

Management Control Procedure

Material Acceptance for Storage



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Materials and Fuels Complex	Management Control Procedure	USE TYPE 3	eCR Number: 607402
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Manual: MFC RSWF Operating Instructions

REVISION LOG

Rev.	Date	Affected Pages	Revision Description
0	10/21/02	All	New issue.
0a	07/31/03	All	Change.
0b	10/31/05	1–5 and 8–11	Change.
1	04/11/07	All	See DAR 509834. Revised.
2	08/30/07	5, 11-13 and 15	See eCR 551557. Revision.
3	12/13/07	4-6, 9, and 11-15	See eCR 555260 and 556395.
4	06/11/09	All	See eCR 569493. Revision.
5	04/08/10	15	See eCR 577281. PFC.
6	06/25/10	8 and 14	See eCR 580339. Revision.
7	08/23/12	All	See eCR 593575. SAR-407 implementation and periodic review.
8	04/09/13	All	See eCRs 607402. PFC.

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1. PURPOSE/SCOPE

To specify requirements and provide instructions for accepting mixed waste (MW), radioactive waste, and radioactive material (e.g., spent nuclear material, accountable material) for storage at Radioactive Scrap and Waste Facility (RSWF).

Specifically, this procedure defines the waste acceptance criteria (WAC) for shipment/transfer of MW, radioactive waste, and radioactive material to RSWF. Waste to be received from all generators must comply with this criteria. To the extent possible, the WAC for RSWF complies with the WAC for various treatment or disposal facilities that could be the ultimate destination of the waste. Since there is not a disposal facility with waste acceptance criteria for some of the types of waste stored at RSWF, compliance with this procedure does not ensure compliance with all transport systems or treatment/disposal facility acceptance criteria.

2. GENERAL

RSWF is located a half mile northeast of the main Materials and Fuels Complex (MFC) site.

RSWF is a Hazard Category-2 nonreactor, nuclear facility. This determination is based upon the conservative estimate of the maximum waste/material inventory in the facility and DOE-STD-1027-92; "Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports." As defined in the DOE Standard, Hazard Category-2 facilities have the potential for significant on-site consequences. While much of the material has undergone radioactive decay during storage at RSWF, and transfers of materials in and out of the facility result in frequent changes to the overall inventory, the total activity associated with the RSWF remains significant. In addition to the radioactive material quantity, the inventory of fissionable material at RSWF also presents the potential for an inadvertent nuclear criticality due to the presence of greater than 700 g of U-235, and greater than 450 g of Pu-239, on an aggregate as well as a liner basis. Therefore, the RSWF is a Hazard Category 2 nuclear facility based on both radionuclide and fissionable material quantities. The Hazard Category 2 designation was also substantiated by the results of the accident analysis in the upgraded safety basis (SAR-407).

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The wide variety of waste/material that can be stored at RSWF makes it a unique and important facility for the INL. The RSWF is presently authorized by DOE and/or DEQ to store the following types of remote-handled (RH) radioactive waste, mixed waste, nuclear materials, and radioactive materials:

- Radioactive Wastes (As defined by DOE Order 435.1 and applicable facility acceptance criteria)
 - Remote-Handled Low-Level Waste (RH-LLW)
 - RH-Transuranic Waste (RH-TRU).
- Mixed Waste (MW) (i.e., material that is radioactive and contains a hazardous constituent as defined in the Code of Federal Regulations [CFR], Title 40, “Protection of Environment,” Part 261, “Identification and Listing of Hazardous Waste”)
 - RH-Mixed Low-Level Waste (RH-MLLW)
 - RH-Mixed Transuranic Waste (RH-MTRU).
- Radioactive/Nuclear Materials
 - EBR-II Sodium-Bonded Spent Nuclear Fuel (SNF)
 - Sodium-Bonded SNF from other DOE Reactors
 - Carbide, Nitride, and Oxide SNF from other DOE Reactors
 - Remote-Handled Accountable Materials (e.g., plutonium, uranium, depleted uranium, etc.)
 - FCF Process Materials (hulls/plenums, electro-refiner salts, uranium product).

RSWF is subject to the requirements of the Hazardous Waste Management Act (HWMA)/Resource Conservation and Recovery Act (RCRA), applicable DOE orders, and INL documents. These requirements and regulations are contained in and/or implemented by the following documents:

- PER-116, “HWMA RCRA PARTIAL PERMIT MATERIALS AND FUELS COMPLEX EPA ID NO. 4890008952”
- INL/INT-08-14180, “Criticality Safety Evaluation for the — Radioactive Scrap and Waste Facility (MFC-771)”

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- LST-391, “Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List”
- SAR-407, “Safety Analysis Report for the Radioactive Scrap and Waste Facility (MFC 771)”
- TSR-407, “Technical Safety Requirements for the Radioactive Scrap and Waste Facility (MFC 771)”
- RSWF-OI-005, “Nuclear Material Control Plan”
- SAR-413, “Safety Analysis Report for Inter-Facility Transfers at MFC”
- TSR-413, “Technical Safety Requirements for Inter-Facility Transfers at MFC.”

