strategic significance is recognized by the IAEA in publication INFCIRC/225/Rev. 1 (Section 4.3.1). The regulation has been revised to allow for this type of different levels of protection.

3.5.7 Continuous Monitoring of Controlled Access Areas

3.5.7.1 Comment Summary: The requirement to continuously monitor the controlled access area is unnecessary. The controlled access areas should be monitored on a continuous basis only when unoccupied. (WEC, AIF, GEV, HAR, UCS, BWC)

3.5.7.2 Response: The term "continuously monitor" has been deleted from the proposed amendments. The revised wording for Section 73.47(d)(3) which used to contain this term now requires only that the licensee monitor such areas. Further guidance is provided in the guidance material being prepared to accompany the proposed amendments.

3.5.8 Searches of Packages and Vehicles Entering and Leaving the Controlled Access Area

3.5.8.1 Comment Summary: Commenters stated that the proposed amendments would require the searching of packages carried by operations and research personnel into and out of the controlled access area (reactor room) on a frequent basis. However, only the Director and Assistant Director were said to have access to the vault, implying a great deal of unnecessary effort. (UCS, RIA)

3.5.8.2 Response: The search requirement for packages or vehicles entering a controlled access area has been deleted from the proposed amendments. Packages need be searched on a random basis only when leaving a controlled access area.

3.5.9 Responsibilities of Carrier for Physical Protection

3.5.9.1 Comment Summary: Commenters questioned whether the numerous requirements for protection of SNM while in transit and for tracing any lost or stolen shipment were the responsibility of the common carrier such as a trucking firm or the licensee. It was noted that the licensee has no control over routing of shipments, carrier employees, etc. (CPL, UCS, TRN)

3.5.9.2 Response: Presently, carriers who are not licensees have no responsibility to provide physical protection for special nuclear material under the proposed amendments. However, the proposed amendments clearly state the responsibilities of licensees in their respective roles as shipper or receiver to provide for the physical protection of SNM in transit. Although the licensee

may not have physical or administrative control over the SNM or the personnel engaged in transporting it while it is in transit, the licensee has the responsibility of contracting with the carrier to assure he will provide for the performance of the required notification and other procedures during transit. The physical security plan submitted by the shipper or receiver licensee must indicate the means by which those procedures are to be carried out and should contain assurances that they will be performed as necessary.

3.5.10 Shipments from Non-Licensees

3.5.10.1 Comment Summary: If the receiver licensee cannot rely upon the non-licensee shipper's verification of container and seal integrity he will be required to send an employee to the shipper's facility prior to each shipment, thus incurring unnecessary expenses and possible delays. (TRN)

3.5.10.2 Response: Under the proposed amendments the licensee who accepts delivery of special nuclear material of moderate or low strategic significance free on board (f.o.b.) the point at which it is delivered to a carrier for transport must arrange for the physical protection of such material in accordance with the requirements of Section 73.47(e)(3). These requirements do not include the checking for integrity of the seals and containers used for the shipment. Section 73.47(e)(1) assigns this responsibility to the shipper or receiver only if he is a licensee. In the case when the shipper is the Department of Energy, current

practices for the transportation of SNM of moderate and low strategic significance require that the cargo containers or compartments be locked and sealed. It should not be difficult to arrange for confirmation of the integrity of locks and seals prior to the material being turned over to a carrier. Such arrangements would be provided for in the receiver licensee's physical security plan.

3.5.11 Exclusive-Use Modes of Transportation Not Required

3.5.11.1 Comment Summary: A commenter suggested that the communications capability requirement would in effect mandate use of an exclusive-use vehicle for road transportation and could effectively rule out use of some other modes of transportation entirely.

(TRN)

3.5.11.2 Response: The requirement for maintaining a communications capability between the carrier and shipper or receiver was not intended to eliminate the possibility of use of any form of transportation or require use of exclusive vehicles. The purpose of the communications requirement was to allow the carrier to notify the shipper or receiver of any delays in the scheduled shipment, rather than to maintain continuous open communications. The proposed amendments have been modified to make this point clear.

3.5.12 Contingency Plans

3.5.12.1 Comment Summary: Some commenters stated that there were no minimum requirements given for contingency plans and that they would require additional time to prepare contingency plans

beyond the 60 days allowed for the physical security plan. (TRN, UCS, MIT, CPL)

3.5.12.2 Response: The term "contingency plans" has been deleted from the proposed amendments to avoid confusion with the type of plans described in Appendix C to Part 73, which do not apply for facilities covered under the proposed amendments. Response procedures for dealing with threats of thefts or thefts of special nuclear materials will be required to be included in the licensee's physical security plan instead, and details regarding the inclusion of these procedures will be much less complex than the contingency plan procedures described in Appendix C. The time for preparation of physical security plans has been extended to 120 days following the effective date of the proposed amendments.

3.5.13 Licensee Responsibilities During Shipment

3.5.13.1 Comment Summary: A commenter suggested that compliance with Sections 73.47(e)(4) and (5) and 73.47(g)(4) and (5) would require the export or import licensee to have an employee at each airport or pier used for export or import shipments. It was suggested instead that the export or import licensee should be allowed to utilize carrier employees or others to perform the integrity check of locks and seals prior to shipment. (TRN)

3.5.13.2 Response: The integrity checks of locks and seals prior to shipment, and other measures required to be taken by the exporter licensee prior to committing the shipment to the carrier, can be performed by the licensee. Additional checks of locks and seals

while the shipment is in progress may be considered prudent by the carrier but are not required under the proposed amendments. Generally, however, physical security responsibilities of the licensee may be delegated to third parties (e.g., carriers, private security forces) through contractual obligations, provided that such obligations assure that all appropriate NRC regulations are satisfied.

3.6 Exemptions and Continued Regulatory Authority in Agreement States
Under Section 274

3.6.1 Coverage of Nuclear Waste Burial Grounds in Agreement States

3.6.1.1 Comment Summary: A commenter inquired as to the extent to which the new Section 150.14 is to apply to State licensed nuclear waste burial grounds. (NFS)

3.6.1.2 Response: Part 150 would be amended by the addition of a new Section 150.14 which extends to Agreement State licensees coverage of the proposed amendments to special nuclear material of moderate and low strategic significance below the present 350 g limit for U-235 and 200 g limits for U-233 and plutonium. Thus, all SNM of moderate and low strategic significance would be covered under the proposed amendments unless specifically exempted.

APPENDIX A

CATEGORY II AND III MATERIALS RULE

LIST OF COMMENTERS

<u>NO.</u>	<u>COMMENTER</u>	<u>ID CODE</u>	<u>DATE RECEIVED</u>
1	Monsanto Research Corporation	MRC	6/06/78
2	Texas A&M University, Nuclear Eng'g. Dept.	TAM	6/16/78
3	State University of New York at Buffalo, Nuclear Science and Technology Facility	SUN	6/19/78
4	Virginia Polytechnic Institute and State University	VPI	6/19/78
5	Rhode Island Atomic Energy Commission, Nuclear Science Center	RIA	6/22/78
6	National Bureau of Standards (Reactor Radiation)	NBS	6/22/78
7	University of California, Santa Barbara	UCS	6/22/78
8	University of Michigan, Phoenix Memorial Laboratory	UMI	6/22/78
9	Conner, Moore & Corber, Law Offices	CMC	6/23/78
10	Exxon Nuclear Company, Inc.	EXN	6/23/78
11	(Comments for wrong rule)		
12	Union Carbide Corporation	UCC	6/27/78
13	Pennsylvania State University	PSU	6/27/78
14	Massachusetts Institute of Technology, Nuclear Reactor Laboratory	MIT	6/27/78
15	National Bureau of Standards (Health Physics)	NBS	6/27/78
16	Battelle, Pacific Northwest Laboratories	PNL	6/27/78
17	University of Illinois at Urbana-Champaign	UIL	6/27/78
18	Oregon State University, Radiation Center	ORS	6/27/78
19	University of Missouri, Research Reactor Facility	UMO	6/27/78
20	Transnuclear, Inc.	TRN	6/27/78
21	General Electric, Nuclear Energy Business Group	GEN	7/10/78
22	Babcock and Wilcox, Power Generation Group	BWC	7/10/78
23	University of Kansas, Dept. of Chem & Petrol. Eng'g	UKA	7/10/78
24	Harvard University, University Health Services	HAR	7/10/78
25	University of Virginia, School of Eng'g & Appl'd Science	UVA	7/10/78
26	Westinghouse Electric Corp., Water Reactor Div.	WEC	7/10/78
27	NUSAC, Inc.	NUS	7/10/78
28	Penn State University	PSU	7/17/78
29	University of Arizona	UAZ	7/17/78
30	General Electric, Nuclear Energy Eng'g Group, Vallecitos Nuclear Center	GEV	7/21/78
31	Transnuclear, Inc.	TRN	7/21/78
32	Brigham Young University	BYU	7/27/78

CATEGORY II AND III RULE

List of Commenters - Continued

33	Nuclear Fuel Services	NFS	7/27/78
34	Carolina Power and Light Company	CPL	8/1/78
U1	University of Arizona	UAZ	6/13/78
U2	Department of Energy, Office of Safeguards & Security	DOE	7/14/78
U3	Pennsylvania State University	PSU	7/31/78
U4	Atomic Industrial Forum, Inc.	AIF	7/27/78

ENCLOSURE C

Standard Format and Content for the Licensee Physical Security Plan
For the Protection of Special Nuclear Material of Moderate or Low Strategic Significance

ENCLOSURE "C"

REGULATORY GUIDE 5.XX

STANDARD FORMAT AND CONTENT FOR THE LICENSEE PHYSICAL SECURITY PLAN
FOR THE PROTECTION OF SPECIAL NUCLEAR MATERIAL OF MODERATE OR LOW STRATEGIC SIGNIFICANCE

INTRODUCTION

The Atomic Energy Act of 1954, as amended, directed the U.S. Atomic Energy Commission (AEC) to regulate the receipt, manufacture, production, transfer, possession, use, import, and export of special nuclear material (SNM) in order to protect the public health and safety and to provide for the common defense and security. The Energy Reorganization Act of 1974 transferred all the licensing and related regulatory functions of the AEC to the Nuclear Regulatory Commission (NRC).

The principal requirements with respect to the physical protection of licensed activities against industrial sabotage and with respect to the physical protection of special nuclear material in transit are found in Title 10, Code of Federal Regulations, Part 50 (10 CFR Part 50), "Licensing of Production and Utilization Facilities"; Part 70, "Special Nuclear Material"; Part 73, "Physical Protection of Plants and Materials"; and Part 110, "Export and Import of Nuclear Facilities and Materials."

Paragraph 50.34(c) of 10 CFR Part 50 and Paragraphs 70.22(g), 70.22(h) and 70.22(k) of 10 CFR Part 70 identify the physical protection information that must be provided in a Physical Security Plan as part of a license application. This plan is required in order for the applicant to demonstrate compliance with the specific physical protection requirements of 10 CFR Part 73 and must be submitted with each application for a license to possess or use SNM (or for a license authorizing transport or delivery of SNM), except for a licensee possessing, using or transporting less than 10 Kg of SNM of low strategic significance where submitting a physical security plan is not required. However, in this case, the licensee is required to meet the requirements of 73.47 for the protection of SNM of low strategic significance.

This document (Standard Format) describes the information required in the physical security plan submitted as part of an application for a license to possess, use, or transport SNM of moderate strategic significance or 10 kg or more of SNM of low strategic significance and prescribes a standard format for presenting the information in an orderly arrangement. This standard format will thus serve as an aid to uniformity and completeness in the preparation and review of the physical protection plan of the license application. This document can also be used as guidance by licensees possessing or transporting less than 10 kg of SNM of low strategic significance in understanding the intent and implementing the requirements of paragraphs 73.47(a), 73.47(f), and 73.47(g) of 10 CFR Part 73.

Aside from providing guidance for the standard format and content of physical security plans, this regulatory guide explains the intent of the various provisions of the regulation. The intent of each requirement is found in the discussion of each subsection and implicitly is provided by outlining alternative systems that could be used to fulfill the requirements. The discussion section and list of alternatives should provide the licensee with the sense of the NRC regulations.

This guide is divided into two parts. Part I, "SNM of moderate strategic significance," prescribes a standard format for preparing the licensee's security plans and provides guidance to licensee's who possess, use, or transport SNM of moderate strategic significance. Chapters 1 through 6 of Part I applies to applications for a license to possess or use at any fixed site, or at contiguous sites, subject to control by the licensee, SNM of moderate strategic significance. Chapters 7 through 11 of Part I of the Standard Format applies to applications for authorization to transport or deliver to a carrier for transport SNM of moderate strategic significance.

Part II, "SNM of Low Strategic Significance," prescribes a standard format for preparing the licensee's security plan for licensees who possess, use, or transport more than 10 kg of SNM of low strategic significance. It also provides guidance to all licensees who possess, use, or transport SNM of low strategic significance. Chapters 12 through 15 of Part II of the Standard Format applies to applications for a license to possess or use at any fixed site, or at contiguous sites, subject to control by the licensee, more than 10 kg of SNM of low strategic significance. Chapters 16 through 20 of Part II of the Standard Format applies to applications for authorization to transport or deliver to a carrier for transport more than 10 kg of SNM of low strategic significance.

Table 1 shows the type and amount of SNM covered in 10 CFR Part 73.47. It should be noted, as stated in Table 1's footnote, that a) plutonium with an isotopic concentration exceeding 80% or more in Pu-238, b) special nuclear material which is not readily separable from other radioactive material and which has a total external radiation dose rate in excess of 100 rems per hour at a distance of 3 feet from any accessible surface without intervening shielding, and c) sealed plutonium-beryllium neutron sources totaling 500 grams or less contained plutonium at any one site or continuous sites are exempt from the requirements of 10 CFR 73.47.

This guide has been prepared to minimize lost time attributable to incomplete applications and to standardize the licensing review process. The applicant is encouraged to prepare his application in accordance with this guide and to provide information in each section to support the conclusion that he will be able to operate in accordance with the pertinent regulations. Although conformance with this guide is not required, it does represent a format and content acceptable to the NRC staff.

As developments and changes in the nuclear industry occur, the Commission's requirements for information may need modification; revisions to this guide will be made as necessary to accommodate these changes.

TABLE 1
CATEGORIZATION OF NUCLEAR MATERIAL

MATERIAL*	ENRICHMENT	MODERATE STRATEGIC SIGNIFICANCE	LOW STRATEGIC SIGNIFICANCE
1. Plutonium**	--	Less than 2000 g but more than 500 g	500 g or less but more than 15 g
2. Uranium-235	20% or more in U-235 isotope	Less than 5000 g but more than 1000 g	1000 g or less but more than 15 g
	10% or more but less than 20% in U-235 isotope	10,000 g or more	Less than 10,000 g but more than 1000 g
	Above natural but less than 10%	---	10,000 g or more
3. Uranium-233	--	Less than 2000 g but more than 500 g	500 g or less but more than 15 g
4. Uranium-235 Uranium-233 and Plutonium** in combination	U-235 portion enriched to 20% or more.	Less than 5000 g according to the formula: grams = (grams contained U-235) + 2.5 (grams U-233 + grams Plutonium**), but more than 1000 g according to the formula: grams = (grams U-235) + 2.0 (grams U-233 + grams Plutonium**)	1000 g or less according to the formula: grams = (grams contained U-235) + 2.0 (grams U-233 + grams Plutonium**), but more than 15 g according to the formula: grams = grams contained U-235 + grams U-233 + grams Plutonium**.

* Plutonium with isotopic concentration exceeding 80% or more in Pu-238 is exempt.

** Special nuclear material which is not readily separable from the radioactive material and which has a total external radiation dose rate in excess of 100 rems per hour at a distance of 3 feet from any accessible surface without intervening shielding is exempt.

o Sealed plutonium-beryllium neutron sources totaling 500 grams or less contained plutonium at any one site or contiguous sites are exempt.

Purpose and Applicability

This standard format document has been prepared as an aid to uniformity and completeness in the preparation and review of the physical protection section of license applications and to clarify the intent of the regulations. The information this document contains will help the licensee plan a physical protection system designed to detect the theft of SNM of moderate or low strategic significance. The physical protection subsystems identified are intended to provide a reference physical protection system that would normally be capable of meeting the performance requirements of paragraph 73.47(a) of 10 CFR Part 73. However, it is recognized that at any particular site there may be some subsystems and components not needed or additional ones needed to meet these performance requirements. In this case the licensee is encouraged to address in his license application specific departures from this guide of subsystems or components.

The information requested in this Standard Format is the minimum needed for a license application. Additional information may be required for completion of the staff review of a particular application and should be included as appropriate. It is also the applicant's responsibility to be aware of new and revised NRC regulations. The information provided should be up-to-date with respect to the state of technology for the physical protection techniques and systems that the applicant proposes to use.

Information and procedures delineated in Regulatory Guides in Division 5, "Materials and Plant Protection," and appropriate to certain sections of the Physical Security Plan may be incorporated by reference.

The applicant should discuss his plans and programs with the NRC staff before preparing his application. This discussion should give particular emphasis to the depth of information required for the plan.

Upon receipt of an application, the NRC staff will perform a preliminary review to determine whether the application provides a reasonably complete presentation of the information needed to form a basis for the findings required before issuance of a license. The Standard Format will be used by the staff as a guideline for identifying the type of information needed. If an application does not provide a reasonably complete presentation of the necessary information, further review of an application will be suspended until this needed information is provided.

