

U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 410.2A

Approved: 08-05-2026

SUBJECT: INTEGRATION OF NUCLEAR MATERIAL & STRATEGIC PLANNING

1. PURPOSE. To establish requirements for the life-cycle management of United States (U.S.) Department of Energy (DOE)-owned and/or managed accountable nuclear materials.
2. CANCELS/SUPERSEDES. DOE Order (O) 410.2, Administrative Change 1, *Management of Nuclear Materials*, dated April 10, 2014.

Cancellation of a Directive does not, by itself, modify or otherwise affect any contractual obligation to comply with the Directive. Contractor Requirements Documents (CRDs) that have been incorporated into or attached to a contract remain in effect until the contract is modified to either eliminate requirements that are no longer applicable or to substitute a new set of requirements.

3. APPLICABILITY.

a. Departmental Applicability.

(1) DOE Elements.

- (a) Except for the exclusions in paragraph 3c, this Order applies to all DOE elements, including the National Nuclear Security Administration (NNSA), involved in the oversight, use, and/or life-cycle management of accountable nuclear materials, comprising americium-241, americium-243, californium, curium, deuterium, enriched lithium, neptunium-237, plutonium-238, plutonium-239-241, plutonium-242, thorium, tritium, depleted uranium, normal uranium, enriched uranium, and uranium-233.
- (b) The Administrator of the NNSA will assure that NNSA employees and contractors comply with their respective responsibilities under this Order. Nothing in this Order will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65, National Defense Authorization Act for Fiscal Year 2000, to establish Administration-specific policies, unless disapproved by the Secretary.

- (c) In accordance with the responsibilities and authorities assigned by Executive Order 12344, Naval Nuclear Propulsion Program, codified at 50 U.S.C. §§ 2406, Deputy Administrator for Naval Reactors, and 2511, Naval Nuclear Propulsion Program, and to ensure consistency throughout the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate.
 - (2) DOE Contractors. Except for the exclusions in paragraph 3c, the CRD, Attachment 1, sets forth requirements that are intended to apply to facilities management contracts. The CRD must be included in contracts that have responsibility for the oversight, use, and/or life-cycle management of accountable nuclear materials listed in paragraph 3.a.
- b. Exclusions. The following organizations are excluded from the scope of this Order to avoid duplicative or conflicting requirements.
 - (1) Department of War or foreign entities that manage DOE-owned materials located at non-DOE facilities.
 - (2) Organizations managing DOE non-accountable nuclear materials in accordance with DOE waste regulations.
 - (3) Nuclear Regulatory Commission (NRC) licensees with DOE-owned materials located at NRC licensed facilities.
 - (4) DOE Power Marketing Administrations.
- 4. REQUIREMENTS. This Order outlines procedural requirements and responsibilities that apply to all DOE elements involved in the oversight, use, and/or life-cycle management of accountable nuclear materials as defined in paragraph 3a. Nuclear materials management must be performed in compliance with this Order.
 - a. Material Forecast Reporting. Category 1, 2, 3, and 4 facilities will provide a 5-year forecast. Forecast must be provided for applicable nuclear material quantities related to programmatic requirements; transfers related to material ownership, material disposition, mutual defense agreements, research reactors and foreign and domestic customers, or to a commercial processor for recovery or down-blending; changes in status related to down-blending of national security highly enriched uranium (HEU) or isotopic down-blending of weapons-grade plutonium; consumption of any very highly enriched uranium; or other materials as identified in the forecast guidance.

The Nuclear Material Integration Division (NMID) is authorized to amend or exempt this requirement for specific nuclear materials or DOE sites as appropriate.

- b. Nuclear Materials Management Plans (NMMPs). DOE Field Elements must prepare annual NMMPs for all applicable nuclear materials unless otherwise amended or exempted in the annual guidance provided by the NMID. As requested by the NMID, Lead Material Management Organizations (LMMOs) must prepare material-specific management plans for their designated nuclear materials.
- c. Inventory Assessments. Each DOE Field Element responsible for nuclear materials defined in paragraph 3a of this Order must prepare an annual Nuclear Material Inventory Assessment (NMIA) Report unless otherwise amended or exempted in the annual guidance provided by the NMID.
- d. Inventory Management. All DOE Headquarters organizations and Field Elements engaged in the management of nuclear material inventories must facilitate the establishment of project numbers, provide for safe and secure packaging, storage, stabilization, and facilitate the consolidation or disposition of the materials, categorize materials as Defined Use/No Defined Use, and effectively manage Restricted Use and National Asset materials under their jurisdiction.
- e. National Strategic Plan for Management of DOE Nuclear Materials. The NMID must coordinate with the Nuclear Materials Advisory Board (NMAB) with Headquarters organizations to prepare a national strategic plan for nuclear materials management every 3 years. The national strategic plan must identify the availability of nuclear materials to meet DOE and customer requirements; identify excess nuclear materials and associated consolidation or disposition plans; identify facility and material requirements and consolidation or disposition strategies; identify technologies and core competencies; describe facility and resource management utilization and/or replacement, including end-of-life and capital equipment requirements; and describe the status of compliance with applicable requirements, as well as plans for achieving compliance, as appropriate.

5. RESPONSIBILITIES.

- a. DOE Headquarters Organizations, Including NNSA, that Manage Any of the Specified Nuclear Materials.
 - (1) Oversee nuclear materials management activities under their control with the support and cooperation of NMID, and DOE Field Elements.
 - (2) Approve designation of the DOE Headquarters organization, or of a DOE Field Element for which it is responsible, as the LMMO for specific nuclear material(s). Approval will be the responsibility of the Program Secretarial Officer.
 - (3) Identify and provide to appropriate DOE Field Elements programmatic requirements for the use of nuclear materials to meet DOE goals and objectives and conserve strategic or unique nuclear materials resources.

