

High-Level Radioactive Waste Requirements and Interactions

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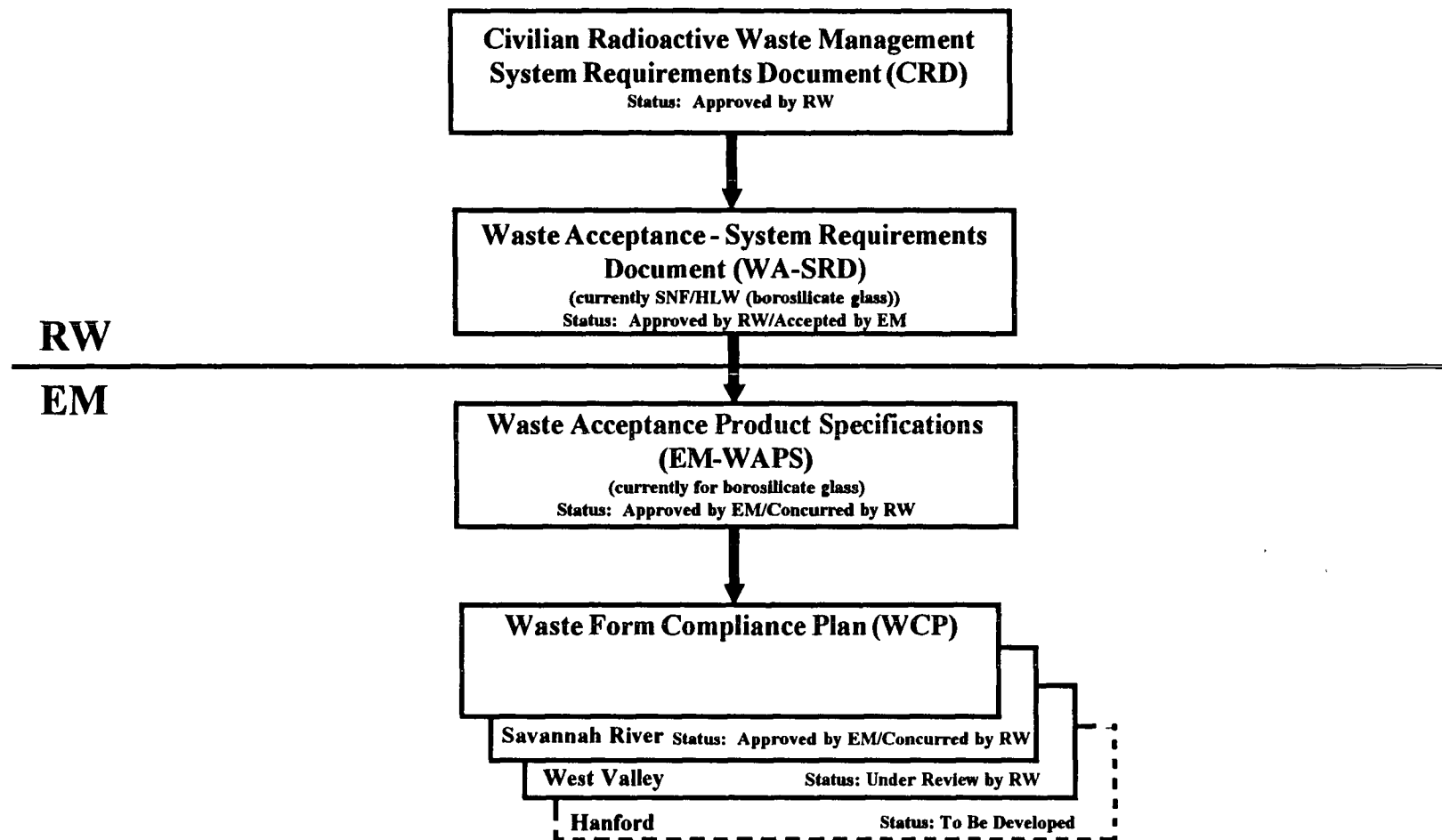
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Purpose

- **To provide an overview of:**
 - **Relationship between Environmental Management (EM) and Office of Civilian Radioactive Waste Management (RW) High-Level Waste Acceptance Technical Baseline Documents**
 - **Interactions between EM and RW to develop and control the Waste Acceptance Process**