3. ADMINISTRATIVE CONTROLS

- 3.1 For waste and material packaged in Hot Fuel Examination Facility (HFEF) or Facility Conditioning Facility (FCF) that is to be stored in RSWF, the waste-characterization data package must be provided to the Treatment, Storage and Disposal (TSD) Shift Supervisor (SS) and TSD Facilities Manager for review and approval **prior to** placing the inner can into the outer can.
- 3.2 For each container to be stored in RSWF, documentation supporting waste characterization by process knowledge or detailed chemical and physical analysis must be assembled into a waste-characterization data package and filed with the RSWF operating records. Data-package information must include a detailed list of the contents and signatures (or initials) of the individuals who loaded the cans. A waste-characterization data package must include the following:
- An RSWF Material Acceptance Checksheet (see Appendix A)
 - Appropriate Safeguards documentation (for accountable material)
 - Additional documentation (e.g., analysis results, calculations, copies of procedures) as needed to show compliance with the requirements for the waste/material to be stored
 - Integrated Waste Tracking System (IWTS) Container Profile.

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- 3.3 Waste-characterization data submitted to profile a waste stream must be sufficient to allow evaluation of the waste and constituents against acceptance and storage requirements. All necessary supporting data must be included, as determined by the SS, to allow full evaluation for waste-stream approval.
- 3.4 The TSD Facilities Environmental Lead/Staff Specialist must indicate by review of the waste-characterization data package, the material is acceptable for storage at RSWF by signing the RSWF Material-Acceptance Checksheet and through electronic approval on the IWTS container profile (applies to waste only).

4. WASTE CHARACTERIZATION, CERTIFICATION, AND VERIFICATION

4.1 General Waste-Packaging Requirements

- 4.1.1 All material packaged for RSWF must be placed in a container system that provides at least double containment. The outer container (payload container) must have a mechanism on its cover (e.g., an eye bolt) to which a cable can be attached to allow the container to be lowered into an RSWF liner.
- 4.1.2 Generators of the material to be stored in RSWF are responsible to ensure that the outer container is contamination free before it leaves their facility.
- 4.1.3 Waste <1,000 R/hr must be placed in up to three 45-gal containers or a Sodium-Loop-Safety-Facility (SLSF) inner waste can. One SLSF inner can or three 45-gal containers, containing the same category of waste, must be placed in an SLSF outer waste can. (Note: *Empty 45-gal cans may be used to complete the loading of an SLSF outer waste can.*) Waste <1,000 R/hr may also be placed in an HFEF-5 can configuration.
- 4.1.4 Waste $\geq 1,000$ R/hr must be placed in an HFEF-5 can configuration.
- 4.1.5 Newly generated waste and material should be segregated into different inner waste cans as follows:
- 4.1.5.1 Metallic sodium waste separated from other mixed waste whenever possible to facilitate future treatment.
 - 4.1.5.2 LLW separated from TRU.
 - 4.1.5.3 Irradiated hardware separated from other waste.
 - 4.1.5.4 HLW separated from LLW and TRU.

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- 4.1.5.5 FCF Product/Material separated from Waste.
- 4.1.5.6 EBR-II SNF from other DOE SNF.
- 4.1.6 To prevent the need for repackaging, RSWF management should be contacted when questions regarding proper segregation arise during packaging of waste destined for RSWF.
- 4.1.7 A detailed description of the physical waste form and the percentage of each must be provided (e.g., angle iron, lathe, pump, motor, wrench, wood, flux wire, high-efficiency-particulate-air [HEPA] filter, met samples, plastic, glass, irradiated or unirradiated stainless steel).
- 4.1.8 A detailed chemical characterization of the material must be provided (e.g., stainless steel, aluminum, copper, Portland cement, ion-exchanger resin).
- 4.1.9 A listing of the radioisotopes, in curies and gram quantities, that contribute up to 95% of the radioactive hazard for the payload container must be identified and added to the waste characterization data package.
- 4.1.10 The amount of transuranic isotopes (in nanocuries per gram of waste) must be documented on the Radioactive Scrap and Waste Storage/Disposal Request and Authorization (see RSWF-OI-001, "Storage Operations," Appendix A).