- (4) Ensure that nuclear materials inventories are justified, optimized, and available to meet programmatic needs.
- (5) Ensure accurate characterization and safe and secure packaging, storage, stabilization, and consolidation or disposition of nuclear materials in accordance with programmatic requirements and consistent with DOE policy and guidance.
- (6) Coordinate management and consolidation or disposition plans with the NMID and other DOE Headquarters organizations to which this Order is applicable, including plans for loan/lease materials under its control.
- (7) Integrate nuclear materials production and utilization programs and activities and coordinate requirements with the NMID and other DOE Headquarters organizations to which this Order applies to ensure a consistent approach to managing nuclear materials.
- (8) Provide guidance to DOE Field Elements to facilitate the effective management of DOE nuclear materials for which the DOE Headquarters organization is responsible.
- (9) Coordinate changes in program ownership of nuclear materials with other DOE Headquarters organizations and the NMID.
- (10) Identify nuclear materials liabilities and assets and acknowledge them on the DOE's financial statements.
- (11) Coordinate the development and reporting of nuclear materials integration and consolidation or disposition performance metrics to the NMID.
- (12) Provide programmatic requirements to the DOE Field Elements to support timely preparation of material forecasts. NMID provide approval for quantity of nuclear material in forecast. Forecasts shall include shipping containers.
- (13) Support the NMID in the review of the DOE Field Elements' nuclear materials forecasts and resolve any issues between programs and sites each year.
- (14) Provide programmatic requirements to the DOE Field Element to support timely preparation of NMMPs.
- (15) As requested by the NMID, review site-specific NMMPs, material-specific management plans, and the national strategic plan for nuclear materials management as they relate to materials under the control of the DOE Headquarters organization.

- (16) Communicate restrictions regarding the use of nuclear materials governed by agreements or obligations to the NMID and the DOE Field Elements.
 - (17) Approve requests for change of designation of Restricted Use materials in coordination with the NMID and applicable DOE Field Elements.
 - (18) Serve as the LMMO for designated nuclear materials if requested by the NMID to ensure that integrated processes and procedures are developed and implemented for management and consolidation or disposition of each designed nuclear material.
 - (19) NMID provide approval for the nuclear material quantities with the forecasts.
- b. DOE Headquarters Organization Senior Representative for Nuclear Materials Management Issues.
- (1) Serve as primary point of contact on nuclear materials management issues.
 - (2) Facilitate the performance of the organization's nuclear materials management responsibilities.
 - (3) Serve on a NMAB to coordinate nuclear materials management activities with the NMID and other DOE Headquarters organizations.
- c. Office of Environment, Safety, and Health (NA-ESH). The NA-ESH serves as the DOE Headquarters organization responsible for integration of nuclear materials management across the Department. Within NA-ESH, the NMID was established to facilitate greater integration of nuclear material management activities within DOE/NNSA. In carrying out its mission, the NMID must coordinate with other DOE Headquarters organizations. That coordination will primarily be implemented through the NMAB, which includes senior level representatives from each of the DOE Headquarters organizations that manage any of the specified nuclear materials. With the advice and counsel of the NMAB, NMID must:
- (1) Develop and issue nuclear materials management policy and guidance.
 - (2) Designate a DOE Headquarters organization or Field Element as the LMMO for specific nuclear material(s), as warranted, in coordination with other appropriate DOE Headquarters organizations and Field Elements.
 - (3) Support and integrate DOE activities for consolidation or disposition of nuclear materials.
 - (4) Maintain and report materials consolidation or disposition planning and performance data.

- (5) Develop Department-wide policy and guidance regarding nuclear materials management and consolidation or disposition to conserve resources and optimize operational effectiveness.
- (6) Assess the adequacy of facilities and processes on a DOE complex-wide level to support nuclear materials management, storage, and consolidation or disposition objectives and make recommendations for improvements as warranted.
- (7) Integrate anticipated needs for nuclear materials across the DOE complex as reported to the NMID by the DOE Headquarters organizations and monitors with the availability and inventory of nuclear materials relative to the need.
- (8) Evaluate resources and facility capabilities, as necessary, to identify integration opportunities and recommend changes in nuclear materials management policy and plans to the Office of the Secretary and senior management.
- (9) Organize and lead the NMAB.
- (10) Support the integration of planning for nuclear materials management and compliance with the National Environmental Policy Act (NEPA).
- (11) Identify the need for NEPA reviews regarding nuclear materials management initiatives and coordinates related NEPA compliance activities with the Office of the General Counsel.
- (12) Provide NMMP guidance each year or provide guidance for special NMMP requests in sufficient time to facilitate preparation of the NMMP. Provides guidance to the LMMOs for material-specific management plans.
- (13) Review and integrate the site NMMPs and material-specific management plans.
- (14) Identify issues from the NMMPs and the material-specific management plans, evaluate alternatives, and make recommendations to the DOE Headquarters organizations.
- (15) Every 3 years (or more frequently, as warranted), coordinate with DOE Headquarters organizations the development of a national strategic plan for the management of DOE nuclear materials.
- (16) Identify, prioritize, and commission analytical studies, as needed, on issues that impact multiple sites or organizations or that impact the coordination and integration of nuclear materials management on a complex-wide level.
- (17) Provide guidance and instructions for performing analytical studies.

- (18) Review and comment on analytical studies prepared by the DOE Field Elements, Contractors, and DOE Headquarters organizations and coordinates review by the NMAB and others as appropriate.
- (19) Provide results of analytical studies to appropriate DOE Headquarters organizations and Field Elements.
- (20) Develop and maintain an integrated Department-level nuclear materials consolidation or disposition plan that optimizes Department resources, provides meaningful performance metrics, and supports the Department's budget and planning processes.
- (21) Coordinate with the Defense Programs (NA-10) which entity is responsible for the management of NMIA to review site NMIA submissions for consistency and accuracy.
- (22) Provide detailed guidance for site preparation of other inventory reports to the appropriate DOE Field Elements as required.
- (23) Reconcile issues regarding other inventory reports within 90 days after receipt and communicate to the appropriate DOE Headquarters organizations and Field Elements, surplus fissile materials baseline, and associated change control processes in coordination with Field Elements.
- (24) Issue guidance to all applicable DOE Field Elements each year for the preparation of nuclear materials allotment forecasts, with a copy to applicable DOE Headquarters organizations.
- (25) Coordinate review of all DOE Field Elements' nuclear materials forecasts with appropriate DOE Headquarters organizations, LMMOs, or other DOE customers, as necessary, and resolve any issues.
- (26) Annually (or more frequently, as warranted) report the status of nuclear materials consolidation or disposition activities, including planning period milestones, compliance with applicable requirements, and current integration issues, to the DOE Under Secretaries and others, as appropriate.
- (27) Review and evaluate the justification for retention of materials designated as Defined Use and the disposition plans for materials designated as No Defined Use.
- (28) Provide guidance to DOE Field Elements as required for Defined Use and No Defined Use materials.
- (29) Provide concurrence on site-level programmatic value determinations (PVDs) to ensure that nuclear materials deemed to have no programmatic value at one site are coordinated across the complex for potential use by other DOE/NNSA customers prior to final PVD designation.

