

**Beaver Valley Units 1 and 2
PWR Nuclear Generating Station**
Fukushima – FLEX Hardened Equipment
Storage Building Project Profile



Client: FirstEnergy Nuclear Operating Company
Project Name: Beaver Valley Units 1 and 2 - FLEX Hardened Equipment Storage Building
Location: Shippingport, Pennsylvania
Size: 1,815 MW total
Schedule: 2014 – 2015



Description:

Sargent & Lundy has been supporting the FirstEnergy Nuclear Operating Company (FENOC) nuclear fleet in the design of a variety of FLEX modifications in response to the Fukushima event. One such project is the development of engineering and design documentation to support the installation of a hardened FLEX equipment storage building at the Beaver Valley pressurized water reactor (PWR) Units 1 and 2. A key facet of this effort was the design of the hybrid FLEX storage building using precast walls and cast-in-place roof to meet project milestones.

Scope of Services:

Our scope encompassed the design, calculations, and drawings for use in the permitting and construction of the FLEX storage building inputs. The design addressed the building foundation, superstructure and architectural design, and associated civil, HVAC, mechanical, and electrical requirements. The superstructure was designed with precast walls and a poured-in-place concrete roof on metal decking and structural steel framing. The work involved an array of activities, including geotechnical, foundation design, buried commodities, superstructure design, barrier designs, and missile barrier and hazard analyses to counter fire and explosion potential due to the building's proximity to the independent spent fuel storage installation (ISFSI).

Sargent & Lundy worked with FENOC to develop a plan, including a conceptual design, to complete the analyses and prepare the final documentation for permitting and construction. Weekly project reviews of the design, construction, and site team activities were conducted, over which time the design was optimized to support safe implementation of the project in a timely manner.

Principal Deliverables

- Various seismic and tornado analyses to demonstrate the adequacy of the design to comply with NRC Order EA 12-049.
- Drawings and technical specifications for final plant stabilization and paving for the facility, including vehicle access to building doors, and restoring surfaces impacted by construction.
- Calculations and analyses documenting the structural integrity and design to meet the requirements of NEI 12-06, NRC Order EA-12-049 and Interim Staff Guidance JLD-ISG-2012-1.
- Calculations and drawings to support the Erosion and Sediment (E&S) Plan to identify the proposed sediment and erosion control requirements for managing and controlling erosion.
- Preparation of engineering documents such as engineering change packages, bill of materials, calculations, procedures, design input documents, drawings, diagrams, and design sketches.
- Preparation of drawings for county reviews and permitting.
- Evaluation of tie-down anchorage for FLEX equipment, missile protection for building penetrations, and bearing capacity and settlement.

Highlights:

- Sargent & Lundy's hybrid design of precast walls and cast-in-place roof approach required less calendar time to complete the designs, analyses, and documentation to support key construction milestones.
- FENOC successfully implemented the hardened FLEX equipment storage building to protect and house the portable equipment at the site to meet the requirements of NRC Order EA 12-049.

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