

Reference: Worthington (D-R) Footprint & Revamp

Project Description

The customer operated an SST-400 steam turbine commissioned in 2005 for the purpose of power generation. As usual for power generation, the steam turbine drives a generator, and the exhaust steam is transferred to the condenser to reach maximum efficiency a d power output. Due to higher profit, the customer became more interested in steam extraction for district heating. Thus, the customer considered a turbine revamp with the goal of extracting the maximum heating steam out of the turbine. In 2018, the customer approached Siemens Energy and asked for a proposal to achieve the new operating conditions.

Solution

Siemens converted the existing condensing turbine into a backpressure turbine mainly with a new optimized steam path: eliminating the last blade stages and implementing a new shaft sealing on the LP end to allow only cooling steam flow. The former extraction was re-used and modified to become the new exhaust of the turbine. The turbine casing could be re-used with minor modifications, minimizing the required investment and shutdown time as much as possible.

Customer Value

Keeping the same turbine casing, same layout and foundations, the customer received an upgraded equipment that is able to deliver a significantly increased heating steam output which allows the customer to have a more profitable operation of the powerplant. Investment cost were minimized as new major equipment was required and the upgrade was possible without having to stop the equipment longer than a usual and anyway required major overhaul.

More heating steam required?

- Product line: SST-400 steam turbine
- Project type: Turbine Revamp
- Year of completion: 2019

New
upgrade
footprint
case



Steam Turbine Design Rating

	Steam Turbine			Steam Rate LB/HP-Hr	Flow PPH C ompr. Rated HP	Delta Steam Flow (PPH)	Annual Savings \$/Yr.	Revamp Costs	Payback Years
	Nameplate	Normal	Speed						
Current Turbine	8539	8539	7000	8,45	72154,55				
Revamp Turbine Alt 1	5800	upm	5800	7,5	64042,5	8112	\$568492	\$1971410	3,47

11.24% Steam savings