Predictability Matters to Heavy-Duty Performance

For nuclear power plants that are planning to operate for an additional 20+ years, steam generator replacement makes financial sense, for both achieving higher heat transfer as well as lowering maintenance costs.

While it may make financial sense, the outlay is enormous. Once initial construction is complete, no other project over the lifetime of a plant will require more time, money, and effort than a steam generator replacement (SGR).

That's why, to ensure predictable success, it's critical to have a a strong, experienced team and a history of excellent SGR performance.

The Steam Generating Team (SGT), a joint venture of Framatome and United Engineers & Constructors, is the leader in the heavy component replacement market for power plants and the only performer of steam generator replacements in the North America for the past eight years.

When SGT was awarded a contract to replace four steam generators at a North American utility, the first two years of the contract were dedicated to the engineering and planning involved in this major component replacement. Framatome provided the design engineering, licensing support and special processes (metrology and critical machining and welding) on the project and worked with United to provide the project management, procurement and construction.

To execute on this scope efficiently in a short schedule, SGT performed mock-ups of critical activities including concrete pours, machining and welds.

These dry runs helped the team identify potential problems beforehand and familiarized the trades with the unique challenges they would face.

"The expertise and experience provided by Framatome and SGT, a team that never left the steam generator replacement market, is invaluable in helping utilities operate for the long-term."

Craig Ranson, Senior Vice President for Installed Base America (IB-A) Framatome

More than 1,000 people would be working on the project 24 hours a day, 7 days a week once underway, which meant close coordination and planning was critical. Developing a good project schedule, which can include more than 25,000 work activities, was a major focus in the preparation phase. Framatome's Installed Base

"I'm especially proud of our team for completing this outage with zero recordable incidents and personnel exposure below ALARA goals," said Art Lembo, president of SGT. "It's an accomplishment that speaks to SGT's vigilance in industrial and radiological safety."

Component Repair & Replacement (IBR) teams kicked off pre-outage work with metrology experts on-site well in advance to ensure proper fit-ups for all piping, and on-site machining executed by our experienced welders and machinists.

Substantial preparations are required when moving components this heavy and large through a completed containment. To remove and replace the 67-foot, 360-ton steam generators, temporary openings in the reactor building dome, containment and steam generator enclosures were required.

In addition, enhancements included in the design of the replacement steam generators must be addressed, and extensive engineering and planning is needed before disconnecting the old steam generator and reconnecting the new one to instrumentation and primary and secondary piping.

Following the removal of massive 300,000-pound concrete cut-outs in the dome of the reactor building, each of the four new, more-efficient steam generators were safely lifted into the building and into place. Exacting measurements utilizing meticulous metrology practices, along with optimized 3D fit-up solutions and specialized machining, enabled experts to precisely place the replacement steam generators into the existing plant configuration.

IBR teams again jumped in to implement pipe-end decontamination, lowering radiation exposure to help meet ALARA goals. In addition, they performed primary nozzle welding utilizing Framatome's adaptable welding equipment (AWE). AWE is an innovative technology that provides a customized system for precision welding capabilities, enabling freedom and flexibility for operators.

Upon completion of welding activities, Framatome's Installed Base NDE Solutions (IBN) team carried out foreign object search and retrieval (FOSAR). After all the four original steam generators were replaced during the scheduled outage, the plant returned to full operations.

From initial project scoping to final installation, **SGT has the people, the resource flexibility, and the knowledge** base to plan and implement your project with predictable results.

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