

SUBJECT: REPORTING OF RADIOACTIVE SEALED SOURCES

1. **OBJECTIVES.**

- a. To establish U.S. Department of Energy (DOE) requirements for inventory reporting of radioactive sealed sources in support of:
 - (1) International Atomic Energy Agency (IAEA) CODEOC/2004, *The Code of Conduct on the Safety and Security of Radioactive Sources*, (January 2004) (hereafter “Code of Conduct”); and
 - (2) IAEA/CODEOC/IMP-EXP/2005, *Guidance on the Import and Export of Radioactive Sources* (March 2005) (hereafter “Guidance on the Import and Export of Radioactive Sources”).
- b. To establish DOE transaction reporting requirements for select radioactive sealed sources in support of:
 - (1) Amendments to title 10 Code of Federal Regulations (CFR) Parts 20 and 32, *National Source Tracking of Sealed Sources*, Final Rule, U.S. Nuclear Regulatory Commission (NRC), Federal Register Vol. 71, No. 216, dated 11-8-06, pages 65686–65709; and
 - (2) Amendments to title 10 CFR Part 110, *Export and Import of Radioactive Materials: Security Policies*, Final Rule, U.S. NRC, Federal Register Vol. 70, No. 126, dated 7-1-05, pages 37985–37994.
- c. To integrate radioactive sealed source reporting requirements and verification of authority to receive radioactive sealed sources with the existing safety accountability and control functions for radioactive sealed sources by building upon the radiological control regulations under 10 CFR 835, *Occupational Radiation Protection*.
- d. To establish and assign responsibilities for the reporting of radioactive sealed sources that are in the custody or possession of DOE and DOE contractors.

2. **CANCELLATIONS.** None.

3. **APPLICABILITY.**

- a. **All Departmental Elements.** Except for the exclusions in paragraph 3c, this Notice applies to all departmental elements that own, possess, use, or maintain in custody those radioactive sealed sources identified in 10 CFR Part 835 *Occupational Radiation Protection*, Appendix E and Categories 1 and 2 radioactive sealed sources identified in attachment 1 of this Notice.

(Go to <http://www.directives.doe.gov/pdfs/reftools/org-list.pdf> for the current listing of Departmental elements. This list automatically includes all departmental elements created after the Notice is issued.)

The Administrator of National Nuclear Security Administration (NNSA) will assure that NNSA employees comply with their respective responsibilities under this Notice. Nothing in this Notice shall be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration-specific policies, unless disapproved by the Secretary.

b. DOE Contractors.

- (1) Except for the exclusions in paragraph 3c, the contractor requirements document (CRD), attachment 2, sets forth requirements of this Notice that will apply to DOE contractors. The CRD sets forth requirements of this Notice that are intended to be applied to contractors.
- (2) The CRD must be included in all DOE contracts that include responsibilities to own, possess, use, or maintain in custody radioactive sealed sources identified in 10 CFR 835 *Occupational Radiation Protection*, Appendix E and Categories 1 and 2 radioactive sealed sources identified in attachment 1 of this Notice.

c. Exclusions.

- (1) Radioactive sealed sources that are regulated through a license or certification (under section 1701 of the Atomic Energy Act) by the Nuclear Regulatory Commission (NRC) or a State under an Agreement with the NRC.
- (2) In accordance with the responsibilities and authorities assigned by Executive Order 12344 and to ensure consistency throughout the joint Navy and DOE organization of the Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors will implement and oversee all requirements and practices pertaining to this DOE Notice for activities under the Deputy Administrator's cognizance.
- (3) Requirements in this Notice that overlap or duplicate requirements of the NRC related to radiation protection, nuclear safety, quality assurance, and safeguards and security of nuclear material do not apply to the design, construction, operation, and decommissioning of Office of Civilian Radioactive Waste Management facilities.
- (4) National Security Exclusion. The requirements of this Notice do not apply to radioactive sealed sources that are classified, or to data and information regarding a radioactive sealed source that would divulge a classified program. Any exclusion beyond that specified above must be processed in

accordance with the deviations process as defined in DOE M 470.4-1 Chg 1, *Safeguards and Security Program Planning and Management*."

- d. Deviations. Deviations from the requirements in this Notice must be processed in accordance with DOE M 470.4-1 Chg 1, *Safeguards and Security Program Planning and Management*.

4. REQUIREMENTS.

- a. Planning and Administration. Line management must help prevent sabotage involving radioactive materials and radioactive sealed sources that could adversely affect national security and the health and safety of employees, the public, and the environment. For the purpose of inventory reporting under this Notice, accountable radioactive sealed sources are those that meet the criteria of 10 CFR 835, Appendix E, including radioisotope thermoelectric generators (RTGs). In addition, a select set of radioactive sealed sources that meet the criteria of Category 1 or 2 (see attachment 1¹) will require transaction reporting. These sources must be safeguarded against loss, theft, diversion, and unauthorized access or use. All site/facility operators using or storing radioactive sealed sources as referenced above must—

(1) Refer to:

- (a) DOE O 470.3A *Design Basis Threat Policy*, dated 11-29-05, when designing and implementing safeguards and security protection and control programs; and
- (b) 10 CFR 835, *Occupational Radiation Protection*, Subpart M and Appendix E, when designing and implementing radiological protection programs.

- (2) Maintain radioactive materials programs that ensure the accountability of radioactive sealed sources identified in this Notice.
- (3) Ensure that site and facility radioactive sealed source accounting systems are established to provide accurate radioactive sealed source transaction information relating to the manufacture, transfer (shipment), receipt, inventory, disassembly, and disposal of Category 1 and 2 radioactive sealed sources as listed in attachment 1 is sufficient to establish a complete audit trail from receipt through disposition.
- (4) Ensure that inventory and transaction reporting data occur in a timely and uniform manner as required for submission to the DOE centralized database repository, the Radiological Source Registry and Tracking (RSRT) database.

¹ (NOTE: Category 3 radioactive sealed sources are presented in attachment 1 for informational purposes only.)

- (5) Ensure that aggregation of individual radioactive sealed sources is taken into account in the protection during transfer (shipment).
- (6) Ensure that classified data or information that would divulge a classified program is not reported to RSRT, which will be maintained as Unclassified Controlled Information.

b. General Requirements.