- (30) Implement change control procedures for Restricted Use materials through DOE Field Elements in coordination with the appropriate DOE Headquarters organization and in compliance with applicable agreements or obligations.
- (31) Coordinate management and disposition of Restricted Use materials with the appropriate DOE Headquarters organization.
- (32) Provide guidance to DOE Field Elements regarding nuclear material discard limits in coordination with appropriate DOE Headquarters organizations.
- (33) Manage, operate, and maintain the Nuclear Materials Management Safeguards System (NMMSS), a classified data management system which functions as the official U.S. state system of accounting for accountable nuclear materials.
- (34) Update and issue the NMMSS User's Guide, as appropriate, to reflect advancements in nuclear material accountancy practices, the expanding nuclear fuel cycle, and emerging technologies.

d. Office of Defense Programs (NA-10).

- (1) Manage the NMIA process by issuing detailed guidance for the DOE Field Elements' submissions of NMIA data by August 31 each year, collect and consolidate the data, maintain and protect data integrity, and provide selected data to authorized users in consultation with the other DOE Headquarters organizations or Field Elements.
- (2) Review site NMIA submissions for consistency and accuracy and provide feedback to the DOE Field Elements each year.
- (3) Provide material-specific NMIA data to applicable DOE Headquarters organizations and LMMOs by June 30 each year.

e. Office of Defense Nuclear Nonproliferation. In addition to the responsibilities identified in paragraph 5a, must:

- (1) Own and oversee the disposition of declared surplus fissile materials (make them "non-weapons-usable") in support of U.S. nonproliferation goals, assisted by other DOE Headquarters organizations, as appropriate.
- (2) Coordinate with international organizations regarding safeguards and other verification protocols and policies for the disposition of declared surplus fissile material.

- (3) Coordinate with the NMID and other DOE Headquarters organizations, as appropriate, regarding activities related to declared surplus fissile materials to ensure consistency in management plans and disposition activities.
 - (4) Coordinate DOE receipt and management of nuclear materials that are removed from domestic or international custody for security or nonproliferation purposes.
- f. Office of Naval Reactors. In addition to the responsibilities identified in paragraph 5a, must oversee all policies and practices pertaining to this Order for activities under its cognizance, in accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 U.S.C. §§ 2406 and 2511 and to ensure consistency throughout the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate.
- g. Office of Nuclear Energy. In addition to the responsibilities identified in paragraph 5a, must assess the impact of a sale or transfer of DOE natural or low-enriched uranium on the domestic uranium mining, conversion or enrichment industries consistent with applicable law.
- h. Office of Science. In addition to the responsibilities identified in paragraph 5a, must designate the Field Element to provide management functions and interfaces to DOE programs and offices for Isotope Development and Production for Research and Applications Program.
- i. Office of Environment, Safety, and Health. In addition to the responsibilities identified in paragraph 5a, must:
 - (1) Establish and maintain a process to assign project numbers consistently throughout the DOE complex including a change process to ensure that project numbers in NMMSS are consistent with valid budget and reporting (B&R) codes established by the DOE Chief Financial Officer.
 - (2) Update project numbers requested by the DOE Field Elements for the upcoming fiscal year effective October 1 each year.
 - (3) In consultation with the NMID and pertinent DOE Headquarters organizations and Field Elements, provide DOE-accountable nuclear materials inventory data to internal and external stakeholders to support nuclear materials management program objectives.

- j. Nuclear Materials Advisory Board. Consists of a senior representative from each DOE Headquarters organization that manages nuclear materials and functional experts from other DOE organizations as determined by the Director of NMID and must:
- (1) Serve as the primary working-level interface between the NMID and DOE Headquarters organizations.
 - (2) Provide advice and counsel to the NMID regarding nuclear materials management policy guidance, planning, integration, and consolidation or disposition.
 - (3) Provide advice and counsel to the NMID in the performance of its mission.
 - (4) Review, evaluate, and advise on nuclear materials management policy and guidance developed by the NMID to supplement this Order.
 - (5) Support integrated program planning activities by the NMID, including development of a national strategic plan every 3 years (or more frequently, as warranted), performance and/or review of analytical studies, and other planning activities as appropriate.
 - (6) Review, evaluate, and advise on annual nuclear materials management plans and reports submitted to or managed by the NMID, including NMMPs, allotment forecasts and allotments, and NMIA reports as appropriate.
- k. DOE Field Elements that Manage Nuclear Materials. With the support of site/facility contractors, must:
- (1) Designate DOE Field Element Senior Representatives to serve as primary points of contact on nuclear materials issues, facilitate the performance of nuclear materials management responsibilities, and coordinate nuclear materials management activities with the NMID and appropriate DOE Headquarters organizations.
 - (2) Implement management activities under their jurisdiction to facilitate safe and secure packaging through M 441.1-1, *Nuclear Material Packaging Manual*, or subsequent documents or other nuclear material package documents. Facilitate the consolidation or disposition of nuclear materials.
 - (3) Document and maintain characterization data to support management of nuclear materials under their jurisdiction. Request guidance and support, as appropriate, from the NMID and/or the designated LMMO for consolidation or disposition of nuclear materials.

