



Idaho National Laboratory

# **DOE Waste Forms Compliance Process Development**

**Henry Loo  
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# Purpose

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- ▶ **To identify repository safety basis/requirements and what is required of the sites to show compliance**
- ▶ **HLW materials have the WAPS, WCP, and WQR**
- ▶ **This exercise mainly covers the DOE SNF**
  - **Repository safety basis compliance for HLW will also be reviewed to ensure that there are no surprises**

# Who, How, and When

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- ▶ **NSNFP staff drafted a compliance process**
- ▶ **Meeting will be held with all parties involved - DOE EM, NSNFP, sites, RW, and others as needed**
  - **The meeting will also ensure the process is consistent with RW's Technical Requirements Manual**
- ▶ **The plan is to have draft process to all parties in October, meetings to start in November**

# Drafted Compliance Process

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- ▶ **Use submitted LA as basis**
- ▶ **Extract the repository LA statements that apply to DOE materials**
- ▶ **Bin the statements**
  - Safety bases
  - Interfaces
  - Legal/regulatory
  - Safeguard and security
- ▶ **Show how each of the LA requirements will be complied with hardware, processes, and/or information**

# Examples – Compliance Process

| Source Document | Section & Page             | LA Statement  | Statement Bin                    | Compliance category                  |
|-----------------|----------------------------|---|----------------------------------|--------------------------------------|
| SAR 1.9 Rev 0   | Table 1.9-1, page 1.9-25   | <b>Component:</b> DOE Standardized Canister and HLW canister<br><b>Preclosure classification:</b> ITS   | <b>Safety basis</b>              | <b>Hardware category</b>             |
| SAR 1.9 Rev 0   | Table 1.9-10, page 1.9-145 | <b>SSC:</b><br>HLW<br><b>Procedural safety control:</b><br>The individual radionuclide inventories per HLW canister are limited to the values presented in the Section 1.8 consequence analysis.<br><b>Basis:</b><br>Table 1.8-5 provides the radionuclide inventories. This control ensures that the dose consequences from Category 2 event sequences involving HLW are within the values presented in Tables 1.8-30 and 1.8-31.<br><b>LA section describing implementation:</b><br>1.5.1.2.1.4 | <b>Procedural safety control</b> | <b>Information category</b>          |
| SAR 1.9 Rev 0   | Table 1.9-8, page 1.9-115  | <b>SSC:</b> Neutron absorbers<br><b>Safety classification:</b> ITWI<br><b>Barrier function:</b> Reduce probability of criticality<br><b>Relevant design parameter:</b> See Waste Acceptance System Requirements Document  | <b>Safety basis</b>              | <b>Hardware and Process category</b> |

# Examples – Compliance Process

| Source Document                      | Section & Page         | LA Statement  | Statement Bin    | Compliance category  |
|--------------------------------------|------------------------|---|------------------|----------------------|
| SAR 1.2.1 Rev 0                      | 1.2.1.4, Page 1.2.1-12 | Prior to SNF or HLW arriving at the repository, a number of notifications are exchanged between the repository and the waste generators. These notifications allow the repository operators to prepare for the incoming material. Prior to receiving waste at the repository, loading plans are prepared that address the handling activities, buffering and staging of waste packages, TAD canisters, SNF assemblies, and canisters for the transfer of SNF and HLW. | Interface        | Information category |
| SAR 1. Rev 0                         | 1., Page 1-2           | Commercial SNF comprises approximately 63,000 MTHM of the anticipated maximum repository inventory of 70,000 MTHM. DOE SNF comprises approximately 2,268 MTHM, naval SNF comprises approximately 65 MTHM (for a total DOE allotment of 2,333 MTHM), and HLW comprises the balance of approximately 4,667 MTHM. (Note: SAR Section 1.2.1.1.2, Page 1.2.1-3 which defines each HLW canister contains 0.5 MTHM.)   | Legal/regulatory | Information category |
| General information sections 1 Rev 0 | GI 1.1.3.1, Page 1-12  | <p>The six configurations are as follows:</p> <ul style="list-style-type: none"> <li>•21-PWR/44-BWR TAD waste package</li> <li>•5-DHLW/DOE Short Codisposal</li> <li>•5-DHLW/DOE Long Codisposal</li> <li>•2-MCO/2-DHLW</li> <li>•Naval Short</li> <li>•Naval Long.</li> </ul> <p>The SNF and HLW transfer system and the waste package closure system are described in SAR Section 1.2.</p>  | Descriptions     | NA                   |

# Examples – Compliance Process

| Source Document | Section & Page               | LA Statement  | Statement Bin     | Compliance category |
|-----------------|------------------------------|---|-------------------|---------------------|
| SAR 1.2.4 Rev 0 | 1.2.4.2.2.1.3, Page 1.2.4-20 | <p>ITS SSCs in the CRCF canister transfer subsystem that are similar to those used in other handling facilities are described below.</p> <p>Defense Waste Processing Facility/Idaho National Laboratory HLW Canister Grapple—The Defense Waste Processing Facility/Idaho National Laboratory HLW canister grapple is used by the canister transfer machine to lift canisters from transportation casks and place them within waste packages or into staging racks. This grapple uses three lifting jaws, equally spaced, to engage a canister. This grapple has a mechanical jaw actuation mechanism with a double setdown safety release feature. The grapple lifting feature interfaces with the canister transfer machine canister grapple. When not in use, this canister grapple rests in the stand located in the canister transfer machine maintenance area. The Defense Waste Processing Facility/Idaho National Laboratory HLW canister grapple has a lifting capacity of 5 tons. This grapple is used in the IHF and CRCF. Figures 1.2.4-43 and 1.2.4-44 provide details of the equipment. The logic diagram for the Defense Waste Processing Facility/Idaho National Laboratory and West Valley Demonstration Project/Hanford HLW canister grapple is shown in Figure 1.2.4-45. The logic diagram applies to the IHF and the CRCF.</p> | RW responsibility | NA                  |

# Examples – Compliance Process

| Hardware | Compliance by   | Value   |
|----------|---|---|
| Canister | Certifying that DOE SNF/HLW have been placed into canister designed and built (as an example, per ASME Section III Div 1 or Div 3) in accordance to approved drawings, specification and N-stamped (if required). | Canister fabrication data package:<br>CMTR, weld and NDE records, shop traveler, etc. |

| Process   | Compliance by showing   | Values  |
|-----------|---|---|
| Packaging | DOE SNFs and HLW are package per approved procedures that have steps to exclude foreign materials. The procedures also have control, accountability logs, and inspections that will limit unauthorized materials entry into the canister. | NA  |
| Drying    | DOE SNF canister dried per approved drying procedure  | Drying record:<br>XX torr,<br>Holding time,<br>Rebound test, etc. |

# Does the proposed process helpful to sites

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- ▶ **What other additional discussion would help the sites to**
  - better plan for spent fuel packaging
  - better plan for interim storage and monitoring
  - better plan for data package preparation for each canister
- ▶ **Are there other topics the sites want to see discuss?**
- ▶ **Other ideas?**

# Summary

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- ▶ **DOE sites will need to show compliance to the repository requirements**
- ▶ **With the submittal of the LA, now is the time to develop a process to show or verify compliance**
- ▶ **A compliance process is in development**
- ▶ **Such compliance process should help the sites plan for packaging and/or data package preparation**