Increased heating steam extraction through conversion form condensing into backpressure turbine

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.

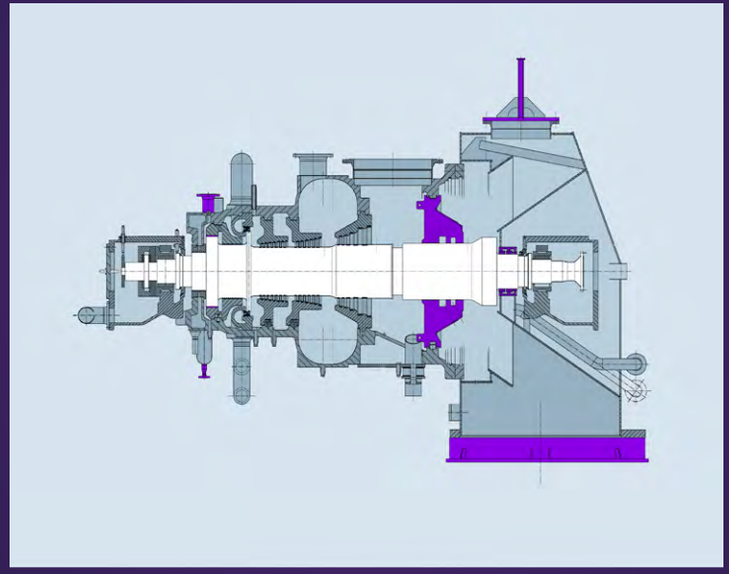
Characteristics

	Tech. data before revamp		Tech. data after revamp	
	Value	**Unit**	**Value**	**Unit**
Heating Power	**40**	MW	**76**	MW
Nominal Power	32	MW	24	MW
Live Steam flow	125	t/h	125	t/h
Live Steam pressure (max.)	66	bar	66	bar
Steam temperature (max.)	515	°C	515	°C
Nominal Speed	5800	upm	5800	upm

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More heating steam required?

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



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