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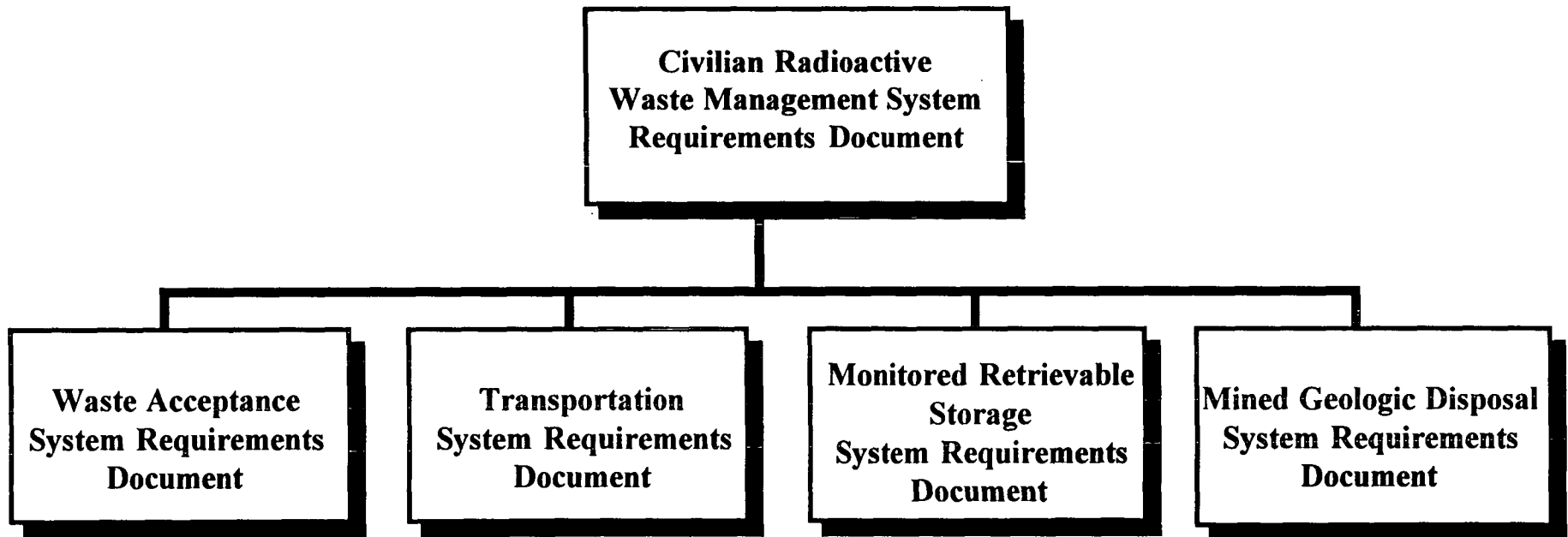
Waste Acceptance Technical Baseline Documents*



(* Must be developed and controlled in accordance with the offices' respective QA and Baseline Change Control Procedures

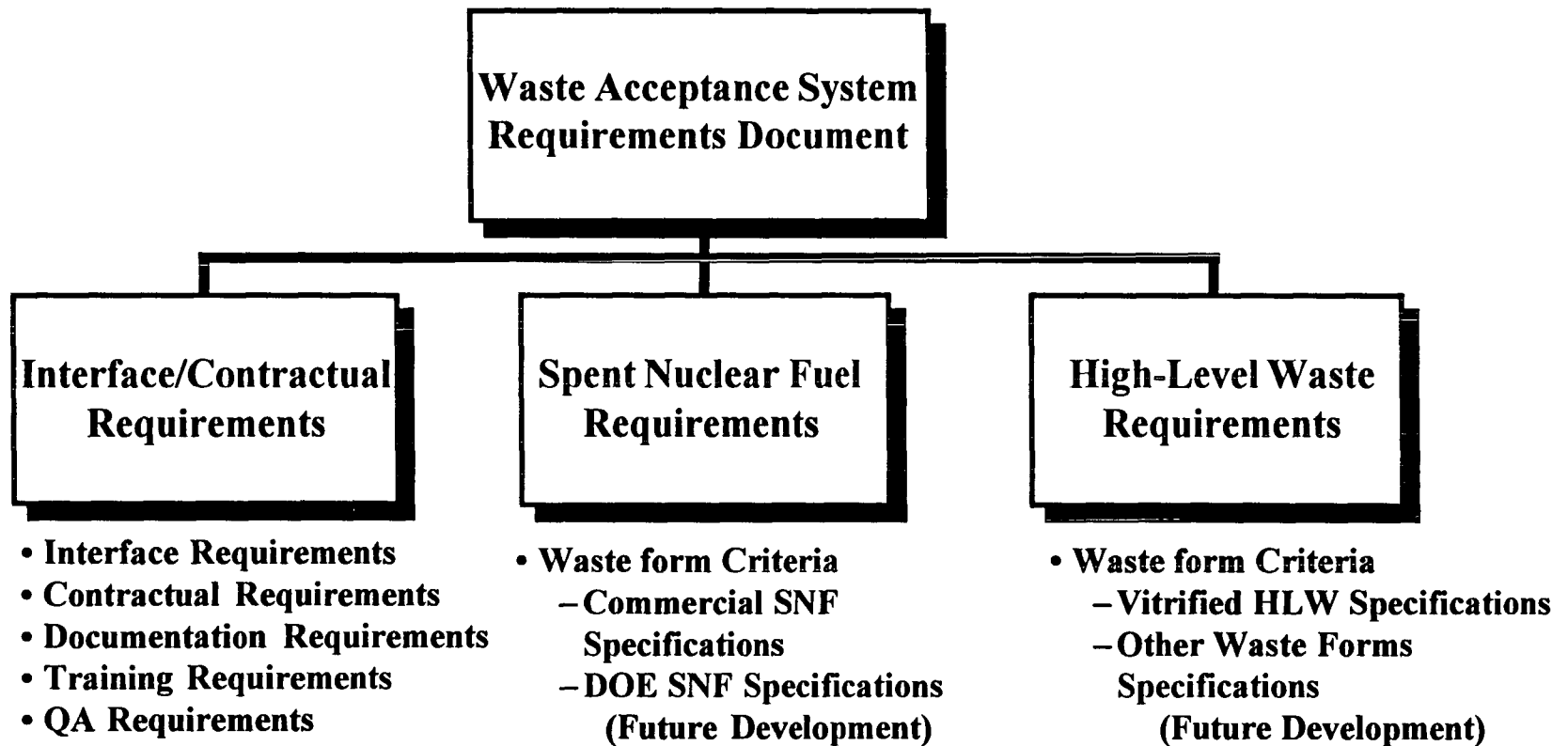
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Office of Civilian Radioactive Waste Management Requirements Hierarchy



