

PHYSICAL PROTECTION AND TRANSPORT OF SPECIAL NUCLEAR MATERIAL AND IRRADIATED FUEL INSPECTIONS OF FUEL FACILITIES

Effective Date: January 1, 2018

2681-01 PURPOSE

This inspection manual chapter (IMC) identifies the requirements for inspecting licensees' physical protection and transportation programs and provides general guidance relative to the overall approach to inspection. The U.S. Nuclear Regulatory Commission (NRC) IMC 2600, Appendix B, NRC Core Inspection Requirements for Fuel Facility Types by Inspection Suites, Tables 1 and 2, outlines the core inspection program.

2681-02 DEFINITIONS

02.01 Fuel Cycle Facility and Activity Types.

- a. Category I fuel facilities - Fuel facilities possessing five formula kilograms or more of strategic special nuclear material (SSNM). Exhibit 1 contains the definitions of categories of special nuclear material (SNM), as provided in Title 10 of the *Code of Federal Regulations* (10 CFR) 73.2.
- b. Category II fuel facilities - Research and development, and specialty facilities possessing Category II quantities of special nuclear material of moderate strategic significance (SNM-MSS).
- c. Category III fuel facilities - Fuel facilities possessing Category III quantities of special nuclear material of low strategic significance (SNM-LSS) with an NRC-approved physical security plan.
- d. Uranium conversion facilities - Fuel facilities involved in the production or disposition of uranium hexafluoride that have received NRC security orders requiring the implementation of additional security measures.
- e. Category I, II, and III SNM transportation - Transportation programs and shipments of formula quantity or more of SSNM, SNM-MSS, and 10 kg or more of SNM-LSS, respectively.
- f. Transportation of irradiated reactor fuel - Transportation programs and shipments of irradiated reactor fuel in excess of 100 grams in net weight of irradiated fuel, exclusive of cladding or other structural or packaging material, which has a total external radiation dose rate in excess of the established self-protection limit [see 10 CFR 73.37(a)].

- g. Classified programs and activities - Programs and activities involving the production, processing, and storage of information and material designated classified National Security Information or Restricted Data.

02.02 Inspection Frequencies.

- a. S = Semiannually
- b. A = Annually
- c. B = Biennially
- d. C = Adjust the inspection scope and frequency to a level which is commensurate with the level of activity
- e. T = Triennially
- f. W = When required
- g. X = Each inspection trip
- h. E = When such inspection coincides with other inspection activity or as events or licensee performance dictate (no specified frequency)

2681-03 GENERAL REQUIREMENTS AND GUIDANCE

To facilitate inspection planning and tracking, the inspection procedures (IPs) are grouped into the following Physical Security Suites (PS): Highly-Enriched Uranium (HEU) Security Measures (PS1); Low-Enriched Uranium (LEU) Security Measures (PS2); Transportation Security (PS3); and SNM-MSS Security Measures (PS4) (see Exhibit 2). Although the title of Physical Security Suite PS1 contains the term "HEU," this suite applies to any Category I fuel cycle facility containing equal or greater than formula quantity of SSNM. PS2 applies to any Category III fuel cycle facility as well as uranium conversion facilities. The appropriate procedures (portions of the corresponding PS suites) to be used in conducting security inspections of different types of fuel facilities and transportation programs and activities and the associated inspection frequencies are specified in Exhibits 3 through 8.

It should be noted that much of the specific criteria referred to or contained in the safeguards IP (other than that in the regulations) provides only general guidance relative to those commitments that an inspector might expect to find in licensee security plans, or their associated implementing procedures. As such, it should be recognized that these criteria are only enforceable if a licensee commits to follow them in NRC-approved security plans and implementing procedures, or if they are required by license condition. If the inspector finds that security implementing procedures or instructions appear to inadequately address regulatory requirements, and the current security plans and license conditions either do not or inadequately address this apparent deficiency, the inspector should confer with licensing personnel to determine what action is needed to rectify this situation.

The inspection program should tend to favor activities that test and/or actively examine the compliance and the effectiveness of the security system. If doubts exist concerning the intent of

a particular requirement, licensing personnel should be consulted in a joint effort to clarify the meaning of such requirements.

