CEYLON HEAVY INDUSTRIES AND CONSTRUCTION CO. LTD (CHICO)

Reduce production delays through installation of high tension transformer for power supply

SUMMARY OF THE OPTION

CHICO is the largest steel rolling mill in Sri Lanka, located at Oruwala, in the Colombo district. Power interruptions were frequent, which was caused by an overloading of the existing electricity cable, and resulting in energy and production losses. The company met with the supplier of electricity to solve this issue. The electricity board agreed to install an additional high tension line transformer to the CHICO supply line.
This option did not require financial investments from CHICO. Each year 135,000 kWh is saved, resulting in US$ 9,450 financial savings. The payback period for this option is immediate. GHG emissions are reduced by 28 tons CO2 each year.
Due to less frequent power interruptions, this option in combination with other options implemented contributed to an improvement of production by 15,000 tons between 2003 and 2004. Solid waste in the form of iron oxide scale and rejected billets was also minimized.

KEYWORDS

Iron and Steel, Sri Lanka, Electricity, Production delay

OBSERVATIONS

Electricity is used to operate all drives and is therefore an important energy source for CHICO's production. The energy assessment found that there are frequent power interruptions in main electricity supply. Power supply is also critical because power failures interrupt billet and rolling processes. For example, if a red hot billet is stuck in between the first roller (zero stand) and the furnace or between the rollers, considerable heat is lost and additional energy is needed to reheat billets. If the power failure is too long, those billets need to be removed from the rolling line. On average, power was down for 3700 minutes per year (based on 2002 and 2003 data), resulting in production and financial losses. During a meeting with the power supplier it became clear that the main cause of the unreliable poor supply was the electric overloading in the existing supply line.

OPTIONS

The following options were proposed to minimize power failure:

1. Installation of backup power generator
2. Request power supply authorities to improve the power supply quality
3. Installation of battery powered UPS (Uninterrupted Power Supply) to complete the billets in the rolling line during power interruptions

Because the unreliable power supply was the "root cause" of the problems, it was decided to try and improve reliability. A discussion with the Ceylon Electricity Board (CEB), which is the authority in electricity supply in Sri Lanka, led them to agree to establish an additional high tension line transformer to the CHICO supply line.

RESULTS

With the improved power supply, power interruptions were minimized. This resulted in an increase in continuous operation and therefore fewer blockages and jamming partially rolled billets between rollers in rolling stands, fewer rejected billets and increased production.

Financial benefits

- Investment: none
- Annual operating costs: none
- Annual cost savings: US$ 9,450 (135,000 kWh X US$ 0.07/kWh)
- Annual cost savings from increased production, raw material savings and solid waste reduction were not determined
- Payback period: immediate

Environmental benefits

- Annual electricity savings: 135 MW
- Steel raw material savings due to less reject billets (not quantified)
- Reduction in solid waste in the form of iron oxide scale (not quantified)
- Annual GHG emission reduction: 28 tons

Electricity saving and GHG emission reductions were calculated as follows:

- Baseline 2003 electricity consumption (Sep 2002 – Aug 2003): 60,000 tons product X 120 kWh/ton product X 1/1000 = 7,200 MW
- Electricity savings in 2004: 1.5% X 120 kWh/ton product = 1.8 kWh/ton product
- 2004 electricity consumption: 75,000 tons product X 118.2 kWh/ton product X 1/1000 = 8,865 MW
- GHG emissions in 2004 compared to 2003:
    - Absolute: 1665 MWh increase X 0.205 ton CO_2/MW electricity = 341 tons CO_2 increase
    - Compared to business-as-usual: 75,000 tons product in 2004 X 1.8 kWh = 135 MW. 135 MW X 0.205 ton CO_2/MW electricity = 28 tons CO_2 reduction

Other benefits

- Less staff time involved with removing billets from rolling line
- Improved product quality
- Overall productivity improvement and hence increase in annual production: 15,000 tons/year (2004 compared with 2003) *(Note: this improvement is for all options implemented at CHICO combined)*

FOR MORE INFORMATION

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