

Diesel Generator Head Preheating using Heat Pumps

Application – Diesel Generator Head Heating

Customer – Auto parts Manufacturer

Fuel Replaced – Electricity

Sector – Automotive

Background

Our customer is an auto parts manufacturing company. Diesel Generator is used as a backup power source during the time of power failures. For smoother starting of industrial generators, it is provided with water jackets over the engine cylinder for a quick start in cold weather as well as reducing the diesel consumption at the startup. To reduce the startup time of the Diesel generator the engine head must be maintained at a constant temperature with the help of forced circulation electrical heating system.

Solution

Aspiration Energy took the challenge and designed an energy efficient heat pump system for the DG Preheating requirement. The heat pump was designed to operate 24X7 and will be cut-off when Diesel Generators are ON.

Aspiration Energy optimized this heating requirement with consumption data analysis and detailed designing. Aspiration Energy proposed a 38kW air source heat pump to replace the electric heaters.

Installation

Design:

A 38Kw Air Source Heat Pump was designed based on the data given by the customer to meet their required capacity.

Integration:

Aspiration Energy installed the heat pump system on par with norms and standards of the customer. In this integration, the process line was installed in series with plate heat exchanger. The process lines are provided with solenoid valves to bypass the flow when the set temperature is attained.

The heat pump system was installed in indirect integration since the jacket water is not chemically compatible with the condenser material of construction.

The existing electric heater is set to be idle and only used if the heat pump requires maintenance.

Installation picture



Performance Comparison

DESCRIPTION	BEFORE	AFTER
Heating Solution	Electrical Heater	Heat Pump
Energy Source	Electricity	Electricity
Capacity	54 kW	38 kW
Operating Costs	Rs. 7 /kWh	Rs. 7 /kWh
Consumption / day	475 kWh	273 kWh

Benefits



Technical

- The Heating system is centralized & hybrid.
- Easy to toggle and operate.
- Installation done in few weeks.



Financial

- More than 50% energy savings compared to the baseline
- Less than 2 years' payback period



Environmental

- The Heat Pump system reduces CO2 emission into the atmosphere.

Heat Pump will save around Rs.4.7 lakhs annually.