When conducting security inspections of SNM or irradiated fuel shipments, only one inspection report should be prepared for each shipment, even when it passes through more than one Region. In such cases, the Region in which the shipping licensee's corporate office exists will coordinate the inspection effort, relying on other Regional Offices' personnel when necessary to ensure complete inspection effort. The supporting office(s) will submit inspection information to the coordinating office which will prepare an inspection report to encompass the entire inspection activity. The report number will be determined by the coordinating office in the same manner used for determining the report numbers of fixed site inspections.

The PS1 inspection procedures include a risk-informed structure that is depicted within the procedures through the application of a "tier level" format to indicate the risk significance of the inspection requirements within the specified sample. The inspection requirements are separated into three tier level sections (Tier I, Tier II, and Tier III) with the most risk significant being assigned to the Tier I section of the procedure. This tier level concept ensures that a licensee's physical protection program and protective strategy receive inspection oversight relative to the risk significance of the specific elements that comprise the licensee's security programs.

END

- Exhibit 1: Categories of Special Nuclear Material as Defined in 10 CFR 73.2
- Exhibit 2: Security Suites and Associated Inspection Procedures
- Exhibit 3: Physical Protection Inspection Program for Category I Fuel Facilities – Fixed Sites
- Exhibit 4: Physical Protection Inspection Program for Category II Fuel Facilities – Fixed Sites
- Exhibit 5: Physical Protection Inspection Program for Category III Fuel and Uranium Conversion Facilities – Fixed Sites
- Exhibit 6: Physical Protection Inspection Program for Transportation of Irradiated Fuel
- Exhibit 7: Physical Protection Inspection Program for Transportation of Material of Moderate and Low Strategic Significance (Category II and III SNM Shipments – Transport Licensee)
- Exhibit 8: Physical Protection of Formula Quantities of Special Nuclear Material in Transit (Category I SSNM Shipments – Transport Licensee)
- Attachment 1: Revision History for IMC 2681

EXHIBIT 1

CATEGORIES OF SPECIAL NUCLEAR MATERIAL AS DEFINED IN 10 CFR 73.2

Strategic special nuclear material

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.

Formula quantity

Formula quantity means strategic special nuclear material in any combination in a quantity of 5,000 grams or more computed by the formula, $\text{grams} = (\text{grams contained U-235}) + 2.5 (\text{grams U-233} + \text{grams plutonium})$. This class of material is sometimes referred to as a Category I quantity of material.

Special nuclear material of low strategic significance

Special nuclear material of low strategic significance means:

- (1) Less than an amount of special nuclear material of moderate strategic significance as defined in paragraph (1) of the definition of strategic nuclear material of moderate strategic significance in this section, but more than 15 grams of uranium-235 (contained in uranium enriched to 20 percent or more in 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, $\text{grams} = (\text{grams contained U-235}) + (\text{grams plutonium}) + (\text{grams U-233})$; or
- (2) Less than 10,000 grams but more than 1,000 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).

This class of material is sometimes referred to as a Category III quantity of material.

Special nuclear material of moderate strategic significance

Special nuclear material of moderate strategic significance means:

- (1) Less than a formula quantity of strategic special nuclear material but more than 1,000 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 1,000 grams when computed by the equation, $\text{grams} = (\text{grams contained U-235}) + 2 (\text{grams U-233} + \text{grams plutonium})$; 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).

This class of material is sometimes referred to as a Category II quantity of material.

EXHIBIT 2

PHYSICAL SECURITY SUITES AND ASSOCIATED INSPECTION PROCEDURES

PS1-HEU Security Measures

- 81700.01 Category I Fuel Cycle Facility Strategic Special Nuclear Material Security Controls
- 81700.02 Category I Fuel Cycle Facility Access Control Measures
- 81700.04 Category I Fuel Cycle Facility Equipment Performance, Testing and Maintenance
- 81700.05 Category I Fuel Cycle Facility Physical Protection Program and Protective Strategy
- 81700.06 Licensee Conducted Force-on-Force Exercises at Category I Fuel Cycle Facilities
- 81700.07 Category I Fuel Cycle Facility Security Training
- 81700.08 Category I Fuel Cycle Facility Fitness for Duty Programs
- 81700.10 Protection of Safeguards Information at Category I Fuel Cycle Facilities
- 81700.11 Annual Observation of Licensee Conducted Force-on-Force Exercises at Category I Fuel Cycle Facilities

PS2-LEU Security Measures

- 81431 Fixed Site Physical Protection of SNM-LSS
- 81810 Protection of Safeguards Information

