

Significant Efficiency Increase

Optimized Plant Performance

Industry: Power

Plant type: 1100+ MW natural gas combined cycle power plant

Application: HRSG HP evaporator system and drains/vents

Location: North America

Product: V1-1

Requirement: A world-renowned OEM was experiencing the difficulties brought on by 70 leaking globe valves in high-pressure, high-temperature severe service applications. Several concerns faced the OEM:

- **Safety** - The OEM made initial attempts to fix the gland packing leaks of the originally installed globe valves by replacing the packing and retorquing the gland packing bolts. Despite their determined efforts, this caused not only a concern of visibility, but as the environmental ambient temperature conditions dropped, the leaking steam would freeze, elevating the level of concern. While the OEM had several requirements, safety was their top priority. Before, the plant could be handed over to the end-user, the OEM knew they had to resolve these serious issues.
- **Efficiency** - In addition to the globes' visible leakage, the hidden leakage leaking past the downstream seat became a major issue. Globe valves are permitted to leak, even when brand new going into the systems as they are only tested to Class IV, V or VI. In order for OEMs/ EPCs to keep to their contractual efficiency promises, it is imperative that steam is kept in the systems. The effects of steam loss results in significant efficiency losses.
- **Back charges/LDs** - The OEM was soon to be exposed to hefty late delivery penalties and back charges due to the inability of not being able to meet their pressing deadlines.

Solution: The OEM was skeptical about cutting out the globe valves and replacing them in-kind. By doing so, they would continue to face the previously identified challenges. The warranty team decided, instead, to replace them with ValvTechnologies' zero-leakage metal-seated ball valves.

Once the decision was made, timing became critical and ValvTechnologies quickly implemented a resolution plan. The plan involved dispatching all available hands on deck in scouring their warehouses and distribution network to locate the valves necessary to not only resolve the leakage issues, but to get the valves expedited to site to meet the OEM's deadline.



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The team's collaboration allowed ValvTechnologies to deliver 70 ball valves in a variety of sizes, pressure classes, materials, etc. required (1" – 3", 900# - 4500# in carbon steel, F22 and F91). All valves arrived in time and were installed within the remaining five weeks prior to the OEM's liquidated damages (LDs) kicking in.

Result: In addition to helping the OEM overcome their immediate problem, ValvTechnologies assisted in addressing their safety concerns that also eliminated massive LDs and performance back charge penalties. The OEM's Optimization Team performed tests to determine the final outcome relating to performance and efficiency of this site.

To the delight of the OEM and its customer, the reported outcome stated that after the steam leakages were fixed and valves were adjusted to capture more steam along with a variety of other maintenance procedures performed, the corrected steam turbine gross power was increased approximately by 10.3 MW. These actions not only increased the overall plant output by roughly 10 MW but also decreased the plant heat rate by 64 Btu/kWh.

This level of improvement significantly impacted the success of the plant. The reliability of ValvTechnologies' product caught the attention of the OEM's warranty, optimization, controls and HRSG design engineering teams. This catapulted the OEM into a full-blown investigation of their other systems that resulted in a number of valve upgrades in their standard plant design. ValvTechnologies' ball valves now routinely replace globe valves saving the customer time, money and increasing plant reliability and efficiency.