4.2 RSWF-HWMA/RCRA Part-B Permit Requirements

NOTE: *RSWF is a RCRA-permitted facility. Permit criteria that the generator must implement are listed below.*

- 4.2.1 Waste must be compatible with the container and the other waste within the container.
- 4.2.2 No free liquids (including NaK or Mercury) are allowed in newly received waste.
- 4.2.3 A maximum of 53,000 gallons of mixed waste is allowed for storage at anytime.
- 4.2.4 Only the following EPA Hazardous waste codes can be received at RSWF:
- D001: Ignitability
 - D003: Reactivity

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- D004: Arsenic
- D005: Barium
- D006: Cadmium
- D007: Chromium
- D008: Lead
- D009: Mercury (mercury-contaminated solid waste only)
- D010: Selenium
- D011: Silver.

- 4.2.5 Any underlying hazardous constituents (UHCs) also present in the waste must be identified if above the universal treatment standards found in 40 CFR 268.48.
- 4.2.6 The hazardous constituents of all material must be quantified (e.g., 100 g of sodium, 300 mg/l of cadmium, 200 lb of lead). Characterization data will be documented by the generator/owner on the INL Integrated Waste Tracking System (ITWS) Material and Waste Characterization Profile (or equivalent).
- 4.2.7 IWTS data (or equivalent) describing each waste's physical, chemical, and radiological properties must be provided to the TSD Facilities Manager for review and approval. All sections of the form must be completed and each blank on the form addressed.

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4.3 Criticality-Hazard-Control-Related Requirements

TSR-407, AC 5.407.6A

4.3.1 FISSIONABLE MATERIAL storage and handling shall be conducted in accordance with a contractor-approved list that establishes specific limits for controlled parameters as derived from applicable criticality safety evaluations (CSEs). The contractor-approved list that addresses FISSIONABLE MATERIAL storage and handling shall provide the following specific details:

- Approved FISSIONABLE MATERIAL storage and handling configurations with the following details, as applicable
 - FISSIONABLE MATERIAL quantity (mass or item)
 - FISSIONABLE MATERIAL configuration and/or PACKAGE requirements
 - Liner and cask limits.
- Applicable CSEs.

4.3.2 Fissionable material storage and handling shall be performed at RSWF in accordance with the liner and cask limits documented in LST-391, “Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List.”

4.3.3 RSWF fissionable material quantities and configuration and/or packaging shall comply with controls identified in LST-391, “Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List.”

TSR-407, AC 5.407.6B

4.3.4 RSWF liners shall be installed with sufficient spacing, at least 4 inches, between adjacent liners.

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4.4 Nuclear-Material-Control-Plan-Related Requirements

NOTE 1: *The RSWF Nuclear Material Control Plan contains the nuclear safeguards requirements applicable to RSWF.*

NOTE 2: *RSWF is a Category-II material balance area (MBA). The Safeguards Department is responsible for the MBA; however, the facility loading the containers to be stored at RSWF is responsible for segregating waste and scrap material into different storage containers and for compliance with RSWF-OI-005 and LRD-11500, "INL Nuclear Material Management Control and Accountability."*

- 4.4.1 The highest amount of nuclear material (e.g., thorium, ^{237}Np , depleted uranium, normal uranium, enriched uranium, ^{233}U , ^{235}U , and plutonium) to be placed in an individual storage liner cannot exceed a Category-II limit.
- 4.4.2 Storage of additional unirradiated special nuclear material (SNM) is not allowed.
- 4.4.3 Safeguards personnel must determine the attractiveness level of the material to be stored at RSWF and record it on the RSWF Material Acceptance Checksheet. The Safeguards Representative (SR) must review the information on the RSWF Material-Acceptance Checksheet and generate the applicable transfer document to ensure the accountability criteria have been met.
- 4.4.4 Safeguards documentation (for storage or retrieval) must be completed and accompany all transfers of nuclear material to or from RSWF.
- 4.4.5 All SNM nuclear material transferred to RSWF must be identified by radionuclide and SPM batch number.

4.5 Inter-Facility Transfer Safety Document Requirements

TSR 413 AC 5.413.1

The proposed transfer of a Hazard Category 3 or greater payload must be approved, as indicated by being listed on LST-337, "Approved Container/Payload List for Inter-Facility Transfer Operations at MFC."

