

Configuration Management History Report for the RH LLW Disposal Facility Project

Project File: 31055

March 2018



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CONFIGURATION MANAGEMENT HISTORY REPORT FOR THE RH LLW DISPOSAL FACILITY PROJECT

1. Overview and Background

This document outlines and summarizes the configuration management process used for the RHLLW Disposal Facility design and turnover to operations in support of process readiness reviews.

The project was originally solicited as a design-build-operate contract, but awarded as a design-build project only to Areva Federal Services in 2014.

The RHLLW requirements were captured in two documents: 1) SPC-1437, Design-Build-Operate Performance Specification for the Remote-Handled Low-Level Waste Disposal Project; and 2) TFR-483, Technical and Functional Requirements for the Remote-Handled Low-Level Waste Disposal Project. TFR-483 and SPC-1437 outlined the requirements for the facility and SPC-1437 documented additional requirements regarding quality, design, and construction for the design-builder.

A Code of Record (COR) was generated during conceptual design and updated during final design to document the design-basis codes and standards (INL/EXT-10-20044).

2. Quality Assurance

SPC-1437 required the Subcontractor to follow their own company NQA-1 quality program for design and construction. Areva submitted their Quality Program as part of the bid proposal, which included design process procedures and subsequently submitted a Project Quality Program Plan through the Vendor Data System after award (VDR-579192). BEA quality performed periodic audits of the Areva quality process during design and construction. Construction quality inspection of safety SSCs was performed by independent inspection agencies and documented in the vault and CVAS data packages and submitted to BEA for approval through the INL Vendor Data System. There are 15 general data packages that cover vault material receipt and inspection logs. Each vault component has a data package that includes certificates of conformance from the fabricator (Oldcastle), the inspection agency (MTI), shop acceptance forms, crack/repair records, concrete batch tickets, and compressive strength test data. The BEA review of the data packages consisted of a review by a third party quality assurance subcontractor to ensure accuracy and completeness.

3. Design Configuration Control Process

Areva created specifications (SPC), calculations (CALC), engineering information records (EIR), test plans and reports (TEST), and drawings (DRAW) in accordance with their NQA-1 quality program plan and procedures to meet the design requirements found in SPC-1437 and TFR-483. See Appendix A for a list of design documents generated for the RHLLW Disposal Facility.

Verification that the design met the TFR and SPC-1437 requirements was accomplished through design review. A preliminary review (60%) kickoff was held on November 3, 2014 for the specifications, calculations, drawings, engineering information records, and test plans included in the review scope. The review was conducted using the BEA electronic change request (eCR) review system. Comments and resolutions for the preliminary review are included in eCR 627027 as "Review Number 1." A final design review (90%) kickoff was held on December 10, 2014 for the final design deliverables. The review process used the electronic eCR system to track comments, resolutions, and acceptance. DOE review of the design documentation was completed in March 2015, with authorization granted to proceed with infrastructure construction received on March 26, 2015 (INL-15-051). Several outstanding comments related to the vault system/cask-to-vault adapting structure design remained to be resolved. Following BEA review of updated vault system/cask-to-vault adapting structure design documentation, the vault system/cask-to-vault adapting structure design documentation was provided to DOE for review in July

2015. Comments from DOE were resolved and final submittal of the vault system/cask-to-vault adapting structure design documentation was completed in August 2015. DOE provided acceptance of the final design on September 4, 2015 (CCN 236501). BEA review documentation is maintained as project records in the eCR system. DOE comments and resolutions pertaining to the design review are maintained as project records.

The Areva engineering deliverables were given INL document numbers and entered into the EDMS system as SPC, ECAR, TEV, and PLN documents. Areva RHLLW drawings were given INL drawing numbers and placed in EDMS with full revision history. The vendor data required by each specification was entered into the INL Vendor Data System for BEA information or BEA mandatory approval.

In accordance with LWP-10501, the engineering design control process was documented in seven Engineering Jobs (EJs) to ensure that documentation for completing engineering design project was tracked and documented properly prior to turnover to the receiving organization. Systems included in each EJ were organized based on quality level, safety SSC designation, or location. They include:

- EJ-1682, RHLLW Disposal Facility Vaults – scope includes the precast concrete RHLLW vaults and vault plugs.
- EJ-1727, RHLLW Disposal Facility Ancillary Equipment – scope includes the cask-to-vault adapting structures (CVAS) and the NuPac 14-210L alignment guide
- EJ-1683, RHLLW Disposal Facility Infrastructure – scope includes necessary features to support the disposal vault system, such as sitework (grading drain septic system, roads), security and safeguards (fences and controlled entry equipment), and buildings (administration building, maintenance building).
- EJ-2282, RHLLW Disposal Facility Mobile Gantry Crane – scope includes the RHLLW mobile gantry crane
- EJ-8.13-45/1840, RHLLW/ATR Underground Utilities – Potable Water – scope includes the potable water piping within the ATR Complex and the tie-in to the existing ATR Complex potable water system
- EJ-8.5-156/1679, RHLLW/ATR Underground Utilities – Electrical and Communications – scope includes the electrical and communications distribution within the ATR Complex and the tie-in to the existing ATR Complex electrical and communication systems
- 8.4-86/1678, RHLLW/ATR Underground Utilities – Firewater – scope includes the fire water piping within the ATR complex and the tie-in to the existing ATR Complex fire water system.