Use of the Standard Format

The applicant should follow the numbering system of the Standard Format at least down to the level of subsection (e.g., 3.4). Under some circumstances certain subsections may not be applicable to a specific application. If so, this should be clearly stated and sufficient information should be provided to support that conclusion.

The applicant may wish to submit information in support of his application that is not required by regulations and is not essential to the description of the applicant's physical protection program. Such information could include, for example, historical data submitted in demonstration of certain criteria, discussion of alternatives considered by the applicant, or supplementary data regarding assumed models, data, or calculations. This information should be provided as an appendix to the application.

Upon completion of the application, the applicant should use the Table of Contents of the Standard Format as a checklist to ensure that each subject has been addressed.

Style and Composition

A table of contents should be included in each submittal.

The applicant should strive for clear, concise presentation of information. Confusing or ambiguous statements and general statements of intent should be avoided. Definitions and abbreviations should be consistent throughout the submittal and consistent with generally accepted usage.

Wherever possible, duplication of information should be avoided. Thus, information already included in other sections of the applications may be covered by specific reference to those sections.

Where numerical values are stated, the number of significant figures should reflect the accuracy or precision to which the number is known. The use of relative values should be clearly indicated.

Drawings, diagrams, and tables should be used when information may be presented more adequately or conveniently by such means. These illustrations should be located in the section where they are first referenced. Care should be taken to ensure that all information presented in drawings is legible, that symbols are defined, and that drawings are not reduced to the extent that they cannot be read by unaided normal eyes.

Physical Specifications of Submittals

All material submitted in an application should conform to the following physical dimensions of page size, quality of paper and inks, numbering of pages, etc.:

1. Paper Size

Text pages: 8-1/2 x 11 inches.

Drawings and graphics: 8-1/2 x 11 inches preferred; however, a larger size is acceptable provided the finished copy when folded does not exceed 8-1/2 x 11 inches.

2. Paper Stock and Ink

Suitable quality in substance, paper color, and ink density for handling and for reproduction by microfilming.

3. Page Margins

A margin of no less than one inch is to be maintained on the top, bottom, and binding side of all pages submitted.

4. Printing

Composition: text pages should be single spaced.

Type face and style: must be suitable for microfilming.

Reproduction: may be mechanically or photographically reproduced. All pages of the text may be printed on both sides, and images should be printed head to head.

5. Binding

Pages should be punched for looseleaf ring binding.

6. Page Numbering

Pages should be numbered by section and sequentially within the section. Do not number the entire report sequentially. (This entire Standard Format has been numbered sequentially because the individual chapters were too short for sequential numbering within each section to be meaningful.)

7. Format References

In the application, references to this Standard Format should be by chapter and section numbers.

Procedures for Updating or Revising Pages

The updating or revising of data and text should be on a replacement page basis.

The changed or revised portion of each page should be highlighted by a vertical line. The line should be on the margin opposite the binding margin for each line changed or added. All pages submitted to update, revise, or add pages to the report are to show the date of change. The transmittal letter should include an index page listing the pages to be inserted and the pages to be removed. When major changes or additions are made, pages for a revised Table of Contents should be provided.

Number of Copies

The applicant should submit the appropriate number of copies of each required submittal pursuant to 10 CFR § 70.21.

Public Disclosure

The NRC had determined that the public disclosure of the details of physical protection programs is not in the public interest, and such details are withheld pursuant to Paragraph 2.790(d) of 10 CFR Part 2. Thus, the physical protection section of each application should be submitted as a separate enclosure. Other proprietary and classified information should be clearly identified and submitted in separate enclosures. Each such submission of proprietary information should be accompanied by the applicant's detailed reasons and justifications for requesting exemption from public disclosure, as required in Paragraph 1.790(b) of 10 CFR Part 2.

PART I: SNM OF MODERATE STRATEGIC SIGNIFICANCE

CHAPTER 1 USE AND STORAGE AREA DESCRIPTION

This chapter provides guidance on meeting the requirements of paragraphs 73.47(d)(1) and (d)(2) which are as follows:

- (d)(1) Use the material only within a controlled access area which is illuminated sufficiently to allow detection and surveillance of unauthorized penetration or activities.
- (d)(2) Store the material only within a controlled access area such as a vault-type room or approved security cabinet or their equivalent which is illuminated sufficiently to allow detection and surveillance of unauthorized penetration or activities.

A controlled access area (CAA) is defined in 73.2 paragraph (z) as, "any temporarily or permanently established area which is clearly demarcated, access to which is controlled and which affords isolation of the material, equipment or persons within it." Thus a CAA can be an approved security cabinet with lock to which only authorized individuals have the combination or key, or a vault or vault-type room which uses some type of access control system to limit access to authorized individual, a locked laboratory for which only authorized individuals such as professors or lab instructors have the combination or key, or any open area whose boundaries are clearly defined and into which access of personnel is controlled. The regulations as written are designed to allow the licensee a great deal of flexibility in meeting the requirements in a cost effective manner.

1.1 AREA WHERE MATERIAL IS USED (73.47(d)(1))

Intent

Temporarily established CAAs for the use of SNM need not have permanent type physical barriers at their boundaries. Office partitions, cordons or other devices can be used to warn

passersby of the restricted nature of the area, while access control can be effected through surveillance or supervision of the area by those using the SNM at the time. However, if the material is to be left unattended in such an area, additional protection must be provided to control access and assure a detection capability in the absence of authorized personnel. This could be accomplished, for example, through the posting of signs and the use of motion detection equipment covering the immediate area in which the SNM is located. Although the material may be considered in "use," protection requirements would be the same as though the material were in storage, since authorized personnel would not be present.

Permanently designated areas for the use of SNM would more closely approximate CAAs intended for the storage of SNM. In this case, permanent type physical barriers would be a more likely choice, such as would be provided in the case of a laboratory or reactor containment structure, in which it was desired to have SNM continually present and in use. Such an area may also serve as a storage area. Although access control and detection capabilities may be provided through the use of appropriate hardware during the period when SNM is stored in this area, other means of providing these capabilities may be required to complement such hardware in the case that alarms are deactivated or doors unlocked, etc. In such cases, licensees may rely upon authorized personnel to effect the required protection.

Illumination sufficient to allow detection and surveillance of unauthorized penetration or activities within the CAA where the material is used need not require the use of high intensity lighting throughout the CAA. What is intended is the use of normal lighting sufficiently uniform throughout the CAA so that material or unauthorized personnel cannot be secreted in a darkened area until a time more convenient for the unauthorized removal of the material. For those facilities where experiments must be conducted in a darkened room, the lighting requirement is exempted for as long as is needed provided access control is assured and the material is accounted for at the end of the experiment.

Content

Describe the CAA where the material will be used. To be included in this description is information on the type of barriers surrounding the material, the portals that allow access to the material, the size of the area, the permanence of the CAA, the use of the CAA (e.g., laboratory, process area, reactor room, etc.), the lighting level and uniformity provided that will allow detection and surveillance of unauthorized penetration or activities and whether the material will be stored there also.

1.2 AREA WHERE MATERIAL IS STORED (73.47(d)(2))

Intent

CAAs used for the storage of SNM should provide protection against theft equivalent to a vault-type room or an approved security cabinet. A vault type room is defined in 10 CFR Part 73.2 as, "a room with one or more doors, all capable of being locked, protected by an intrusion alarm which creates an alarm upon the entry of a person anywhere into the room and upon exit

from the room or upon movement of an individual within the room." An approved security cabinet is one that is designed to afford protection against surreptitious entry and lock manipulation and which has been approved by the General Services Administration or other standardizing organization (e.g., ANSI) as being equivalent to a class 6 GSA rating or better.

A vault-type room, by definition, must be protected by motion detection equipment. This is considered a valid tradeoff for the physical barrier protection offered by the security cabinet. The vault-type room can be a locked laboratory, a supply room, or closet equipped with a tamper-resistant motion detector device. The motion detector generally would also satisfy the monitoring requirement addressed in Chapter 2 of this guide, depending upon the site-specific considerations. By "equivalent to a vault-type room" is meant that a piece of equipment (such as a fission chamber, reactor core, or storage rack) even though it does not resemble a "room" may meet the storage requirement if there is a means of controlling access to it (e.g., locked grill, inaccessibility beneath water as in a storage pool, etc.) and it is protected with a tamper-resistant motion detection system.

The illumination level required for the CAA should be sufficiently uniform and bright to detect penetration of or tampering with the CAA (e.g., approved security cabinet) or unauthorized penetration of or activities within the CAA (e.g., vault-type room).

Content

Describe in detail the CAA in which the material will be stored. To be included in this description is information on the type of barriers surrounding the material, the portals that allow access to the material, the size of the area, the type of CAA (e.g., vault-type room, vault, security cabinet, etc.), and the location and level of lighting provided that will allow detection of unauthorized penetration or activities. If a vault-type room is used to store the material, describe in Chapter 2, Section 1 the type of intrusion alarm system used there. If a security cabinet is used, describe in Chapter 3, Section 3, the type of locking system used.

CHAPTER 2 DETECTION DEVICES OR PROCEDURES

This chapter provides the following guidance for meeting the requirement of 73.47(d)(3):

- (d)(3) Monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetration or activities.

In order to help detect unauthorized activities or penetrations of CAAs where the material is used or stored either intrusion alarms or other devices or security procedures are needed. Section 2.1 provides guidance if the licensee chooses to use intrusion alarms or devices and Section 2.2 provides guidance if he chooses to use security procedures.

2.1 DETECTION DEVICES (73.47(d)(3))

Intent

For CAAs where the material is used, the licensee will probably wish to rely upon personnel-oriented procedures for assuring that the CAA is not penetrated inadvertently or purposefully by unauthorized personnel while the material is in use. However, material left temporarily unattended should be protected by a motion detector (e.g., suspended from above) which incorporates adequate tamper-resistant features. Licensees should design their system to minimize the rate of spurious or false alarms through proper installation and procedures.

For CAAs where the material is stored, the detection capability will be satisfied through the use of motion detection equipment. However, the detection capability requirement may also be satisfied by different types of safety detection devices or security procedures. Information regarding intrusion alarm devices which could be used is available in NUREG 0320, "Interior Intrusion Alarm Systems." However, any choice of detection device, intrusion or safety, must include tamper-resistant features.

Content

Describe, if applicable, the tamper-resistant intrusion alarm devices or tamper-resistant safety devices which are used to monitor the CAA where the material is used and stored. Included in this description should be:

- a. type of device used with brief theory of operation
- b. location of detection device
- c. type and location of annunciation
- d. area of coverage
- e. tamper-resistant features
- f. signal line protection features
- g. emergency power features for devices
- h. conditions under which detection device will be used.

2.2 DETECTION PROCEDURES (73.47(d)(3))

Intent

Licensees may choose to provide the required detection capability during certain periods through reliance on personnel-oriented procedures rather than by the use of detection devices. This may be desirable during periods of heavy usage of material when frequent traffic into and out of a CAA may make the use of an intrusion alarm system inconvenient. Authorized personnel engaged in the use of the material or otherwise present within the CAA or its immediate vicinity may satisfy the detection capability requirement provided they can reasonably maintain surveillance over the material and control access to the CAA or its immediate vicinity while carrying

on whatever other activities they may be engaged in. At least one authorized person should be present at all times in the absence of detection devices while the material is in use.

If the material is in storage in an approved security cabinet or its equivalent, the material may be left unattended without an intrusion alarm system provided some other detection procedure is employed. This may include remote surveillance, using a closed circuit television system or randomized periodic patrols by a watchman or campus police.

Content

Describe, if applicable, the procedures which are used or may be used to monitor the controlled access areas where the material is used or stored. These descriptions should include: the conditions under which the procedures would be used; the CAAs for which the procedures would be used; individuals, categories of individuals or personnel positions assigned to carry out procedures; devices used in conjunction with the procedures; other assignments or activities to be performed by personnel concurrently with their execution of detection procedures; provisions for documentation of inspection procedures being executed (e.g., log); description of the procedures themselves; and any techniques employed for randomization of patrols.

CHAPTER 3 ACCESS CONTROL

This chapter provides guidance on meeting the requirements of paragraphs 73.47(d)(4), (d)(5), (d)(6), (d)(7), and (d)(10) which are as follows:

- (d)(4) Conduct screening prior to granting an individual unescorted access to the controlled access area where the material is used or stored, in order to obtain information on which to base a decision to permit such access,
- (d)(5) Develop and maintain a controlled badging and lock system to identify and limit access to controlled access areas to authorized individuals,
- (d)(6) Limit access to the controlled access areas to authorized or escorted individuals who require such access in order to perform their duties,
- (d)(7) Assure that all visitors to the controlled access areas are under the constant escort of an individual who has been authorized access to the area,
- (d)(10) Search on a random basis vehicles and packages leaving the controlled access areas.

3.1 PREAUTHORIZATION SCREENING (73.47(d)(4))

Intent

The intent of the requirement for preauthorization screening is to assure that the licensee will have sufficient knowledge of an individual to determine his reliability and need for access

prior to granting him authorized access to the CAA where the material is used or stored. The selection of procedures for conducting this examination and the criteria he employs to make his judgments are the responsibility of the licensee, and of course should be consistent with all local, state and federal laws and regulations regarding the protection of the privacy and other rights of the individual. The screening process may be conducted in the same manner as other investigations customarily conducted by potential employers for similarly sensitive positions. There is no requirement for the licensee to arrange for an NRC clearance or similar clearance from any other government organization. Examples of procedures and criteria which may be employed in the screening process include: holding of or having recently held a government sanctioned clearance; examination of past employment or educational record (to determine any unsatisfactory employment or school actions or incidents which would indicate any unreliability or previous breaches of trust between the individual and his employer); endorsements or references from previous employers, teachers, or colleagues which would support the need for access, trustworthiness and reliability of the individual; and consideration of the individual's present employment record indicating demonstrated trustworthiness and reliability over an extended period of employment with the licensee. (This may be considered in the nature of "grandfathering.")

Content

Describe the procedures and criteria that will be used for obtaining sufficient information needed prior to making a decision on granting unescorted access or authorization to an individual to CAAs where the material is used or stored. Identify the types of individuals who will be screened (e.g., process engineers, supervisory personnel, professors, instructors, graduate students, etc.) and who will perform the screening process.

3.2 BADGING SYSTEM (73.47(d)(5))

Intent

The purpose of the badging system is to facilitate access control of authorized individuals into or within the CAA where the material is used or stored. Information on the badge should be such that it is possible to clearly distinguish personnel authorized access to the CAAs from those requiring an escort. Information on the badge should also uniquely identify the individual possessing the badge. This personalized information can be obtained through the use of photographs, personal vital statistics, signatures, or any means the licensee may wish to use that will uniquely identify the individual.

Content

Describe the badging system used to facilitate control of access to the CAAs. This description should include

- a. the size, shape, color and material construction of badges.
- b. the distinguishing features of the badge that identify authorized individuals from escorted individuals.

- c. how the badges will be used for controlling access. (For example, will all individuals be checked prior to entering the CAAs or will periodic checks be made of individuals within a CAA to determine if they are authorized or under escort or will the badge itself permit authorized entrance such as a card key.)
- d. the system used for issuing, controlling, and accounting for the badges.

3.3 LOCK SYSTEM (73.47(d)(5))

Intent

Locks used to control access to CAAs should be resistant to manipulation or picking, and should not be mastered. Examples of typical lock systems which fit this description are: three-position dial-type combination locks, six-pin key locks, and card-key lock systems. The procedures for assigning keys and combinations to individuals is an integral part of the lock system and should be designed to assure that only authorized personnel have access to such items. Locks and combinations should be changed when information is obtained that the lock system may have been compromised. Further information may be obtained in Regulatory Guide 5.12, "General Use of Locks in the Protection and Control of Facilities and Special Nuclear Material."

Content

Describe the system for the locking system used to control access to the CAAs where material is used and stored. This description should include: locations of all locks included in the system by type of lock; the pick-resistant and manipulation-resistant characteristics of each lock type used; personnel responsible for issuing keys or combinations and changing combinations or locks; criteria for changing combinations or locks; personnel authorized to be given keys or combinations; and descriptions of types of locks used (references may be made to Regulatory Guide 5.12 for this purpose).

3.4 ACCESS CONTROL DESCRIPTION (73.47(d)(6))

Intent

The success of other access control system components, such as preauthorization screening, badging, and lock control, is dependent upon effective control of personnel access into the CAA. Physical access may be controlled in a number of different ways depending upon the actual configuration of the CAA and other site specific factors. Some examples of these alternatives are:

a. Control by Authorized Person

If the area to be controlled is sufficiently small and free of obstructions, an authorized person performing other activities in a CAA may effect physical access control by monitoring entry into the area of unauthorized persons. A sign posted at the entrance would help deter casual passers-by. A typical application of this approach would be the case of a laboratory instructor conducting a class in which he is familiar with each of his students and could easily recognize unauthorized persons not in the class.

c. Card Key, Combination or Key Lock Control System

A more sophisticated, hardware oriented system involves the use of a card key, combination or key lock system. Physical access control in this case consists of the use of physical barriers to deter unauthorized persons. A limited number of entrances are provided which are controlled by authorized personnel using a card key combination or key. This system may be more useful when larger numbers of authorized personnel, who would not necessarily be familiar with one another, would need to share the use of the CAA.

c. Control by Security Organization

If security organization personnel are available, physical access control may be accomplished by stationing a person at the entrance to the CAA to check identification and allow only authorized persons into the CAA. This alternative may be unjustifiably expensive unless the security organization member's salary can be justified on other grounds as well. A variation of this system requires persons seeking entrance to the CAA to obtain a key from a properly designated person or security organization for each use.