- (1) DOE will maintain a centralized reporting capability to provide information consistent with the IAEA Code of Conduct and the Guidance on the Import and Export of Radioactive Sealed Sources. The RSRT database will serve as DOE's centralized repository for inventory and transaction data and will be used by DOE to provide appropriate data on Category 1 and 2 radioactive sealed sources to the NRC National Source Tracking System (NSTS) when the NSTS is operational and available to DOE.
- (2) DOE elements must document to the RSRT database all radioactive sealed source inventories maintained under 10 CFR 835, Appendix E, including RTGs and radioactive sealed sources that have been identified for disposal but not yet disposed, and Category 1 and 2 radioactive sealed source transactions in accordance with the instructions provided in this Notice.
- (3) When the NSTS is operational and available, DOE will report appropriate data from the DOE RSRT on transactions involving select radioactive sealed sources between DOE and the commercial sector, and DOE imports and exports of radioactive sealed sources.
- (4) Information regarding specific radioactive sealed sources will remain on the DOE RSRT inventory until transferred (shipped), disassembled or disposed of from the DOE site.
- (5) Radioisotope decay and in-growth will be taken into account in the transaction reporting of Category 1 and 2 radioactive sealed sources.
- (6) For Category 1 and 2 radioactive sealed sources, any missed transaction or errors found in previously filed inventory or transaction reports will be corrected or a new report will be filed within five business days of the discovery of the error or missed transaction.
- (7) Incidents of loss or theft of radioactive sealed sources will be addressed and managed in DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, dated 8-19-03, and DOE M 470.4-1 Chg 1, *Safeguards and Security Program Planning and Management*.

- c. Serialization of Select Category 1 and 2 Radioactive Sealed Sources. After the effective date of this Notice:
 - (1) A unique serial number must be assigned to each Category 1 or 2 radioactive sealed source upon manufacture. If a unique serial number is not available for existing Category 1 or 2 sealed sources, other information to uniquely identify the source must be used.
 - (2) Serial numbers must be composed only of alpha-numeric characters.
- d. Initial (Baseline) Inventory of Accountable Radioactive Sealed Sources.
 - (1) Each DOE site/facility operator that possesses accountable radioactive sealed sources as listed in Appendix E of 10 CFR 835 and as defined in this Notice must report its initial inventory or verify previously reported inventory to the RSRT within 6 months after issuance of this Notice.
 - (2) The information may be submitted by using any of the methods identified in paragraph 4f(6) of this Notice.
 - (3) If multiple isotopes are in an individual source, a record for each isotope must be submitted. (See also attachment3, Required Fields for Inventory and Transaction Reporting).
 - (4) The initial (Baseline) inventory must include the following fields:
 - (a) site source ID (unique source identification);
 - (b) the radionuclides in the source (single or multiple);
 - (c) the initial (if known) or current source strength (activity) in terabecquerels (TBqs). (NOTE: curies may be provided for information only);
 - (d) the date for which the source strength (activity) is reported;
 - (e) neutron component (Yes/No);
 - (f) manufacture date, if known;
 - (g) the reporting identification symbol (RIS) code;²
 - (h) facility/building name;

² A unique combination of three or four letters assigned to each reporting organization by DOE for the purpose of identification in the Nuclear Material Management and Safeguards System database. Each contractor and facility RIS is associated with a specific DOE element. RIS codes can be obtained through the RSRT database administrator. (DOE M 470.4-6 Chg 1)

- (i) a description of the source;
 - (j) physical form (solid/liquid);
 - (k) manufacturer, model, and serial number of the source or, if not available, other information to uniquely identify the source; and
 - (l) name and phone number of the individual preparing the report.
- e. Verification of Book Inventory Records.
 - (1) The book inventory of radioactive sealed sources must be verified annually against the site/facility operator's listing in the RSRT.
 - (2) The book inventory verification may be satisfied at each DOE site in conjunction with existing inventory requirements under 10 CFR 835, *Occupational Radiation Protection*.
- f. Transaction Reporting to the RSRT of Select Category 1 and 2 Radioactive Sealed Sources. A Sealed Source Transaction Report as specified below must be completed and submitted to the RSRT database for select Categories 1 and 2 solid radioactive sealed sources for each type of transaction: manufacture, transfer (shipment), receipt, disassembly and disposal as defined in paragraph 6g, (see also attachment 3, Required Fields for Inventory and Transaction Reporting):
 - (1) For each DOE site/facility operator that manufactures (produces) a Category 1 or 2 radioactive sealed source, the transaction report must include data listed in paragraphs 4d(4)(a)-(l).
 - (2) For each DOE site/facility operator that ships or receives a Category 1 or 2 radioactive sealed sources, the transaction report, in addition to data listed in paragraphs 4d(4)(a)-(l), must include:
 - (a) the name and address of the shipping and/or receiving facilities and NRC license number (if appropriate);
 - (b) dates of shipping and/or receipt;
 - (c) for shipments, the estimated arrival date;
 - (d) waste manifest number (if required for transfer);
 - (e) container identification with the sealed sources; and
 - (f) export/import license number, or DOE authorization, as appropriate.

- (3) For each DOE site/facility operator that disassembles or disposes of a Category 1 or 2 radioactive sealed source, the transaction report, in addition to data listed in paragraphs 4d(4)(a)-(l) and 4f(2)(a)-(f) must include:
 - (a) the date of disassembly or disposal;
 - (b) the method of disposal; and
 - (c) container ID for final disposition.
- (4) The transaction reports discussed in paragraphs 4f(1)-(3) must be submitted to the RSRT within three business days after the transaction.
- (5) A single transaction report may be submitted for multiple sources and transactions.
- (6) The reports must be submitted to the RSRT by using one of the following modes, in accordance with site and DOE data transmission requirements for the protection of the information:
 - (a) the on-line system at such time as established and available to the DOE sites; or
 - (b) electronic format, pre-defined, computer-readable format; or
 - (c) facsimile or e-mail using a pre-defined format.
- g. Reconciliation of Category 1 and 2 Radioactive Sealed Source Information. Each DOE site/facility operator must reconcile and verify Categories 1 and 2 radioactive sealed source physical inventories against the site/facility operator's data in the DOE RSRT.
 - (1) The reconciliation process must resolve any discrepancies between the RSRT and site physical inventory.
 - (2) Modifications made to the RSRT inventory must be submitted as transactions via the reports identified in paragraphs 4f(1)-(3) or as inventory correction as defined below.
 - (a) Inventory corrections for Category 1 or 2 radioactive sealed sources will be made within five business days of the discovery of the error or missed inventory.
 - (b) Reconciliation and verification must be based upon December 31 inventories and submitted to the RSRT within 3 weeks after the end of the calendar year.

h. Verification of Authorities for Receipt of Accountable Radioactive Sealed Sources.