- (4) Approve PVDs and discard limits established or recommended by the contractor for disposal of low equity or waste or excess nuclear materials based on guidance from the NMID. (For government-owned nuclear material at NRC-licensee facilities, the approval of discard limits is the responsibility of the NRC.)
- (5) Prepare and submit Nuclear Materials Forecast Reports each year for their respective sites in response to guidance from the NMID and in accordance with programmatic requirements from applicable DOE Headquarters organizations.
- (6) Prepare and submit NMIA data each year in response to guidance from the NMID.
- (7) Prepare and submit other inventory reports as requested by NMID.
- (8) Prepare and submit NMMPs at their respective sites using the prior fiscal year NMIA data, in response to guidance from the NMID.
- (9) As requested by the NMID, review materials-specific management plans and the national strategic plan regarding nuclear materials under their control.
- (10) Approve Defined Use or No Defined Use designation for all materials at sites under the Field Element's control. Provide justification in the NMMP for materials designated as Defined Use at sites under the Field Element's control. Develop disposition plans or options for materials designated as No Defined Use and provide recommendations to the NMID.
- (11) Ensure transfer of nuclear materials as directed by the responsible DOE program office for production, research and development, consolidation or disposition, and other purposes.
- (12) Serve as the LMMO for designated nuclear materials if requested by the NMID to ensure that integrated processes and procedures are developed and implemented for management and consolidation or disposition of each designated nuclear material.
- (13) Conduct or contribute to complex-wide analytical studies and plans in response to guidance from the NMID and DOE Headquarters organizations.
- (14) In coordination with the cognizant DOE Headquarters organizations and the Office of Health, Safety and Security, provide site-specific nuclear materials inventory data to authorized external stakeholders.
- (15) Evaluate nuclear material liabilities and assets for acknowledgement on the Department's financial statements.

- (16) Provide facility landlord and infrastructure support to materials management activities located at facilities under the DOE Field Element's control.
 - (17) Coordinate with NMID and appropriate DOE Headquarters organizations to ensure that project numbers for nuclear materials are established, reported, and deactivated in accordance with guidance from NMID.
 - (18) Annually review and direct the update of project numbers to reflect B&R code changes for the upcoming fiscal year.
 - (19) In coordination with appropriate DOE headquarter organizations, support the development and reporting of nuclear materials integration and consolidation or disposition performance metrics to NMID.
1. Lead Materials Management Organization. A DOE Headquarters organization or Field Element designated by the NMID in coordination with other appropriate DOE Headquarters organizations and Field Elements to integrate and coordinate the management of a designated nuclear materials, as assigned. For its assigned nuclear materials the LMMO, consistent with guidance and direction from the NMID, must:
- (1) Implement and administer a program to integrate and coordinate planning for the production, stabilization, recovery, management, storage, consolidation, or disposition of designated nuclear material(s).
 - (2) Review DOE Field Elements' material forecasts, validate programmatic requirements with responsible DOE Headquarters organizations and coordinate with the NMID to resolve any issues. Provide consolidated material forecast report for their designated materials to the NMID.
 - (3) Prepare material-specific management plans if requested by the NMID. Review site NMMPs for assigned materials. If requested by the NMID, review national strategic plan with respect to assigned materials.
 - (4) Evaluate storage and disposition options for technical feasibility, cost-effectiveness, and support of programmatic requirements.
 - (5) Develop storage and disposition recommendations for materials with No Defined Use in coordination with the appropriate DOE Field Elements, headquarters organizations, and the NMID.
 - (6) Facilitate review of site plans for acceptance, retention, use, or disposition of Defined Use and No Defined Use materials.
 - (7) Coordinate evaluation of disposition opportunities for No Defined Use materials prepared by sites and programs.

- (8) Execute sales contracts and loan/lease agreements in coordination with other DOE offices as appropriate.
- (9) Facilitate the recovery, storage, and consolidation or disposition of nuclear material from U.S. colleges/universities and other domestic and foreign private entities or government agencies that possess DOE-owned or U.S.-origin nuclear materials obtained under DOE contract or loan/lease agreement. Likewise, facilitate the recovery, storage, and consolidation or disposition of non-U.S.-origin nuclear materials provided to DOE by mutual agreement for management or disposition.
- (10) Conduct or review and evaluate analytical studies related to their assigned material(s) and prepare plans for implementation of results as appropriate.
- (11) Coordinate, procure, and make settlement for non-DOE-owned nuclear materials that are required to meet DOE's programmatic needs or mission.
- (12) Monitor and ensure that DOE-owned nuclear material inventories are effectively utilized, including Restricted Use and National Asset materials.
- (13) Supplement DOE's requirements for programmatic nuclear material by coordinating the recovery of excess or scrap nuclear material. Execute contracts for commercial processing as required.

m. Chief Financial Officer.

- (1) Acknowledge assets and liabilities of nuclear materials on the Department's financial statements. The CFO will consult with the Office of Nuclear Energy regarding the market value of nuclear materials.
- (2) Provide the NMID, DOE Headquarters organizations, and DOE Field Elements with a listing of B&R code changes for the upcoming fiscal year.

n. Contracting Officer. Once notified that this Order is applicable, incorporates the CRD (Attachment 1) into affected contracts.

- 6. INVOKED STANDARDS. This Order does not invoke any DOE technical standards or industry standards as required methods. Note: DOE O 251.1, current version, provides a definition for "invoked technical standard."
- 7. DEFINITIONS. Definitions of commonly used terms are provided in Attachment 6, and acronyms are provided in Attachment 7.
- 8. REFERENCES.
 - a. DOE O 470.4A, *Safeguards and Security Program*, current version, which establishes the roles and responsibilities for Safeguards and Security for nuclear materials.