PS3-Transportation Security

- 81360 General Requirements for Physical Protection of Formula Quantity of SSNM in Transit
- 81365 Records, Reports, and Planning for Physical Protection of Formula Quantity of SSNM in Transit
- 81370 Specific Requirements for Physical Protection of Formula Quantity of SSNM in Transit
- 81501 Personnel Training and Qualification
- 81810 Protection of Safeguards Information
- 81335 Physical Protection of Shipment of SNM-MSS
- 81340 Physical Protection of Shipment of SNM-LSS
- 81310 Physical Protection of Shipments of Irradiated Fuel

PS4-SNM-MSS Security Measures

- 81401 Physical Security and Safeguards Contingency Plans
- 81421 Fixed Site Physical Protection of SNM-MSS
- 81810 Physical Protection of Safeguards Information

Other

- 96001 Contingency Response -Annual Force-on-Force Testing Category I Fuel Cycle Facilities
- 81402 Reports of Safeguards Events

EXHIBIT 3

PHYSICAL PROTECTION INSPECTION PROGRAM FOR
CATEGORY I FUEL FACILITIES - FIXED SITES

PHYSICAL SECURITY SUITES AND INSPECTION PROCEDURES

IP NUMBER	IP TITLE	FREQUENCY
<u>PS1-HEU Security Measures</u>		
81700.01	Category I Fuel Cycle Facility Strategic Special Nuclear Material Security Controls	B
81700.02	Category I Fuel Cycle Facility Access Control Measures	A
81700.04	Category I Fuel Cycle Facility Equipment Performance, Testing and Maintenance	B
81700.05	Category I Fuel Cycle Facility Physical Protection Program and Protective Strategy	T
81700.06	Licensee Conducted Force-on-Force Exercises at Category I Fuel Cycle Facilities	T
81700.07	Category I Fuel Cycle Facility Security Training	B
81700.08	Category I Fuel Cycle Facility Fitness for Duty Programs	T
81700.10	Protection of Safeguards Information at Category I Fuel Cycle Facilities	T
81700.11	Annual Observation of Licensee Conducted Force-on-Force Exercises at Category I Fuel Cycle Facilities	A
<u>PS3-Transportation Security</u>		
81360	General Requirements for Physical Protection of Formula Quantity of SSNM in Transit	C
81365	Records, Reports, and Planning for Physical Protection of Formula Quantity of SSNM in Transit	C
81370	Specific Requirements for Physical Protection of Formula Quantity of SSNM in Transit	C
81810	Protection of Safeguards Information	C
81335	Physical Protection of Shipment of SNM-MSS	T
81340	Physical Protection of Shipment of SNM-LSS	T
<u>Other</u>		
96001	Contingency Response -Annual Force-on-Force Testing Category I Fuel Cycle Facilities	T
81402	Reports of Safeguards Events	E

* Inspectors should also review the licensee's programs to address the issue of inattentive officers. Use licensee response to Security Bulletin 2007-1, "Security Officer Attentiveness" (December 2007), and local written procedures when reviewing the licensee's program.

EXHIBIT 4

PHYSICAL PROTECTION INSPECTION PROGRAM FOR
CATEGORY II FUEL FACILITIES - FIXED SITES

PHYSICAL SECURITY SUITES AND INSPECTION PROCEDURES

IP NUMBER	IP TITLE	FREQUENCY
<u>PS4-SNM-MSS Security Measures</u>		
81401	Physical Security and Safeguards Contingency Plans	B
81421	Fixed Site Physical Protection of SNM-MSS	B
81810	Protection of Safeguards Information	B
<u>PS3-Transportation Security</u>		
81335	Physical Protection of Shipment of SNM-MSS	B
81340	Physical Protection of Shipment of SNM-LSS	W
<u>Other</u>		
81402	Reports of Safeguards Events	E

EXHIBIT 5

PHYSICAL PROTECTION INSPECTION PROGRAM FOR CATEGORY III FUEL AND
URANIUM CONVERSION FACILITIES – FIXED SITES

PHYSICAL SECURITY SUITES AND INSPECTION PROCEDURES

IP NUMBER	IP TITLE	FREQUENCY
<u>PS2-LEU Security Measures</u>		
81431	Fixed Site Physical Protection of SNM-LSS	T
81810	Protection of Safeguards Information	T
<u>PS3-Transportation Security</u>		
81340	Physical Protection of Shipment of SNM-LSS	T
<u>Other</u>		
81402	Reports of Safeguards Events	E