Content

Describe the system for limiting physical access to each CAA identified in Sections 1.1 and 1.2 to only authorized personnel or those escorted by authorized personnel. Include in this description the names or titles of individuals granting access authorizations, the criteria to be used in granting authorizations, the procedures used to assure only authorized or properly escorted persons are allowed access to the CAA. Reference can be made to Sections 3.1, 3.2, 3.3, 3.5, and 3.6 of this chapter as they affect this section, to the descriptions of locks, barriers, or other hardware which are used to control access.

3.5 ESCORT SYSTEM DESCRIPTION (73.47(d)(7))

Intent

The intent of requiring that an escort system be established is in recognition of the fact that the licensee may wish to allow access to certain persons or classes of persons on a temporary or infrequent basis, or on short notice, thus making the routine process for granting access authorizations impractical or inexpedient. Typical arrangements for escorted access may include escorts for maintenance or repair personnel, laboratory classes, public tours, guests and visitors as required.

Content

Describe the system that will be used to escort individuals in the CAAs. In his security plan, the licensee should assure that only properly authorized individuals will be allowed to escort individuals. This description should include:

- a. criteria to be used for granting escorted access,
- b. criteria to be used for escorting others,
- c. procedures for escorting individuals into CAAs (e.g., students under supervision of lab instructor, public tours, etc.).
- d. the number of escorted individuals per escort, and
- e. the responsibilities of the escort (e.g., periodic surveillance of all individuals under escort, accounting for all material prior to leaving the CAA, remaining in general area during the time unauthorized individuals are present, etc.).

3.6 SEARCH DESCRIPTION (73.47(d)(10))

Intent

The primary intent of the search requirement is to deter and possibly detect attempted thefts of SNM. The search procedures developed by the licensee should take into consideration the environment where the material is used or stored, the physical characteristics of the material itself, and the frequency of accounting for the material. In some cases, this will require that all vehicles and packages leaving the CAAs be searched in a random manner. The frequency of randomness should be determined by the ease with which the material can be stolen and the length of time it would take to detect a theft. In other cases only packages which equal or exceed the size of the material being used or stored would have to be searched, taking into consideration the difficulty with which the material could be broken into smaller more easily concealed parts.

Content

Describe the system to be used for randomly searching vehicles or packages that leave the CAA. Included in the description should be information as to

1. the scope of the search -

the criteria that will be used for searching vehicles and packages (e.g., whether all packages and vehicles are subject to search or just those packages or vehicles which are larger than the smallest configuration of material being used or stored).

2. the randomness of the search -

the randomness can vary from subjecting each package or vehicle to a search, to using a random number generator for determining whether a candidate package or vehicle is to be searched, to searching a minimum percentage of all packages or vehicles leaving each day from the CAA.

CHAPTER 4 SECURITY ORGANIZATION DESCRIPTION

This chapter provides guidance on meeting the requirements of paragraph 73.47(c)(9) which states:

- (d)(8) Establish a security organization or modify the current security organization to consist of at least one watchman* per shift able to assess and respond to any unauthorized penetrations or activities in the controlled access areas.

4.1 SECURITY ORGANIZATION (73.47(d)(8))

Intent

The intent of this requirement is to assure that in the event of a security incident someone will be available to assess alarms or other unauthorized penetrations or activities and, if warranted, notify the NRC, the local law enforcement authorities, and the responsible person in licensee management. Early detection and notification of any missing material will help facilitate its prompt recovery. In some cases the licensee may assign additional duties to members of the security organization, where procedurally oriented options are chosen to satisfy physical protection requirements (e.g., periodic patrols and inspections of CAAs for storage of SNM). Security organization members are not required to be fully dedicated, full time employees of the licensee. They may include unarmed campus security personnel,* contract guards, members of the local law enforcement agency (if sufficiently close to the site), etc. No formal or comprehensive training program is required for security organization personnel. However, under 10 CFR Part 73, Appendix B, the licensee should be prepared to demonstrate that each security person understands and is fully qualified and trained to perform those particular duties assigned to him.

Content

Describe the security organization which will be responsible for assessing and responding to security incidents. Indicate the other responsibilities of the security organization such as:

- a. conducting periodic physical security checks of CAAs,
- b. maintaining liaison with the local law enforcement agency,
- c. notifying the local law enforcement agency of any unauthorized penetrations or activities in the CAAs, and
- d. notifying licensee management of any unauthorized penetrations or activities in the CAAs.

CHAPTER 5 COMMUNICATIONS

This chapter provides guidance on meeting the requirements of paragraph 73.47(d)(9) which states:

- (d)(9) Provide a communication capability between the security organization and appropriate response force.

* A "watchman" is defined in 10 CFR Part 73.2 as "an individual, not necessarily uniformed or armed with a firearm, who provides protection for a plant and the special nuclear material therein in the course of performing other duties."

5.1 COMMUNICATION SYSTEM DESCRIPTION (73.47(d)(9))

Intent

The intent of this regulation is to assure that a communication capability exists between the licensee and the designated response force. It is implied that prior to setting up a communication capability, procedures and responsibilities will have been established between the response force and the licensee. (Note: see Chapter 6 Response Procedures.) The type of communication system chosen by a licensee should:

- a. provide for a full duplex voice communication capability,
- b. be easily accessible to the licensee's security organization, and
- c. be reliable and available for immediate use at any time.

Some communication systems which would provide these capabilities are: dedicated telephone system, non-dedicated public telephone system, radio, or any combination thereof.

Content

Describe the communication system which is used between the security organization and the appropriate response force. Included in this description should be information on:

- a. type of communication system,
- b. location of voice terminals in relationship to CAAs,
- c. availability of communication system on a 24-hour basis, and
- d. reliability of communication system.

CHAPTER 6 RESPONSE PROCEDURES

This chapter provides guidance on meeting the requirements of paragraph 70.47(d)(11) which states:

- (d)(11) Establish and maintain response procedures for dealing with threats of thefts or thefts of such materials.

6.1 RESPONSE PROCEDURES DESCRIPTION (73.47(d)(11))

Intent

The intent of this regulation is to help the licensee identify those security incidents which could result in the loss of SNM of moderate strategic significance and to develop response procedures to prevent or reduce the likelihood of such a loss. Some types of incidents which should be considered and for which response procedures should be developed are:

- a. civil strife such as student demonstrations or employee strikes,
- b. fire,
- c. discovery that some SNM is missing, and
- d. bomb threats.

Content

Identify those events for which response procedures will be developed. Also describe the type of response to be accomplished for each event identified and the duties and responsibilities of the security organization and management involved in the response. Assure that the NRC will be notified immediately in the event of theft or attempted theft of the material. Describe what local law enforcement assistance is available, their response capabilities, and any agreements made with them to respond in the case of theft of the material.

CHAPTER 7 MATERIAL TRANSPORTATION REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(e)(1) which are as follows:

- (e)(1) Each licensee who transports, exports, or delivers to a carrier for transport special nuclear material of moderate strategic significance shall:
 - (i) Provide advance notification to the receiver of any planned shipment specifying the mode of transport, estimated time of arrival, location of the nuclear material transfer point, name of carrier and transport identification,
 - (ii) Receive confirmation from the receiver prior to the commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and that he acknowledges the specified mode of transport,
 - (iii) Transport the material in a tamper indicating sealed container,
 - (iv) Check the integrity of the containers and seals prior to shipment, and
 - (v) Arrange for the in-transit physical protection of the material in accordance with the requirements of paragraph 73.47e(3) of this part, unless the receiver is a licensee and has agreed by written contract to arrange for the in-transit physical protection.

7.1 ADVANCE NOTIFICATION DESCRIPTION (73.47(e)(1)(i))

Intent

It is the intent of this section that the shipper will have preplanned the transportation of the material and informed the receiver of his plans prior to shipment. This is the first of

the several transportation requirements that will allow the receiver to take delivery of the material as planned or to help assure traceability of any missing material that might occur.

Content

The licensee should assure, in his security plan, that prior to each shipment of material, notification of the impending shipment will be given to the receiver providing him with the following types of information:

- a. mode of transport (e.g., truck, plane, train or ship),
- b. estimated time of arrival,
- c. location where material is to be transferred to receiver,
- d. name of carrier, and
- e. transport identification (e.g., truck, train, or flight number, ship name, etc.).

7.2 RECEIVER CONFIRMATION DESCRIPTION (73.47(e)(1)(ii))

Intent

It is the intent of this requirement that prior to shipment the shipper will be assured that the receiver is ready to accept the shipment at the planned time and location and acknowledges the mode of transport.

Content

Describe what procedures will be used to assure that shipment of material does not take place until the receiver acknowledges the planned shipment and mode of transport, and that he will be ready to accept the shipment at the planned time and location.

7.3 CONTAINER DESCRIPTION (73.47(e)(1)(iii))

Intent

The intent of this requirement is to provide a mechanism or system that will help the receiver detect any tampering that may have occurred with the material's container during shipment. Regulatory Guide 5.15 entitled, "Security Seals for the Protection and Control of Special Nuclear Material," is available from the NRC for guidance in this area. Requirements for containers are contained in 10 CFR Part 71 and a summary report of approved containers is in NUREG-0383.

Content

Describe the types of seals that will be used to monitor the material's container during transport.

7.4 INSPECTION DESCRIPTION (73.47)(e)(iv))

Intent

It is the intent of this requirement that the shipper check the integrity of the material container's seals just prior to shipment, so that he can be assured that they haven't been compromised. Then, if upon receipt of the shipment, the receiver discovers the container's integrity has been compromised and the material missing, the scope of the recovery operation can focus on the transportation route.

Content

Describe the procedures to be used to assure that the integrity of the containers or seals is checked just prior to shipment.

7.5 IN-TRANSIT PHYSICAL PROTECTION (73.47)(e)(1)(v))

Intent

It is the intent of this requirement that either the shipper or receiver be made responsible for the physical protection of the material while it is in transit and that the responsible licensee has acknowledged this responsibility by written agreement.

Content

In his security plan, the shipper should either acknowledge responsibility for the in-transit physical protection of SNM of moderate strategic significance, or assure that written agreement from the receiver licensee has been received in which the receiver either accepts full responsibility or shared responsibility for the in-transit physical protection of this material according to 10 CFR Part 73.47e(3).

CHAPTER 8 RECEIVER REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(e)(2) which are as follows:

- (e)(2) Each licensee who receives special nuclear material of moderate strategic significance shall:
- (i) Check the integrity of the containers and seals upon receipt of the shipment, and
 - (ii) Notify the shipper of receipt of the material as required in 70.54 of Part 70 of this chapter.

- (iii) Arrange for the in-transit physical protection of the material in accordance with the requirements of paragraph 73.47e(3) of this part unless the shipper is a licensee and has agreed in writing to arrange for the in-transit physical protection.

8.1 INSPECTION DESCRIPTION (73.47(e)(2)(i))

Intent

This requirement is intended to determine whether the material's container has been compromised enroute and whether any material has been removed so that immediate recovery procedures can be initiated, if required.

Content

Describe the procedures to be used to assure that the integrity of the containers and seals will be checked upon receipt of the shipment of material.

8.2 NOTIFICATION DESCRIPTION (73.47(e)(2)(ii))

Intent

This requirement is intended to:

- a. allow that knowledge of the current location of all SNM is available, and
- b. formally inform the shipper that the material has been received.

Content

Assure that a completed copy of standard Form NRC-741, "Nuclear Material Transaction Report," will be sent to the shipper within (10) days of receiving a shipment of material as required in § 70.54 of Part 70 of 10 CFR.

8.3 IN-TRANSIT PHYSICAL PROTECTION (73.47(3)(2)(iii))

Intent

It is the intent of this requirement that either the licensee receiver or shipper be made responsible for the physical protection of the material while it is in transit and that the responsible person has acknowledged this responsibility by written agreement.

Content

In his security plan, the receiver should either acknowledge responsibility for the in-transit physical protection of SNM of moderate strategic significance or assure that written agreement

from the shipper has been received in which the shipper either accepts full responsibility or shared responsibility for the in transit physical protection of this material according to 10 CFR Part 73.47e(3).

CHAPTER 9 IN-TRANSIT PHYSICAL PROTECTION REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(e)(3) which are as follows:

- (e)(3) Each licensee, either shipper or receiver, who arranges for the physical protection of special nuclear material of moderate strategic significance while in transit or who takes delivery of such material free on board (f.o.b.) the point at which it is delivered to a carrier for transport shall:
- (i) Arrange for a telephone or radio communications capability, for notification of any delays in the scheduled shipment, between the carrier of the material and the shipper or receiver,
 - (ii) Minimize the time that the material is in transit by reducing the number and duration of nuclear material transfers and by routing the material in the most safe and direct manner.
 - (iii) Conduct screening of all licensee employees involved in the transportation of the material in order to obtain information on which to base a decision to permit them control over the material,
 - (iv) Establish and maintain response procedures for dealing with threats of thefts or thefts of such material,
 - (v) Make arrangements to be notified immediately of the arrival of the shipment at its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination, and
 - (vi) Conduct immediately a trace investigation of any shipment that is lost or unaccounted for after the estimated arrival time and report to the Nuclear Regulatory Commission as specified in § 73.71 and to the shipper or receiver as appropriate. The licensee who made the physical protection arrangements shall also immediately notify the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix A of the action being taken to trace the shipment.

9.1 COMMUNICATIONS DESCRIPTION (73.47(e)(3)(i))

Intent

The primary intent of this requirement is to assure that the carrier will notify the shipper, or receiver of any changes in plans or delays in the scheduled arrival of a shipment to its destination due to mechanical breakdown, adverse environmental conditions, public disorders, etc. The shipper or receiver can then decide whether or not to initiate response procedures. The intent of this regulation is not to require periodic check-in. Public telephone or full duplex voice radio are acceptable methods for meeting the intent of this requirement.

Content

Describe the type of communication system and procedures to be used by the carrier of SNM of moderate strategic significance for notifying the shipper or receiver of any change in plans or delays in arrival.

9.2 MINIMUM TRANSIT TIMES DESCRIPTION (73.47(e)(3)(ii))

Intent

This requirement is intended to have the shipper or receiver make a reasonable effort to ship the material in the fastest and most direct method possible. It is not intended to necessarily require exclusive-use carriers or expensive modes of travel.

Content

Describe the procedures and considerations which apply in the transportation planning process which assure that a determined effort will be made to minimize transit times.

9.3 PREAUTHORIZATION SCREENING (73.47(e)(3)(iii))

Intent

The intent of the requirement for preauthorization screening is to assure that the licensee will have sufficient knowledge of an individual to determine his reliability and need for access prior to granting him authorized access to the material in transit. The selection of procedures for conducting this examination and the criteria he employs to make his judgements are the responsibility of the licensee, and of course should be consistent with all local, State and Federal laws and regulations regarding the protection of the privacy and other rights of the individual. The screening process may be conducted in the same manner as other investigations customarily conducted by potential employers for similarly sensitive positions. There is no requirement for the licensee to arrange for an NRC clearance or similar clearance from any other government organization. Examples of procedures and criteria which may be employed in the screening process include: holding of or having recently held a government sanctioned clearance;

examination of past employment record (to determine any unsatisfactory employment or incidents which would indicate any unreliability or previous breaches of trust between the individual and his employer); endorsements or references from previous employers or colleagues which would support the need for access, trustworthiness, and reliability of the individual; and consideration of the individual's present employment record indicating demonstrated trustworthiness and reliability over an extended period of employment with the licensee. (This may be considered in the nature of "grandfathering.")

Content

Describe the procedures that will be used for obtaining sufficient information prior to making a decision on granting unescorted access authorization to those licensee employees who will be involved in the transportation of the material. Identify by title or name those employees who will be screened and those who will perform the screening process.

9.4 RESPONSE PROCEDURES DESCRIPTION (73.47(e)(3)(iv))

Intent

The intent of this regulation is to help the licensee identify those transportation incidents for which he might expect to be notified and which might affect the security of the SNM in transit and to plan response procedures for such situations. For example, if the shipper is informed by the carrier that adverse weather conditions have temporarily prevented further progress of the shipment, the licensee should inform the receiver of a new estimated time of arrival.

Content

Identify those events for which response procedures will be developed. Also describe types of response to be accomplished for each event identified and the duties and responsibilities of members of the security organization and management for dealing with the response. Assure that the NRC will be notified immediately in the event of theft or attempted theft of the material.

9.5 NOTIFICATION DESCRIPTION (73.47(e)(3)(v))

Intent

The intent of this requirement is to assure that the licensee responsible for the physical protection of SNM in transit will have a firm basis for deciding whether or not to initiate response procedures in the event a shipment becomes overdue or is lost.

Content

Describe the arrangements and procedures which will be used for notifying the licensee who arranges for the physical protection of material in transit of the arrival of the shipment at

its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination.