- b. DOE Manual 441.1-1, *Nuclear Material Packaging Manual*, current version, which provides criteria for packaging nuclear materials.
 - c. DOE O 534.1B, *Accounting*, current version, which prescribes the requirements and responsibilities for accounting and financial management.
 - d. “Memorandum of Agreement for Control of Surplus Highly Enriched Uranium (HEU) and Plutonium (Pu),” May 18, 2000. [Authorized by Nuclear Weapons Council, approved by the President, concurrence by the Office of Defense Programs (DP), Office of Nuclear Nonproliferation (NN), the Office of Nuclear Energy and Technology (NE), and Office of Environmental Management (EM).]
 - e. “Memorandum of Agreement for Implementation and Control of Surplus Highly Enriched Uranium (HEU) Removed from Use of Fissile Material for Nuclear Weapons,” March 1, 2006. (Concurrence by NN, DP, NR, and NE.)
 - f. P.L. 83-703, *Atomic Energy Act of 1954*, as amended codified at 42 U.S.C. §§ 2011–2286i, 2297f–2297g-4.
9. CONTACT. Questions concerning this Order should be addressed to the Office of Nuclear Materials Integration (NMID), (202) 586-5272.

BY ORDER OF THE SECRETARY OF ENERGY:



JAMES P. DANLY
Deputy Secretary

ATTACHMENT 1
CONTRACTOR REQUIREMENTS DOCUMENT
DOE ORDER 410.2A, MANAGEMENT OF NUCLEAR MATERIALS &
STRATEGIC PLANNING

This contractor requirements document (CRD) establishes the requirements for Department of Energy (DOE) and National Nuclear Security Administration (NNSA) contractors awarded contracts involving the management of nuclear materials. Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this CRD and flowing down CRD requirements to subcontractors at any tier to the extent necessary to ensure contractor compliance.

As directed by the contracting officer, the contractor must meet the following requirements:

1. Designate a senior representative to serve as the contractor's primary point of contact on nuclear materials issues, facilitate the performance of nuclear materials management responsibilities, and coordinate nuclear materials management activities with their responsible DOE Field Element, the Office of Nuclear Materials Integration (NMID), and appropriate DOE Headquarters organizations.
2. Conduct nuclear materials management activities in such a manner as to ensure the safe and secure packaging, storage, stabilization, and consolidation or disposition of nuclear materials as directed by the responsible DOE Field Element.
3. Prepare and submit Nuclear Materials Allotment Forecast Reports for the contractor's site by June 15 each year, in accordance with section 2 of Attachment 3 and guidance from its responsible DOE Field Element and the NMID.
4. Receive material allotments from the NMID through the DOE Field Element prior to utilization of nuclear materials. DOE Field Elements may approve material allotments for limited quantities of nuclear materials based on guidance from the NMID.
5. Prepare NMMP for materials under the contractor's control in accordance with section 2 of Attachment 4 and programmatic requirements from applicable DOE Headquarters organizations. Submit to the NMID through the responsible DOE Field Element by June 30 each year using the prior fiscal year's Nuclear Material Inventory Assessment (NMIA) data.
6. Through the responsible DOE Field Element, submit to the NMID by January 31 each year, an NMIA based on inventories as of September 30 of the prior year.
7. Submit data for other inventory reports as requested by the responsible DOE Field Element and the NMID.
8. Transfer nuclear materials as provided in the DOE programmatic guidance for production, research and development, consolidation or disposition, and other purposes.

9. Support the contractor's responsible DOE Field Element in the operation and management of lead materials management organizations (LMMOs) as may be assigned for designated nuclear materials to ensure that integrated processes and procedures are developed and implemented for management and consolidation or disposition of each designated nuclear material.
10. Conduct or contribute to analytical studies and plans in response to guidance from its responsible DOE Field Element, the NMID, and DOE Headquarters organizations.
11. As directed by its responsible DOE Field Element and in coordination with the cognizant DOE Headquarters organizations and the Office of Health, Safety and Security, provide site-specific nuclear materials inventory data to authorized external stakeholders.
12. As directed by the contractor's responsible DOE Field Element, evaluate nuclear material liabilities and assets for acknowledgement on the Department's financial statements.
13. As directed by the contractor's responsible DOE Field Element, coordinate with appropriate DOE Headquarters organizations to ensure that project numbers for nuclear materials are established, reported, and deactivated in accordance with guidance from the NMID. Update project numbers to reflect B&R code changes for the upcoming fiscal year by October 1.
14. As directed by its responsible DOE Field Element and in coordination with appropriate DOE Headquarters organizations, support the development and reporting of nuclear materials integration and consolidation or disposition performance metrics to the NMID.
15. Document and maintain characterization data to support safe management, storage, consolidation, and disposition of nuclear materials. Request guidance and support, as appropriate, from the responsible DOE Field Element for consolidation or disposition of nuclear materials.
16. Recommend Defined Use or No Defined Use designations for all materials under its control. Provide justification in the Nuclear Materials Management Plan (NMMP) for materials designated as Defined Use under its control. Develop disposition plans or options for materials designated as No Defined Use and provide recommendations to the responsible DOE Field Element and the NMID.
17. Manage Restricted Use materials according to the restrictions in governing agreements or obligations.
18. Manage and store National Asset materials, as assigned.

ATTACHMENT 2
CALENDAR OF EVENTS FOR SIGNIFICANT ACTIONS

Projected Month-Day	Action
January 31	Department of Energy (DOE) Field Elements provide Nuclear Material Inventory Assessment (NMIA) report to the Nuclear Material Integration Division (NMID).
January 31	The NMID provides guidance to the DOE Field Elements for nuclear material management plan (NMMP) preparation.
January 31	The NMID provides guidance to the DOE Field Elements for preparation of the nuclear materials allotment forecast.
June 15	DOE Field Elements provide allotment forecast reports to the appropriate lead material management organizations (LMMOs) and to the NMID.
Within 90 days of submission of NMIA	The NMID completes the NMIA and provides feedback to the DOE Field Elements and material-specific data to appropriate DOE Headquarters organizations and LMMOs.
June 30	DOE Field Elements provide NMMP to the NMID.
July 31	LMMOs, as designated, provide consolidated allotment forecast reports for their assigned materials to the NMID and appropriate DOE Headquarters organizations.
August 31	The NMID provides guidance to the DOE Field Elements for NMIA preparation.
September 1	DOE Headquarters organizations and the NMID review the DOE Field Element allotment forecasts and resolve any issues between programs and sites regarding the Forecast.
September 15	The NMID issues Allotments to the DOE Field Elements prior to the utilization of nuclear materials.
September 30	Applicable LMMOs, as designated, issue Material-Specific Management Plans for their assigned materials upon request by the NMID.
October 1	DOE Field Elements ensure all project numbers are updated to reflect valid budget and reporting codes.