- (1) No accountable radioactive sealed source will be transferred from a DOE organization or from a DOE contractor except as authorized.
- (2) Except as otherwise provided in this section and subject to the provisions of paragraphs 4h(3) of this section, an accountable radioactive sealed source may be transferred—
 - (a) to another authorized DOE organization or DOE contractor;
 - (b) to the agency in any NRC agreement state, which regulates radioactive material pursuant to an agreement under section 274(b) of the Atomic Energy Act of 1954 (as amended);
 - (c) to any person authorized to receive such radioactive material under terms of a specific license or a general license or their equivalents issued by the NRC or an Agreement State;
 - (d) to a person abroad pursuant to an export license issued under Departmental requirements or NRC regulations as applicable; or
 - (e) as otherwise authorized by the Department in writing.
- (3) Before transferring an accountable radioactive sealed source to a DOE organization or contractor, a specific licensee of the NRC or an agreement state, or a general licensee who is required to register with the NRC or with an agreement state prior to receipt of the material, the transferor of the material will obtain written verification that the transferee's DOE approved radiation protection program or license encompasses or authorizes the receipt of the type, form, and quantity of material to be transferred. Verification methods include:
 - (a) Current copy of the transferee's specific license or registration certificate, or DOE authorization;
 - (b) The transferor may obtain other sources of information compiled by a reporting service from official records of the NRC, the licensing agency of an Agreement State, or the Department as to the identity of licensees and the scope and expiration dates of licenses, registration, or authorization.

i. Records.

- (1) Inventory and accountability reporting procedures must be documented for all accountable radioactive sealed sources as defined by this Notice.

- (2) See 10 CFR Part 835 for additional documentation and record keeping requirements for accountable radioactive sealed sources (<http://www.hss.energy.gov/healthsafety/wshp/radiation/>).
- (3) See DOE Record Retention Scheduling for information about DOE records retention and disposition requirements (<http://www.cio.energy.gov/records-management.htm>).

5. RESPONSIBILITIES.

a. Chief Health, Safety and Security Officer.

- (1) Develop, coordinate, and clarify policies and standards for the transaction and inventory reporting, and verification and reconciliation of the radioactive sealed sources identified in this Notice.
- (2) Operate and maintain the DOE RSRT database for radioactive sealed sources as identified in this Notice.
- (3) Develop procedures and criteria for the submission of information on Categories 1 and 2 radioactive sealed source transactions and inventories from the RSRT to the U.S. centralized repository [the NRC NSTS]. Ensure that Heads of DOE elements are informed of procedures and criteria developed pursuant to this paragraph.
- (4) Prepare and provide data for reports to the Secretary on the status of the DOE radiological source registry and tracking program, as requested.
- (5) Perform the DOE RSRT quality assurance and control checks for transaction and inventory data as submitted from the DOE sites.
- (6) Communicate RSRT data inconsistencies to the field for reconciliation.
- (7) When NSTS is established and available, report data from the DOE RSRT as appropriate.
- (8) Maintain national-level liaison and memorandums of agreements with the NRC and other Federal agencies in support of reporting and tracking of Categories 1 and 2 radioactive sealed sources, as necessary.
- (9) Develop policies to monitor and control the transfer of radioactive sealed source information contained in the DOE RSRT.

b. Heads of DOE Elements.

- (1) Ensure that programs for inventory and transaction reporting and verification and reconciliation of radioactive sealed sources under their

cognizance are implemented in conformance with this Notice, Department policies and applicable laws.

- (2) Notify contracting officers of affected site/facility management contracts.
- (3) Evaluate programs for the reporting of radioactive sealed sources under their cognizance to ensure the effectiveness of and compliance with the Department's requirements.
- (4) Ensure that responsibilities and authorities for inventories, transaction reporting, verification and reconciliation of radioactive sealed sources are addressed in the memorandums of agreement and associated appendices, where applicable, between heads and deputy administrators of DOE headquarters offices and field elements managers.
- (5) Work with the Office of International Regimes and Agreements on obtaining and recording authorizations for the import or export of Category 1 and 2 sources.
- (6) Review procurement requests for new non-site/non-facility management contracts and if appropriate, ensure that the clause at 48 CFR 952.204-2 and the requirements of the CRD of this Notice are included in the contracts.

c. Heads of DOE Field Elements. (Operations offices, service centers, site offices, area offices, field offices, project management offices, and regional offices of federally staffed laboratories.)

- (1) Identify and categorize radioactive sealed sources under their cognizance.
- (2) Develop procedures for the reporting of radioactive sealed sources to the DOE RSRT database.
- (3) Ensure the inventory and inventory verification of all accountable radioactive sealed sources under their cognizance is reported to the DOE RSRT.
- (4) Ensure transaction reporting and reconciliation of Category 1 and 2 radioactive sealed sources under their cognizance is reported to the DOE RSRT.
- (5) Ensure verification of recipient's authority to receive accountable radioactive sealed sources in accordance with paragraph 4.i of this Notice prior to transferring possession of accountable radioactive sealed sources.
- (6) Ensure the maintenance of records and issuance of periodic reports reflecting transactions and inventories for radioactive sealed sources under their cognizance.

- (7) Conduct oversight tests and evaluations of radioactive sealed source reporting and transactions.
 - (8) Require each contractor, facility, and Departmental element under their reporting jurisdiction to determine the reasons for discrepancies in transactions between shippers and receivers.
 - (9) Ensure that those assigned to report, verify, and reconcile radioactive sealed source information to the RSRT are identified to the RSRT manager, have training appropriate to the task and understand their responsibilities.
- d. Contracting Officers.
- (1) After being notified, incorporate this Notice into affected DOE contracts.
 - (2) Assist originators of procurement requests who want to incorporate requirements of the CRD in new contracts, as appropriate.

