Focus Team: Partnering Design with Construction Yields Positive Returns

What is a Focus Team and Why is it Innovative?

Performing complex large component replacement projects in operating nuclear plants requires innovation in every aspect in order to ensure that safety remains the highest priority while aggressive schedules are maintained. One innovation that has yielded positive results is by enhancing collaboration through the use of Focus Teams—construction and engineering integrated in the project planning phase to jointly develop the path forward. This is in contrast to the traditional approach of treating engineering and construction as separate entities.

What Changed and How The Innovation Has been Used

Three Mile Island Unit 1 (TMI-1) Reactor Coolant Pumps (RCP)

During the steam generator replacement project at TMI-1, there was an increase in work-hours, radiological dose, schedule durations, and safety risks associated with the work of pinning RCP constant force spring supports. Acting as a Focus Team, engineering and construction initiated a collaborative design effort that resulted in significant savings.

The pinning/unpinning of the RCP constant force spring supports is a unique evolution performed by installation/removal of temporary travel stops. Installing travel stops and pinning the RCP constant force spring supports was originally planned in accordance with historical work practices. Traditional efforts to adjust the load coupling were unsuccessful. Additional attempts were not productive but resulted in beneficial lessons learned that the Focus Team built on. The Focus Team initiated a tooling design effort to provide an engineered solution for the lessons learned and minimize schedule durations, work-hours, costs, radiological dose, and safety risks. SGT partnered with Hytorc Tooling to develop the Generation II JLSST, tailored for the pinning and unpinning of RCP constant force spring supports.

The Generation II JLSST tooling cost was approximately $35,115 for the design, material, fabrication, and delivery—costs more than offset by the results:

- 576 fewer work-hours—an estimated labor cost reduction of $33,293
- Effective dose rates include a reduction factor of 30% (work-hours not spent in expected dose fields)
- 390 fewer mrem, resulting in an estimated radiation exposure cost reduction of $31,200.
- Significantly reduced injury potential from overexertion, fatigue, and heat stress due to ergonomic design and practices

Diablo Canyon Unit 1 Steam Generator Replacement Project (SGRP)

After completion of the first SGRP (Unit 2) with Pacific Gas & Electric (PG&E), the integrated SGT-client team sought to improve performance on the subsequent Unit 1 project. Focus Teams were put in place with both SGT and client personnel carefully scrutinizing the lessons learned from the previous Unit 2 project to determine ways to improve. Despite a short duration between the projects, the Focus Teams implemented new ways to approach the work, improved contingency plans, and revised the design as necessary to support work in the field.

Results of the Focus Teams were immediately noticeable during performance of the Unit 1 project. Some highlights of project performance include:

- Unit 1 Project completed 11 days faster than Unit 2 (nearly 20% improvement)
- Achieved one million safe work hours without a recordable or lost time injury
- Improved first time large bore pipe weld quality
- Zero schedule impacts related to document closeout (essential to plant start-up)
- Named a Top Plant of 2009 by *POWER* magazine, which credited Focus Teams as an integral part of the project's success
- *Power Engineering* magazine's Best Nuclear Project of 2009

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