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OCRWM Requirements in Waste Acceptance System Requirements Document



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High-Level Waste (HLW) Acceptance Requirements (WA-SRD)

- **Vitrified HLW Minimum Acceptance (10 CFR 60.135)**
 - **Waste shall be in solid form**
 - **Waste forms shall be consolidated**
 - **Combustible wastes shall be reduced to non-combustible forms**
 - **Waste forms shall not contribute to free liquids**
 - **Waste forms shall not contain explosives, pyrophoric, or chemically reactive materials**

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HLW Acceptance Requirements

Continued

Vitrified HLW Standard Form Criteria

- Borosilicate glass in austenitic stainless steel canister
- Length: 3.000m (+0.005, -0.020m)
- Diameter: 61.0cm (+1.5, -1.0cm)
- Weight: \leq 2500kg
- Fill Height: \geq 80% volume of empty canister
- Heat Generation: \leq 1500 watts per canister at the year of shipment
- Temperature: \leq 400°C during storage so that glass transition temperature is not exceeded
- Leak Rate: \leq 10^{-4} atm.cc/sec at 25° C

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HLW Acceptance Requirements

Continued

Requirements to Report:

- Chemical composition
- Canister material and fabrication
- Radionuclide inventory

Vitrified HLW Requirements:

- Criticality safety
- Waste form-material compatibility
- Phase stability and integrity
- Hazardous waste determination
- Product consistency test

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HLW Acceptance Requirements

Continued

Canister Requirements:

- Canister impact characteristics
- Canister label requirements
- Canister handling features

Canistered Vitrified HLW Requirements:

- Dose rate at shipment
- Removable radioactive contamination on canister
- Canister physical condition at delivery
- Canister contents after closure

Other Requirements:

- Records requirements
- Nonconforming and nonstandard waste delivery
- Quality assurance requirements

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EM Waste Acceptance Product Specification (WAPS)

- **Translates RW WA-SRD requirements into an EM-controlled document**
- **Identifies HLW technical specifications**
- **Provides waste acceptance requirements to EM waste form producers**
- **Tailored specifically for vitrified borosilicate glass (currently being used by Savannah River and West Valley)**

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EM Waste Form Compliance Plan (WCP)

- **Outlines plan for compliance with each WAPS specification.**
- **Identifies compliance strategies**
 - Tests
 - Analyses
 - Process controls
- **Identifies records required as objective evidence of compliance**

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EM-RW Memorandum of Agreement (MOA) High Level Waste Acceptance Technical Baseline

April 4, 1994

- **Control of HLW Technical Baseline Documents**
 - RW: CRD and WA-SRD
 - EM: WAPS and WCP
- **Review of Technical Baseline Documents**
 - EM has participated in technical reviews of RW documents
 - RW is a member of the EM Waste Acceptance Technical Group
- **Participation in each other's change control process**
 - EM and RW have membership on corresponding Change Control Boards
- **EM participation in RW Interface Control Working Group meetings**
 - Waste acceptance issues
 - Technical input
 - Identify agenda items
- **Quarterly RW/EM waste acceptance issues meeting**

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EM-RW Interactions DOE Spent Nuclear Fuel (SNF)

- **MOA similar to HLW Waste Acceptance Technical Baseline - to be developed**
- **RW supporting EM DOE SNF meetings**
- **RW reviewed the Draft DOE SNF Quality Assurance Program Description Document**
- **RW reviewed the Draft DOE Spent Fuel Program Plan**

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HLW Acceptance Sensitivities

Assessment Planned by the OCRWM M&O Contractor

Purpose and Scope

- **to identify CRWMS alternatives associated with the acceptance, transportation, and disposal of defense and commercial high level wastes (HLW) in glass/ceramic form**
- **to quantitatively assess design, operational, and cost impacts on the CRWMS of:**
 - **number of HLW canisters**
 - **size of the Hanford HLW canisters**
 - **HLW pickup schedule for sites**

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Summary

EM-RW have established a close working relationship to develop, control, and resolve waste acceptance requirements and issues.

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