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5. REFERENCES

INL/INT-08-14180, "Criticality Safety Evaluation for the — Radioactive Scrap and Waste Facility (MFC-771)"

LST-337, "Approved Container/Payload List for Inter-facility Transfer Operations at MFC"

LST-391, "Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List"

LWP-1202, "Records Management"

PER-116, "HWMA RCRA PARTIAL PERMIT MATERIALS AND FUELS COMPLEX
EPA ID NO. 4890008952"

Resource Conservation and Recovery Act (RCRA)

RSWF-OI-001, "Storage Operations"

RSWF-OI-005, "Nuclear Material Control Plan"

SAR-407, "Safety Analysis Report for the Radioactive Scrap and Waste Facility
(MFC 771)"

SAR-413, "Safety Analysis Report for Inter-Facility Transfers at MFC"

TSR-407, "Technical Safety Requirements for the Radioactive Scrap and Waste Facility
(MCF 771)"

TSR-413, "Technical Safety Requirements for Inter-Facility Transfers at MFC"

6. APPENDIX

Appendix A, RSWF Material Acceptance Checksheet

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Appendix A

RSWF Material Acceptance Checksheet

SECTION 1 — WASTE/MATERIAL DESCRIPTION AND INFORMATION			
Originating Facility:		Date:	
Facility process knowledge contact:		Expected transfer date:	
Waste/Env process knowledge contact:		Container ID Number:	
Container and Contents Information			
Inner container type:	<input type="checkbox"/> FSC <input type="checkbox"/> FIFSC <input type="checkbox"/> BSC <input type="checkbox"/> S/A Basket <input type="checkbox"/> Other (describe below)		
Inner container(s) description:			
Outer (payload) container type:	<input type="checkbox"/> Gasketed inner can <input type="checkbox"/> Welded outer can <input type="checkbox"/> Other (describe below)		
Outer (payload) container description:			
Payload identified in LST-337:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Contents			
Type(s):	<input type="checkbox"/> MW <input type="checkbox"/> LLW <input type="checkbox"/> SPENT FUEL <input type="checkbox"/> ACCOUNTABLE MATERIAL <input type="checkbox"/> TRU <input type="checkbox"/> HLW		
Source:			
Detailed physical description and chemical characterization including weights (lb) and volumes (gal) (attach additional pages as necessary):			
Requirement-Compliance Checklist			
			Initials
Requirement-Related Information for all types of Waste/Material			Generator/ Requester
All material packaged in double containment with a mechanism on the outer container lid for attaching a lifting cable:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Outer container is contamination free.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Outer container is welded.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Radioisotope inventory (in curies and gram quantities [where applicable]) attached:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Inventory of transuranic isotopes calculated in nCi/g of waste:	(_____ nCi/g)		

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Requirement-Related Information for all types of Waste/Material		Initials	
		Generator/ Requester	TSDF SS
Copy of waste can loading log attached:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Thermal load:	W		
Material has been properly segregated:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Material is stored in compliance with LST-391, "Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List" requirements:	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Waste container contains no free liquids	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Requirement-Related Information for MW			
Applicable EPA Hazardous waste codes: _____ / _____ / _____ / _____ / _____ _____ / _____ / _____			
Verify EPA Hazardous waste codes written down above by generator are the same EPA Hazardous waste codes identified in the IWTS profile(s) provided by the generator and that the EPA Hazardous waste codes meet acceptable EPA Hazardous waste codes for RSWF documented below.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
RSWF Acceptable EPA Hazardous Waste Codes	Ignitable	Reactive	Toxic
	D001	D003	D004 – D011
Generator's Hazardous Waste/Material Profile and Container Sheets completed and attached:	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
IWTS Material Profile Number			
IWTS Container Profile Number			
Site Treatment Plan Waste Stream ID Number			
Requirement-Related Information for LLW			
LLW approved by DOE-ID for storage longer than one year.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Requirement-Related Information for Accountable Material			
Type of accountable material:	<input type="checkbox"/> SNF <input type="checkbox"/> Accountable material		
Special nuclear material (SNM) does not exceed limit for Category II:	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
Attractiveness level (determined by Safeguards):			

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Storage method for SNM fuel in element form:			
Safeguards documentation completed:	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
For each inner container, all SNM has been identified by radionuclide and batch number:	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		

TSR 407 AC 5.407.6

The material/waste to be stored at RSWF complies with the requirements of LST-391, "Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List."

TSD Shift Supervisor		Date:	
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The material/waste to be stored at RSWF complies with the requirements of LST-391, "Radioactive Scrap and Waste Facility (MFC-771) Criticality Control List" and is approved for transfer from a criticality standpoint. (The FMH and CSO signatures cannot be made by the same person.)

RSWF CSO		Date:	
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Accountable material meets the requirements of the RSWF Nuclear Material Control Plan.

Safeguards Representative		Date:	
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SECTION 2 — TSD FACILITIES ENVIRONMENTAL LEAD/STAFF SPECIALIST REVIEW

The waste-characterization data package has been reviewed and meets the waste and environmental requirements of this procedure.

TSD Staff Specialist		Date:	
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SECTION 3 — FCF/TSD FACILITY MANAGER REVIEW AND APPROVAL

Based upon generator-supplied information and its compliance with the RSWF WAC, the material is approved for storage at RSWF.

FCF/TSD Facilities Manager		Date:	
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