

■ ENGINEERING ■ ARCHITECTURE ■ DESIGN-BUILD ■ GEOSPATIAL SOLUTIONS ■ SURVEYING

In association with fabrication subcontractors, Merrick & Company designed, fabricated, and tested gloveboxes for the Commercial Light Water Reactor Tritium Extraction Facility (CLWR-TEF) at the Department of Energy's Savannah River Site (SRS). Merrick provided nine major glovebox assemblies plus airlock hoods and connecting airlocks, which will be used for tritium services. Due to facility access requirements, the gloveboxes were designed and built in modules to facilitate installation.

Merrick's responsibilities included:

- Overall project management
- Conceptual and detailed system design
- Analysis to verify structural integrity
- Quality assurance of design and fabrication activities to NQA-1 Standards, fabrication (subcontracted)
- Supplier acceptance testing
- Delivery
- Assembly and commissioning support

Merrick utilized two custom fabricators in three locations to perform the manufacturing activities: Jona Machining in Broomfield, Colorado; Flanders/CSC in Bath, North Carolina; and Flanders/FFI in Washington, North Carolina.

The gloveboxes were produced using Pro/ENGINEER[®] software and were supported with numerous fabrication and testing specifications, calculations, seismic analysis, and component data sheets. Merrick procurement supported the project with separate equipment procurements such as cooling coils, blowers, valves, hoists, and trolleys.

Since the process equipment systems inside the gloveboxes were designed concurrently by WSRC, Merrick and WSRC established a design partnership to successfully facilitate the integration of the process and support systems with the glovebox systems.

Each of the nine gloveboxes was extremely large in size, averaging 40 feet long by 5 feet wide by 16 feet tall. The external skin consisted of 7-gauge stainless steel and safety glass. The design included internal equipment support frames, material handling systems in the form of manual and electric hoists on monorails, overpressure protection bubblers, chilled water recirculating HVAC systems, internal and external electrical power distribution, and half-inch thick equipment airlocks. All of the gloveboxes were designed to be air tight and contain argon inert gas. After fabrication all gloveboxes were proven air tight with helium leak-testing.

Because of their large size, gloveboxes from Denver were shipped horizontally (as oversized loads) while those from North Carolina were shipped vertically (requiring escorts by both state patrols and utility companies). All shipments arrived safely at SRS.

