

## Boiler Feed Pump Reliability Upgrade

Historically these boiler feed water pumps have suffered from premature failures and reduced performance. Damaged balance drums or wear rings have led to failed bearings and impellers contacting the diffusers.



### Objective

Upgrade boiler feed pumps to reduce failures and increase performance.

### Solution

- Upgrade stationary eye seal material.
- Upgrade stationary impeller hub seal material.
- Mechanically lock the wear rings in place without the use of fasteners using Conhagen's clic-loc tongue & groove design.
- Add pressure reducing grooves to the high-pressure bushing for enhances rotodynamic stability.
- Install composite material in the balance drum assembly to allow for intermittent dry-running.
- Perform rotodynamic analysis to confirm compliance to API 610 stability requirements for the upgrade.

### Results

Conhagen has several of these upgrades installed across multiple customer sites, one of the early conversion pumps was pulled recently for scheduled overhaul after 12 years and wear rings were found to be in "like new" condition.

By upgrading to non-metallic rings the pump efficiency can be improved. The non-metallic wear rings allow tightening of ring clearances (50-75% of API) which improves pump efficiency. This upgrade can be easily applied during a scheduled overhaul, all the changes are internal to the pump components and will not affect any piping or auxiliary systems. Typically, this upgrade can be approved with a standard MOC process.

