

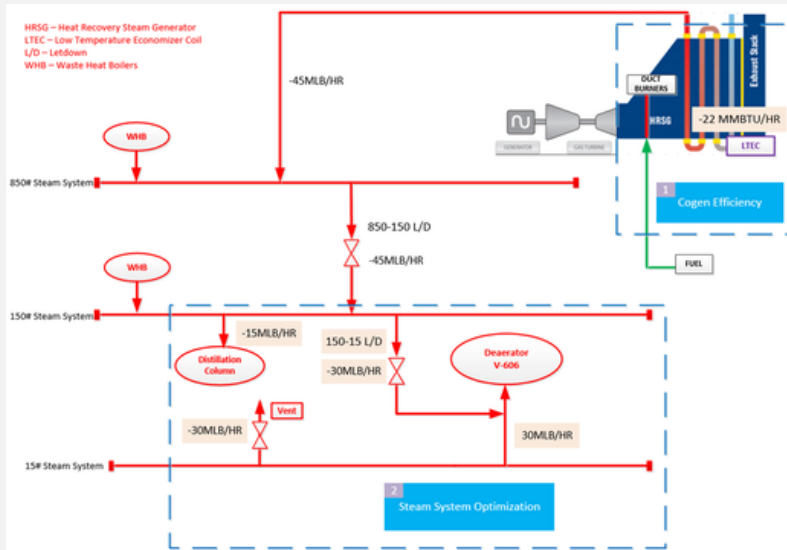
BEST PRACTICE SERIES

Refinery steam system optimization

Four refinery projects were carried out to improve energy efficiency at the assets and to reduce greenhouse gas emissions

Refinery Steam System

A simplified steam system diagram of the changes covered in this project



Project Highlights

At each refinery, the following steps were carried out:

1. New low temperature economizer coil installed to recover more steam from co-generation waste heat recovery.
2. Upgrade co-generation duct burner controls to allow greater operational flexibility - lower minimum firing, improved burner operability.
3. Upgrade piping and control valves to utilise low pressure steam, optimise its usage in a de-aerator, and minimise steam venting.
4. Reduce column pressure to reduce steam consumption.

Benefits

- Lower steam consumption
- Improved steam generation efficiency
- Fuel gas savings: reduced energy usage
- by 1-2% and 43 ktktCO₂e/yr
- reduction in GHG emissions
- Lower energy apex

Implementation

Projects were implemented over the course of 3 years from 2018-2021.

Key Learnings

- Energy efficiency opportunities not only lower carbon emissions, but can improve project economics through opex reduction
- Low temperature economizer had to be installed during a cogen turnaround