

IN TRANSIT PHYSICAL PROTECTION OF IRRADIATED REACTOR FUEL – NON-POWER REACTORS

Effective Date: 06/01/2020

PROGRAM APPLICABILITY: IMC 2545

This inspection procedure (IP) is applicable to all U.S. Nuclear Regulatory Commission (NRC) licensed non-power reactors that transport irradiated reactor fuel in quantities greater than 100 grams.

Inspection activities related to transportation of irradiated reactor fuel in quantities of 100 grams or less are covered by IP 69422, "In Transit Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material and 100 Grams or Less of Irradiated Reactor Fuel – Non-Power Reactors."

81614-01 INSPECTION OBJECTIVE

The objective of this IP is to gather information to determine whether reasonable assurance exists that licensee activities, since the last inspection, were conducted in accordance with regulatory requirements in Title 10 of the *Code of Federal Regulations* (CFR) Part 73, "Physical Protection of Plants and Materials."

- 01.01 Preplanning and Coordination. To assure that the licensee appropriately preplans and coordinates transportation of irradiated reactor fuel.
- 01.02 Advance Notifications. To assure that the licensee appropriately provides advance notifications of transportation of irradiated reactor fuel.
- 01.03 Access Authorization. To assure that the licensee has an access authorization program that will provide a basis upon which to make a determination of trustworthiness and reliability of personnel granted unescorted access or access authorization to any activity related to transportation of irradiated reactor fuel.
- 01.04 Transportation Physical Protection Program. To assure that the licensee has a physical protection system that will: 1) minimize the potential for unauthorized removal of irradiated reactor fuel; and, 2) facilitate the location and recovery of missing irradiated reactor fuel.
- 01.05 Contingency and Response Procedures. To assure that the licensee has adequate procedures in place to respond to facilitate recovery of lost or missing shipments of irradiated reactor fuel.

- 01.06 Shipments by Road/Rail/Water. To assure that the licensee has adequate measures in places based on the mode of transportation used for shipments of irradiated reactor fuel.
- 01.07 Investigations. To assure that the licensee promptly initiates investigations into lost or missing shipments of irradiated reactor fuel.

81614-02 INSPECTION REQUIREMENTS

02.01 Preplanning and Coordination.

- a. Verify that any armed escorts, other than members of local law enforcement agencies (LLEA), received deadly force training consistent with applicable Federal and State Laws. [10 CFR 73.37(b)(1)(i)]
- b. Verify that the licensee preplanned and coordinated shipment itineraries to ensure that the receiver at the final delivery point is present to accept the shipment. [10 CFR 73.37(b)(1)(ii)]
- c. Verify that the licensee ensured written certification of transfer of custody. [10 CFR 73.37(b)(1)(iii)]
- d. Verify that the licensee preplanned and coordinated shipment information no later than 2 weeks prior to the shipment or first shipment in a series of shipments with a State governor's designee to: minimize intermediate stops; arrange for State law enforcement escorts; arrange for positional information sharing when requested; and, develop route information, including safe havens. [10 CFR 73.37(b)(1)(iv)]
- e. Verify that the licensee arranged with LLEA along the route, including U.S. ports, to respond to a security-related emergency or a call for assistance. [10 CFR 73.37(b)(1)(v)]
- f. Verify that the licensee obtained NRC approval of the route used for the irradiated reactor fuel shipment prior to the 10-day advance notification. Information provided with the route approval shall include: locations of safe havens; shipper, consignee, carriers, transfer points, modes of shipment; and, security arrangements and responsibility transfers. [10 CFR 73.37(b)(1)(vi)]
- g. Verify that the licensee documented the preplanning and coordination activities. [10 CFR 73.37(b)(1)(vii)]
- h. Verify that the licensee is protecting information relative to irradiated reactor fuel in transit as safeguards information (SGI). [10 CFR 73.37(b)(1)(viii)]

02.02 Advance Notifications.

- a. Verify that the licensee provided notifications to the NRC, the Governor's designee, and the Tribal official at least 10 days in advance of a shipment of irradiated reactor fuel

leaving the confines of the licensee's facility and moving through or across the boundaries of any State or Tribal reservation. [10 CFR 73.37(b)(2)(i)]

