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Pu-238 Consolidation Conceptual Design Report

Idaho National Laboratory
Idaho Falls, ID

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Merrick & Company provided specialized design support to Burns & Roe Enterprises, Inc. (BREI) for the conceptual development of facilities and systems for the consolidation of Pu-238 production at the Idaho National Laboratory. Merrick was responsible for the concept development for enclosures and shielded systems (hot cells) for Pu-238 separation and packaging production processes. Merrick's work products were incorporated into the Conceptual Design Report (CDR) that was submitted by the Idaho National Laboratory to the U.S. Department of Energy for consideration for Critical Decision – 1 (CD-1). The hot cells and glovebox concepts developed by Merrick were designed to accept irradiated targets; process the targets for Pu-238 separation, purification, and packaging; and treat and package the waste produced by separation.

Deliverables produced by Merrick for the hot cell area included:

- Hot cell area technical and functional requirements (T&FR) development
- Hot cell area descriptive input and figures into the Conceptual Design Report
- Hot cell area sketches and drawings
- Hot cell area model and animation
- T&FR and Conceptual Design input to other project documents
- Remote handling equipment design and specification
- Remote handling operations design and specification
- Hot cell design and specification
- Remote process equipment design and specification
- Remote process operations design and specification
- HVAC design for remote operations and processes
- Maintenance and repair for remote operations and processes

Conceptual design deliverables for the Pu-238 gloveboxes developed by Merrick included:

- Glovebox Requirements
- Glovebox Description in CDR
- Glovebox Drawings
- Glovebox Model and Animation
- Input to Acquisition Plan
- Input to Project Cost Estimate
- Input to Preliminary Documented Safety Analysis (DSA)
- Input to Preliminary Fire Hazards Analysis (FHA)
- Equipment List
- Size of Gloveboxes
- GB Atmosphere (Inert vs. Air, Flow type, Cooling)
- Material Pass-Thru
- Material Handling
- Waste Management / Packaging
- Installation Access
- Maintenance Access