9.6 LOST MATERIAL NOTIFICATION (73.47(e)(3)(vi))

Intent

The intent of this requirement is to assure that in case a shipment becomes overdue, and no reasonable explanation has been received from the carrier regarding its status, a trace investigation will be conducted to locate the missing SNM. The NRC is to be notified at this time that the material is missing and informed as to what steps are being taken to recover the missing material. Although the licensee is responsible for notifying the NRC of any missing material and to initiate and assist in the subsequent investigation, the law enforcement agencies bears the responsibility for physically recovering the material.

Content

Describe what procedures will be used to trace any shipment that is lost or has not arrived by the estimated arrival time. Assure that all lost or missing material will be immediately reported to the appropriate NRC Regional Office along with what actions are being taken to trace the shipment, that the NRC will be notified as specified in § 73.71 and that the shipper or receiver, as appropriate, will also be notified.

CHAPTER 10 EXPORT REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(e)(4) which reads as follows:

- (e)(4) Each licensee who exports special nuclear material of moderate strategic significance shall comply with the requirements specified in § 73.47(c), (e)(1) and (e)(3).

10.1 SECURITY DESCRIPTIONS (73.47(e)(4))

Use Chapters 7 and 9 of this guide to describe the security procedures which will be used to protect the material up to the point where the receiver accepts physical protection responsibility for the shipment.

CHAPTER 11 IMPORT REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(e)(5) which reads as follows:

(e)(5) Each licensee who imports special nuclear material of moderate strategic significance shall:

(i) Comply with the requirements specified in § 73.47(c), (e)(2) and (e)(3), and

(ii) Notify the exporter who delivered the material to a carrier for transport of the arrival of such material.

11.1 SECURITY REQUIREMENTS (73.47(e)(5)(i))

Use Chapters 8 and 9 of this Standard Format to describe the security procedures which will be used to protect the material from the first point where the shipment is picked up inside the United States.

11.2 NOTIFICATION (73.47(e)(5)(ii))

Intent

The intent of this requirement is to notify the exporter that the material has arrived safely.

Content

Describe the procedures to be used for notifying the exporter of the material that the shipment has been received.

PART II: SNM OF LOW STRATEGIC SIGNIFICANCE

CHAPTER 12 USE AND STORAGE AREA DESCRIPTION

This chapter provides guidance on meeting the requirement of paragraph 73.47(f)(1) which is as follows:

(f)(1) Store or use such material only within a controlled access area.

A controlled access area is defined in 73.2 paragraph (z) as, "any temporarily or permanently established clearly demarcated area, access to which is controlled and which affords isolation of the material, equipment or persons within it." Thus a CAA can be an approved security cabinet with lock to which only authorized individuals have the combination or key or a vault or vault-type room which uses some type of access control system to limit access to authorized individual or a locked laboratory for which only authorized individuals such as professors or lab instructors have the combination or key.

12.1 AREA WHERE MATERIAL IS USED (73.47(f)(1))

Intent

Temporarily established CAAs for the use of SNM need not have permanent type physical barriers at their boundaries. Office partitions, cordons or other devices can be used to warn passers-by of the restricted nature of the area, while access control can be effected through surveillance or supervision of the area by those using the SNM at the time. However, if the material is to be left unattended in such an area, additional protection must be provided to control access and assure a detection capability in the absence of authorized personnel. This could be accomplished, for example, through the posting of signs and the use of motion detection equipment covering the immediate area in which the SNM is located. Although the material may be considered in "use," protection requirements would be the same as though the material were in storage, since authorized personnel would not be present.

Permanently designated areas for the use of SNM would more closely approximate CAAs intended for the storage of SNM. In this case, permanent type physical barriers would be a more likely choice, such as would be provided in the case of a laboratory or reactor containment structure, in which it was desired to have SNM continually present and in use. Such an area may also serve as a storage area. Although access control and detection capabilities may be provided through the use of appropriate hardware during the period when SNM is stored in this area, other means of providing these capabilities may be required to complement such hardware in the case that alarms are deactivated or doors unlocked, etc. In such cases, licensees may rely upon authorized personnel to effect the required protection.

Content

Describe the Controlled Access Area (CAA) where the material will be used. To be included in this description is information on the type of barriers surrounding the CAA, the portals that allow access to the CAA, and the size of the area. Some typical CAAs where the material may be used are: laboratories, process areas, reactor rooms, spent fuel pools, or fenced-in areas.

12.2 AREA WHERE MATERIAL IS STORED (73.47(f)(1))

Intent

This area may be similar to that required for the storage of special nuclear material of moderate strategic significance (see Chapter 1, Section 1.2 of this Guide), but does not necessarily have to be equivalent to a vault, vault-type room, or approved security cabinet. Examples of typical CAAs where special nuclear material of low strategic significance may be stored are:

1. Vault - has barriers sufficiently strong to prevent or deter penetration and a locking mechanism on the door.

2. Approved Security Cabinets - cabinets which are GSA approved, class 6 or greater, or other testing group approved for protection against surreptitious entry and lock manipulation.
3. Reactor - the reactor is so designed that it does not allow for easy removal of material.
4. Vault-type Room - some typical vault-type rooms where materials are stored and protected with a motion detector are storage pools, rooms containing in-process storage racks and laboratories where material is left unattended. In all cases movement in the near-vicinity of the material should generate an alarm signal.
5. Locked laboratories or Supply Rooms - these areas must be sufficiently penetration resistant to afford a means of access control and permit the proper functioning of the system for monitoring of the storage area as required under § 73.47(f)(2) of the rule as described in Chapter 13 of this guide.

Content

Describe in detail the CAA in which the material will be stored. To be included in this description is information on the type of barriers surrounding the material, the portals that allow access to the material, the size of the area, and the locking mechanism used to secure the material (see Chapter 3 of this guide for guidance on locking mechanisms).

CHAPTER 13 DETECTION DEVICES OR PROCEDURES

This chapter provides guidance for meeting the requirement of 73.47(d)(3) which is as follows:

- (f)(2) Monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetration or activities.

In order to help detect unauthorized activities or penetrations of CAAs where the material is used or stored either intrusion alarms or other devices or security procedures are needed. Section 13.1 provides guidance if the licensee chooses to use intrusion alarms or devices and Section 13.2 provides guidance if he chooses to use security procedures.

13.1 DETECTION DEVICES (73.47(f)(2))

Intent

For CAAs where the material is used the licensee will probably wish to rely upon personnel-oriented procedures for assuring that the CAA is not penetrated inadvertently or purposefully by unauthorized personnel. However, material left temporarily unattended should be protected by a motion detector (e.g., suspended from above) which incorporates adequate tamper resistant features. Licensees should design their system to minimize the rate of spurious or false alarms through proper installation and procedures.

For CAAs where the material is stored, the detection capability will be satisfied through the use of motion detection equipment. However, the detection capability requirement may also be satisfied by different types of safety detection devices or security procedures. Information regarding intrusion alarm devices which could be used is available in NUREG 0320, "Interior Intrusion Alarm Systems." However, any choice of detection device, intrusion or safety, must include tamper-resistant features.

Content

Describe the tamper-resistant intrusion alarm devices or tamper-resistant safety devices which are used to monitor the controlled access areas (CAA) where the material is used and stored. Included in this description should be:

- a. type of device used with brief theory of operation,
- b. location of detection device,
- c. type and location of annunciation,
- d. area of coverage,
- e. tamper-resistant features,
- f. signal line protection features,
- g. emergency power features for devices, and
- h. conditions under which detection devices will be used.

13.2 DETECTION PROCEDURES (73.47(f)(2))

Intent

Licensees may choose to provide the required detection capability during certain periods through reliance on personnel-oriented procedures rather than by the use of detection devices. This may be desirable during periods of heavy usage of material, when frequent traffic into and out of a CAA may make the use of an intrusion alarm system inconvenient. Authorized personnel engaged in the use of the material or otherwise present within the CAA or its immediate vicinity may satisfy the detection capability requirement provided they can reasonably maintain surveillance over the material and control access to the CAA or its immediate vicinity while carrying on the other activities they may be engaged in. At least one authorized person should be present at all times in the absence of detection devices while the material is in use.

If the material is in storage in an approved security cabinet or its equivalent, the material may be left unattended without an intrusion alarm system provided some other detection procedure is employed. This may include remote surveillance, using a closed-circuit television system, or randomized periodic patrols by a watchman.

Content

Describe, if applicable, the procedures which are used or may be used to monitor the controlled access areas where the material is used or stored. These descriptions should include:

the conditions under which the procedures would be used; the CAAs for which the procedures would be used; individuals, categories of individuals, or personnel positions assigned to carry out procedures; devices used in conjunction with the procedures; other assignments or activities to be performed by personnel concurrently with their execution of detection procedures; provisions for documentation of inspection procedures being executed (e.g. log); and description of the procedures themselves.

CHAPTER 14 SECURITY RESPONSE

This chapter provides guidance on meeting the requirement of paragraph 73.47(f)(3) which is as follows:

- (f)(3) Assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities.

14.1 SECURITY (73.47(f)(3))

Intent

The intent of this requirement is to assure that in the event of a security incident someone will be available to assess alarms or any unauthorized penetrations or activities and, if warranted, notify the NRC, the local law enforcement authorities, and the responsible person in licensee management. Early detection and notification of any missing material will help facilitate its prompt recovery. For purpose of this regulation, an offsite response force can be a local law enforcement agency or a contract guard service.

Content

Describe the security organization which will be responsible for assessing and responding to any unauthorized penetrations or activities. Assure that at least one guard, watchman, or member of an offsite response force will respond to all unauthorized penetrations or security incidents at the CAAs.

CHAPTER 15 RESPONSE PROCEDURES

This chapter provides guidance on meeting the requirements of paragraph 70.47(f)(4) which states:

- (f)(4) Establish and maintain response procedures for dealing with threats of thefts or thefts of such materials.

15.1 RESPONSE PROCEDURES DESCRIPTION (73.47 (f)(4))

Intent

The intent of this regulation is to help the licensee identify those security incidents which could result in the loss of SNM of low strategic significance and to develop response procedures to prevent or reduce the likelihood of such a loss. Some types of incidents which should be considered and for which response procedures should be developed are:

- a. civil strife such as student demonstrations or employee strikes,
- b. fire,
- c. discovery that some SNM is missing, and
- d. bomb threats

Content

Identify those events for which response procedures will be developed. Also describe the type of response to be accomplished for each event identified and the duties and responsibilities of the security organization and management involved in the response. Assure that the NRC will be notified immediately in the event of theft or attempted theft of the material. Describe what local law enforcement assistance is available, their response capabilities and any agreements made with them to respond in the case of theft of the material.

CHAPTER 16 MATERIAL TRANSPORTATION REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(g)(1) which are as follows:

- (g)(1) Each licensee who transports, exports, or who delivers to a carrier for transport special nuclear material of low strategic significance shall:
- (i) Provide advance notification to the receiver of any planned shipments specifying the mode of transport, estimated time of arrival, location of the nuclear material transfer point, name of carrier and transport identification,
 - (ii) Receive confirmation from the receiver prior to the commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and that he acknowledges the specified mode of transport,
 - (iii) Transport the material in a tamper-indicating sealed container,
 - (iv) Check the integrity of the containers and seals prior to shipment, and
 - (v) Arrange for the in-transit physical protection of the material in accordance with the requirements of paragraph 73.47(g)(3) of this part, unless the receiver is a

licensee and has agreed by written contract to arrange for the in-transit physical protection.

16.1 ADVANCE NOTIFICATION DESCRIPTION (73.47(g)(1)(i))

Intent

It is the intent of this section that the shipper will have preplanned the transportation of the material and informed the receiver of his plans prior to shipment. This is the first of the several transportation requirements that will allow the receiver to take delivery of the material as planned or to help assure traceability of any missing material that might occur.

Content

The licensee should assure that prior to each shipment of material, notification of the impending shipment will be given to the receiver giving him the following types of information:

- a. mode of transport (e.g., truck, plane, train or ship),
- b. estimated time of arrival,
- c. location where material is to be transferred to receiver,
- d. name of carrier, and
- e. transport identification (e.g., truck, train, or flight number, ship name, etc.).

16.2 RECEIVER CONFIRMATION DESCRIPTION (73.47(g)(1)(ii))

Intent

It is the intent of this requirement that prior to shipment the transporter will be assured that the receiver is ready to accept the shipment at the planned time and location and acknowledges the mode of transport.

Content

Describe what procedures will be used to assure that shipment of material does not take place until the receiver acknowledges the planned shipment and mode of transport, and assures he will be ready to accept the shipment at the planned time and location.

16.3 CONTAINER DESCRIPTION (73.47(g)(1)(iii))

Intent

The intent of this requirement is to provide a mechanism or system that will help the receiver detect any tampering that may have occurred with the material's container during shipment. Regulatory Guide 5.15 entitled "Security Seals for the Protection and Control of Special Nuclear Material," is available from the NRC for guidance in this area.

Content

Describe the types of seals that will be used to secure the material's container during transport.

16.4 INSPECTION DESCRIPTION (73.47(g)(1)(iv))

Intent

The intent of this requirement that the shipper check the integrity of the material container's seals just prior to shipment, so that he can be assured that they haven't been compromised. Then if upon receipt of the shipment the receiver discovers the container's integrity has been compromised and the material missing, the scope of the recovery operation can focus on the transportation route.

Content

Describe the procedures to be used to assure that the integrity of the containers or seals is checked just prior to shipment.

16.5 IN-TRANSIT PHYSICAL PROTECTION (73.47(g)(1)(v))

Intent

It is the intent of this requirement that either the shipper or receiver be made responsible for the physical protection of the material while it is in transit and that the responsible person has acknowledged this responsibility by written agreement.

Content

In his security plan, the shipper should either acknowledge responsibility for the in-transit physical protection of SNM of low strategic significance, or assure that written agreement from the receiver has been received in which the receiver either accepts full responsibility or shared responsibility for the in-transit physical protection of this material according to 10 CFR Part 73.47(g)(3).

CHAPTER 17 RECEIVER REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(g)(2) which are as follows:

(g)(2) Each licensee who receives special nuclear material of low strategic significance shall:

(i) Check the integrity of the containers and seals upon receipt of the shipment,

- (ii) Notify the shipper of receipt of the material as required in § 70.54 of Part 70 of this chapter, and
- (iii) Arrange for the in-transit physical protection of the material in accordance with the requirements of paragraph 73.47(g)(3) of this part, unless the shipper is a licensee and has agreed in writing to arrange for the in-transit physical protection.

17.1 INSPECTION DESCRIPTION (73.47(g)(2)(i))

Intent

This requirement is intended to determine whether the material's container has been compromised enroute and whether any material has been removed, so that immediate recovery procedures can be initiated, if required.

Content

Describe the procedures to be used to assure that the integrity of the containers and seals will be checked upon receipt of the material shipment.

17.2 NOTIFICATION DESCRIPTION (73.47(g)(2)(ii))

This requirement is intended to:

- a. allow that knowledge of the current location of all SNM is available, and
- b. formally inform the shipper that the material has been received.

Content

Assure that a completed copy of standard Form NRC-741, "Nuclear Material Transaction Report," will be sent to the shipper within (10) days of receiving a material shipment as required in § 70.54 of Part 70 of 10 CFR.

17.3 IN-TRANSIT PHYSICAL PROTECTION (73.47(g)(2)(iii))

Intent

It is the intent of this requirement that either the receiver or shipper licensee be made responsible for the physical protection of the material while it is in transit and that the responsible licensee has acknowledged this responsibility by written agreement.

Content

In his security plan, the receiver should either acknowledge responsibility for the in-transit physical protection of SNM of low strategic significance, or assure that written agreement from the shipper has been received in which the shipper either accepts full responsibility or shared responsibility for the in-transit physical protection of this material according to 10 CFR Part 73.47(g)(3).

CHAPTER 18 IN-TRANSIT PHYSICAL PROTECTION REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(g)(3) which are as follows:

- (g)(3) Each licensee, either shipper or receiver, who arranges for the physical protection of special nuclear material of low strategic significance while in transit or who takes delivery of such material free on board (f.o.b.) the point at which it is delivered to a carrier for transport shall:
- (i) Establish and maintain response procedures for dealing with threats of thefts or thefts of such material,
 - (ii) Make arrangements to be notified immediately of the arrival of the shipment at its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination, and
 - (iii) Conduct immediately a trace investigation of any shipment that is lost or unaccounted for after the estimated arrival time and report to the Nuclear Regulatory Commission as specified in § 73.71 and to the shipper or receiver as appropriate. The licensee who made the physical protection arrangements shall also immediately notify the Director of the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix A of the action being taken to trace the shipment.

18.1 RESPONSE PROCEDURE (73.47(g)(3)(i))

Intent

The intent of this regulation is to help the licensee identify those transportation incidents that could affect the security of the SNM in transit for which he might expect to be notified and for which response procedures should be planned.

Content

Identify those events for which response procedures will be developed. Also describe type of response to be accomplished for each event identified and the duties and responsibilities of

the security organization and management involved in the response. Assure that the NRC will be notified immediately in the event of theft or attempted theft of the material.

18.2 NOTIFICATION DESCRIPTION (73.47(g)(3)(ii))

Intent

The intent of this requirement is to assure that the licensee responsible for the physical protection of SNM in transit will have a firm basis for deciding whether or not to initiate response procedures in the event a shipment becomes overdue or is lost.

Content

Describe the arrangements and procedures which will be used for notifying the licensee who arranges for the physical protection of material in transit of the arrival of the shipment at its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination.