- b. Verify that the licensee provided information with the advance notification that included: name/address/telephone number for the shipper/carrier/receiver; license numbers for the shipper/receiver; description of the shipment as specified by DOT in 49 CFR 172.202 and 49 CFR 172.203(d); and, listing of the routes to be used within the State or Tribal reservation. [10 CFR 73.37(b)(2)(ii)]
- c. Verify that the licensee provided information in a separate enclosure with the advance notification that included: estimated date/time of departure of first/last shipment(s) from the point of origin; estimated date/time of entry of first/last shipment(s) into the State or Tribal reservation; estimated date/time of arrival of first/last shipment(s) at the destination. [10 CFR 73.37(b)(2)(iii)]
- d. Verify that the licensee notified, by telephone, the governor's designee or Tribal official of any schedule change that differs from the original by more than 6 hours. [10 CFR 73.37(b)(2)(iv)]
- e. Verify that the licensee sent a cancellation notice to the governor's designee or Tribal official for any shipment, for which an advance notification has been sent, that is cancelled. [10 CFR 73.37(b)(2)(v)]
- f. Verify that the licensee maintained records of preplanning and coordination activities, advance notification, and any revision or cancellation notices for shipments of irradiated reactor fuel for a period of three years. [10 CFR 73.37(b)(2)(vi)]

02.03 Access Authorization.

- a. Access Authorization Program Review. Verify that the licensee reviewed, at an appropriate frequency, the program content and implementation, initiated corrective actions to address conditions adverse to proper program performance, reassessed deficient areas, and maintained review records. [10 CFR 73.38(a)(2)(i-iv)]
- b. Relief from Fingerprinting and Background Investigations. As applicable, verify that the licensee appropriately determines personnel meet the exemption criteria of the category of individuals to be exempt from the criminal history records check and background check. [10 CFR 73.38(c)(2), 10 CFR 73.59, 10 CFR 73.61]
- c. Informed Consent.
 - 1. Verify that the licensee has not initiated background investigations or reinvestigations without the informed and signed consent of any individual. [10 CFR 73.38(d)(1)]
 - 2. Verify that the licensee has a process for an individual to withdraw consent at any time. [10 CFR 73.38(d)(1)(i-iii)]
- d. Personal History Disclosure. Verify that individuals disclosed personal history information required by the licensee access authorization program for the reviewing official to make the trustworthiness and reliability determination. [10 CFR 73.38(d)(2)]

- e. Criminal History Records Check. Verify that the licensee obtained fingerprints for an FBI identification and criminal history records check for each individual who is to be permitted unescorted access or access authorization to irradiated reactor fuel in transit. [10 CFR 73.38(d)(3), 10 CFR 73.57]
- f. Verification of True Identity. Verify that the licensee ensured each individual, seeking or permitted unescorted access or access authorization to irradiated reactor fuel in transit, is who they claim to be through comparison of official identification documents to personal information data. [10 CFR 73.38(d)(4)]
- g. Employment/Military/Educational History Evaluation. Verify that the licensee evaluated the history provided by the individual to include, as applicable: (1) reason for any termination, eligibility for rehire, and other applicable information affecting trustworthiness and reliability determination, (2) characterization of military service, reason for separation, any disciplinary actions affecting trustworthiness and reliability determination, (3) classes attended, grades received, and (4) any information affecting trustworthiness and reliability determination. [10 CFR 73.38(d)(5)]
- h. Credit History Evaluation. Verify that the licensee evaluated the full credit history of each individual, seeking or permitted unescorted access or access authorization to irradiated reactor fuel in transit, including: inquiry to detect potential fraud or misuse of social security numbers or other financial identifiers; and, review and evaluation of the individual's credit history from a national credit reporting agency. For those individuals without an established credit history (i.e. at least the past 7 years), verify that the licensee documented efforts to obtain information regarding the individual's credit history and financial responsibility. [10 CFR 73.38(d)(6)]
- i. Criminal History Review. Verify that the licensee evaluated the entire criminal history record for each individual seeking or permitted unescorted access or access authorization to irradiated reactor fuel in transit, covering all residences of record for the past 10 years. [10 CFR 73.38(d)(7)]
- j. Character and Reputation Determination. Verify that the licensee conducted reference checks to determine the character and reputation of each individual seeking or permitted unescorted access or access authorization to irradiated reactor fuel in transit. [10 CFR 73.38(d)(8)]
- k. Corroboration. Verify that the licensee, to the extent practicable, obtained independent information from sources other than those provided by the individual. [10 CFR 73.37(d)(9)]
- l. Documentation. Verify that the licensee determined whether to grant, deny, unfavorably terminate, maintain, or administratively withdraw an individual's authorization and did not permit any individual to have unescorted access or access authorization to irradiated reactor fuel in transit until all of the information was evaluated by a reviewing official and a trustworthiness and reliability determination was made. [10 CFR 73.38(e)]
- m. Protection of Information. Verify that the licensee appropriately protects records and personal information from unauthorized disclosure. [10 CFR 73.38(f)]

