Replacing inefficient rewound motor with energy efficient motor in soft water pump in a cast iron foundry unit

Tags

Type: Unit case study

Sub-sector: Foundry

Location: Kolhapur

Partners: GEF, World Bank, SIDBI, BEE, TERI, IIF–Kolhapur chapter, Kolhapur Engineering Association

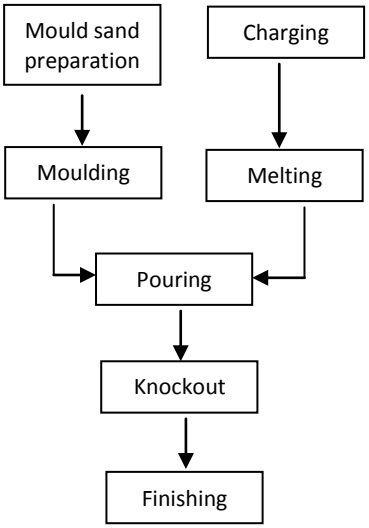
Year:2012–14

Cluster background

Kolhapur (Maharashtra) is one of the important foundry clusters in India. The cluster has around 300 MSME foundries producing about 600,000 tonne of castings annually, primarily ferrous (iron) castings for the automotive sector, and accounting for about 7–8% of India's total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum (tpa).

Unit profile

The MSME foundry unit **K6** manufactures graded cast iron (CI) castings. The production is about 16,345 tpa. The annual energy bill of the unit was Rs 1185 lakhs. The major process steps involved in the production of castings include mould preparation, melting, pouring, knockout and finishing. Green sand is prepared using sand mixer and the moulding is done manually. The charge material is melted in an electrical induction furnace. The molten metal is poured into moulds, which are cooled down and knocked out manually to remove the castings. The castings are subjected to finishing operations such as shotblasting and machining. The sand from the moulds is sent for reuse in moulding process.



Production process in a foundry

Energy consumption

The major energy consuming equipment electrical induction furnace were the electrical induction furnace and electrical motors associated with process equipment such as air compressor, fan, pump, etc.The annual energy consumption was around 1575 tonnes of oil equivalent (toe) in the form of grid electricity.

Intervention

During the energy audit, it was observed that the soft water pump had been rewound three times, resulting in low efficiency. As per the recommendation of the energy audit, the foundry unit replaced the soft water pump with an energy efficient pump having 91.3% efficiency.

The energy efficient pump has reduced the annual electricity consumption by about 26,000 kWh. The investment of Rs 0.4 lakhs for the energy efficient pump is saving Rs 1.9 lakhs annually. The simple payback period is 0.2 year. The estimated greenhouse gas (GHG) reductions are 23 tonnes of CO_2.

The unit replaced the inefficient rewound motor of its soft water pump with an energy efficient motor