6. DEFINITIONS AND ABBREVIATIONS.

- a. Accountable Sealed Radioactive Source. A sealed radioactive source having a half-life equal to or greater than 30 days and an isotopic activity equal to or greater than the corresponding value provided in Appendix E of 10 CFR 835. Also referred to as an accountable radioactive sealed source.
- b. Book Inventory. The number of radioactive sealed sources and their activity present at a given time as reflected by accounting records.
- c. Categorization of Radioactive Sealed Sources. A designation of radioactive sealed sources determined by the quantity and type of radioactive source, as well as any deterministic health effects. The IAEA TECDOC-1344 establishes this categorization and it is used in the IAEA Code of Conduct.
 - (1) Category 1. As defined by the IAEA, an amount of radioactive material which, if not safely managed or securely protected, would be likely to cause permanent injury to a person who handled or were otherwise in contact with it, for more than a few minutes. It would probably be fatal to be close to this amount of unshielded material for a period of a few minutes to an hour.
 - (2) Category 2. As defined by the IAEA, an amount of radioactive material which, if not safely managed or securely protected, could cause permanent injury to a person who handled it, or were otherwise in contact with it for a short time (minutes or hours). It could possibly be fatal to be close to this amount of unshielded radioactive material for a period of hours to days.

- (3) Category 3. As defined by the IAEA, an amount of radioactive material which, if not safely managed or securely protected, could cause permanent injury to a person who handled it, or were otherwise in contact with it for some hours. It could possibly, although it is unlikely, be fatal to be close to this amount of unshielded radioactive material for a period of days to weeks.
- d. Disassembly (of a radioactive sealed source). As defined by the NRC, the source is taken apart, the radioactive material is removed, and the material may be used for manufacture of new sources or sent for disposal. The unique serial number of the source is destroyed. This is a permanent endpoint. (NSTS Final Rule, Section I.)
- e. Radioactive Sealed Source. A radioactive material that is permanently sealed in a capsule or closely bonded to a non-radioactive substrate designed to prevent leakage or escape of the radioactive material. It is a solid form of radioactive material which is not exempt from regulatory control and may be subject to transaction reporting, depending on the activity level of the source. For the purpose of this Notice, the term radioactive sealed source includes RTG's but does not include material encapsulated solely for disposal; or nuclear material contained in a nuclear weapon; or in any nuclear reactor fuel assembly, subassembly, fuel rod, or fuel pellet.
- f. Site/Facility Operator. The corporate or governmental entity responsible for the day-to-day operations involving storage, processing, or use of nuclear materials at the site/facility. For contractor-operated facilities, this refers to the site/facility contractor. For the DOE-operated facilities, this refers to the DOE organization operating the facility. (DOE M 470.4-6 Chg 1)
- g. Transactions. Category 1 or 2 radioactive sealed sources as identified in attachment 1 that are:
 - (1) transferred (shipped) or received
 - (a) between DOE RISs or
 - (b) from a DOE RIS to an NRC or Agreement State licensee or
 - (c) exported from or imported to a DOE RIS;
 - (2) manufactured;
 - (3) disassembled or
 - (4) sent for disposal.

7. REFERENCES. The following references are applicable to this Notice.

- a. IAEA-TECDOC-1344, *Categorization of Radioactive Sources*, July 2003.
http://www-pub.iaea.org/MTCD/publications/PDF/te_1344_web.pdf
- b. IAEA/CODEOC/2004, *Code of Conduct on the Safety and Security of Radioactive Sources*, January 2004.
http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf
- c. IAEA/CODEOC/IMP-EXP/2005, *Code of Conduct on the Safety and Security of Radioactive Sources - Guidance on the Import and Export of Radioactive Sources*, March 2005.
http://www-pub.iaea.org/MTCD/publications/PDF/Imp-Exp_web.pdf
- d. Amendments to 10 CFR Part 110, Export and Import of Radioactive Materials: Security Policies, Federal Register, vol. 70, No. 126, dated 7-1-05, pp. 37985-37994.
- e. Amendments to 10 CFR 20 and 32, National Source Tracking of Sealed Sources, Federal Register vol. 71, No. 216, dated 11-8-06, pp. 65686-65709.
- f. 10 CFR Part 835 *Occupational Radiation Protection*.
- g. 48 CFR § 952.204-2, *Security Requirements*.
- h. Executive Order 12344, *Navy Nuclear Propulsion Program*, 2-1-82 (see also 50 U.S.C. § 2406).
- i. DOE O 470.3A, *Design Basis Threat Policy*, dated 11-29-05.
- j. DOE O 470.4A, *Safeguards and Security Program*, dated 5-25-07.
- k. DOE M 470.4-1 Chg 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05.
- l. DOE M 470.4-6 Chg 1, *Nuclear Material Control and Accountability*, dated 8-26-05.
- m. DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, dated 8-19-03.
- n. DOE G 441.1-1B, Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection;" Chapter 15 "Sealed Radioactive Source Accountability and Control", March 2007.
- o. DOE O 5400.5, change 2, *Radiation Protection of the Public and the Environment*, 1-7-93.

8. NECESSITY FINDING STATEMENT. In compliance with Sec. 3174 of P.L. 104-201 (42 USC 7274k note), DOE hereby finds that this Order is necessary for the protection of human health and the environment or safety, fulfillment of current legal requirements, and conduct of critical administrative functions.
9. CONTACT. Questions concerning this Notice should be addressed to the Office of Health, Safety and Security at 301-903-1566 (for security) or at 301-903-5641 (for safety).

BY ORDER OF THE SECRETARY OF ENERGY:



CLAY SELL
Deputy Secretary

TABLE OF SELECT RADIOACTIVE SEALED SOURCES*

| Radionuclide | Category 1 ¹ [1000 x D] ² | | Category 2 [10 x D] | | Category 3 [1 x D] | |
|---------------------|--|-------------------|------------------------|---------|-----------------------|---------|
| | (TBq) ³ | (Ci) ⁴ | (TBq) | (Ci) | (TBq) | (Ci) |
| Ac-227 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Am-241 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Am-241/Be | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Cf-252 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Cm-244 | 5.E+01 | 1.4E+03 | 5.E-01 | 1.4E+01 | 5.E-02 | 1.4E+00 |
| Co-60 | 3.E+01 | 8.1E+02 | 3.E-01 | 8.1E+00 | 3.E-02 | 8.1E-01 |
| Cs-137 | 1.E+02 | 2.7E+03 | 1.E+00 | 2.7E+01 | 1.E-01 | 2.7E+00 |
| Gd-153 | 1.E+03 | 2.7E+04 | 1.E+01 | 2.7E+02 | 1.E+00 | 2.7E+01 |
| Ir-192 | 8.E+01 | 2.2E+03 | 8.E-01 | 2.2E+01 | 8.E-02 | 2.2E+00 |
| Pm-147 | 4.E+04 | 1.1E+06 | 4.E+02 | 1.1E+04 | 4.E+01 | 1.1E+03 |
| Po-210 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-236 ⁵ | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-238 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-239 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-239/Be | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-240 ⁵ | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Ra-226 | 4.E+01 | 1.1E+03 | 4.E-01 | 1.1E+01 | 4.E-02 | 1.1E+00 |
| Se-75 | 2.E+02 | 5.4E+03 | 2.E+00 | 5.4E+01 | 2.E-01 | 5.4E+00 |
| Sr-90 (Y-90) | 1.E+03 | 2.7E+04 | 1.E+01 | 2.7E+02 | 1.E+00 | 2.7E+01 |
| Th-228 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Th-229 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Tm-170 | 2.E+04 | 5.4E+05 | 2.E+02 | 5.4E+03 | 2.E+01 | 5.4E+02 |
| Yb-169 | 3.E+02 | 8.1E+03 | 3.E+00 | 8.1E+01 | 3.E-01 | 8.1E+00 |