- n. Reinvestigations. Verify that the licensee conducts reinvestigations every 10 years for individuals with unescorted access to category 1 or category 2 quantities of radioactive material. [10 CFR 73.38(h)]
- o. Self-reporting of Legal Actions. Verify that the licensee has a process in place to reassess trustworthiness and reliability determinations based on reporting by individuals of legal actions. [10 CFR 73.38(i)]
- p. Procedures. Verify that the licensee has developed, implemented, and maintained written procedures for implementing the access authorization program, including: conducting background investigations; updating background investigations; access controls relative to individuals that have been denied access; and, denial or termination of access with provisions for an individual to be informed and provide additional information. [10 CFR 73.38(j)]
- q. Right to Correct and Complete Information. Verify that the licensee has a process for allowing individuals the right to complete and correct information. [10 CFR 73.38(k)]
- r. Records.
 - 1. Verify that the licensee retains documentation regarding the trustworthiness and reliability determinations of individual employees for 5 years after the date the individual no longer requires unescorted access. [10 CFR 73.38(l)(1)]
 - 2. Verify that the licensee retains a copy of the current access authorization procedures as a record for 5 years after the date the procedure is no longer needed. If any portion of the procedure is superseded, the licensee shall maintain a copy of the superseded material for 5 years after the record is superseded. [10 CFR 73.38(l)(2)]
 - 3. Verify that the licensee retains a copy of the list of persons approved for unescorted access for 5 years after the list is superseded or replaced. [10 CFR 73.38(l)(3)]

02.04 Transportation Physical Protection Program.

- a. Verify that the licensee used armed escorts to protect shipments of irradiated reactor fuel. [10 CFR 73.37(b)(3)(i)]
- b. Verify that the licensee has a movement control center staffed and equipped to: monitor and control irradiated reactor fuel shipments; communicate with LLEA; and, respond to safeguards contingencies. [10 CFR 73.37(b)(3)(i)]
- c. Verify that the licensee's movement control center was staffed continuously by at least one individual who actively monitored the progress of the shipment and has the authority to coordinate the physical protection activities. [10 CFR 73.37(b)(3)(ii)]
- d. Verify that the licensee's movement control center personnel monitored the shipment continuously, i.e. 24 hours a day, from the time the shipment commences until the delivery of the shipment at its final destination and immediately notified the appropriate agencies in the event of a safeguards event. [10 CFR 73.37(b)(3)(iii), 10 CFR 73.71]

