January 16, 1979

UNITED STATES
NUCLEAR REGULATORY COMMISSION SECY-79-38

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

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

520 097

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 allows 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:

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

520 104

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:
Commissioners
Commission Staff Offices
Exec. Dir. for Opers.
Regional Offices
ACRS
AS&LBP
AS&LAP
Secretariat

ENCLOSURE A

FEDERAL REGISTER NOTICE

ENCLOSURE A

Title 10 - Energy

CHAPTER I - NUCLEAR REGULATORY COMMISSION

PART 70 - DOMESTIC LICENSING OF SPECIAL NUCLEAR MATERIAL

PART 73 - PHYSICAL PROTECTION 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

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)).

518 291

520 108

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.

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

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

520 115

Enclosure "A"

518 298

industrial sabotage relating to the special nuclear material in transit. Each application for such a license 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, grams = (grams contained U-235) + 2.5 (grams U-233 + 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.

520116

~~520 2916~~

~~5180 2916~~

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

* * * * *

(k)[~~(j)~~]* 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 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)(1)~~], 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

518 302

520 119

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

(ii) 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.

520 122

~~518~~ 305

(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:

(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,

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

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

(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,

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

518 306 520 123

(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.

520 125

~~518 308~~

(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

~~518~~ 309

(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-ispicked-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.

520 128

~~518~~ 311

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 stragegic 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:

520 134

518 317

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.]

520 135

~~510~~ 318

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 then 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

518 521

520 138

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

518 322

520 139

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.

~~518~~ 323

520 140

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.

518 325

520 142

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.

518 327

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.

518 328

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

518 330

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.

518 332

520 149

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

518 354

520 151

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 con sion 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, ould 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

NO.	COMMENTER	ID CODE	DATE RECEIVED
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	Massachussetts 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

518 558

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

~~518 339~~

520 156

ENCLOSURE C

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