(*Ac-227, Th-228, and Th-229 are not in the IAEA Code of Conduct. DOE and NRC have determined they will be included in the National System.)

¹ Designates IAEA Category 1, 2, and 3 radioactive sealed sources [IAEA TECDOC-1344]

² “D” designate a dangerous source as defined in the NRC Final Rule for National Source Tracking of Sealed Sources and the IAEA Code of Conduct.

³ “TBq” designates Terabecquerel, a unit of radioactivity.

⁴ “Ci” designates Curie, a unit of radioactivity.

⁵ Inventory and transaction data on Pu-236 and Pu-240 will not be reported in the NSTS and are included for DOE purposes only.

CONTRACTOR REQUIREMENTS DOCUMENT (CRD)
DOE N 234.1, REPORTING OF RADIOACTIVE SEALED SOURCES

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this CRD. The contractor is responsible for flowing down the requirements of this CRD to subcontractors at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

The requirements in this CRD are intended to be applicable to Department of Energy (DOE) and National Nuclear Security Administration (NNSA) contractors who own, possess, use, or maintain in custody those radioactive sealed sources identified in 10 CFR Part 835 *Occupational Radiation Protection*, Appendix E and Categories 1 and 2 radioactive sealed sources identified in attachment 1 of this Notice.

A violation of the provisions of this CRD relating to the safeguarding or security of Restricted Data or other classified information may result in a civil penalty pursuant to subsection a. section 234B of the Atomic Energy Act of 1954 (42 U.S.C. 2282b). The procedures for the assessment of civil penalties are set forth in Title 10, Code of Federal Regulations (CFR), Part 824, *Procedural Rules for the Assessment of Civil Penalties for Classified Information Security Violations*, (10 CFR Part 824).

1. **REQUIREMENTS.**

- a. **Planning and Administration.** Contractors must help prevent sabotage involving radioactive materials and radioactive sealed sources that could adversely affect national security and the health and safety of employees, the public, and the environment. For the purpose of inventory reporting under this CRD, accountable radioactive sealed sources are those that meet the criteria of 10 CFR 835, Appendix E, including radioisotope thermoelectric generators (RTG's). In addition, a select set of radioactive sealed sources that meet the criteria of Category 1 or 2 (see Appendix 1³) will require transaction reporting. These sources must be safeguarded against loss, theft, diversion, and unauthorized access or use. All contractors using or storing radioactive sealed sources as referenced above must—

(1) Refer to:

- (a) The CRD to DOE O 470.3A *Design Basis Threat Policy*, dated 11-29-05, or its successor, when designing and implementing safeguards and security protection and control programs; and
- (b) 10 CFR 835, *Occupational Radiation Protection*, Subpart M and Appendix E, when designing and implementing radiological protection programs.

³ (NOTE: Category 3 radioactive sealed sources are presented in Appendix 1 for informational purposes only.)

- (2) Maintain radioactive materials programs that ensure the accountability of radioactive sealed sources identified in this CRD.
- (3) Ensure that radioactive sealed source accounting systems are established to provide accurate radioactive sealed source transaction information relating to the manufacture, transfer (shipment), receipt, inventory, disassembly, and disposal of Category 1 and 2 radioactive sealed sources as listed in Appendix 1 is sufficient to establish a complete audit trail from receipt through disposition.
- (4) Ensure that inventory and transaction reporting data occur in a timely and uniform manner as required for submission to the DOE centralized database repository, the Radiological Source Registry and Tracking (RSRT) database.
- (5) Ensure that aggregation of individual radioactive sealed sources is taken into account in the protection during transfer (shipment).
- (6) Ensure that classified data or information that would divulge a classified program is not reported to RSRT, which will be maintained as Unclassified Controlled Information.

b. General Requirements.

- (1) Contractors must maintain a centralized reporting capability to provide information consistent with the International Atomic Energy Agency (IAEA) Code of Conduct and the Guidance on the Import and Export of Radioactive Sealed Sources. (See References at the end of this CRD.) The RSRT database will serve as DOE's centralized repository for inventory and transaction data and will be used by DOE to provide appropriate data on Category 1 and 2 radioactive sealed sources to the U.S. Nuclear Regulatory Commission National Source Tracking System (NSTS) when the NSTS is operational and available to DOE.
- (2) Contractors must document to the RSRT database all radioactive sealed source inventories maintained under 10 CFR 835, Appendix E, including RTG's and radioactive sealed sources that have been identified for disposal but not yet disposed, and Category 1 and 2 radioactive sealed source transactions in accordance with the instructions provided in this CRD.
- (3) Information regarding specific radioactive sealed sources must remain on the DOE RSRT inventory until transferred (shipped), disassembled, or disposed of from the DOE site.
- (4) Radioisotope decay and in-growth must be taken into account in the transaction reporting of Category 1 and 2 radioactive sealed sources.