- e. Verify that the licensee maintained movement control center log entries for each irradiated reactor fuel shipment, including information describing the shipment and significant events that occurred during the shipment, for a period of 3 years following completion of the shipment. [10 CFR 73.37(b)(3)(iv)]
- f. Verify that the licensee developed, maintained, revised, and implemented written transportation physical protection procedures that address: (1) access controls to ensure no unauthorized person has access to the shipment and related information controlled as SGI, (2) roles and responsibilities of movement control center personnel, drivers, armed escorts, and other individuals relative to the security of the shipment, (3) reporting of safeguards events under 10 CFR 73.71, (4) communications protocols that include a strategy for the use of authentication and duress codes, management of refueling or other ships, detours, and the loss of communications, and (5) normal conditions operating procedures. [10 CFR 73.37(b)(3)(v)]
- g. Verify that the licensee retains transportation physical protection procedures for three years following the time period for which the licensee possesses irradiated reactor fuel. [10 CFR 73.37(b)(3)(vi)]
- h. Verify that the transportation physical protection program provided for escorts, other than LLEA, to have successfully completed the equivalent of a weapons training and qualification program. [10 CFR 73.37(b)(3)(vii)(A)]
- i. Verify that the transportation physical protection program provided for shipment escorts to communicate with the movement control center at random intervals, not to exceed 2 hours, to advise of the status of the shipment for road and rail shipments, and for sea shipments when vessels are docked at U.S. ports. [10 CFR 73.37(b)(3)(vii)(B)]
- j. Verify that the transportation physical protection program provided for at least one armed escort to remain alert at all times, maintained constant visual surveillance of the shipment, and periodically reports to the movement control center at regular intervals not to exceed 30 minutes during periods when the shipment vehicle/vessel is stopped/docked. [10 CFR 73.37(b)(3)(vii)(C)]

02.05 Contingency and Response Procedures.

- a. Verify that the licensee established, maintained, and followed written contingency and response procedures to address threats, thefts, and radiological sabotage related to irradiated reactor fuel in transit. [10 CFR 73.37(b)(4)(i)]
- b. Verify that the licensee conducts training on contingency and response procedures for personnel associated with the shipment. [10 CFR 73.37(b)(4)(ii)]
- c. Verify that the licensee retains contingency and response procedures for three years following the time period for which the licensee possesses irradiated reactor fuel. [10 CFR 73.37(b)(4)(iii)]
- d. Upon detection of the abnormal presence of unauthorized persons, vehicles, or vessels in the vicinity of an irradiated reactor fuel shipment or upon detection of a deliberately induced situation that has the potential for damaging an irradiated reactor fuel shipment,

verify that the contingency and response procedures direct the armed escort to:
(1) determine whether a threat exists; assess the extent of the threat, if any,
(2) implement the contingency and response procedures, (3) take necessary steps to delay or impede threats, thefts, or radiological sabotage of irradiated reactor fuel, and
(4) inform LLEA of the threat and request assistance, without delay, but not to exceed 15 minutes after discovery. [10 CFR 73.37(b)(4)(iv)]

02.06 Shipments by Road/Rail/Water.

a. Shipments by Road

1. Verify that the transport vehicle was either: (1) occupied by at least two individuals, one of whom serves as an armed escort, and escorted by an armed member of the LLEA in a mobile unit of such agency; OR, (2) led and trailed by separate vehicles, with each vehicle occupied by at least one armed escort. [10 CFR 73.37(c)(1)]
2. Verify that, as permitted by law, all armed escorts, other than members of LLEA, were equipped with a minimum of two weapons. [10 CFR 73.37(c)(2)]
3. Verify that the transport and escort vehicles were equipped with redundant, 2-way communications between the transport vehicle, escort vehicle(s), movement control center, LLEA, and one another. [10 CFR 73.37(c)(3)]
4. Verify that the transport vehicle was equipped with an NRC-approved immobilization feature of the cab or cargo carrying portion of the vehicle. [10 CFR 73.37(c)(4)]
5. Verify that the transport vehicle driver was familiar with, and capable of implementing, transport vehicle immobilization, communications, and other security procedures. [10 CFR 73.37(c)(5)]
6. Verify that the movement control center provided: (1) continuous and active monitoring of the shipment by telemetric position monitoring or alternative tracking system, (2) positive confirmation of the location, status, and control over the shipment, and (3) implementation of preplanned procedures related to deviations from an authorized route, notifications of actual/attempted/unauthorized activities related to theft/loss/diversion/radiological sabotage of a shipment, and identification of and contact information for appropriate LLEA along the shipment route. [10 CFR 73.37(c)(6)]

b. Shipment by Rail

1. Verify that the shipment car was accompanied by at least two armed escorts (who may be LLEA), at least one of whom is stationed at a location on the train that will permit observation of the shipment car while in motion. [10 CFR 73.37(d)(1)]
2. Verify that, as permitted by law, all armed escorts, other than members of LLEA, were equipped with a minimum of two weapons. [10 CFR 73.37(d)(2)]