ATTACHMENT 3

MATERIAL FORECAST AND ALLOTMENT REPORTING

1. GENERAL. The utilization of nuclear materials involves major expenditures and long lead times. The objective of the material allotment forecast is to document anticipated programmatic actions related to nuclear materials, and to request DOE Headquarters' allotment for the utilization of a quantity of nuclear materials in DOE programs and for other DOE customers. The 5-year material allotment forecast report complements but does not replace the need for shipping and receiving projections, the supply and demand analyses included in nuclear material management plans (NMMPs), or other longer-range studies of nuclear materials requirements.
2. PREPARATION OF MATERIAL FORECASTS. Material forecasts will be submitted in a format provided in annual guidance and will include projections for the next 5 years (the upcoming fiscal year plus 4 years). Unless otherwise amended or exempted in the NMID's annual guidance, material forecasts must include the following:
 - a. Requests for a quantity of material to support programmatic requirements.
 - b. Transfers of nuclear materials that must be forecasted that are:
 - (1) Transfers of material ownership between DOE programs (both intra-site and inter-site), such as transfers from DP to naval reactors.
 - (2) Transfers of material into a material disposition program or project.
 - (3) Transfers related to mutual defense agreements between the U.S. and other countries.
 - (4) Transfers related to research reactors and foreign and domestic customers.
 - (5) Transfers of material to a commercial processor for recovery or down-blending.
 - c. Procurements of nuclear materials.
 - d. Changes in status of nuclear materials that must be forecast:
 - (1) Down-blending of national security highly enriched uranium.
 - (2) Isotopic blending of weapons-grade plutonium to produce a non-weapons-grade assay.

ATTACHMENT 4 MATERIALS MANAGEMENT PLANS (MMPS)

1. GENERAL. Materials management planning requires annual evaluations of current and projected mission needs; material characterization/identification; material packaging, storage, and disposition; and impacts on site and Department of Energy (DOE) operations and budgets. The efficient utilization of resources to meet DOE objectives requires an understanding of site-specific, materials-specific, and complex-wide perspectives. This attachment provides direction for the uniform preparation of the field nuclear material management plan (NMMP), materials-specific management plans, and a national strategic plan for nuclear materials management.
2. SITE NUCLEAR MATERIALS MANAGEMENT PLANS.
 - a. NMMPs will cover nuclear materials activities for the current year and a minimum of 5 years.
 - b. Plans will address.
 - (1) Site inventory, including projected shipments and receipts, and any off-site inventory for which the site is responsible.
 - (2) Program requirements that reflect supply and demand analysis.
 - (3) Justification for retention of Defined Use materials.
 - (4) Status of disposition and processing plans for No Defined Use materials.
 - (5) Identification of Restricted Use materials.
 - (6) Technical considerations, including facility capabilities, utilization, and the need for new production, processing, and storage facilities.
 - (7) Packaging and shipping projections and resources.
 - (8) Barriers, issues, integration opportunities, accomplishments and recommendations.
3. MATERIAL-SPECIFIC MANAGEMENT PLANS. If requested by the Nuclear Material Integration Division (NMID), material-specific management plans will be developed for assigned nuclear materials by the applicable lead material management organization based on requirements determined by the NMID in coordination with appropriate DOE Headquarters organizations. These material-specific management plans may use information provided in the NMMPs. Unresolved issues will be addressed in the following year's management plans.

If requested, material-specific management plans will be required annually by September 30 for materials designated by the NMID.

4. DOE NATIONAL STRATEGIC PLAN FOR MANAGEMENT OF NUCLEAR MATERIALS. The NMID and the Nuclear Materials Advisory Board will coordinate the development of a national strategic plan for nuclear materials management. The national strategic plan will integrate key features of the site NMMPs and material-specific plans, as appropriate. It will identify material and infrastructure requirements, issues, and integration opportunities and recommend alternatives for future action.

ATTACHMENT 5 INVENTORY MANAGEMENT

1. GENERAL. This attachment provides additional information related to the management of nuclear material inventories, including project numbers, storage and disposition, Defined Use/No Defined Use materials, Restricted Use materials.
2. PROJECT NUMBERS. Nuclear materials under the jurisdiction of this Order will be categorized using the assignment of an appropriate project number to each inventory record. Department of Energy (DOE) Field Elements will ensure project numbers are established for all DOE-owned nuclear materials under their control. Project numbers identify the DOE Headquarters organizations and Field Elements with programmatic responsibility and allow sites to consistently manage nuclear materials based on material characteristics, programmatic requirements, classification, and other considerations such as budget and reporting (B&R) codes. Project numbers will be consistent with B&R codes found on the U.S. DOE Office of the Chief Financial Officer web site, <https://www.energy.gov/cfo/office-chief-financial-officer>, to allow DOE Headquarters organizations to identify and evaluate funding needs for nuclear materials management.
3. STORAGE AND DISPOSITION. Storage and disposition are major functions required to implement life-cycle management of nuclear materials. At least annually, and consistent with guidance from the Nuclear Materials Integration Division (NMID), DOE Headquarters organizations that manage any of the special nuclear materials the responsible DOE Field Element, nuclear materials will be evaluated for future use, storage, or disposition.
 - a. Storage methods and systems will comply with DOE Orders, standards, criteria, and facility-specific authorization bases. Storage consolidation for improved security and cost effectiveness will be considered in nuclear materials management planning. Characterization data will be linked to existing nuclear material packages to assure safe storage and/or shipment. Detailed packaging requirements are found in DOE Manual 441.1-1, *Nuclear Material Packaging Manual*. (Additional guidance may be provided by the NMID.)
 - b. Disposition is the process of preparing for and/or placing nuclear materials in their life-cycle end state. Disposition is essential for sites to support ongoing and future nuclear materials missions by removing unneeded materials. Disposition may include consumption in DOE or non-DOE programs, transfer or sale to domestic or foreign programs, or disposal as waste.