- (5) For Category 1 and 2 radioactive sealed sources, any missed transaction or errors found in previously filed inventory or transaction reports must be corrected or a new report will be filed within five business days of the discovery of the error or missed transaction.
 - (6) Incidents of loss or theft of radioactive sealed sources must be addressed and managed. (See DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, dated 8-19-03, and DOE M 470.4-1 Chg 1, *Safeguards and Security Program Planning and Management*).
- c. Serialization of Select Category 1 and 2 Radioactive Sealed Sources. Once this CRD becomes part of the contract:
 - (1) A unique serial number must be assigned to each Category 1 or 2 radioactive sealed source upon manufacture. If a unique serial number is not available for existing Category 1 or 2 sealed sources, other information to uniquely identify the source must be used.
 - (2) Serial numbers must be composed only of alpha-numeric characters.
- d. Initial (Baseline) Inventory of Radioactive Sealed Sources.
 - (1) Each contractor that possesses accountable radioactive sealed sources as listed in Appendix E of 10 CFR 835 and as defined in this Notice must report its initial inventory or verify previously reported inventory to the RSRT within 6 months after this CRD becomes part of the contract.
 - (2) The information may be submitted by using any of the methods identified in paragraph 1f(6) of this CRD.
 - (3) If multiple isotopes are in an individual source, a record for each isotope must be submitted. (See also Appendix 2, Required Fields for Inventory and Transaction Reporting).
 - (4) The initial (Baseline) inventory must include the following fields:
 - (a) site source ID (unique source identification);
 - (b) the radionuclides in the source (single or multiple);
 - (c) the initial (if known) or current source strength (activity) in terabecquerels (TBqs). (NOTE: curies may be provided for information only);
 - (d) the date for which the source strength (activity) is reported;
 - (e) neutron component (Yes/No);

- (f) manufacture date, if known;
 - (g) the reporting identification symbol (RIS) code;⁴
 - (h) facility/building name;
 - (i) a description of the source;
 - (j) physical form (solid/liquid);
 - (k) manufacturer, model, and serial number of the source or, if not available, other information to uniquely identify the source; and
 - (l) name and phone number of the individual preparing the report.
- e. Verification of Book Inventory Records.
- (1) The book inventory of radioactive sealed sources must be verified annually against the contractor's listing in the RSRT.
 - (2) The book inventory verification may be satisfied at each contractor facility in conjunction with existing inventory requirements under 10 CFR 835, *Occupational Radiation Protection*.
- f. Transaction Reporting to the RSRT of Select Category 1 and 2 Radioactive Sealed Sources. A Sealed Source Transaction Report as specified below must be completed and submitted to the RSRT database for select Categories 1 and 2 radioactive sealed sources for each type of transaction: manufacture, transfer (shipment), receipt, disassembly and disposal as defined in 2g, (see also Appendix 2, Required Fields for Inventory and Transaction Reporting):
- (1) For each contractor that manufactures (produces) a Category 1 or 2 radioactive sealed source, the transaction report must include data listed in paragraphs 1d(4)(a)-(l).
 - (2) For each contractor that ships or receives a Category 1 or 2 radioactive sealed sources, the transaction report, in addition to data listed in paragraphs 1d(4)(a)-(l), must include:
 - (a) the name and address of the shipping and/or receiving facilities and NRC license number (if appropriate);
 - (b) dates of shipping and/or receipt;

⁴ A unique combination of three or four letters assigned to each reporting organization by DOE for the purpose of identification in the Nuclear Material Management and Safeguards System database. Each contractor and facility RIS is associated with a specific DOE element. RIS codes can be obtained through the RSRT database administrator. (DOE M 470.4-6 Chg1)

- (c) for shipments, the estimated arrival date;
 - (d) waste manifest number (if required for transfer);
 - (e) container identification with the sealed sources; and
 - (f) export/import license number, or DOE authorization, as appropriate.
- (3) For each contractor that disassembles or disposes of a Category 1 or 2 radioactive sealed source, the transaction report, in addition to data listed in paragraphs 1d(4)(a)-(l) and 1f(2)(a)-(f) must include:
 - (a) the date of disassembly or disposal;
 - (b) the method of disposal; and
 - (c) container ID for final disposition.
- (4) The transaction reports discussed in paragraphs 1f(1)-(3) must be submitted to the RSRT within three business days after the transaction.
- (5) A single transaction report may be submitted for multiple sources and transactions.
- (6) The reports must be submitted to the RSRT by using one of the following modes, in accordance with site and DOE data transmission requirements for the protection of the information:
 - (a) the on-line system at such time as established and available to the contractor; or
 - (b) electronic format, pre-defined, computer-readable format; or
 - (c) facsimile or e-mail using a pre-defined format.
- g. Reconciliation of Category 1 and 2 Radioactive Sealed Source Information. Each contractor must reconcile and verify Categories 1 and 2 radioactive sealed source physical inventories against the contractor's data in the DOE RSRT.
 - (1) The reconciliation process must resolve any discrepancies between the RSRT and contractor's physical inventory.
 - (2) Modifications made to the RSRT inventory must be submitted as transactions via the reports identified in paragraphs 1f(1)-(3) or as inventory correction as defined below.

- (a) Inventory corrections for Category 1 or 2 radioactive sealed sources will be made within five business days of the discovery of the error or missed inventory.
 - (b) Reconciliation and verification must be based upon December 31 inventories and submitted to the RSRT within 3 weeks after the end of the calendar year.
- h. Verification of Authorities for Receipt of Accountable Radioactive Sealed Sources.
 - (1) No accountable radioactive sealed source will be transferred from a contractor except as authorized.
 - (2) Except as otherwise provided in this section and subject to the provisions of paragraphs 1h(3) of this section, an accountable radioactive sealed source may be transferred—
 - (a) to another authorized DOE organization or DOE contractor;
 - (b) to the agency in any NRC agreement state, which regulates radioactive material pursuant to an agreement under section 274(b) of the Atomic Energy Act of 1954 (as amended);
 - (c) to any person authorized to receive such radioactive material under terms of a specific license or a general license or their equivalents issued by the NRC or an Agreement State;
 - (d) to a person abroad pursuant to an export license issued under Departmental requirements or NRC regulations as applicable; or
 - (e) as otherwise authorized by the Department in writing.
 - (3) Before transferring an accountable radioactive sealed source to a DOE organization or contractor, a specific licensee of the NRC or an agreement state, or a general licensee who is required to register with the NRC or with an agreement state prior to receipt of the material, the transferor of the material must obtain written verification that the transferee's DOE approved radiation protection program or license encompasses or authorizes the receipt of the type, form, and quantity of material to be transferred. Verification methods include:
 - (a) Current copy of the transferee's specific license or registration certificate, or DOE authorization;
 - (b) The transferor may obtain other sources of information compiled by a reporting service from official records of the NRC, the licensing agency of an Agreement State, or the Department as to

the identity of licensees and the scope and expiration dates of licenses, registration, or authorization.

i. Records.