3. Verify that the train operator(s) and each escort were equipped with redundant, 2-way communications between the transport, escort(s), movement control center, LLEA, and one another. [10 CFR 73.37(d)(3)]
4. Verify that the movement control center provided: (1) continuous and active monitoring of the shipment by telemetric position monitoring or alternative tracking system, (2) positive confirmation of the location, status, and control over the shipment, (3) implementation of preplanned procedures related to deviations from an authorized route, notifications of actual/attempted/unauthorized activities related to theft/loss/diversion/radiological sabotage of a shipment, and identification of and contact information for appropriate LLEA along the shipment route. [10 CFR 73.37(d)(4)]

c. Shipment by U.S. Waters

1. Verify that the shipment vessel, while docked at a U.S. port, was either: (1) occupied by at least two armed escorts on board or on the dock at a location that permitted observation of the shipment vessel; OR, (2) occupied by a member of LLEA with communications on board or on the dock at a location that permitted observation of the shipment vessel. [10 CFR 73.37(e)(1)]
2. Verify that, as permitted by law, all armed escorts, other than members of LLEA, were equipped with a minimum of two weapons. [10 CFR 73.37(e)(2)]
3. Verify that an individual, who may be an officer of the shipment vessel's crew, assured that the shipment was unloaded only as authorized by the licensee. [10 CFR 73.37(e)(3)]
4. Verify that each armed escort were equipped with redundant, 2-way communications between the transport, escort(s), movement control center, LLEA, and one another. [10 CFR 73.37(e)(4)]

02.07 Investigations. Verify that the licensee immediately conducted an investigation, in coordination with the receiving licensee, of any shipment that is lost or unaccounted for after the designated no-later-than arrival time in the advance notification. [10 CFR 73.37(f)]

81614-03 INSPECTION GUIDANCE

This section is intended to provide guidance to assist the inspector in measuring the licensee's performance in each of the preceding sections. The statements below do not represent regulatory requirements but are standards and methods by which the individual elements may be judged.

Additionally, the inspector should be aware that any written inspection notes, related to the specific details of how a licensee is in compliance with the regulatory requirements, could be considered Law Enforcement Sensitive or Safeguards Information. Care should be exercised to avoid discussing or recording site-specific details and instead use general statements related to compliance with the regulations, transportation security plan, or other commitments.

03.01 Preplanning and Coordination.

Details regarding shipments of irradiated reactor fuel that are to be protected as Safeguards Information include: (1) preplanning and coordination activities,(2) transportation physical security plan,(3) schedules and itineraries for 10 days after the shipment,(4) vehicle immobilization features, intrusion alarm devices, and communications,(5) arrangements with and capabilities of local police response forces,(6) locations of safe havens along the transportation route,(7) limitations of communications during transport,(8) procedures for responding to security contingency events,(9) information concerning tactics and capabilities required to defend against attempted sabotage, or theft and diversion of irradiated reactor fuel, and (10) engineering or safety analyses, security-related procedures or scenarios, and other information related to the protection of the transported material if the unauthorized disclosure could have a significant adverse effect of public health and safety or the common defense and security by significantly increasing the likelihood of theft, diversion, or sabotage of irradiated reactor fuel in transit.

03.02 Advance Notifications.

The inspector should note that the advance notifications sent to the NRC must be received no later than 10 days prior to initiating the shipment; advance notifications sent to the applicable Governor's designee(s) or Tribal official(s) must be postmarked 10 days prior to initiating the shipment such that they may be received no later than 7 days prior to initiating the shipment.