4. DEFINED USE/NO DEFINED USE MATERIALS. Sites will categorize all nuclear materials as Defined Use or No Defined Use based on programmatic requirements and guidance from DOE Headquarters organizations, to identify materials available to meet mission needs, determine storage requirements, and support disposition planning. This information is collected annually in the Nuclear Materials Inventory Assessment.
 - a. Defined Use materials are nuclear materials that are actively being used by a program or being held for future programmatic use including strategic reserve and National Asset materials. Defined Use may also include materials that require processing or materials suitable for storage that are compatible with the site's missions.
 - b. No Defined Use materials are nuclear materials that are not actively being used by any program and are not being held for future programmatic use. No Defined Use may include materials that are being stabilized for discard, materials that may require processing, or materials suitable for storage pending future disposition.
5. RESTRICTED USE MATERIALS. Restricted Use materials are nuclear materials that are governed by domestic or foreign agreements or obligations that restrict the reuse of the materials for specific purposes, most commonly restricting nuclear materials from utilization in nuclear weapons programs. Examples include, but are not limited to:
 - a. Foreign Obligation Materials are nuclear materials received or returned from foreign entities that are governed by processing/use restrictions. Bulk special nuclear material or tritium may be governed by restrictions on the use of the materials in nuclear weapons programs.
 - b. International Atomic Energy Agency (IAEA) Safeguarded Materials are specific nuclear materials that have been offered for safeguarding by the IAEA. In general, restrictions are imposed only on the total quantities declared by the U.S. for current or potential future safeguarding.
 - c. Excess/Surplus Material Declarations are quantities of highly enriched uranium (HEU) and plutonium that the U.S. declared to be permanently unavailable for nuclear weapons programs. This includes the Surplus Fissile Materials Baseline for the 1994 Declarations and the 2005 Excess HEU Declaration. Future declarations of withdrawals from national security weapons programs will follow similar guidelines.

ATTACHMENT 6 DEFINITIONS

The following definitions are provided for the purpose of defining the use and meaning of certain words and terms as they apply to this Order and Attachments.

1. Accountable Nuclear Material. Nuclear materials as defined in Department of Energy (DOE) Manual 470.4-6, *Nuclear Material Control and Accountability*, Table I-1.
2. Canned Subassembly. Complete hermetically sealed weapons component.
3. Consolidation. Reconfiguration of nuclear materials storage within the DOE complex to improve security and cost effectiveness, and for other appropriate reasons as determined by DOE.
4. Defined Use. Nuclear material that is actively being used by a DOE program or being held for future programmatic use including strategic reserve and National Asset materials. Defined Use may also include material that may require processing or material suitable for storage that is compatible with the site's mission(s).
5. Depleted Uranium. Uranium containing less of the fissile isotope uranium-235 than the naturally occurring distribution of uranium isotopes (less than 0.71% by weight).
6. Discard Limit. A threshold quantity of nuclear material below which the material may be discarded as waste. The discard limit for a specific nuclear material may be a function of the material quantity, form, concentration, location, and other factors.
7. Disposal. Emplacement of waste in a manner that assures isolation from the biosphere with little or no maintenance and with little or no intent of retrieval, and which requires deliberate and detectable action to gain access after emplacement.
8. Disposition. The process of preparing for and/or placing nuclear materials in their life-cycle end state. Disposition may include consumption in DOE or non-DOE programs, transfer or sale to domestic or foreign programs, storage, or disposal as waste.
9. Down-blending. Intimate mixing of enriched uranium or plutonium with blend material to reduce the enrichment of the product material.
10. Enriched Uranium. Uranium containing a higher concentration of the fissile isotope U-235 than normal uranium (i.e., higher than 0.71% U-235).
11. Excess. Fissile materials that have been declared under U.S. policy to be permanently withdrawn from use in nuclear weapons, or nuclear materials that have been approved by a DOE Headquarters organization to be withdrawn from use in national security weapons-related activities.
12. 2005 Excess Declaration–E05. Approximately 200 metric tons of HEU removed from any future use as fissile material for nuclear warheads in October 2005. This is in addition to the approximately 174.3 metric tons of HEU included in Surplus Fissile Material–S94.

13. Excess to National Security. Nuclear materials that are no longer needed to support current or future national security requirements.
14. Field Element. Includes all of the DOE-designated operations offices, site offices, and other offices such as the Naval Reactors Laboratory Field Offices.
15. Fissile Material. Material capable of undergoing fission by interaction with slow neutrons (uranium-233, uranium-235, plutonium-239, and plutonium-241).
16. Foreign Obligation. Nuclear materials from foreign entities that are governed by processing/use restrictions.
17. Headquarters Organization. Includes all DOE or NNSA headquarters organizations, whether programmatic or administrative.
18. Highly Enriched Uranium. Uranium enriched to at least 20% by weight in the fissile isotope uranium-235.
19. International Atomic Energy Agency (IAEA). A United Nations agency established in 1957 to promote the peaceful use of nuclear energy and to inhibit its use for military purposes. DOE interacts with IAEA on U.S. application of specific IAEA programs and initiatives.
20. Irradiated Nuclear Material. Nuclear material that has been subjected to a form of nuclear irradiation that consequently delivers an external radiation dose requiring special containment and handling.
21. Lead Materials Management Organization (LMMO). A DOE Headquarters organization or Field Element designated by Nuclear Material Integration Division (NMID) to develop plans, integrate, conduct special studies, and coordinate the management, safe and secure packaging, storage, stabilization, and consolidation or disposition of specific nuclear materials.
22. Life-cycle Management. All activities related to the acquisition/production, general characterization, utilization, recycle, storage, and disposition of DOE-owned or DOE-managed accountable nuclear materials.
23. Low-Enriched Uranium. Uranium enriched to less than 20% by weight in the fissile isotope uranium-235.
24. Material Allotments. Quantities of nuclear materials that have received DOE Headquarters' approval for a DOE Field Element to utilize such materials for a specific purpose or to dispose of such materials.
25. Material Allotment Forecasts. Projections of nuclear material requirements, transfers, or change in status for existing and planned project use or disposition.