18.3 LOST MATERIAL NOTIFICATION (73.47 (g)(3)(iii))

The intent of this requirement is to assure that in the case a shipment becomes overdue, and no reasonable explanation has been received from the carrier regarding its status, a trace investigation will be conducted to locate the missing SNM. The NRC is to be notified at this time that the material is missing and informed as to what steps are being taken to recover the missing material. Although the licensee is responsible for notifying the NRC of any missing material and to initiate and assist in the subsequent investigation, the law enforcement agencies bear the responsibility for physically recovering the material.

Content

Describe what procedures will be used to trace any shipment that is lost or has not arrived by the estimated arrival time. Assure that all lost or missing material will be immediately reported to the appropriate NRC Regional Office along with what actions are being taken to trace the shipment, that the NRC will be notified as specified in § 73.71 and that the shipper or receiver, as appropriate, will also be notified.

CHAPTER 19 EXPORT REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(g)(4) which reads as follows:

- (g)(4) Each licensee who exports special nuclear material of low strategic significance shall comply with the requirements specified in § 73.47(c), (g)(1) and (g)(3).

19.1 SECURITY DESCRIPTIONS (73.47(g)(4))

Use Chapters 16 and 18 of this Standard Format to describe the security procedures which will be used to protect the material up to the point where the receiver accepts physical protection responsibility for the shipment.

CHAPTER 20 IMPORT REQUIREMENTS

This chapter provides guidance on meeting the requirements of paragraph 73.47(g)(5) which reads as follows:

- (g)(5) Each licensee who imports special nuclear material of low strategic significance shall:
- (i) Comply with the requirements specified in § 73.47(c), (g)(2) and (g)(3), and
 - (ii) Notify the exporter who delivered the material to a carrier for transport of the arrival of such material.

20.1 SECURITY REQUIREMENTS (73.47(g)(5)(i))

Use Chapters 17 and 18 of this Standard Format to describe the security procedures which will be used to protect the material from the first point where the shipment is picked up.

20.2 NOTIFICATION (73.47(g)(5)(ii))

Intent

The intent of this regulation is to notify the exporter that the material has arrived safely.

Content

Describe the procedures to be used for notifying the exporter of the material that the shipment was received.

ENCLOSURE D

VALUE/IMPACT ASSESSMENT CONTAINING A
REPORT JUSTIFICATION ANALYSIS
PHYSICAL PROTECTION OF PLANTS AND MATERIALS

ENCLOSURE "D"

VALUE/IMPACT ASSESSMENT
CONTAINING A
REPORT JUSTIFICATION ANALYSIS
PHYSICAL PROTECTION OF PLANTS AND MATERIALS

EXEMPTIONS AND CONTINUED REGULATORY AUTHORITY
IN AGREEMENT STATES UNDER SECTION 274

Proposed Amendments to §70, §73, and §150

I. The Proposed Action

A. Description

Proposed amendments to 10 CFR Part 73 would require that various Part 50, Part 70 and State licensees including some nonpower reactors, various fuel cycle facilities and many research and teaching institutions possessing, using, or transporting nonself-protecting SNM of moderate or low strategic significance* implement new provisions for physical security. These provisions are equivalent to those standards set out in the International Atomic Energy Agency (IAEA) circular INFIRC/225/Rev. 1.

*"Special nuclear material of moderate strategic significance" means:

- (1) less than a formula quantity of strategic special nuclear material, but in a quantity of more than 1000 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or more than 500 grams of uranium-233 or plutonium or in a combined quantity of more than 1000 grams when computed by the equation, grams = (grams contained U-235) + 2 (grams U-233 + grams plutonium), or
 - (2) 10,000 grams or more of uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope).
- (Continued)

B. Need for the Proposed Action

The publication of recommended physical security requirements for materials of moderate and low strategic importance by the IAEA, INFCIRC/225/Rev. 1, and the participation by the United States in their development, was accompanied by and continues to be accompanied by assessments of domestic safeguards needs related to those materials. It is the staff judgment that the proposed requirements are technically justified as a necessary safeguards upgrading action commensurate with internationally recognized requirements, developed and promulgated with full United States participation.

C. Value/Impact of the Proposed Action

1. NRC Operations

The amendments proposed in this paper would impact NRC resources as follows:

- a. Amendments to physical security plans for an estimated 50 non-power reactor licensees would need to be reviewed. This would require about 3.5 man-years of effort in the Office of Nuclear Reactor Regulation. This effort would be completed by the end of FY 1980. New plans and plan maintenance during the period FY 1981 through 1984 is estimated to require 3.5 man-years of effort in NRR.

(Continued)

"Special nuclear material of low strategic significance" means:

- (1) less than an amount of strategic special nuclear material of moderate strategic significance, as defined above, but more than 15 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or 15 grams of uranium-233 or 15 grams of plutonium or the combination of 15 grams when computed by the equation, grams = grams contained U-235 + grams plutonium + grams U-233, or
- (2) less than 10,000 grams but more than 1000 grams of uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope), or
- (3) 10,000 grams or more of uranium-235 contained in uranium enriched above natural but less than 10 percent in the U-235 isotope.

- b. Fuel cycle physical security plans for 8 Category II facilities and 7 Category III facilities, and 20 transportation plans would need to be reviewed. This would require an estimated 6.3 man-years of effort in the Office of Nuclear Material Safety and Safeguards. This effort would be completed by the end of FY 1980. These plans are completely new plans whereas the nonpower reactor plans, referred to above would be modifications of current plans already reviewed and approved by NRR pursuant to §73.40. New fuel cycle plans and plan maintenance during the period FY 1981 through FY 1984 is estimated to require 3.2 man-years of effort in NMSS.
- c. Inspection of these physical security requirements will be included in the currently programmed efforts for the material control and accounting inspectors and health physics inspectors to minimize the impact on IE resources. For those fixed sites not currently covered by any inspection program, one additional man-year and \$25,000 in travel funds would be required. This would provide inspections of Category II facilities once every 2 years and Category III facilities once every 3 years. Three additional man-years and \$75,000 in travel funds would be required to inspect 20 percent of Category II shipments and 10 percent of Category III shipments. One additional man-year would be required to administer the program.

2. Other Government Agencies

Other agencies of the Federal Government will not be involved in the development of plans for responding to detections of thefts of special nuclear material of moderate or low strategic significance. Such agencies as the FBI, DOE and DOD may be involved in search and recovery operations according to their currently defined responsibilities. However, plans for such actions have already been set in motion with regard to possible thefts of strategic special nuclear material and no additional effort would be required with regard to the material protected under the proposed amendments.

3. Industry

Benefits to industry would be improved protection of valuable materials and facilities. Much of the industry is already in substantial conformance with the proposed requirements, having responded to interim guidance on such matters in the case of medium power nonpower reactors, and elsewhere due to the general

prudent observance of accepted industrial security practices. Promulgation of the proposed requirements would codify widely existent practice.

The impact upon the licensees will be costs incurred to comply with the proposed regulations and fees paid to the NRC to have their security plans amended. Costs and benefits of particular safeguards items are detailed in Annex 1 to this Enclosure D. The affected industry and the development of industry wide cost impacts are described in further detail in Annex 2 to this Enclosure D.

Physical protection requirements for special nuclear material of moderate strategic significance would apply at about 37 facilities. The maximum capital cost per affected facility would be \$3,653 with about \$44,290 per year thereafter in annually recurring costs, assuming the facility has no protection whatever currently in place. However, these maximum cost estimates are very conservative on the high side since many of the licensed facilities do have considerable portions of the required protection already in place. Taking this into account, and also considering that many of the licensees may opt to utilize procedures which would tend to reduce the costs of their physical protection systems, it is then estimated that the capital costs for any given facility are not expected to exceed \$1,884 with a total cost to the industry of about \$69,708. Similarly, annually recurring costs for a facility are more likely to be about \$4,975 with a total cost to the industry of about \$184,076 per year. The bases for these estimates are detailed in Tables 1 and 2 of Annex 1 to this Enclosure D and Tables IV and V of Annex 2 to this Enclosure D.

Physical protection requirements for special nuclear material of low strategic significance would apply to about 61 facilities. The maximum cost per affected facility would be \$2,604 with an annually recurring cost of about \$773 per year (Annex 2 Tables VIII and IX). However, these maximum costs are somewhat conservative since many of these facilities have portions of the required protection in place. Taking this into account, and also considering that some facilities may opt to utilize procedures which would tend to reduce the costs of their physical protection systems, it is estimated that the capital costs per facility are not expected to exceed \$910 with a total cost to industry of \$55,446 with a probable annual cost per facility of \$309 and a total annual cost to industry of \$18,828. The bases for these estimates are detailed in Tables 5 and 6 of Annex 1 to this

Enclosure D and Tables VIII and IX of Annex 2 to this Enclosure D.

The maximum costs for transportation of special nuclear material of moderate and low strategic significance are \$14,600 capital expenses and about \$1,720 operating expenses. However, estimates for all transportation costs are reduced from these values when less conservative assumptions are made as indicated in Tables 3, 4, 7 and 8 of Annex 1 of this Enclosure D and Tables VI, VII, X, and XI of Annex 2 of this Enclosure D. The resultant low estimates are about \$12,574 for capital costs and \$1,430 for annual recurring costs.

In addition to the costs stated above, some licensees will be required to pay a licensing fee to have their security plans reviewed. Those licensees required to pay a licensing fee are identified in Table XII of Annex 2 of Enclosure D along with the estimated amount they must pay. The total fee impact is approximately \$190,000 which would be collected initially--approximately \$125,000 for Category II and \$65,000 for Category III. Fees listed that are \$2,000 and greater, however, are subject to manpower cost review, (i.e., when review of the plan is complete, the expenditures for professional manpower and support services will be determined and the resultant fee assessed, but in no event will the fee exceed that shown in the schedule,) and because of the possibility of refunds, the net effect of the fee impact may be less than \$190,000. Colleges and Universities required to file plans for research reactors and special nuclear material licenses under the rule would not be subject to fees.

4. Public

No significant adverse impact on the public can be foreseen. The public will benefit in that a more rigorous approach to physical security will have been implemented leading to a higher level of assurance that repeated thefts or attempted thefts of special nuclear materials of moderate and low strategic significance will likely be detected in a timely manner. Further, the proposed amendments support international safeguards and nonproliferation objectives which promise to improve physical security for the affected materials on a global basis. It is not expected that the financial impact on institutional licensees will be so severe as to force them to terminate their licenses or adversely affect their educational programs.

II. Technical Approach

A.1. Technical Alternatives

- a. Specification of detailed technical requirements in the regulations.
- b. Statement of objectives and performance requirements in the regulations leaving technical alternatives to be decided on a site specific basis.

2. Coverage Alternatives

- a. Replacement of strategically significant materials, i.e., Pu in Pu-Be sources with AmO₂ or ²³⁸PuO₂.
- b. Exemption of small quantities of Pu in Pu-Be type sealed sources from physical protection requirements.

B. Value/Impact of Alternatives

1. With respect to alternatives 1.a and 1.b., many technical alternatives could be specified in the regulations for upgrading physical security and to achieve protection equivalent to the IAEA standards recommended in INFCIRC/225. Although specification of detailed technical alternatives would accomplish safeguards upgrading and demonstrate the U.S. willingness to endorse IAEA standards, other alternatives which could be equally as effective might then be precluded. A statement of objectives and performance requirements will accomplish upgrading safeguards equivalent to IAEA standards recommended in INFCIRC/225 and still permit licensees to select cost effective technical alternatives appropriate to their sites.
2. An alternative, 2.a above, with respect to coverage to be afforded by the regulations which might have applied to some extent as an unavoidable economic consequence of the proposed regulations if Alternative 2.b., above, were not chosen, is the replacement of the entire SNM inventories of some 400 licensees possessing material of low strategic significance, consisting almost exclusively of 1 to 5 curie Pu-Be neutron sources, with sources containing no materials of strategic significance. Pu-Be neutron sources have already been largely replaced in the commercial sector by AmO₂-Be or ²³⁸PuO₂-Be sources. Replacement with such sources would, in some cases, be less expensive than acquisition of the physical

security requisite to continued possession of Pu-Be neutron sources. Commercially supplied "Standard IAEA Capsule" neutron sources of 1 to 5 curies cost from \$1,400 to \$1,900 for ^{238}Pu -Be and from \$1,600 to \$2,900 for AmO_2 -Be. This alternative might have been elected by many affected licensees. Others may simply have elected disposal of the sources and license terminations. Either alternative would involve processing of license amendments by NRC and/or various State licensing authorities and repossession of the leased ^{239}Pu by the DOE at its Mound Laboratories.

3. The IAEA recognized in INFCIRC/225 the possibility that "research type facilities outside the nuclear fuel cycle and corresponding shipments may not be able to meet the recommendations. In such cases the State's physical protection system may make specific exceptions on a case-by-case basis." The overwhelming majority of licensees affected by the proposed regulations are "research type facilities outside the nuclear fuel cycle" and are, in fact, mostly universities. The larger university facilities possess research reactors and related facilities and the smaller ones possess one or more Pu-Be neutron sources. The economic impacts of the proposed regulations could be substantially reduced by exempting some or all research type facilities. However, nonpower reactor facilities are, for the most part, already protected to levels commensurate with the proposed regulations and such protection is largely regarded as only prudent and necessary for industrial security and for protection from sabotage and theft of valuable equipment, etc., other than SNM.

Small inventories of SNM consisting only of one or a few sealed Pu-Be sources and, perhaps, an even smaller quantity of Pu or U-235 in sealed fission foils or neutron detectors characterize almost 500 licensees. Those are typically universities which may be ill equipped to bear the expense of acquiring alarmed intrusion detection systems but who generally already control access to those materials with locked storerooms and or locked neutron irradiators. The exception, as stated in 2.b above, to the requirement for further physical protection for those materials would relieve individual licensees of at least \$2,200 new capital expenditure and \$700 per year operating costs each. Thefts or other losses of such materials are already required to be reported and any attempt to gather greater than formula quantities by a series of thefts would be impossible due to the limited amounts of such material in existence. Such an exception is judged to not

drastically compromise either the furtherance of our international safeguards objectives or effective domestic safeguards.

C. Decision on Technical Approach

Alternatives 1.b and 2.b are judged to be the most cost effective.

III. Procedural Approach

A. Procedural Alternatives

Upgraded physical security for use and transportation of materials of moderate or low strategic significance could be effected several ways. Some of those are:

1. Issue guides with detailed criteria and implement on a case-by-case basis. This has been the practice with many medium power nonpower reactors except that the guides were not formally promulgated.
2. Issue guides with detailed criteria and revise regulations to include physical security objectives and performance criteria equivalent to those of INFCIRC/225.
3. Revise regulations to include all necessary information and detailed criteria to meet physical security requirements.

B. Value/Impact of Procedural Alternatives

All of the procedural alternatives could effect the required upgrading. However, only alternative (2) provides a high visibility endorsement of IAEA and would be the most effective in furthering international safeguards. Alternative (1) suffers from having less than the appearance of law and would require extensive negotiations with affected licensees. Alternative (3) would put an unseemly amount of detail into the regulations.

C. Decision on Procedural Approach

Alternative (2) is judged to be the most desirable of the alternative procedural approaches.

IV. Report Justification Analysis

A. Need for Rule Amendments

The proposed amendments are in the interest of national security to assure protection of public health and safety and are for the purpose of protection against theft of special nuclear material of moderate and low strategic significance.

The need for the U.S. adoption of the proposed amendments is contingent on both domestic and international factors, which are closely interrelated. Current NRC physical protection regulations apply primarily to strategic special nuclear material (uranium enriched in the isotope U-235 to 20% or greater, U-233, and plutonium) in quantities of five formula kilograms or greater. There are no specific physical protection requirements for quantities in lesser amounts. Yet, it can be properly argued that a 4.9 formula kilogram quantity of SNM is about as important a quantity as 5.0 formula kilograms. Multiple thefts of such materials in close to formula quantities could result in the accumulation of more than a formula quantity.

In regard to low enriched uranium (LEU) (enrichments less than 20%), clandestine enrichment to higher levels may go beyond the capability of subnational terrorists, but it does not go beyond the capability of other governments. Unless properly safeguarded, LEU could be stolen on behalf of foreign governments and enriched to explosive useable levels after it is smuggled out of the U.S.

The Nuclear Non-Proliferation Act of 1978 specifies that NRC shall promulgate regulations which assure that physical security measures are provided to special nuclear materials exported from the United States without specifying whether the materials are LEU or HEU. Pursuant to this legislation, the Commission has promulgated 10 CFR Part 110.43 which provides among other things that:

"(b) Commission determinations on the adequacy of physical security programs in recipient countries for Category II and III quantities of material will be based on available relevant information and written assurances from the recipient country or group of countries that physical security measures providing as a minimum protection comparable to that set forth in INFCIRC/225 will be maintained."

While the proposed amendments would provide a needed extension of domestic physical protection to special nuclear materials for which the level of physical protection required was not previously specified, the full value of such protection could not be realized until similar protection is afforded all such material among the nations utilizing such materials. Physical protection measures similar to those proposed, which are based on the recommendations of the IAEA Information Circular INFICIRC/225/ Rev. 1, have already been adopted by several countries.

