Triveni TURBINES

Industry Case Study

Cement

Case Studies:

Waste Heat Recovery based Power plant installed in (Satna) Madhya Pradesh,India

Waste Heat Recovery based Power plant installed in (Guntur) Andhra Pradesh, India

Waste Heat Recovery based Power plant installed overseas

The project is driven by *1*22.5 MWe Injection Condensing steam turbines with an inlet steam parameter of 12 Bar and 425 Deg C with 0.2 Bar Exhaust*

Waste Heat Recovery based Power plant installed in (Satna) Madhya Pradesh, India

Challenge: The steam flow originates from multiple boilers. The generation of steam relies on the utilization of waste heat derived from the elevated temperature of hot exhaust gases during both the preheating and AQC processes. Variability is observed in the steam inlet at both the Medium Pressure (MP) and Low Pressure (LP) sides, as well as fluctuations in the load and power output.

Solution: Triveni Turbines proposed an Injection Condensing turbine, which utilizes Medium Pressure (MP) steam as its inlet and introduces Low Pressure (LP) steam injection into the intermediate steam path. The steam is sourced from a total of 4 Preheater (PH) boilers and 2 After Quenching Cooler (AQC) boilers connected to cement kilns with capacities of 7,000 and 8,000 tons per day (TPD) respectively. The steam turbine generator (STG) has been designed to accommodate an air-cooled condenser and features an innovative blade design and reaction stages. Despite encountering various challenges, the commissioning of the turbine was executed within a remarkable 8-month timeframe, setting a notable industry benchmark for Triveni Turbines in the cement sector.

Benefits: The customer currently lacks an in-house power plant, but the Waste Heat Recovery (WHR) facility has presented numerous advantages. The waste gas, which originates at approximately 400°C, is effectively cooled down to 130°C, ensuring environmental protection while harnessing the waste heat to produce nearly cost-free electricity.

The project is driven by *1*6.8 MWe Axial Exhaust Injection Condensing steam turbines with an inlet steam parameter of 15 Bar and 387 Deg C with 0.1 Bar Exhaust*

Waste Heat Recovery based Power plant installed in (Guntur) Andhra Pradesh, India

Customer Challenge: The customer aimed to enhance their current cement manufacturing setup and sought a steam turbine solution provider. As part of this effort to enhance the overall efficiency of their existing power generation system, they introduced Waste Heat Recovery (WHR) units. These units are designed to capture the heat emitted by the rotary kiln in their existing cement plant and convert it into electrical energy.

Solution: Triveni Turbines offered its optimal solution to align with the plant's efficiency requirements, ensuring the provision of necessary power to support the diverse operations within the cement plant.

Benefits: The generated power will not only support various plant processes / operations but also lead to increased return on investment (ROI) and reductions in fuel expenses.

The project is driven by *1*30 MWe Bleed condensing steam turbines with an inlet steam pressure of 65 Bar and 505 Deg C with 0.1 Bar Exhaust pressure*

Waste Heat Recovery based Power plant installed overseas

Customer Challenge: The customer expressed their intention to set up a power plant as part of their company's expansion of manufacturing capabilities. They were actively seeking for a steam turbine solution provider. The objective was to produce the required power using their existing captive power resources, guaranteeing a consistent supply for critical processes.

Solution: Triveni Turbines offered the optimal solution to enhance plant efficiency by harnessing the recovered waste heat from the existing blast furnace to generate power.

Benefits: The customer relied on Triveni Turbine's manufacturing expertise and awarded the contract to supply a steam turbine generator. This steam turbine contributes to enhancing the plant's energy efficiency, cutting down energy expenses, and feeding excess electricity into the grid.

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Thank you.