03.03 Access Authorization.

The inspector should be aware that the access authorization program is applicable to: (1) any individual to whom a licensee intends to grant unescorted access to spent nuclear fuel in transit, including employees of a contractor or vendor,(2) any individual whose duties and responsibilities permit the individual to take actions by physical or electronic means that could adversely impact the safety, security, or emergency response to spent nuclear fuel in transit (i.e., movement control center personnel, vehicle drivers, or other individuals accompanying spent nuclear fuel shipments),(3) any individual whose duties and responsibilities include implementing a licensee's physical protection program, including but not limited to, non-LLEA armed escorts,(4) any individual whose assigned duties and responsibilities provide access to spent nuclear fuel shipment information that is considered to be Safeguards Information, and (5) the licensee's access authorization program reviewing official.

The inspector may also determine that fingerprinting relief has been provided to:

(1) Commission employees or the Executive Branch,(2) members of Congress,(3) employee of a member of Congress or Congressional Committee,(4) Comptroller General or employee of the Government Accountability Office,(5) the Governor of a State or Governor's designee,(6) representative of foreign government organization approved by the Commission,(7) Federal, State, or local law enforcement personnel,(8) State Radiation Control Program Directors and State Homeland Security Advisors or their designate State employee representatives,(9) Agreement State employees conducting security inspections; Representatives of the IAEA,(10) Federal, State, and local officials, including inspectors, whose occupational status are consistent with the promotion of common defense and security and the protection of public health and safety relative to irradiated reactor fuel in transit,(11) emergency response personnel responding to an emergency,(12) individuals who have had a favorably adjudicated U.S. Government criminal history records check within the last 5 years, under a comparable U.S. Government program involving fingerprinting and an FBI identification and criminal history

records check, and (13) individual who has an active Federal security clearance, including the appropriate documentation.

The inspector should note that the licensee's existing access authorization program(s) may provide a basis for granting individuals unescorted access or access authorization to shipments of irradiated reactor fuel. The inspector should determine whether all of the appropriate elements have been considered. Alternatively, the inspector may consider if investigations/reinvestigations within the past 5 years provide a basis to consider granting access based on a comparable program, as long as the program involves an FBI fingerprint-based identification and criminal history records check.

03.04 Transportation Physical Protection Program.

The inspector should note that non-power reactors may coordinate shipments on their own or with a third party. The inspector should carefully consider the applicability of the requirements to each shipping campaign.

Department of Transportation (DOT) regulations (see 49 CFR 172.804) provide relief from unnecessary duplication of security requirements. Security plans that conform to regulations, standards, protocols, or guideline issued by other government agencies may be used to satisfy the DOT requirements, provided such security plans address the requirements specified in the DOT requirements.

03.05 Contingency and Response Procedures.

No specific guidance is available for this section.

03.06 Shipments by Road/Rail/Water.

Prior to arriving on site, the inspector should verify that the shipping company has received NRC approval for features that permit immobilization of the cab or cargo-carrying portion of the vehicle.

03.07 Investigations.

No specific guidance is available for this section.

81614-04 RESOURCE ESTIMATE

For planning purposes, the estimated, direct, onsite inspection effort to complete this inspection procedure is 8 hours. Actual inspection at any facility may require more or less effort depending on past inspection history, changes since the last inspection, conditions at the facility, and significance of the inspection findings.

81614-05 PROCEDURE COMPLETION

The inspection of each of the applicable areas described above will constitute completion of this procedure. This inspection procedure will be completed if the inspector is onsite during a shipment of irradiated reactor fuel.

81614-06 REFERENCES

Manual Chapter 2545, "Research and Test Reactor Inspection Program"

NUREG/CR-0099, "Evaluation of Road Transit Physical Protection Systems"

NUREG/CR-0100, "Estimates of Local Law Enforcement Agency Officer Availability"

NUREG-0465, "Transportation Security Personnel Training Manual"

NUREG-0561, "Physical Protection of Shipments of Irradiated Reactor Fuel"

NUREG-0794, "Protection of Unclassified Safeguards Information"

Regulatory Guide 5.31, "Specially Designed Vehicle with Armed Guards for Road Shipment of Special Nuclear Material"

Regulatory Guide 5.32, "Communication with Transport Vehicles"

END

Attachment:

1. Revision History Sheet for IP 81614

Attachment 1 - Revision History for IP 81614

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)
	ML19190A276 03/13/20	Initial issue to support inspection of research and test reactor programs described in IMC 2545.	None	ML19205A354