



Merrick & Company provided preliminary (Title I) and detailed (Title II) design for Building 792 modifications and additions at the Argonne National Laboratory - West (ANL-W). These modifications were required to support the development of Building 792 to house the Radioisotope Power System (RPS) manufacturing process, which is being moved from DOE's Mound, Ohio, facility to ANL-W. The RPS manufacturing process produces Radioisotope Thermal Generators (RTGs) using Pu-238. RTGs are used by NASA for deep-space probes due to their long-life and stable, low-power generation.

Building 792, constructed in 1971, is a 50 ft. x 60 ft. x 24 ft. high structure with reinforced masonry walls and prestressed double-tee roof beams. It is located at the ANL-W site, which is approximately 35 miles west of Idaho Falls, Idaho.



The structural analysis of Building 792 performed during Title I determined that the building would not meet the PC-3 natural hazards standards. Because of this finding, a new addition (792A) was designed to house the RPS manufacturing process and the existing Building 792 was renovated for offices, a conference room, change room, and network room.

Merrick's scope of work included:

- Prepared structural analysis of existing Building 792 for meeting PC-3 natural hazards criteria
- Prepared structural analysis of new addition (Building 792A) for meeting PC-3 natural hazards analysis
- Prepared Title I and II design drawings and construction specifications for Building 792 renovations and Building 792A construction (Title II design packages were provided for PDSA, excavation package, footings package, structural package, remaining work package)
- Completed Preliminary Documented Safety Analysis (PDSA) for Building 792 (as renovated) and 792A (as constructed)
- Prepared Title I and II arrangement drawings of the proposed RPS manufacturing equipment, including gloveboxes, enclosures, test chambers, and associated service equipment for Building 792A
- Finalized Process and Instrumentation Drawings (P&IDs) for RPS manufacturing systems and supporting services
- Finalized cost estimate for Building 792 renovation and addition
- Evaluated use of labyrinth entrances to specific rooms in Building 792A for shielding
- Created pressure differential drawing for Building 792A.



Major design criteria included PC-3 natural hazards criteria from DOE-STD-1020 Natural Phenomena Hazards Design and Evaluation Criteria, NFPA 101 - Life Safety Codes, ANL-W design standards, 10CFR830 QA standards, and DOE Order 414.1A QA standards.