

Salem Nuclear Station

Advanced Digital Feedwater Control System Upgrade Project Profile



Client: PSEG Nuclear

Project Name: Salem Advanced Digital Feedwater Control System Upgrade

Location: Hancock's Bridge, New Jersey

Schedule: June 2013 – April 2016



Description:

The Salem nuclear station installed a Westinghouse WDPF-based advanced digital feedwater control system (ADFCS) in the mid-1990s. The ADFCS provides steam generator level control via feedwater regulating valves and via setting the speed for the steam generator feed pump (SGFP). In addition, the ADFCS provides steam pressure control via atmospheric relief valves. The WDPF-based ADFCS included custom circuit cards that interfaced with the existing control console pushbutton stations. These custom circuit cards later became obsolete and were no longer being supported by the vendor, and their continued use would have resulted in operational challenges if hardware failures occurred.

The station elected to upgrade the ADFCS to an Emerson Ovation-based system, also provided by Westinghouse. In addition to the functions previously provided by the ADFCS, the Ovation-based ADFCS upgrade added the SGFP speed control loop (replaced an obsolete Woodward controller), added additional redundant sensors/probes, and upgraded control room interfaces to include a graphical user interface.

The Salem Unit 2 upgrade was installed during a refueling outage in fall 2015, and the Salem Unit 2 upgrade installation is scheduled to be completed during a refueling outage in spring 2016.



Scope of Services:

Sargent & Lundy provided engineering support throughout the project's life cycle, from project conception through installation and testing. This Sargent & Lundy support included the following activities:

- Producing a conceptual design study to aid PSEG Nuclear in defining the scope of the ADFCS upgrade.
- Preparing a procurement specification that identified the applicable requirements for equipment procurement from the vendor. In addition, as the primary technical interface with the equipment vendor, Sargent & Lundy participated in reviews of vendor documentation and in all phases of vendor testing.
- Developing the design change package in accordance with PSEG Nuclear's design change procedures. This design change package included updates to more than 250 plant design drawings, revisions to station design calculations (including electrical, instrumentation, combustible load, HVAC, and seismic calculations), and incorporation of new vendor documents and software configuration control documents into PSEG Nuclear's document management system.
- Providing markups to the affected maintenance and operations procedures.
- Drafting the modification acceptance test procedures, including installation checkout, energized testing, and power ascension testing.
- Providing onsite engineering support during the installation and testing activities.

Highlights:

- Sargent & Lundy worked closely with PSEG Nuclear's design engineering, system engineering, maintenance, operations, and installation organizations in efforts to satisfy the requirements of all of the stakeholders.
- The station successfully installed, tested, and commissioned the new ADFCS for Unit 2 with minimal impact to the refueling outage critical path.

Sargent & Lundy Contact:

Sandra J. Jannetty, Senior Vice President and Project Director
302-622-7252