B. Cost/Burden

Costs, the number of licensees, and manhours for particular safeguards items (security plan preparation, response procedure plan preparation, revision and upkeep) are listed in Annex 1 and 2 of this Enclosure D. Other paperwork costs and burden (notice of shipments and receipts and reports on lost or unaccounted for items of shipment) are either of such infrequent occurrence or of such minor effort as to be considered not significant.

C. Alternative Data Sources and Other Alternative Considered

There are no valid alternatives to obtaining the data required for advance shipment notification, reports of results of trace investigation of any shipment lost or unaccounted for and notification regarding a shipment that fails to arrive at its destination. Security plans and response procedures are intended to be well thought out programs which will assure the NRC that each licensee is effectively performing his assigned security related responsibility. Without documented plans approved by the NRC there is no bench mark for either the licensee or the NRC to assure adequate protection.

D. Value/Impact Assessment

Benefit from the recording and reporting requirements will accrue to the licensee, the NRC, and the public. Industry and the licensee will derive benefits in that the requirements for submission of a security plan will motivate the licensee to analyze and identify each security related task. As a part of this analysis he will need to document each physical security objective to minimize the possibility of unauthorized removal of SNM. This action in turn will provide the NRC with a yardstick to measure licensee performance. Thus, the public in general will benefit by assurance of an adequate protection system.

E. Requirements

The reporting requirements or paperwork burden will include security plans, response procedures, advance notifications, reports of results of trace investigation of any shipment lost or unaccounted for and notification of a shipment that fails to arrive at its destination.

1. 10 CFR Part 70, §70.22(g) will require each application for a license which would authorize the transport, export or delivery to a carrier for transport SNM of moderate strategic significant or 10 kg or more of SNM of low strategic significance (low enriched uranium) to provide a plan for physical protection of intransit material.
2. 10 CFR Part 70 §70.22(k) will require each application for a licensee to possess or use at any site or contiguous sites subject to control by the licensee quantities and types of SNM of moderate strategic significant or 10 kg or more of low strategic significance (low enriched uranium), other than a license for possession or use of such material in the operation of a nuclear power reactor, to include a physical security plan which will demonstrate how the applicant plans to meet general performance objectives to minimize the possibilities for unauthorized removal of SNM consistent with potential consequences of such action; and facilitate the location and recovery of missing SNM.
3. 10 CFR Part 73, §73.47(a) will require a licensee who possesses, uses, or transports SNM of moderate strategic significance or 10 kg or more of SNM of low strategic significance (low enriched uranium) to submit 120 days (four months) from effective date of amendment, a security plan or an amended security plan, including schedules for implementation. The security plan or the amended security plan is to describe how the licensee will comply with the applicable requirements of §73.47.
4. A licensee who transports, exports or delivers to a carrier for transport moderate strategic significance SNM shall:
 - (a) provide advance notification to the Nuclear Regulatory Commission (NRC) and the receiver of any planned shipments specifying the mode of transport, estimated time of arrival, location of the nuclear material transfer

point, name of carrier and transport identification, and

- (b) receive confirmation from the receiver prior to the commencement of the planned shipment that the receiver will be ready to accept the shipment at the planned time and location and acknowledges the specified mode of transport.
5. The receiving licensee of SNM of moderate strategic significance shall notify the shipper of receipt of the material and may agree in writing to arrange for the in-transit physical protection.
 6. A licensee who arranges for the physical protection of moderate strategic significance SNM while in transit or who takes delivery of material f.o.b. point of delivery to a carrier for transport shall conduct immediately a trace investigation of any shipment lost or unaccounted for after the estimated arrival time and report the results to the NRC and to the shipper or receiver as appropriate.
 7. A licensee who exports SNM of moderate strategic significance shall:
 - (a) comply with 4.a. and b. above,
 - (b) make arrangements with the consignee to be notified immediately of the arrival of the shipment at its destination, or of any such shipment that is lost or unaccounted for after the estimated time of arrival at its destination, and
 - (c) conduct immediately a trace investigation of any shipment that is lost or unaccounted for after the estimated arrival time and report to the NRC.
 8. Each licensee who imports SNM of moderate strategic significance shall notify the exporter who delivered the material to a carrier for transport of the arrival of the material. In the event a shipment fails to arrive at its destination at the estimated time, the consignee shall notify the NRC and the shipper that the material is missing and shall also notify the Director of the appropriate NRC Inspection and Enforcement Regional Office of the action being taken to trace the shipment.

9. 10 CFR 73.71, §73.71(a) will require a written report fifteen (15) days after the trace investigation to the appropriate NRC Regional Office setting forth the details and results of the investigation. A copy of the report is to be sent to the Director, Office of Inspection and Enforcement.

V. Statutory Considerations

A. NRC Authority

Section 204(b)(1) of the Energy Reorganization Act of 1974, allots to the NRC the Atomic Energy Act authority for the "provision and maintenance of safeguards against threats, thefts, and sabotage of ... licensed facilities, and materials." The Atomic Energy Act of 1954 as amended provides ample authority for the Commission to require of licensees whatever measures for physical security for materials of moderate and low strategic significance are deemed necessary to protect the public health and safety and the common defense and security.

B. Need for NEPA Assessment

The proposed amendments have an insignificant environmental impact and pursuant to 10 CFR 51(a)(3) require neither an environmental impact statement nor a negative declaration.

VI. Relationship to Other Existing or Proposed Regulations or Policies

There are no apparent potential conflicts or overlaps with other agencies. Coordination with other Federal agencies will be done by the NRC.

VII. Summary and Conclusions

The proposed regulations will both further our international safeguards objectives and effect necessary upgrading of domestic safeguards without working undue hardships on either the licensees or the NRC staff. However, it cannot be predicted with certainty that some small nonfuel-cycle research facilities will not elect to discontinue or markedly amend their operations rather than incur the costs for upgrading.

ANNEX 1
COST BENEFIT ANALYSIS OF
PROPOSED §73.47 OF 10 CFR PART 73

To estimate the cost to the licensee using or storing special nuclear material of moderate or low strategic significance, several conservative assumptions were made. It was assumed that:

1. the licensee would be using the material in a room 50 ft W x 100 ft L + 20 ft H. This room would have 3 doors entering it. Two of these doors would be fire/exit type doors while the third door would be used for normal personnel entrance. The controlled access area, however, can be made much smaller and can even be considered as the security cabinet or vault-type room for most purposes and at most times.
2. the licensee would want to have a minimum of a 30 foot-candle light level at the work area. This was based on Regulatory Guide 5.14, "Visual Surveillance of Individuals in Material Access Areas." However, the proposed amendments require no quantitative minimum level of illumination in this area.
3. the licensee would not already have onsite a night watchman or guard who could respond to security incidents.
4. it would take the licensee between 2 weeks and one month (depending on the level of security required) to prepare the security plan and one week to prepare the response procedures plan. In both cases, this time could probably be substantially reduced.

Tables 1, 3, 5, and 7 show maximum and probable estimates of the capital cost for implementing the proposed amendment. Tables 2, 4, 6, and 8 give the estimated maximum and probable recurring annual costs once the security system has been implemented. Tables 9, 10, 11, and 12 give the benefits for each of the specific requirements of the proposed amendment.

Table 1

Capital Costs for Security at Facilities
Having Special Nuclear Material of Moderate Strategic Significance

Requirement	Cost to Facility per § 73.47	
	Maximum	Probable
1. Door Locks	\$ 940	\$ 940
2. Improved Lighting	\$ 3237	\$ 324
3. Approved Security Cabinet	\$ 410	\$ 410
4. Interior Intrusion Alarm (Monitored Onsite)	\$ 1195	\$ 1195
5. Preauthorization Screening		
a. NAC	\$ 90	\$ 90
6. Badging System	\$ 100	\$ 100
7. Card Key System	\$ 675	\$ 18
8. Security Plan Preparation	\$ 3350	\$ 480
9. Response Procedures Plan Preparation	\$ 770	\$ 96

Explanation of Table 1

Item

1. Locks - It was assumed that the controlled access area will have 3 doors at its perimeter. Two doors would be emergency type doors requiring emergency breaker strikes costing approximately \$250 each. The third door would be the main entrance and would be equipped with a combination or electric type lock. The cost for a 3-position combination type lock is \$170. Installation time for the 3 locks would be approximately 8 hours costing about \$270.00. Total cost therefore will be approximately $2 \times \$250 + \$170 + \$270 = \940 .
2. Improved Lighting - Although there are no minimum illumination level requirements in § 73.47, for costing purposes we assumed an illumination level of 30 foot-candles throughout the area based on Regulatory Guide 5.14, "Visual Surveillance of Individuals In Material Access Areas." The size of the controlled access area was assumed to be 50' x 100' x 20'. The walls and ceiling were assumed to be painted in a light color with the floor a dark color. A utility firm estimated a minimum of 90 40-watt fluorescent lamps would be needed to obtain a 30 foot-candle level.

Fluorescent lamps cost approximately \$1.50 each. A 2' x 4' fixture which contains 4 lamps was assumed to be used. These fixtures cost approximately \$75 each. Installation costs, including the wiring for 22 fixtures needed to obtain a 30 foot-candle light level, would be about \$1452. (NOTE: Fluorescent lamps were chosen since it was assumed most facilities were already equipped with them. However, High Pressure Sodium Vapor lamps might prove more cost effective in the long run.)
Total Maximum Cost = $(90)(\$1.50) + (22)(\$75) + \$1452 \cong \3237.00

A lower cost estimate can be obtained by consideration of the guidance relating to the lighting requirement. No minimum level of illumination is specified as was mentioned above. The level of illumination must be sufficiently uniform and bright to detect penetration of or tampering with the CAA or unauthorized activities within or penetration of the CAA, depending upon the configuration of the CAA (whether vault-type room or security cabinet). Thus, it is within the control of the licensee to define the CAA in such a way that normal lighting could suffice to meet the lighting requirement in the proposed rule. In this case the additional cost of lighting would be zero. However, some licensees might want to add some additional lighting to

improve inadequately lighted CAA's. It is estimated that an improvement of 10% in the existing lighting system would satisfactorily meet the requirement. Probable cost = 10% x Maximum cost = \$324.00.

3. Approved Security Cabinet - It was assumed that some facilities would have only small quantities of moderate or low strategic significance material which could then be stored in approved security cabinets. The cheapest class and the one used by NRC for protecting classified documents is a GSA class #6 security cabinet. The price of a 2-drawer legal size version is about \$410 and a 4-drawer legal size version is about \$650. (Note: GSA approved security cabinets are cheaper than nonapproved cabinets because of the large number purchased by the government thus reducing their unit cost.)

Generally, however, an approved security cabinet would be used as a substitute for the need to secure an entire area, such as a laboratory, using appropriately designed door locks. Thus both the door locks and the security cabinet would not both be required. For purposes of the low cost estimate, it is assumed although the security cabinet may not be appropriate in all cases some licensees would still purchase them.

4. Interior Intrusion Alarm - It was assumed that 3 balanced magnetic switches and a volumetric ultrasonic detector with 4 slave units would be needed to provide protection to the 50' x 100' x 20' controlled access area. The onsite security organization was assumed to have a guard station where the alarm system would be monitored. It was also assumed a simple D.C. line supervisory system would be needed to monitor the area. Costs of purchasing and installing the equipment for one year are as follows:

1. Ultrasonic detector	\$140
2. 4 slave units	\$120
3. 3 Balanced Magnetic Switches	\$125
4. D.C. line supervisory	\$450
5. Installation	\$360
Total	<u>\$1195</u>

The intrusion alarm system may be substituted for by a program of periodic surveillance by security personnel as described in the guidance. In cases where the licensee already has such personnel in his service, this alternative would represent the most cost effective means of fulfilling the detection requirement. The cost of providing the periodic inspection capability for the sole purpose of detecting intruders would be much more

than the cost of the interior intrusion alarm system. However, since the 37 facilities which would be covered under the proposed amendments for special nuclear material of moderate strategic significance are known all to have onsite physical security forces, the requirement for either interior intrusion alarms or security procedures might be satisfied more economically using security procedures.

5. Preauthorization Screening - Two types of screening services were investigated. The first is a National Agency Check (NAC) which costs \$15/person. Assuming 6 people will require such a check, this would cost the licensee \$90. The second type of check would be a credit-employment check. The commercial credit investigative service we checked with charges \$75 per year plus \$2.25/person for a credit check, plus \$7.35/person for an employment check going back 2 years. Assuming 6 people require such a check, the licensee would pay $75 + (6)(2.25 + 7.35) \cong \135 a year. Since the NAC check was less expensive, it was chosen.

The guidance indicates that the licensee's present routine screening procedures for hiring personnel or selection of students for admission may be sufficient for meeting the requirements for preauthorization screening. Although most licensees presently employ some screening process for this purpose already, the probable estimate assumes that some additional administrative or screening might be required which would be comparable to the NAC check in cost.

6. Badging System - Since the number of people requiring a badge is small, it was assumed the licensee would have his badge designed and made by a commercial firm. The design and printing of 200 badges costs approximately \$70.00. The cost of taking a photograph of each person and placing it in the badge costs approximately \$5 each. Therefore, the first year the licensee should expect to pay approximately $\$70 + (6)(\$5) = \$100$.
7. Card Key System - A simple magnetic card key system, in which the authorized individual places a magnetic key card in a slot at the door to unlock the door, is assumed as probably the most efficient way of limiting access to authorized employees. Cost of such a system is:

1. Card Reader	\$214
2. Electric Strike	\$200
3. Transformer	\$ 50
4. Installation Cost (\$33/hour)	\$200
5. (6) Plastic Laminate Cards @ \$1.25 each	<u>\$ 7.50</u>
Total Maximum Cost =	\$671.50 \cong \$675

Since the proposed amendments do not specifically require a card-key system, and access control can be effected through the use of appropriate procedures, no card key system is necessary. Thus, the low estimate for this item is zero. A probable cost would be to issue door keys to the 6 authorized individuals costing \$3/ea for a total probable cost of \$18.00.

8. Security Plan Preparation - It is assumed a maximum of (1) person-month will be required to prepare the security plan. Based on one person-year costing \$40,000, one person-month will cost a maximum of $\$40,000 \div 12 \cong \3350 .

In light of the guidance for the proposed amendments, the time for completion of the physical security plan can be expected to be very much less than one month. A less conservative estimate would be one person-week. Also, it can be assumed that the bulk of the labor involved in the preparation of the plan would be capable of being done by lower paid individuals. It is, therefore, estimated that the average expense of labor to prepare the plan would be about \$25,000 per person-year. The low estimate for plan preparation is, thus, $\$25,000 \div 52 \text{ weeks} \times 1 \text{ week} = \480 .

9. Response Procedures Plan Preparation - It is assumed a maximum of (1) person-week will be required to prepare the plan. Based on a person-year costing \$40,000, one person-week will have a maximum cost of: $\$40,000 \div 52 \cong \770 .

Based upon the guidance, the preparation of a response procedures plan should require only a minimal effort of about one day. The mix of labor assumed to prepare this aspect of the security plan is the same as that for the low estimate for the physical security plan as a whole, or \$25,000/person year. Thus, the low estimate for response procedures plan preparation is $\$25,000 \div 52 \text{ weeks} \times 1 \text{ day (or fifth of a week)} = \96 .

Table 2

Annual Recurring Costs for Physical Security
at Facilities Having Special Nuclear Material of
Moderate Strategic Significance

Requirement	Annual Cost to Facility	
	Maximum	Probable
1. Locks	\$ 94	\$ 94
2. Lighting	\$ 178.50	\$ 32
3. Security Cabinets	\$ 41	\$ 0
4. Interior Intrusion Alarms	\$ 260	\$ 260
5. Badging System	\$ 10	\$ 10
6. Card Key System	\$ 67.50	\$ 6
7. Preauthorization Screening		
a. NAC	\$ 30	\$ 30
8. Security Organization		
a. Watchman	\$43,800	\$43,800
9. Security Plan Revisions	\$ 335	\$ 48
10. Response Procedures Plan Revisions	\$ 77	\$ 10

Explanation of Table 2

1. Based on a draft copy of a MITRE report, MTR-3541, prepared for the NRC entitled "An Evaluation of Cost Estimates of Physical Security Systems for Recycled Nuclear Fuel," an annual maintenance and service cost of 10% of initial hardware cost was used to determine the maximum annual recurring costs for the following items:

A. Locks	$10\% \times \$940 = \94
B. Lighting	$10\% \times \$1785 = \178.50
C. Security Cabinets	$10\% \times \$410 = \41
D. Card Key System	$10\% \times \$675 = \67.50

The corresponding low estimates for these items would be:

A. Locks	$10\% \times \$940 = \94
B. Lighting	$10\% \times \$324 = \32
C. Security Cabinets	0
D. Card Key System	2 (keys replaced each year) $\times \$3 = \6

2. A commercial central alarm service would cost approximately \$260 for annual maintenance and service.
3. For the Badging System and the Preemployment Screening it was assumed that the facility would have an average of 33% turn-over rate per year in personnel or 2 new individuals per year. Therefore, recurring costs are based on this figure.

A. Badging System	$(2) \times \$5/\text{individual} = \10
B. Preauthorization Screening	
a. Maximum (NAC)	$2 \times \$15/\text{person} = \30
b. Probable	$2 \times \$15/\text{person} = \30

3. To provide a 24-hour commercial armed guard service at the facility costs approximately \$5.50/hour which includes the uniform and service revolver. To provide a 24-hour watchman, or unarmed guard, service at a facility costs approximately \$5.00/hour. Therefore, a year's guard service will cost approximately $24 \times 365 \times \$5.50 = \$48,180$ or a year's watchman service will cost approximately $24 \times 365 \times 5 = \$43,800$. Since only a watchman is required, the lower figure was chosen.

