DOE-ID NEPA CX DETERMINATION
Idaho National Laboratory

CX Posting No.: DOE-ID-INL-16-070

SECTION A. Project Title: Hot Fuel Examination Facility (HFEF) 1M Window and Tank Unit Replacement

SECTION B. Project Description and Purpose:

Window 1M at the Hot Fuels Examination Facility (HFEF) has an oil leak from the window tank unit through the A-slab seal. In addition, a lead sheet has fallen from the upper window frame and is hanging with one end free. A drip system has been installed to collect oil leakage. Replacement of the window and tank unit is needed.

All main floor cell windows in HFEF have a hinged protection plate (A), commonly referred to as the A-slab, installed from the hot side. The A-slab was originally equipped with a secondary-seal assembly located between the glass and the liner flange. In 1975, the seal design was changed. The bolts for compressing the seal were changed from ferry head (12 point head) cap screws to socket head cap screws. The secondary seal was replaced with a dust seal. This change involved relocating the seal from the glass surface to the window frame. In the dust seal design, the gasket was removed and the argon gas from the leak monitoring system purges the cavity between the A-slab and B-slab. This change alleviated concerns of over-pressurization of the A-slab due to heating of trapped gasses between the A- and B-slabs. In the dust seal design the gases between the A-slab and B-slab are not in a sealed space but float with purge pressure and leakage to the cell through the dust seal.

The dust seal is an elastomer with a lead sheet backing. The lead sheet interfaces with the window liner flange. The dust seal arrangement allows for leakage around the glass/packing/lead sheeting and is not recognized as a seal which can be relied upon for the cell boundary. If the tank unit is removed, the A-slab must be removed and transferred to the High Radiation Area (HRA). The dust seal is removed and a secondary seal is installed. The A-slab is reinstalled and once the secondary seal is established then the window tank unit can be removed.

The tank unit is supported near the cold end to prevent cantilevering the weight of the tank from the window-liner flange to which the tank is bolted. During installation, a machine-leveling jack was placed under the support leg and adjusted to carry half the load. After installation and leak-check of the seals, the remaining annular space between the tank and window liner was carefully filled with a low-strength concrete grout.

The oil reservoir (mounted on the operating corridor wall above the window) has a sight gauge with a capacity of about 1.6 gal of mineral oil. Argon gas is piped into the free-air space in the top of the reservoir to prevent air from coming in contact with the window oil.

The argon purge is connected through a series of passages drilled through the window liner flange. For the A-slab this purge purges the cavity space between the A- and B-Slab and flows out around the dust seal and slab mounting into the main cell or through the packed lead wool/lead sheets holding the A-slab in position. For the primary seal, the purge pressurizes the space between the two contact points on the H shaped seal. The arrangement only purges one side of the seal.

The proposed action would design a new A-slab window to establish a secondary seal boundary with the ability to control oil accumulation between the B-slab and the A-slab. The old A-slab window would be removed from the frame, refurbished and mounted in a new frame for future use. The window tank unit would also be replaced to minimize down time while the old tank is refurbished. The refurbished tank would also be saved for future use.

In order to complete the proposed action, the following activities would occur:

Phase 1 - A-Slab Replacement

Phase 1 performs the design, fabrication and installation of a new A-slab for window 1M. The following activities are associated with Phase 1:

- Development of a specification for design/build of the new A-slab frame assembly and associated seals.
- Development of a torque application method tooling for installation of the new A-slab. This requires testing in mockup for development.
- Development of transfer stands (based on current designs) for transfer of the new A-slab.
- Development of tools for jacking the window, as necessary, for bolt alignment. (Finalization of this will occur in mockup during qualification testing.)
- Development of qualification plans, procedures, drawings, and Configuration Management (EJ) paperwork.
- Removal of the old A-slab from the existing frame, decontamination and packaging for shipping to the fabricator for refurbishment and installation in the new frame.
- Packaging of tooling and transfer stands for future use or disposal.

