

Nuclear Power Plant Inspection



St. Lucie Nuclear Power Plant Nuclear Generating Station Upgrading

Overview

Owned by Florida Power & Light, Turkey Point Nuclear Generating Station is a twin reactor nuclear power station located on a 3,300-acre (1,300 ha) site 2 miles east of Homestead, Florida, United States, next to Biscayne National Park located about 25 miles (40 km) south of Miami, Florida near the southernmost edge of Miami-Dade County. The St. Lucie Nuclear Power Plant is a twin nuclear power station located on Hutchinson Island, near Ft. Pierce, Florida in St. Lucie County.

Team Industrial Services was contracted to provide inspection services as part of a \$1.5 billion project to increase the capacity of its two existing reactors at Turkey Point and two at the St. Lucie Nuclear Power Plant by a total of about 400 MW.

Project: Turkey Point & St. Lucie Nuclear Power Plant Nuclear Generating Station Upgrading

Location: Homestead & Hutchinson Island, Florida

Team Service: Inspection

Need and Challenge: The project was slated to be the largest uprating project, to increase a nuclear plant's maximum power level, to date.

As a result, there was nothing routine about the project. The first major challenge was the nuclear setting where work would be performed. Radiation safety was critical and the majority of the work was to be performed in contained conditions. Additionally, the variance of the material thickness of the valves being inspected would require special inspection techniques to perform testing and analysis according to ASME BPVC Section III standards.

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Solution and Outcome

Before being selected as the vendor of choice, Team underwent a thorough quality program audit to ensure the company could meet the standards of nuclear record keeping. Team passed the audit with zero findings.

Once approved for the project, Team quickly adopted Florida Power & Light's philosophy on radiation safety. All work was performed to NRC regulations. Team was proud to boast no radiation safety incidents and minimal doses of exposure as a result of the team's attention to safety and containment.

To inspect the valves, Team used Conventional Radiography Testing (RT). It is a nondestructive examination method that uses X-ray and Gamma ray for detecting internal imperfections, measuring wall thickness and detection of corrosion. With RT, the material is exposed to a homogenous ray from a radioactive isotope or an X-ray tube while a negative film is positioned behind the material to be examined. After development of the film, thickness and density differences (material imperfections) will show as blackness. Acceptance criteria define whether or not the indication is non-acceptable (a defect).



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Due to the equipment's varying material thickness challenge and the need for working in nuclear containment conditions, this project required highly-trained, highly-experienced Team technicians to conduct the inspection and make the call. The technicians trained on mock-ups of the equipment to ensure first-time quality on all work completed in the facilities.

Multiple speeds of film were used, which required the knowledge of different film loading techniques. The attention to detail in the quality of the film was critical. All equipment was accurately deemed compliant the first time as a result of Team's strict attention to safety and quality. And above all else, the project was completed with zero incidents and no recordable injuries.