This figure appears much larger than necessary if it is recognized that the watchman need not be totally dedicated to the single function of providing a response capability for the controlled access area. All facilities having SNM of moderate strategic significance are

known to have onsite security forces. Generally, these forces protect nonnuclear facilities belonging to the licensee as well as the nuclear facility. A more accurate treatment of this item would allocate a portion of the cost of the security force needed to support the response capability. Since no new costs are contemplated for such facilities, further refinement of this amount was determined to be unnecessary.

4. It was assumed that 10% of the initial preparation cost of the Security and Response Procedures Plan would be spent each year in revision preparation.

A. Security Plan Revision	10% x \$3350 = \$335
B. Response Procedures Plan Revision	10% x \$770 = \$77

Based upon the low estimate of the corresponding capital costs, the low values for these items annually would be:

A. Security Plan Revision	10% x \$480 = \$48
B. Response Procedures Plan Upkeep	10% x \$96 = \$10

Table 3
 Capital Costs for Implementing § 73.47
 Security Requirements for Transportation of
 Special Nuclear Material of Moderate Strategic Significance

Requirement	Cost	
	<u>Maximum</u>	<u>Probable</u>
1. Seals for Containers	\$ 100	\$100
2. Telephone	-	-
3. Security Plan Preparation	\$1540	\$480
4. Response Procedures Plan Preparation	\$ 770	\$ 96
5. Preauthorization Screening	\$ 90	\$ 90

Explanation of Table 3

1. The licensee is to use tamper indicating seals on containers. The cost of seals, including a sealing device and a lengthy supply of consumable seals, is estimated to cost no more than \$100 (based upon \$.06/seal and \$20 per sealer).
2. A telephone could be used to provide frequent communication with the licensee. This represents no significant additional cost.
3. It is estimated that a maximum of about 2 person-weeks will be required to prepare the security plan. Based on one person-year costing \$40,000, 2 person-weeks will cost $\$40000 \div 52 \times 2 \cong \1540 .

The probable estimate for preparation of the security plan is about (1) one person-week at a rate of \$25,000 per person-year. This amounts to $\$25,000 \div 52 \text{ weeks} \times 1 \text{ week} = \480 .
4. It was assumed a maximum of 1 person-week will be required to prepare the response procedures plan. Based on one man-year costing \$40,000, one person-week will cost $\$40,000 \div 52 = \770 .

Table 3 (Continued)

The probable estimate assumes only one person-day of effort will be required to complete the response procedures plan at a cost of \$25,000 per person-year. Thus, the estimated low cost would be $\$25,000 \div 52 \text{ weeks} \div 5 \text{ days per week} = \96 .

5. Since an NAC check is less expensive than a commercial credit-employment check, it was chosen. Again as in fixed sites, 6 persons are assumed to require such a check, each costing \$15. Therefore total cost = $6 \times 15 = \$90$.

The probable cost estimate for pre-authorization screening is \$90, consistent with the reasoning provided for the case of fixed sites.

Table 4

Annual Recurring Security Costs for
Transportation of Special Nuclear Material
of Moderate Strategic Significance

Requirement	Annual Cost [*]	
	<u>Maximum</u>	<u>Probable</u>
1. Seals For Containers	\$ 10	\$ 10
2. Preauthorization Screening	\$ 30	\$ 30
3. Security Plan Revision	\$154	\$ 48
4. Response Procedures Plan Revision	\$ 77	\$ 10

* Explanation for determining these costs are the same as found for Explanation of Table 2.

Table 5

Capital Costs for Security at Facilities Having
Special Nuclear Material of Low Strategic Significance

Requirement	Cost to Facility per \$ 73.47	
	Maximum	Probable
1. a. Door Locks	\$940	\$940
b. Security Cabinets	\$410	\$410
2. Interior Intrusion Alarm		
a. Monitored Offsite	\$660	\$660
3. Card Key System	\$675	\$ 18
4. Security Plan Preparation	\$3350	\$480
5. Response Procedures Plan Preparation	\$ 770	\$ 96

Explanation of Table 5

1. a. Door Locks - The same assumptions as to room size and number of doors used for estimating costs of physical security for special nuclear material of moderate strategic significance were used here. See Explanation of Table 1.
- b. Security Cabinets - Could also be used as substitute for door locks. See Explanation of Table 1.
2. Interior Intrusion Alarm - It was assumed in this case that a commercial offsite central alarm service would be used. Costs for alarming a 50' x 100' x 20' room are as follows:

	Equip. Cost	Install. Cost
(1) Master Ultrasonic Detector	140	80
(4) Slave Ultrasonic Detectors	115	80
(3) Balanced Magnetic Switches	125	120
	<hr style="width: 50px; margin: 0 auto;"/> 380	<hr style="width: 50px; margin: 0 auto;"/> 280

Total Initial Capital
Equipment Cost \$380 + \$280 = \$660

If the facility normally employs a security force as is common at many universities and government and commercial establishments, these personnel can be used at very small marginal cost to perform the detection functions intended to be done by the interior intrusion alarm system. In this case, the alarm system hardware would not be necessary.

3. Card Key System - It was assumed that the same type of access control system as used in Table 1 would be used for SNM of low strategic significance. See Explanation of Table 1.

Since the card-key system can be substituted for by appropriate door key or access control procedures the card key system is not necessary and the probable estimate for this item is \$18.

4. A security plan is required for facilities having more than 10 kg of special nuclear material of low strategic significance. It is estimated that 1 person-month will be required to prepare the security plan. Assuming 1 person-year costs \$40,000, one person-month will cost $\$40,000 \div 12 \cong \3350 .

The low estimate for the preparation of this plan is the same as for the "moderate" case, \$480.

5. Response Procedures Plan Preparation - It was assumed 1 person-week would be required to prepare the response procedures plans. Assuming 1 person-year costs \$40,000, 1 person-week will cost $\$40,000 \div 52 \cong \770 .

The low estimate for this task is the same as for the moderate case, \$480.

Table 6

Annual Recurring Costs for Physical Security at
Facilities Having Special Nuclear Material of
Low Strategic Significance

Requirements	Annual Cost to Facility	
	Maximum	Probable
1. Door Locks	\$ 94	\$ 94
2. Interior Intrusion Alarm	\$375	\$375
3. Offsite Guard Response	\$240	\$240
4. Card Key System	\$ 68	\$ 6
5. Security Plan Revision	\$335	\$ 48
6. Response Procedures Plan Revision	\$ 77	\$ 10

Explanation of Table 6

1. Per Mitre report number MTR-3541 entitled "An Evaluation of Cost Estimates of Physical Security Systems for Recycled Nuclear Fuel" door locks, security cabinets, and card key systems are estimated to have a 10 percent of initial cost as recurring maintenance and service cost.
2. A commercial central alarm service would cost approximately \$375 for annual maintenance and service plus leasing costs of the telephone line.
3. A commercial offsite guard response, if tied into a commercial central alarm service, costs about \$240/year.
4. It was assumed that 10% of the initial preparation cost of the Security Plan and Response Procedures Plan would be spent each year in revision preparation.

Table 7

Capital Costs for Implementing § 73.47 Security Requirements for Transportation of Special Nuclear Material of Low Strategic Significance

Requirement	Cost	
	Maximum	Probable
1. Seals For Containers	\$ 100	\$100
2. Security Plan Preparation	\$1540	\$480
3. Response Procedures Plan Preparation	\$ 770	\$ 96

1. Seals - The licensee is to use tamper-indicating seals on all containers. The cost of seals, including a sealing device and a lengthy supply of consumable seals, is estimated to cost no more than \$100 (based upon \$.06/seal and \$20 per sealer).

2. Security Plan Preparation - It was estimated a maximum of 2 person-weeks would be required. It was assumed 1 person-year costs \$40,000. Therefore, 2 person-weeks = $\$40,000 \div 52 \times 2 \cong \1540 .

The low estimate for preparation of the security plan is about (1) one person-week at a rate of \$25,000 per person-year. This amounts to $\$25,000 \div 52 \text{ weeks} \times 1 \text{ week} = \480 .

3. Response Procedures Plan Preparation - It was assumed 1 person-week would be required. It was also assumed 1 person-year costs \$40,000. Therefore 1 person-week = $\$40,000 \div 52 \cong \770 .

The low estimate assumes only one person-day of effort will be required to complete the response procedures plan at a cost of \$25,000 per person-year. Thus, the estimated low cost would be $\$25,000 \div 52 \text{ weeks} \div 5 \text{ days per week} = \96 .

Table 8

Annual Recurring Security Costs for
Transportation of Special Nuclear Material
of Low Strategic Significance

Requirement	Annual Cost	
	<u>Maximum</u>	<u>Probable</u>
1. Seals	\$ 10	\$ 10
2. Security Plan Revision	\$154	\$ 48
3. Response Procedures Plan Revision	\$ 77	\$ 10

Explanation for costs of Table 8 are the same as found for explanation of Table 2.

Table 9

Benefits of Increased Security for Facilities
Having Special Nuclear Material of Moderate
Strategic Significance

Requirement and Cost	Benefit
1. Door Locks (\$940)	Allows for positive control of personnel access into the controlled area, while still permitting emergency exit from the area. Also allows for high lock security during inactive time periods in area.
2. Improved Lighting (\$3237)	Allows for visual detection of security incidents affecting the safekeeping of this material.
3. GSA Security Cabinet (\$410)	Allows for the safe storage of small quantities of SNM during periods of time when such material is not being used.
4. Interior Intrusion Alarm System (\$1195)	Allows for immediate detection of an intruder entering or moving within the controlled area during unoccupied periods of time so that assistance can be summoned in time for adequate response.
5. Preauthorization Screening (\$90)	Gives the employer assurance of the character of the people who will be working with the material.
6. Badging System (\$100)	Allows fellow employees to quickly ascertain who has been authorized access to the controlled area, thus allowing for more positive access control.

Table 9

Benefits of Increased Security for Facilities
Having Special Nuclear Material of Moderate
Strategic Significance

(Continued)

Requirement and Cost	Benefit
7. Onsite Guard Service (\$43,800)	Allows for a 24-hour immediate watchman response to security incidents. Also watchman will periodically check packages, escort visitors, patrol the area, monitor alarm system, and communicate security incidents to the appropriate response force.
8. Card Key System (\$675)	Magnetic card keys would be issued to authorized employees. Each time they desired access to the controlled area they would have to insert the card key, thus giving positive control over personnel entering area.
9. Security Plan Preparation (\$3350)	This allows NRC licensors to determine the adequacy of the physical security measures implemented.
10. Response Procedures Plan Preparation (\$770)	Allows the licensee to know in advance what his response should be to any security incident.

Table 10

Benefits of Increased Security for Transportation
of Special Nuclear Material of Moderate
Strategic Significance

Requirement and Cost	Benefit
1. Locks For Containers (\$2000)	Allows for some deterrence against unauthorized penetra- tion and tampering while the material is in transit.
2. Response Procedures Plan Preparation (\$770)	Allows the licensee to know in advance what his response should be to any security incident.
3. Preauthorization Screening (\$90)	Gives the employer assurance of the character of the people who will be working with the material.
4. Security Plan Preparation (1540)	This allows NRC licensors to determine the adequacy of the physical security measures implemented.

Table 11

Benefits of Increased Security at Facilities
Having Special Nuclear Material of Low
Strategic Significance

Requirements and Costs	Benefit
1. Door Locks (\$940)	Allows for positive control of personnel access into the area while still permitting emergency exit from the area. Also allows for high lock penetration security during inactive time periods in the area.
2. Interior Intrusion Alarm System (\$660)	Allows for immediate detection of an intruder entering or moving within the controlled area during inactive time period so that assistance can be summoned in time for adequate response.
3. Offsite Guard Response (\$240)	Allows for 24-hour guard monitoring and response to alarms.
4. Card-Key System (\$675)	Magnetic card keys would be issued to authorized employees. Each time they desired access to the controlled area they would have to insert the card key, thus giving positive control over personnel entering the area.
5. Security Plan Preparation (\$3350)	This allows NRC licensors to determine the adequacy of the physical security measures implemented.
6. Response Procedures Plan Preparation (\$770)	Allows the licensee to know in advance what his response should be to any security incident.

Table 12

Benefits of Increased Security for Transportation of
Special Nuclear Material of Low Strategic Significance

Requirements and Cost	Benefit
1. Locks for Containers (\$2000)	Allows for some deterrence against unauthorized penetration and tampering while the material is in transit.
2. Security Plan Preparation (\$1540)	This allows the NRC licensors to determine the adequacy of the physical security measures implemented.
3. Response Procedures Plan Preparation (\$770)	Allows the licensee to know in advance what his response should be to any security incident.

ANNEX 2

The Affected Industry and Industrywide Costs

The affected industry handling materials of moderate strategic significance (Category II) consists of about 37 licensees, all except 8 of which are primarily nonpower reactor operators. Those 37 facilities are identified in Table II. The industry handling materials of low strategic significance (Category III) consists of fabricators of low enriched uranium fuels, lower powered nonpower reactor facilities, and research facilities using a few hundreds of grams of plutonium or U-235 in various enrichments. Identification of the industry handling materials of low strategic significance is given in Table III. A survey of licensees revealed that, of 60 respondees, only 13 did not already have intrusion alarms. In view of internal interim guidance for security plans for medium power nonpower reactors, which has been used by NRR since 1974 and which calls for intrusion alarms for such facilities, it is felt that almost all nonpower reactor facilities in the moderate category already have intrusion alarms and most of the other provisions for physical security which would be required by the proposed regulations. All licensees possessing material of moderate strategic significance already have onsite physical security forces.

Overall cost impacts of the proposed regulations to industry are estimated to range from a probable \$137,728 to a maximum of \$308,605 capital costs and from a probable \$204,334 to a maximum of \$1,687,600 annual costs. The lower estimates are based upon knowledge of what protection already exists.

Costs elements for facilities possessing special nuclear material of moderate strategic significance are assessed in Tables IV through VII, while those for the lower category are assessed in Tables VIII through XI. Each of these tables provide estimates of the maximum costs a facility might incur if there were no physical protection resources currently in place, as well as lower cost estimates which take into account knowledge of what resources currently are known to be in place at the different types of facilities. Table summarizes the probable cost impacts expected to be experienced by the entire industry.

In addition to the costs stated above, some licensees will be required to pay a licensing fee to have their security plans reviewed. Those licensees required to pay a licensing fee are identified in Table XII along with the estimated amount they must pay. The total fee impact is approximately \$190,000 which would be collected initially--approximately \$125,000 for Category II and \$65,000 for Category III.

TABLE I
 EXPECTED INDUSTRY INCREMENTAL IMPLEMENTATION COSTS

	<u>Capital Costs</u>	<u>Annual Recurring Costs</u>
<u>Fixed Sites</u>		
Moderate	\$ 69,708	\$184,076
Low	55,446	18,828
<u>Total Fixed Sites</u>	<u>\$ 125,154</u>	<u>\$202,904</u>
<u>Transportation</u>		
Moderate	\$ 7,566	\$ 926
Low	5,008	504
<u>Total Transportation</u>	<u>\$ 12,574</u>	<u>\$ 1,430</u>
<u>Average Cost Per Facility</u>		
Moderate		
a. Fixed Site	\$ 1,884	\$ 4,975
b. Transportation	\$ 630	\$ 77
Low		
a. Fixed Site	\$ 910	\$ 309
b. Transportation	\$ 626	\$ 63

Table II

LICENSEES HAVING SNM OF MODERATE STRATEGIC SIGNIFICANCE (CATEGORY II)

<u>Non-Power Reactors: (Total 29)</u>	<u>License Numbers*</u>
Babcock and Wilcox - Lynchburg	R-47, CX-10
General Atomic	R-38, R-67
General Electric - Vallecitos	TR-1; R-33
Union Carbide	R-81
Massachusetts Institute of Technology	Ex
Georgia Tech	Ex
University of Michigan	Ex
Rhode Island AEC	Ex
Oregon State University	Ex
Texas A&M	Ex
University of Wisconsin	Ex
Washington State University	Ex
University of California - Los Angeles	Ex
Virginia Polytechnic Institute	Ex
University of Missouri/Rolla	Ex
University of Washington	Ex
SUNY at Buffalo	Ex
Lowell Technical Institute	Ex
Worcester Polytechnic Institute	Ex
Ohio State University	Ex
Manhattan College	Ex
University of Kansas	Ex
Purdue University	Ex
University of California - Santa Barbara	Ex
North Carolina State University	Ex
University of Florida	Ex
University of Missouri - Columbia	Ex
University of Virginia	Ex
Iowa State University	Ex
<u>Other Than Non-Power Reactors (Total 8)</u>	
Naval SWC	Ex
Intelcom Industries	SNM-1405
David Witherspoon, Inc.	SNM-952
Eastman Kodak	SNM-1513
Teledyne Isotopes, Inc. - Westwood	SNM-107
NBS (in addition to reactor)	Ex
Union Carbide (Tuxedo)	SNM-639
Lowell Technical Institute	Ex

* A license number is given for those licensees which must submit a protection plan and pay fees. Ex means that these plan submittals are exempt from fees.