Phase 2 - Window Tank Unit Replacement

Phase 2 performs the design, fabrication and installation of a new tank unit. The following activities are associated with Phase 2:

- Development of a specification for design/build of the new tank unit
- Perform load analysis to support removal of the window tank unit and transfer of the window tank unit to the truck lock (the window tank unit is approximately 12,500 lb)
- Perform/verify seismic analysis of the tank unit

- Perform design activities for the removal and installation of interferences, and facility preparations associated with the tank unit installation (e.g., wall and floor anchors)
- Design of temporary in-cell shielding
- Development of qualification plans, procedures, drawings, safety reviews, implementation reviews, and Configuration Management paperwork
- Fabrication of the replacement tank unit by a subcontractor
- Fabrication of the in-cell temporary shielding
- Assembly and removal of the in-cell temporary shielding
- Permanent removal of electrical interferences which are no longer required (Interbuilding-Cask [IBC] Cask blower controls and Cooling Grapple Controls)
- Temporary removal of electrical interferences (panel boards, crane/electro-mechanical [EM] control station, operator alert station)
- Installation of concrete anchors in the cell wall and corridor floor to support activities
- Preparation of transfer path from window 1M to the truck lock
- Relocation of radiation sources in-cell
- Installation of temporary shielding in-cell
- Replacement of the window tank unit (requires facility shutdown and securing radioactive source movements) as follows:
    - Removal of grout around window
    - Removal of existing tank unit
    - Cleanup window opening
- Repair/Replacement of purge lines to liner flange (embedded in grout)
- Installation and leak test of the new tank unit
- Installation of new grout around the window.
- Removal of the in-cell temporary shielding
- Re-installation of electrical components removed for work
- Removal of equipment for work performance
- Repainting of affected areas.

The removed tank unit will be decontaminated to levels for shipping and receiving and crated for shipping and storage.

Stabilization of the oil leak would occur by methods such as covering the B-slab end.

Phase 3 - Window Tank Unit Refurbishment
Phase 3 performs the refurbishment of the window tank unit. The following engineering activities are associated with Phase 3:

- Development of a specification for refurbishment of the tank unit
- Refurbishment of the existing tank unit for future use in all Type A window assemblies.

Construction cost is expected to be approximately $300-500K.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Disturbing Cultural or Biological Resources

HFEF (Materials and Fuels Complex [MFC]-785) is eligible for nomination to the National Register of Historic Places. Prior to beginning work, obtain cultural/historical resource review by contacting Christina Olson (526-1692). Approval must be demonstrated by written communication from this organization prior to beginning work, and any instructions contained in the review must be followed.

Generating and Managing Waste

The removal and replacement of the tank unit would create low-level radioactive waste and industrial type waste. The disposal of all waste would be managed by Waste Generator Services (WGS). Waste determination and disposition forms (WDDF's) are already established for both waste streams at HFEF.

Releasing Contaminants

Typical construction chemicals such as adhesives, lubricants, oils, paints, etc., would be used on the project. All chemicals would be entered in the vendor data system for approval. The Chemical Coordinator would track these chemicals in the INL Comply Plus Chemical Management System. Chemical use has a potential for small amounts of air emission and spills. Any spills that occur from these chemicals would be reported to the Spill Notification Team and would be cleaned up.

Using, Reusing, and Conserving Natural Resources

All material will be reused and/or recycled where economically practicable. All applicable waste would be diverted from disposal in the landfill when possible.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References: 10 CFR 1021, Appendix B to Subpart D item B2.5, "Facility safety and environmental improvements".

Justification: The proposed action is consistent with 10 CFR 1021, Appendix B to Subpart D categorical exclusion B2.5, "Safety and environmental improvements of a facility (including, but not limited to, replacement and upgrade of facility components) that do not result in a significant change in the expected useful life, design capacity, or function of the facility and during which operations may be suspended and then resumed. Improvements include, but are not limited to, replacement/upgrade of control valves, in-core monitoring devices, facility air filtration systems, or substation transformers or capacitors; addition of structural bracing to meet earthquake standards and/or sustain high wind loading; and replacement of aboveground or belowground tanks and related piping, provided that there is no evidence of leakage, based on testing in accordance with applicable requirements (such as 40 CFR part 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" and 40 CFR part 280, "Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks"). These actions do not include rebuilding or modifying substantial portions of a facility (such as replacing a reactor vessel)."

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) ☐ Yes ☒ No

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on: 6/29/2016