EXHIBIT 6

PHYSICAL PROTECTION INSPECTION PROGRAM FOR TRANSPORTATION OF
IRRADIATED FUEL*

PHYSICAL SECURITY SUITES AND INSPECTION PROCEDURES

IP NUMBER	IP TITLE	FREQUENCY
<u>PS3-Transportation Security</u>		
81310	Physical Protection of Shipments of Irradiated Fuel	W
81810	Protection of Safeguards Information	W
<u>Other</u>		
81402	Reports of Safeguards Events	E

*Shipment of irradiated fuel from foreign research reactors should be inspected as needed. Inspections should be conducted at the point that a shipment is off-loaded in the United States and put aboard the licensee's truck. In addition, such inspections should be continued at some point in transit if circumstances indicate that this would be desirable.

EXHIBIT 7

PHYSICAL PROTECTION INSPECTION PROGRAM FOR TRANSPORTATION OF
MATERIAL OF MODERATE AND LOW STRATEGIC SIGNIFICANCE
(CATEGORY II AND III SNM SHIPMENTS – TRANSPORT LICENSEE)

PHYSICAL SECURITY SUITES AND INSPECTION PROCEDURES

IP NUMBER	IP TITLE	FREQUENCY
<u>PS3-Transportation Security</u>		
81335	Physical Protection of Shipment of SNM-MSS	C
81340	Physical Protection of Shipment of SNM-LSS	C
81810	Protection of Safeguards Information	C
<u>Other</u>		
81402	Reports of Safeguards Events	E

EXHIBIT 8

PHYSICAL PROTECTION OF FORMULA QUANTITIES OF SPECIAL NUCLEAR MATERIAL
IN TRANSIT (CATEGORY I SSNM SHIPMENTS – TRANSPORT LICENSEE)*

PHYSICAL SECURITY SUITES AND INSPECTION PROCEDURES

IP NUMBER	IP TITLE	FREQUENCY
<u>PS3-Transportation Security</u>		
81360	General Requirements for Physical Protection of Formula Quantity of SSNM in Transit	C
81365	Records, Reports, and Planning for Physical Protection of Formula Quantity of SSNM in Transit	C
81370	Specific Requirements for Physical Protection of Formula Quantity of SSNM in Transit	C
81501	Personnel Training and Qualification	C
81810	Protection of Safeguards Information	W
<u>Other</u>		
81402	Reports of Safeguards Events	E

*Each shipment of Formula Quantity of SSNM (import, export, and domestic) will be inspected at the point of origin or entry into the United States. An inspection will be made of the licensee's movement control center, point of destination (or departure from the United States), and selected segments enroute. Scheduled intermodal transfers will be monitored and all temporary storage areas will be inspected.

ATTACHMENT 1

Revision History for IMC 2681

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML092090466 01/27/10 CN-10-003	This document has been revised in its entirety to: (1) emphasize the risk-informed, performance-based approach to inspections, (2) impose changes to inspection activities due to orders issued that have not been incorporated by rulemaking. Completed 4 year historical CN search.	None	N/A

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML14129A204 06/27/14 CN 14-014	Inspection procedures 81815 and 81820 were removed from Manual Chapter 2681 "Physical Protection and Transport of SNM and Irradiated Fuel Inspections of Fuel Facilities" because NRC has designated cognizant security authority to DOE Naval Reactors (NR) for NRC interests in the protection of classified information at Category 1 Fuel Facilities. This provision was agreed to by NRC and DOE NR during a meeting held at NRC Headquarters on April 29, 2014. DOE NR also agreed to conduct inspections involving NRC interests in accordance with DOE NR regulations, as they are not substantially different from 10 CFR 25 and 10 CFR 95, and perform enforcement actions related to classified information protection.	None	ML14129A216
N/A	ML16274A079 05/15/17 CN 17-010	This document has been revised to reflect the inspection procedure consolidation changes for the CAT I Fuel Cycle Facilities inspection program (<u>PS1-HEU Security Measures</u>).	None	ML16277A017

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML17240A158 10/27/17 CN 17-023	This document has been revised to reflect the inspection procedure consolidation changes for the CAT I Fuel Cycle Facilities inspection program (<u>PS1-HEU Security Measures</u>). This revision added an inspection procedure to the PS1-HEU Security Measures Program prior to implementation.	None	ML17240A320