3.1 Design and Construction Change Control

Areva performed design change control in accordance with their Quality Program, and included Engineering Change Notices (ECN) and Field Change Notices (FCN). Areva submitted drafts and final versions of ECN/FCN changes to BEA for review. The final ECN/FCN changes were officially approved via the BEA Construction Field Problem/Change (CFP) process. The CFP records include email approvals from the Design Authority and SMEs as appropriate. After a set number of ECN/FCNs, the Areva QPP required a revision to the engineering document. The document revisions incorporating the ECN/FCN changes also followed the same draft review and CFP approval process.

3.2 Vault Prototype Testing

The fit-up inspection requirements were validated by fabricating a prototype and testing the fit-up of each vault designs and the two CVAS's (PLN-5463, RHLLW-TEST-00012-002). The prototype test reports for each vault design and the fit-up CVAS test reports are available in the vendor data system.

3.3 Construction and Fabrication Nonconformances

Nonconformances to the design specifications or drawings resulted in either an Areva Nonconformance Report (NCR) or Supplier Nonconformance Report (SNR). Areva evaluated and dispositioned the nonconforming condition and submitted the draft SNRs/NCRs to BEA for review. The final SNR/NCR was submitted through the INL Vendor Data System for final approval by the RHLLW Design Authority and subject matter experts as applicable.

3.4 Unreviewed Disposal Question Evaluation Process for Design and Construction (UDQE)

In addition to design authority and SME review and approval of design changes, the Unreviewed Disposal Question Evaluation (UDQE) process established a formal process for screening and evaluating the potential impact of design changes, new information, or newly discovered conditions on facility performance (environmental, nuclear safety, and safeguards and security). The process ensured that information, assumptions, and results delineated in facility long-term performance, nuclear safety, and safeguards and security documentation remain valid or required to be addressed through further evaluation. When a change/new information/discovery had the potential to affect the vault performance assessment, safety basis, or vulnerability and physical protection assessment, a UDQE was generated to screen and evaluate the impacts in accordance with MCP-4058.

4. Construction Turnover

Construction turnover was performed in accordance with the BEA process outlined in MCP-7460, “Project Turnover and Acceptance, and Closeout.” The MCP-7460 process transfers all operations, maintenance, and control responsibilities from the project to the owner or Facility Manager. Additionally, it includes the steps necessary to achieve Critical Decision (CD)-4 and close out the project. Form 432.04 was used to document and effect the final inspection between the Subcontractor and the Facility Manager. Signature of the form documents that all contractual obligations have been satisfied and the construction subcontract work is accepted by the Facility Manager.

Steps in the turnover process included spare parts and consumables identification; determination of functional or integrated testing requirements; identification of operating and maintenance procedures to be created; identification of life safety or emergency preparedness plans to be created or updated; and security plans or procedures to be created or updated for the project. During construction completion, the previously identified tests were performed and documented in the vendor data system; and maintenance procedures, life safety, emergency preparedness, and security plans were prepared. Spare parts and consumables were ordered and stocked. Operator and maintenance training was performed.

Punch list walkthroughs for functional areas were performed (life safety/fire protection, environmental, rad con and safety and operations) and punch lists were created for Subcontractor resolution. Outstanding vendor data submittals were completed and submitted. After the punch list and outstanding vendor data items were resolved, Form 432.04 was used for final transfer of the project construction scope. No post-turnover testing was identified for this project.

5. Operations Configuration Management

In accordance with LWP-10500, “Managing the Configuration of Structures, Systems, and Components,” the project system engineer created a Configuration Management Plan as documented on Form 431.500-1. Drawings designated as Essential were as-built and verified and released in EDMS. Preventative maintenance justifications, model work orders, spare parts lists, and maintenance instructions were created as required for the project.

6. Operations Readiness Core Requirements (CR)

6.1 CR-8 Configuration Management

6.1.1 Requirement 1

The facility systems and procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, accident analyses, and assumptions included in the safety documentation.

Response:

Several processes ensure that the safety documentation reflects the facility configuration, including the CFP process, which requires Nuclear Safety review when applicable, and the UDQE process, which ensures that new information or changes to the original design is reviewed by nuclear safety personnel.

Supporting Objective Evidence:

MCP-4058, Unreviewed Disposal Question Evaluations (UDQE)

Project UDQE records

CFP records

6.1.2 Requirement 2

A formal program is defined and implemented to control facility modifications. Authorized modifications within the scope of the Readiness Review have been completed and fully closed.

Response:

A company-wide formal program is defined and implemented to control facility modifications. Engineering Job forms were filled out for the project to control the facility modification process. The EJs are in process and will be closed prior to the MSA.

Supporting Objective Evidence:

EJ Records

6.1.3 Requirement 2

Ensure that engineering documentation, construction through startup/operations, is in place and supports maintenance, operations, and surveillances.

Response:

Engineering documentation required for facility configuration management is documented on Form 431.500-1, "System Configuration Management Plan," and the EJ form. The project as-built drawings and EJs are in process and will be complete by the MSA.

Supporting Objective Evidence:

Form 431.500-1, "System Configuration Management Plan"

EJ Records

Appendix A

RHLLW Disposal Facility Design Documents

RHLLW DISPOSAL FACILITY DESIGN DOCUMENTS

