## Attachment 6: Summary of Feeder Lessons Learned and Actions

The following table provides a summary of improvement areas identified for the feeder procurement and installation series on Unit 2, and of the corrective actions implemented in these areas. These improvements provide high confidence that the issues will not recur on the Remaining Units.

| Improvement Area | Actions Implemented |
|---|---|
| Planning, Project Management and Construction Management | • Project vision developed with detailed logistics, organization, role documents, and resource plans to optimize production in four quadrants on each reactor face (8 quadrants total).<br>• Implemented “Project-centric” organization that integrates Construction resources into the Project team.<br>• Strengthened the integration, collaboration, and “One Team” approach between OPG and the contractor.<br>• Assigned a Construction Director and acquired additional experienced construction staff from other vendors.<br>• Placed Reactor Engineering, Field Engineering and other Subject Matter Experts on shift to support construction crews.<br>• Activity based project controls implemented to measure cost and schedule performance in greater detail/smaller increments.<br>• Implemented a detailed look ahead process and reviews for all future work including “deep dives” on training, materials availability, logistical plans, and resourcing.<br>• Established new daily planning and shift turnover protocols.<br>• Implemented enhanced issues escalation protocol and more frequent reporting routine. |
| Feeder Fabrication and Delivery | • Welding techniques for Inconel 690 materials and feeder fabrication with Inconel 690 components have been developed and qualified and do not need to be repeated on for the Remaining Units.<br>• Feeder fabrication is complete for Unit 3 and all feeders delivered prior to breaker open. |
| Training for Proficiency | • Implemented upgrades/expansions to reactor training mock-up facilities to more accurately mimic “in plant” conditions.<br>• Expanded mock-up rehearsal time to ensure proficiency beyond qualification, using integrated teams that include Trades, Quality Control, Radiation Protection, and Trades supervision.<br>• Expanded tooling/spares for mock-up to improve reliability of training equipment.<br>• Project Managers assigned accountabilities for training. |

| Improvement Area | Actions Implemented |
|---|---|
| Tooling | • Acquired additional tooling to facilitate construction including gap measurement tools, tools to hoist and stack feeders in batches and “skates” to facilitate movement of feeders during fit-up. |
| Installation Process and Methods | • Developed an Integrated plan for all Feeder work, including completion of upper feeders, scaffold modifications, and foreign material exclusion inspections.<br>• Brought in additional expertise to support and manage upper feeder work.<br>• Streamlined installation procedures based on early installation experience.<br>• New techniques for installation of Upper Feeders evaluated to simplify the field installation.<br>• Modified field installation procedure to meet seismic requirements.<br>• Implemented independent third-party testing to confirm seismic qualification of cantilevers (feeders are suspended from these).<br>• Put a team in place to ensure foreign material challenges are fully resolved prior to fuel load.<br>• Implemented cycle time report for each Feeder to understand individual delays.<br>• Assigned Subject Matter Experts to resolve issues, make process adjustments, enhance tooling, and provide additional training, where required, to increase the competency of the trades.<br>• Integrated lead trainers on each work crew.<br>• Changed work plans to improve schedule efficiency, e.g. radiography of welds taken off critical path. |
| Weld Pass Rates | • Implemented fit-up checks before welding; and made various welding parameter changes.<br>• Assigned additional welding engineer to each construction crew.<br>• Assigned welding technicians to verify tooling condition and set-up prior to each weld. |
| Scaffolds – Reduce Build Time and Unplanned Modifications | • Assigned a scaffold Subject Matter Expert to optimize scaffold modifications and look ahead to avoid unnecessary scaffold modifications.<br>• Re-sequenced feeder installation to minimize scaffold modifications.<br>• Acquired specialty scaffolding staff and supervisors. |
| Quality Issues Resolution | • Re-assigned additional Quality Control staff to support Lower Feeder work and to work in the Reactor Vault<br>• Brought in additional Quality Control staff from other contractors. |

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