

## TALen Energy • Susquehanna -Unit II Replacement of 3 Condenser Neck Feedwater Heaters

### Project Description

BHI Energy Specialty Services was contracted by TALEN Energy to replace three Condenser Neck Feedwater Heaters at Susquehanna Unit 2. The feedwater heaters were experiencing degradation due to Flow Accelerated Corrosion (FAC) over the life of the systems. The degradation included excessive wall thinning and loss of tube utilization, wall thinning was encroaching on code minimum thickness requirements and the loss of tubes was reducing the capacity and loss of power production.

During the previous year's project, TALEN separated the scopes involved and awarded contracts to multiple vendors for Planning, Heavy Rigging, Piping, Condenser, Insulation and Scaffolding. This created challenges for TALEN with managing, scheduling, coordination and budget. The total project went over schedule and budget.

TALEN wanted a better way to control costs, and a sole source contractor to perform all scopes under one contract. BHI was awarded this contract as a Turn Key Contractor to provide all of the management, supervision, craft and subcontractors to perform all scopes of work involved in the project. Scopes included planning, scheduling, piping replacement, condenser cut outs, heavy rigging, scaffolding, insulation, asbestos removal, FME, hole watch and fire-watch attendants.

BHI managed and coordinated all tasks and over 470 subcontractor resources. The project was scheduled for a 28 day Pipe Tight Milestone with a bonus penalty contract associated with Safety, Schedule, Budget, etc. BHI completed the project in 27 days and under budget with zero recordable injuries.



### Project Challenges

- An aggressive schedule of 28 days for all three feedwater heaters, piping and condenser walls and interferences to be removed and replaced.
- Safety concerns due to heavy lifts, thermal cutting, confined space, asbestos, pipe cutting, welding and rigging.
- Poor planning and field implementation in prior project due to multiple contracts and lack of alignment between vendors
- Limited labor supply

### BHI Energy Alternative Repair Approach

BHI offered a Turn Key solution with a "skin in the game" approach and schedule - from planning to execution - to successfully deliver the project schedule, quality, safety and budget milestones. BHI employed a team of management, supervision and field specialty union workforce, with extensive component repair and replacement experience, to lead, plan and perform this scope of work.

## Scope Description

- Project planning of all work orders, schedule and training qualifications
- Heavy lifts utilizing platforms, cranes and structural steel
- Asbestos abatement of existing heater insulation
- Insulation removal, fabrication and install
- Scaffold erections and removals
- Condenser wall and interference removals and installs
- All large bore piping removals and replacement – over 35 welds of 14" OD to 24" OD with no defects
- Fabrication of new Heater Level Trees – over 500 small bore EPPRI 2:1 welds
- All pipe machining and end preparations
- Pre and Post Weld Heat Treatment on chrome nozzle and pipes
- Condenser and piping support modifications and replacements



## Project Challenges Resolved

- Completed pipe tight milestone 24 hours earlier than scheduled.
  - Reduced schedule by 32 hours, by proposing TALEN install clam shells to heater supports in lieu of replacement
  - Reduced schedule by 36 hours by building mock ups of heaters and fabricating 90% of the level tree small bore welds during the pre-outage
- Over 190,000 man hours worked with no OSHA Recordables
- Utilized our Union Specialty Agreements and relationships with the locals to travel in qualified welders and to filter through local craft

## Customer Feedback

BHI provided Talen with a turnkey approach for full integration of craft and resources to create a success path for this schedule critical quality critical scope. Offering a long resume of successful component replacements utilizing OE, Best Practices, Project Managed Approach and an understanding of integration of multiple crafts, we provided an outline of our capabilities and experience and we delivered on it.

## Customer Comments

Prior to this outage, "we had some emergent discovery and multiple contracts, contractors, contractor management this impacted that evolution of FWH replacement....we (Talen Energy) decided that a general contractor approach would eliminate some of those deltas. BHI's Project Management team came in and did an excellent job managing the sub-contractors, cost, schedule, and providing innovative solutions that decreased the cost and duration of the project."