- (1) Inventory and accountability reporting procedures must be documented for all accountable radioactive sealed sources as defined by this CRD.
- (2) See 10 CFR Part 835 for additional documentation and record keeping requirements for accountable radioactive sealed sources
(<http://www.hss.energy.gov/healthsafety/wshp/radiation/>).
- (3) See DOE Record Retention Scheduling for information about DOE records retention and disposition requirements
(<http://www.cio.energy.gov/records-management.htm>).

2. DEFINITIONS AND ABBREVIATIONS.

- a. Accountable Sealed Radioactive Source. A sealed radioactive source having a half-life equal to or greater than 30 days and an isotopic activity equal to or greater than the corresponding value provided in Appendix E of 10 CFR 835. Also referred to as an accountable radioactive sealed source.
- b. Book Inventory. The number of radioactive sealed sources and their activity present at a given time as reflected by accounting records.
- c. Categorization of Radioactive Sealed Sources. A designation of radioactive sealed sources determined by the quantity and type of radioactive source, as well as any deterministic health effects. The IAEA TECDOC-1344 establishes this categorization and it is used in the IAEA Code of Conduct.
 - (1) Category 1. As defined by the IAEA, an amount of radioactive material which, if not safely managed or securely protected, would be likely to cause permanent injury to a person who handled or were otherwise in contact with it, for more than a few minutes. It would probably be fatal to be close to this amount of unshielded material for a period of a few minutes to an hour.
 - (2) Category 2. As defined by the IAEA, an amount of radioactive material which, if not safely managed or securely protected, could cause permanent injury to a person who handled it, or were otherwise in contact with it for a short time (minutes or hours). It could possibly be fatal to be close to this amount of unshielded radioactive material for a period of hours to days.
 - (3) Category 3. As defined by the IAEA, an amount of radioactive material which, if not safely managed or securely protected, could cause permanent injury to a person who handled it, or were otherwise in contact with it for some hours. It could possibly, although it is unlikely, be fatal to be close

to this amount of unshielded radioactive material for a period of days to weeks.

- d. Disassembly (of a radioactive sealed source). As defined by the NRC, the source is taken apart, the radioactive material is removed, and the material may be used for manufacture of new sources or sent for disposal. The unique serial number of the source is destroyed. This is a permanent endpoint. (NSTS Final Rule, Section I.)
 - e. Radioactive Sealed Source. A radioactive material that is permanently sealed in a capsule or closely bonded to a non-radioactive substrate designed to prevent leakage or escape of the radioactive material. It is a solid form of radioactive material which is not exempt from regulatory control and may be subject to transaction reporting, depending on the activity level of the source. For the purpose of this Notice, the term radioactive sealed source includes RTG's but does not include material encapsulated solely for disposal; or nuclear material contained in a nuclear weapon; or in any nuclear reactor fuel assembly, subassembly, fuel rod, or fuel pellet.
 - f. Site/Facility Operator. The corporate or governmental entity responsible for the day-to-day operations involving storage, processing, or use of nuclear materials at the site/facility. For contractor-operated facilities, this refers to the site/facility contractor. For the DOE-operated facilities, this refers to the DOE organization operating the facility. (DOE M 470.4-6 Chg 1)
 - g. Transactions. Category 1 or 2 radioactive sealed sources as identified in attachment 1 that are:
 - (1) transferred (shipped) or received
 - (a) between DOE RISs or
 - (b) from a DOE RIS to an NRC or Agreement State licensee or
 - (c) exported from or imported to a DOE RIS;
 - (2) manufactured;
 - (3) disassembled or
 - (4) sent for disposal.
3. REFERENCES. The following references are relevant to this CRD.
- a. IAEA-TECDOC-1344, *Categorization of Radioactive Sources*, July 2003.
http://www-pub.iaea.org/MTCD/publications/PDF/te_1344_web.pdf

- b. IAEA/CODEOC/2004, *Code of Conduct on the Safety and Security of Radioactive Sources*, January 2004.
http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf
- c. IAEA/CODEOC/IMP-EXP/2005, *Code of Conduct on the Safety and Security of Radioactive Sources - Guidance on the Import and Export of Radioactive Sources*, March 2005.
http://www-pub.iaea.org/MTCD/publications/PDF/Imp-Exp_web.pdf
- d. Amendments to 10 CFR Part 110, Export and Import of Radioactive Materials: Security Policies, Federal Register, vol. 70, No. 126, dated 7-1-05, pp. 37985-37994.
- e. Amendments to 10 CFR 20 and 32, National Source Tracking of Sealed Sources, Federal Register vol. 71, No. 216, dated 11-8-06, pp. 65686-65709.
- f. 10 CFR Part 835 *Occupational Radiation Protection*.
- g. 48 CFR § 952.204-2, *Security Requirements*.
- h. Executive Order 12344, *Navy Nuclear Propulsion Program*, 2-1-82 (see also 50 U.S.C. § 2406).
- i. DOE O 470.3A, *Design Basis Threat Policy*, dated 11-29-05.
- j. DOE O 470.4A, *Safeguards and Security Program*, dated 5-25-07.
- k. DOE M 470.4-1 Chg 1, *Safeguards and Security Program Planning and Management*, dated 8-26-05.
- l. DOE M 470.4-6 Chg 1, *Nuclear Material Control and Accountability*, dated 8-26-05.
- m. DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, dated 8-19-03.
- n. DOE G 441.1-1B, *Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection*; Chapter 15 "Sealed Radioactive Source Accountability and Control," March 2007.
- o. DOE O 5400.5, change 2, *Radiation Protection of the Public and the Environment*, dated 1-7-93.