26. Material Management Plan. Periodic evaluation of current and projected mission needs; material characterization/identification; material packaging, storage, and disposition; and impacts on site and DOE operations and budgets. The three levels of material management plans addressed in this Order include nuclear material management plans to be prepared by the sites, material-specific management plans to be prepared by the applicable LMMO, and the DOE National Strategic Plan for Management of Nuclear Material to be prepared by the NMID and the Nuclear Materials Advisory Board.
27. National Asset Material. A nuclear material that has no current programmatic use but that is judged to be unique or difficult to reproduce, and that is set aside because of a significant chance that it will be required for future programmatic use.
28. National Environmental Policy Act. A United States statute that was signed into law on January 1, 1970, to establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes. This Act may be cited as the *National Environmental Policy Act of 1969*.
29. National Security Materials. Nuclear materials, including Strategic Reserves, which are designated for use by the National Nuclear Security Administration (NNSA) for weapons-related or Naval Reactors support. [As a result of the 2005 Excess Declaration (E05), Naval Reactor support will come from excess (E05) material in the future.]
30. Natural Uranium. Uranium as found in nature containing about 0.71% of the fissile isotope U-235.
31. No Defined Use. Nuclear material that is not actively being used by a DOE program and not being held for future programmatic use.
32. Non-DOE-Owned. Nuclear material not owned by DOE; e.g., material owned by a commercial firm or another government agency.
33. Normal Uranium. Uranium containing about 0.71% of the fissile isotope uranium-235 by weight. Normal uranium may include uranium as found in nature (natural uranium) and uranium reconstituted to have the same uranium-235 concentration as natural uranium.
34. Nuclear Materials. A collective term for materials designated in this Order. For information, these materials are americium-241, americium-243, californium, curium, deuterium, enriched lithium, neptunium-237, plutonium-238, plutonium-239–241, plutonium-242, thorium, tritium, depleted uranium, normal uranium, enriched uranium, and uranium-233.
35. Nuclear Materials Advisory Board. DOE Headquarters-level board organized and led by the NMID and consisting of a senior representative from each DOE Headquarters organization that manages nuclear materials and other functional experts as determined by the Director of the NMID.

36. Nuclear Materials Management and Safeguards System. The national database and information support system for nuclear materials regulated by the U.S. Government, created to support national safeguards and management objectives in the domestic and foreign utilization of nuclear resources. The system stores data on nuclear material transactions and inventories, and produces a wide range of reports.
37. Nuclear Materials Integration Division. Established office in NNSA responsible for nuclear materials management policy, guidance, and integration of DOE complex-wide management, consolidation, and/or disposition of nuclear materials.
38. Pit. Complete hermetically sealed weapons component.
39. Project Number. A 10-character alphanumeric description that identifies nuclear materials for tasks or phases of work assigned to a DOE Headquarters organization and Field Element.
40. Reserve. A quantity of nuclear material set aside for a specific reason, such as a strategic reserve for defense applications or a programmatic reserve for an identified program use.
41. Restricted Use. Nuclear material governed by domestic or foreign agreements or obligations that restrict the use of the material to a specific purpose, most commonly restricting nuclear material from utilization in nuclear weapons.
42. Special Nuclear Material. Plutonium, uranium-233, uranium enriched in the isotope 235, and any other material, which pursuant to 42 United States Code 2071 (§ 51, as amended, of the *Atomic Energy Act of 1954*), has been determined to be special nuclear material, but does not include source material; or any material artificially enriched by any of the foregoing, not including source material.
43. Storage. The operations by which nuclear material is retained and secured with the intent of retrieval for processing, use, or disposition.
44. Supply and Demand Analysis. Evaluation of current inventory quantity and characteristics against identified program needs, including material for reserves, over a given time frame. These analyses identify potential need for production or acquisition to meet programmatic requirements.
45. Surplus Nuclear Material. Nuclear materials that are excess to national security and have no DOE programmatic use.
46. Surplus Fissile Materials Baseline. A process used to track U.S. policy for the removal of plutonium and HEU from potential use in weapons programs, based on material quantities declared surplus by the Nuclear Weapons Council in 1994. A similar process is also applied to separate tracking and reconciliation for additional excess materials declared at later dates, including a 2005 declaration of additional HEU and future U.S. declarations.
47. Unirradiated Nuclear Material. Nuclear material that has not been irradiated in a nuclear reactor or accelerator, or if it has been irradiated, does not require special equipment or handling.

48. Very Highly Enriched Uranium. Uranium enriched to more than 94%, by weight, in the fissile isotope uranium-235.
49. Waste. Radioactive solid, liquid, or gaseous material of negligible programmatic and/or economic value and having a documented waste declaration.
50. Weapons-Grade Plutonium. Plutonium containing less than 7%, by weight, of the isotope plutonium-240 and not qualifying for tracking as plutonium-238 or plutonium-242. A similar, but separate definition is used in certain international nonproliferation activities, where the boundary is raised to less than a ratio of 0.10 between isotopes plutonium-240 and plutonium-239.

ATTACHMENT 7
ACRONYMS

B&R	budget and reporting
CFO	Chief Financial Officer
CRD	Contractor Requirements Document
DP	Office of Defense Programs
DOE	Department of Energy
EM	Office of Environmental Management
HEU	highly enriched uranium
IAEA	International Atomic Energy Agency
LEU	low-enriched uranium
LMMO	Lead Materials Management Organization
MMP	Materials Management Plan
NE	Office of Nuclear Energy
NEPA	National Environmental Policy Act
NMAB	Nuclear Materials Advisory Board
NN	Office of Nuclear Nonproliferation
NNSA	National Nuclear Security Administration
NMIA	Nuclear Materials Inventory Assessment
NMMP	Nuclear Materials Management Plan
NMMSS	Nuclear Materials Management and Safeguards System
NR	Office of Naval Reactors
NRC	Nuclear Regulatory Commission
NMID	Office of Nuclear Materials Integration

P.L.	Public Law
PVD	Programmatic value determination
SC	Office of Science