Table III

LICENSEES HAVING SNM OF LOW STRATEGIC SIGNIFICANCE (CATEGORY III)

<u>Non-Power Reactors: (Total 21)</u>	<u>License Number*</u>
Northrop Corporation	R-90
DOW Chemical Co.	R-108
Aerotest Operations	R-98
Rockwell International Nuclear Examination Reactor	R-118
North American Aviation Atomic International	R-40
University of Illinois	Ex
Penn. State University	Ex
University of California, Berkeley	Ex
University of California, Irvine	Ex
U.S. Geological Survey	Ex
University of Utah	Ex
Armed Force Radiobiology Research Inst.	Ex
Michigan State University	Ex
University of Texas, Nuc. Reactor Lab	Ex
University of Maryland	Ex
Kansas State University	Ex
University of Arizona	Ex
Reed College	Ex
Veterans Admin. Hospital	Ex
Brigham Young University	Ex
Cornell University	Ex
 <u>Other Than Non-Power Reactors:</u>	
<u>U-235 20% + Enrichment (Total 33)</u>	<u>License Number*</u>
USNRC Region I King of Prussia	NP
USNRC Region II Atlanta	NP
USNRC Region III Argone, Ill.	NP
Westinghouse Corp., Elec. Tube Div.	NP
U.S. Naval Research Lab.	NP
Western Michigan University	NP
Reuter-Stokes, Inc.	NP
Nuclear Battery Corp.	NP
Towson State College	NP
Washington University	NP
Ledoux and Co., Inc.	NP
AVCO Everett Research Laboratory	NP
Hittman Nuclear & Development Corp.	NP
Mallinckrodt Chemical Works	NP
Isotopic Analysis, Inc.	NP
The Boeing Company	NP
Stanford University	NP
1155 Technical Operations Squadron	NP

Continued:

U-235 20% + Enrichment (Total 33)

License Number*

Isotopes Inc., Teledyne Co., Palo Alto	NP
Nuclear Sources & Services, Inc.	NP
U.S. Naval Postgraduate School	NP
California Inst. of Tech.	NP
NASA	NP
Exxon Research and Engineering Co.	NP
Dept. of Army, Harry Diamond Labs.	NP
Lockheed Missiles and Space Co., Inc.	NP
National Spectrograph Labs, Inc.	NP
General Electric Co., Nuclear Energy	NP
Ballistics Research Laboratories	NP
SUNY at Stonybrook	NP
Lewis Research Center NASA	NP
University of Rochester	NP
Exxon Nuclear Company, Inc.	NP

U-235 10% + but Less than 20% Enrichment (Total 0)

U-235 - Less than 10% Enrichment (Total 7)

License Number*

Westinghouse Corp., Columbia, S.D.	SNM-1107
General Electric Co. Wilmington	SNM-1097
Babcock and Wilcox Lynchburg R&D	SNM-778
Babcock and Wilcox Lynchburg Commercial	SNM-1168
Babcock and Wilcox Apollo	SNM-145
Combustion Engineering - Windsor	SNM-1067
Combustion Engineering - Hematite	SNM-33

*
A license number is given for those licensees which must submit a protection plan and pay fees. Ex means that these plan submittals are exempt from fees. NP stands for facilities for which the NMIS records show a September 30, 1978 holding of under 10 kgs of SNM of low strategic significance and hence are not required to submit protection plans but must comply with 10 CFR 73.47.

Table IV
Material of Moderate Strategic Significance Fixed Site Capital Costs

	Estimated Capital Cost to Facility		Estimated Number of Facilities Requiring		Estimated Industry Capital Costs	
	Maximum**	Probable**	Maximum	Probable	Maximum	Probable
Door Locks	\$ 940	\$ 940	37	21	\$ 34,780	\$ 19,740
Improved Lighting	3,237	324	37	6	11,988	1,944
GSA Approved Security Cabinet*	410	410	37	14	15,170	5,740
Interior Intrusion Alarm Monitored on Site	1,195	1,195	37	14	44,215	16,730
6 Preauthorization Screening	90	90	37	21	3,330	1,890
Badging System	100	100	37	21	3,700	2,100
Card Key System	657	18	37	14	666	252
Security Plan Preparation	3,350	480	37	37	17,760	17,760
Response Procedure Plan Preparation	770	96	37	37	3,552	3,552
					135,161	69,708
					(\$3,653/fac)	(\$1,884/fac)

Annex 2 to Enclosure "D"

* A security cabinet would probably not be required if the controlled access area already was equipped with door locks, card-key system and intrusion alarm system.

** The dollar totals here represent the maximum cost possible to a licensee and does not give credit in some cases for security subsystems already in place. The probable column is a more realistic estimate of what will be required by industry to meet requirements of 10 CFR 73.47.

Table V

Material of Moderate Strategic Significance Fixed Site Annual Costs

<u>Requirement</u>	<u>Estimated Annual Costs to Facility</u>		<u>Estimated Number of Facilities Incurring</u>		<u>Estimated Industry Incremental Annual Costs</u>	
	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>
Door Locks	\$ 94	\$ 94	37	21	\$ 3,478	\$ 1,974
Improved Lighting	178.50	32	37	6	1,184	192
Security Cabinet	41	0	37	9	0	0
Interior Intrusion Alarms Monitored on Site	260	260	37	14	9,620	3,640
Preauthorization Screening	30	30	37	21	1,110	630
Badging System	10	10	37	21	370	210
Onsite Security Force	43,800	43,800	37	4	1,620,600	175,200
Card Key System	67.50	6	37	14	222	84
Security Plan Revisions	335	48	37	37	1,776	1,776
Response Procedures Plan Revisions	77	10	37	37	370	370
					<u>\$1,638,730</u>	<u>\$184,076</u>
					(44,290/facility)	(\$4,975/facilit

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Annex 2 to Enclosure "D"

Table VI

Material of Moderate Strategic Significance Capital Costs for Transportation

<u>Requirement</u>	<u>Estimated Capital Cost per Shipper</u>		<u>Estimated Number of Shippers Incurring Incremental Costs</u>		<u>Estimated Incremental Industry Capital Costs</u>	
	<u>Maximum</u>	<u>Probable</u>			<u>Maximum</u>	<u>Probable</u>
Seals for Containers	\$ 100	\$ 100	12	2	\$ 1,200	\$ 24
Telephone	-----	-----	12	0	-----	-----
Security Plan Preparation	1,540	480	12	12	5,760	5,760
Response Procedures Plan Preparation	770	96	12	12	1,152	1,152
8 Preauthorization Screening	90	90	12	7	1,080	630
					<u>\$ 9,192</u> (\$766/fac)	<u>\$ 7,566</u> (\$630/fac)

Table VII

Materials of Moderate Strategic Significance Annual Costs for Transportation

<u>Requirement</u>	<u>Maximum</u>	<u>Estimated Capital Cost per Shipper</u>		<u>Estimated Number of Shippers Incurring Incremental Costs</u>		<u>Estimated Incremental Industry Capital Costs</u>	
			<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>
Seals for Containers	\$ 10	\$ 10	12	2	\$ 120	\$ 20	
Security Plan Upkeep	154	48	12	12	576	576	
Response Procedures Plan Upkeep	77	10	12	12	120	120	
Preauthorization Screening	30	30	12	7	360	210	
					<u>1,176</u>	<u>926</u>	
					(\$98/facility)	(\$77/facility)	

Table VIII

Materials of Low Strategic Significance Fixed Site Capital Costs

<u>Requirement</u>	<u>Estimated Capital Cost to Facility</u>		<u>Estimated Number of Facilities Requiring</u>		<u>Estimated Industry Capital Costs</u>	
	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>
Door Locks	\$ 940	\$ 940	61	5	\$57,340	\$ 4,700
Security Cabinet	410	410	61	5	25,010	2,050
Interior Intrusion Alarm Monitored Offsite	660	660	61	20	40,260	13,200
Card Key System	675	18	61	20	1,098	360
Security Plan Preparation (Large LEU Facilities)	3,350	480	61	61	29,280	29,280
Response Procedures Plan Preparation	770	96	61	61	5,856	5,856
					\$ 158,844	\$ 55,446
					(\$2604/facility)	(\$910/facility)

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Table IX

Materials of Low Strategic Significance Fixed Site Annual Costs

<u>Requirement</u>	<u>Estimated Capital Cost to Facility</u>		<u>Estimated Number of Facilities Requiring</u>		<u>Estimated Industry Capital Costs</u>	
	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>
Door Locks	\$ 94	\$ 94	61	5	\$ 5,734	\$ 470
Security Cabinet	41	0	61	5	0	0
Interior Intrusion Alarm Monitored Offsite	375	375	61	20	22,875	7,500
Offsite Guard Response	240	240	61	30	14,640	7,200
Card Key System	68	6	61	20	363	120
Security Plan Upkeep (Large LEU Facilities)	335	48	61	61	2,928	2,928
Response Procedures Plan	77	10	61	61	610	610
					<u>47,150</u>	<u>18,828</u>
					(\$773/facility)	(\$309/facility)

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Table X

Materials of Low Strategic Significance Capital Costs for Transportation

<u>Requirement</u>	<u>Estimated Capital Costs Per Shipper</u>		<u>Estimated Number of Shippers Incurring Incremental Costs</u>		<u>Estimated Incremental Industry Capital Costs</u>	
	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>
Seals for Containers - 20	\$ 100	\$ 100	8	4	\$ 800	\$ 400
Security Plan Preparation (Large LEU Shippers)	1,540	480	8	8	3,840	3,840
Response Procedures Plan Preparation	770	96	8	8	768	768
					<u>\$ 5,408</u>	<u>\$ 5,008</u>
					(\$676/facility)	(\$625/facility)

Table XI

Materials of Low Strategic Significance Annual Costs for Transportation

<u>Requirement</u>	<u>Estimated Capital Costs Per Shipper</u>		<u>Number of Shippers Incurring Incremental Costs</u>		<u>Incremental Industry Capital Costs</u>	
	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>	<u>Maximum</u>	<u>Probable</u>
Seals for Containers - 20	\$ 10	10	8	4	\$ 80	40
Security Plan Revisions	154	48	8	8	384	384
Response Procedures Plan Revisions	77	10	8	8	80	80
					<u>\$ 544</u>	<u>\$ 504</u>
					(\$68/facility)	(\$63/facility)

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Table XII

IDENTIFIED LICENSEES REQUIRED TO PAY LICENSING FEE

NON-POWER REACTORS

CATEGORY II-
MODERATE STRATEGIC

	<u>Licensee</u>	<u>License No.</u>	<u>Amendment Fee Class</u>	<u>Fee</u>
1.	General Electric	TR-1	4	\$ 6,000
		R-33	1	0
2.	B&W	CX-10	3	2,000
		R-47	1	0
3.	General Atomic	R-67	4	6,000
		R-38	1	0
4.	Union Carbide	R-81	3	2,000
			TOTAL	<u>\$16,000</u>

CATEGORY III-
LOW STRATEGIC

	<u>Licensee</u>	<u>License No.</u>	<u>Amendment Fee Class</u>	<u>Fee</u>
1.	Aerotest	R-98	3	2,000
2.	Dow Chemical	R-108	3	2,000
3.	Northrup	R-90	3	2,000
4.	Rockwell	R-118	3	2,000
5.	North American	R-40	3	2,000
			TOTAL	<u>\$10,000</u>

Table XII (cont'd)

SNM OF MODERATE STRATEGIC SIGNIFICANCE

CATEGORY II

	<u>Licensee</u>	<u>License No.</u>	<u>Amendment Fee Category</u>	<u>Fee</u>
1.	David Witherspoon	SNM-952	1J	\$ 110
2.	Eastman Kodak	SNM-1513	1J	110
3.	IntelCom Industries	SNM-1405	1D-1F	4,800
4.	Teledyne Isotopes	SNM-107	1G	2,800
5.	Union Carbide	SNM-639	1G	2,800
			TOTAL	\$10,620

SNM OF LOW STRATEGIC SIGNIFICANCE

CATEGORY III

	<u>Licensee</u>	<u>License No.</u>	<u>Fee Category (Minor Sfgds. Amd.)</u>	<u>Fee</u>
1.	B&W - Apollo	SNM-145	1A	\$ 3,500
2.	B&W - Lynchburg	SNM-778	1B	3,500
3.	B&W - Commercial	SNM-1168	1B	3,500
4.	Combustion Engr.	SNM-33	1B-1G	3,500
5.	Combustion Engr.	SNM-1067	1B	3,500
6.	G.E. -Wilmington	SNM-1097	1B	3,500
7.	Westinghouse	SNM-1107	1B	3,500
			TOTAL	\$24,500

Table XII (cont'd)

TRANSPORTATION PLANS

CATEGORY II - MODERATE STRATEGIC

<u>Licensee</u>	<u>License No.</u>	<u>Amendment Fee Category</u>	<u>Fee</u>
B&W Lynchburg - Naval	SNM-42	1A	\$ 8,300
B&W Lynchburg	SNM-414	1C-1G	13,800
Battelle Columbus Labs	SNM-7	1A	8,300
General Atomic Corp.	SNM-696	1A-1F	8,300
Nuclear Fuel Services-Erwin	SNM-124	1A	8,300
Rockwell International	SNM-21	1A-1E	8,300
Texas Instruments	SNM-23	1A	8,300
Union Carbide-Tuxedo	SNM-639	1G	2,800
United Nuclear-Uncasville	SNM-368	1A	8,300
United Nuclear-Wood River Jun.	SNM-777	1A	8,300
National Bureau of Standards	SNM-362		- 0 -
Westinghouse-Cheswick	SNM-1120	1A-1C	13,800
		TOTAL	<u>\$96,800</u>

CATEGORY III - LOW STRATEGIC

<u>Licensee</u>	<u>License No.</u>	<u>Amendment Fee Category</u>	<u>Fee</u>
B&W Lynchburg-Research	SNM-778	1B	\$ 3,500
B&W Lynchburg-Commercial	SNM-1168	1B	3,500
B&W Apollo	SNM-145	1A	3,500
Combustion Engr.-Hematite	SNM-33	1B-1G	3,500
Combustion Engr.-Windsor	SNM-1067	1B	3,500
Exxon Nuclear	SNM-1227	1B-1C	6,200
General Electric-Wilmington	SNM-1097	1B	3,500
Westinghouse-Columbia	SNM-1107	1B	3,500
		TOTAL	<u>\$ 30,700</u>

SUBTOTAL CATEGORY II \$123,420SUBTOTAL CATEGORY III \$ 65,200GRAND TOTAL \$188,620

ENCLOSURE E

NRC AMENDS REGULATIONS ON PROTECTION OF NUCLEAR MATERIALS AND FACILITIES

ENCLOSURE "E"
NRC AMENDS REGULATIONS ON
PROTECTION OF NUCLEAR MATERIALS AND FACILITIES

The Nuclear Regulatory Commission is amending its regulations for the protection of nuclear materials and nuclear facilities other than power reactors and independent spent fuel storage installations.

The amendments are designed to provide a level of protection against theft of special nuclear material of low and moderate strategic significance equivalent to that recommended in Information Circular/225, which was published by the International Atomic Energy Agency in June 1977.

Special nuclear material of low and moderate strategic significance is not directly usable in the manufacture of a nuclear weapon, but nevertheless could be of assistance in such a project.

Material of moderate strategic significance includes (1) between 500 grams and 2 kilograms of plutonium or uranium-233, (2) between 1 and 5 kilograms of uranium-235 enriched to 20% or more, and (3) 10 kilograms or more of uranium-235 enriched to at least 10% but less than 20%.

Material of low strategic significance includes (1) between 15 and 500 grams of plutonium or uranium-233, (2) between 15 grams and 1 kilogram of uranium-235 enriched to 20% or more, (3) between 1 and 10 kilograms of uranium-235 enriched to at least 10% but less than 20%, and (4) 10 or more kilograms of uranium enriched above its natural state but to less than 10%.

The NRC's new physical protection measures for special nuclear material of low strategic significance basically require that licensees use and store the material in a controlled access areas, monitor the controlled access area to detect unauthorized activities, and transport the material under controlled and planned conditions.

The requirements for material of moderate strategic significance are similar, except that licensees are additionally required to limit access to the material to individuals who have been specifically authorized to have such access.

More specific guidance to licensees on the types of physical security plans for material of low and moderate strategic significance that are acceptable to the NRC staff is contained in a regulatory guide that is being published concurrently with the amendments. Single copies of the guide, entitled "Standard Format and Content for the Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance," are available without charge by written request to the Director, Division of Technical Information and Document Control, Nuclear Regulatory Commission, Washington, D.C. 20555.

Interested persons are invited to submit comments on the guide within the next 60 days. Comments should be addressed to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

After consideration of the comments received, the guide will be reissued and the amendments, which are to Parts 70, 73 and 150 of the Commission's regulations, will become effective. Licensees will then

have 120 days to submit their physical security plans to the NRC for approval. The plans would have to be implemented 30 days after approval by the NRC or 360 days after publication of the amendments in the Federal Register on _____.

The amendments were published in proposed form on May 24, 1978, for public comment. Some details of the amendments were changed as a result of the comments received (plutonium-beryllium sealed sources and plutonium containing more than 80% plutonium-238 were exempted from the requirements, and the time period for submission of physical security plans was extended from 60 days to 120 days).

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