TABLE OF SELECT RADIOACTIVE SEALED SOURCES*

| Radionuclide | Category 1 ¹ [1000 x D] ² | | Category 2 [10 x D] | | Category 3 [1 x D] | |
|---------------------|--|-------------------|------------------------|---------|-----------------------|---------|
| | (TBq) ³ | (Ci) ⁴ | (TBq) | (Ci) | (TBq) | (Ci) |
| Ac-227 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Am-241 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Am-241/Be | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Cf-252 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Cm-244 | 5.E+01 | 1.4E+03 | 5.E-01 | 1.4E+01 | 5.E-02 | 1.4E+00 |
| Co-60 | 3.E+01 | 8.1E+02 | 3.E-01 | 8.1E+00 | 3.E-02 | 8.1E-01 |
| Cs-137 | 1.E+02 | 2.7E+03 | 1.E+00 | 2.7E+01 | 1.E-01 | 2.7E+00 |
| Gd-153 | 1.E+03 | 2.7E+04 | 1.E+01 | 2.7E+02 | 1.E+00 | 2.7E+01 |
| Ir-192 | 8.E+01 | 2.2E+03 | 8.E-01 | 2.2E+01 | 8.E-02 | 2.2E+00 |
| Pm-147 | 4.E+04 | 1.1E+06 | 4.E+02 | 1.1E+04 | 4.E+01 | 1.1E+03 |
| Po-210 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-236 ⁵ | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-238 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-239 | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-239/Be | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Pu-240 ⁵ | 6.E+01 | 1.6E+03 | 6.E-01 | 1.6E+01 | 6.E-02 | 1.6E+00 |
| Ra-226 | 4.E+01 | 1.1E+03 | 4.E-01 | 1.1E+01 | 4.E-02 | 1.1E+00 |
| Se-75 | 2.E+02 | 5.4E+03 | 2.E+00 | 5.4E+01 | 2.E-01 | 5.4E+00 |
| Sr-90 (Y-90) | 1.E+03 | 2.7E+04 | 1.E+01 | 2.7E+02 | 1.E+00 | 2.7E+01 |
| Th-228 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Th-229 | 2.E+01 | 5.4E+02 | 2.E-01 | 5.4E+00 | 2.E-02 | 5.4E-01 |
| Tm-170 | 2.E+04 | 5.4E+05 | 2.E+02 | 5.4E+03 | 2.E+01 | 5.4E+02 |
| Yb-169 | 3.E+02 | 8.1E+03 | 3.E+00 | 8.1E+01 | 3.E-01 | 8.1E+00 |

(*Ac-227, Th-228, and Th-229 are not in the IAEA Code of Conduct. DOE and NRC have determined they will be included in the National System.)

¹ Designates IAEA Category 1, 2, and 3 radioactive sealed sources [IAEA TECDOC-1344]

² “D” designate a dangerous source as defined in the NRC Final Rule for National Source Tracking of Sealed Sources and the IAEA Code of Conduct.

³ “TBq” designates Terabecquerel, a unit of radioactivity.

⁴ “Ci” designates Curie, a unit of radioactivity.

⁵ Inventory and transaction data on Pu-236 and Pu-240 will not be reported in the NSTS and are included for DOE purposes only.

| Required Fields for Inventory and Transaction Reporting | | | | | | |
|---|---|--|----------|-----------|-------------|---------|
| Data Field | Inventory Reporting (Appendix E 10 CFR 835) | Transaction Reporting for Category 1 and 2 Sources | | | | |
| | | Manufacture | Shipment | Receipt | Disassemble | Dispose |
| Site Source ID(unique source identification) | √ | √ | √ | √ | √ | √ |
| Radionuclide(s) in the source (single or multiple) | √ | √ | √ | √ | √ | √ |
| Initial or current source strength (activity) in Terabecquerels (TBq). (Curies are provided for information only) | √ | √ | √ | √ | √ | √ |
| Activity Date (the date for which the source strength is reported) | √ | √ | √ | √ | √ | √ |
| Neutron component (Yes/No) | √ | √ | √ | √ | √ | √ |
| Manufacturer date of source (if known) | √ | √ | √ | √ | √ | √ |
| The Reporting Identification Symbol (RIS Code) | √ | √ | √ | √ | √ | √ |
| Facility/building name* | √ | √ | √ | √ | √ | √ |
| Description of the source | √ | √ | √ | √ | √ | √ |
| Physical Form (solid/liquid) | √ | √ | N/A | If import | N/A | N/A |
| Manufacturer, model, serial number or other unique identifier. | √ | √ | √ | √ | √ | √ |
| Name and phone number for Individual preparing the report | √ | √ | √ | √ | √ | √ |
| Name/address of shipping and/or recipient facilities and License number (if appropriate) | | | √ | √ | N/A | N/A |
| Date of shipment or receipt | | | √ | √ | N/A | N/A |
| Estimated arrival date | | | √ | N/A | N/A | N/A |
| Waste manifest number (if applicable) | | | √ | √ | N/A | √ |
| Container ID | | | √ | √ | N/A | √ |
| Import/Export License number (if appropriate) | | | √ | √ | N/A | √ |
| Disposal / disassembly date | | | | | √ | √ |
| Method of Disposal | | | | | N/A | √ |
| Container ID for final disposition | | | | | N/A | √ |

*Information in this field is for DOE purposes only and will not be reported to the NSTS

| Required Fields for Inventory and Transaction Reporting | | | | | | |
|---|---|--|----------|-----------|-------------|---------|
| Data Field | Inventory Reporting (Appendix E 10 CFR 835) | Transaction Reporting for Category 1 and 2 Sources | | | | |
| | | Manufacture | Shipment | Receipt | Disassemble | Dispose |
| Site Source ID(unique source identification) | √ | √ | √ | √ | √ | √ |
| Radionuclide(s) in the source (single or multiple) | √ | √ | √ | √ | √ | √ |
| Initial or current source strength (activity) in Terabecquerels (TBq). (Curies are provided for information only) | √ | √ | √ | √ | √ | √ |
| Activity Date (the date for which the source strength is reported) | √ | √ | √ | √ | √ | √ |
| Neutron component (Yes/No) | √ | √ | √ | √ | √ | √ |
| Manufacturer date of source (if known) | √ | √ | √ | √ | √ | √ |
| The Reporting Identification Symbol (RIS Code) | √ | √ | √ | √ | √ | √ |
| Facility/building name* | √ | √ | √ | √ | √ | √ |
| Description of the source | √ | √ | √ | √ | √ | √ |
| Physical Form (solid/liquid) | √ | √ | N/A | If import | N/A | N/A |
| Manufacturer, model, serial number or other unique identifier. | √ | √ | √ | √ | √ | √ |
| Name and phone number for Individual preparing the report | √ | √ | √ | √ | √ | √ |
| Name/address of shipping and/or recipient facilities and License number (if appropriate) | | | √ | √ | N/A | N/A |
| Date of shipment or receipt | | | √ | √ | N/A | N/A |
| Estimated arrival date | | | √ | N/A | N/A | N/A |
| Waste manifest number (if applicable) | | | √ | √ | N/A | √ |
| Container ID | | | √ | √ | N/A | √ |
| Import/Export License number (if appropriate) | | | √ | √ | N/A | √ |
| Disposal / disassembly date | | | | | √ | √ |
| Method of Disposal | | | | | N/A | √ |
| Container ID for final disposition | | | | | N/A | √ |

*Information in this field is for DOE purposes only and will not be reported to the NSTS.