



CEYLON HEAVY INDUSTRIES AND CONSTRUCTION CO. LTD (CHICO)

Reduce production delays through improvement of fuel oil quality

SUMMARY OF THE OPTION

CHICO is the largest steel rolling mill in Sri Lanka, located at Oruwala, in the Colombo district. The energy assessment found that burner nozzles in the furnace were frequently blocked, due to poor oil quality which was caused by the supplier mixing fuel oil with waste oil. The company met with the furnace oil supplier and found that during transport of fuel oil to the plant, waste oil was mixed with furnace oil. The supplier ensured that waste oil would in the future not be mixed with fuel oil, whilst CHICO introduced a new procedure to check oil quality.

These options did not require financial investments from CHICO. Each year 150,000 liters of oil or US\$ 30,000 is saved due to an improvement of specific oil consumption by 2 liters/ton product. This option in combination with other options implemented contributed to an improvement of production by 15,000 tons between 2003 and 2004.

KEYWORDS

Iron and Steel, Sri Lanka, Fuels and combustion, Production delay

OBSERVATIONS

The steel rolling mill mainly uses furnace oil to heat billets in the furnace and therefore the energy assessment focused on this energy source. The assessment found that burner nozzles were frequently blocked. This results in poor billet heating and production delays. Cleaning the nozzles requires a furnace shutdown. Two causes were found:

- Poor furnace oil quality: Furnace oil is preheated and fired through a burner to maintain high preheating, heating and soaking temperatures in the billet's heating furnace. The oil contained high levels of impurities and the viscosity was high, causing the nozzles to block. Investigations into the variation of oil quality revealed that oil suppliers were mixing fuel oil with poor quality waste oils during transport
- Substandard nozzle quality at the furnace

OPTIONS

To minimize the burner nozzle blocks due to oil quality variation, following options were proposed:

1. Changing the furnace oil supplier or brand
2. Replacing furnace oil with heavy diesel
3. Mixing diesel with furnace oil to improve viscosity and flow
4. Increasing the oil preheating temperature
5. Analyzing the reasons for oil quality variation and adopting measures to keep the oil quality constant

Because the reason for the oil quality variation lay with the oil supplier, a meeting was held with the Oil supply company management to sort out this issue. It was agreed between both parties to minimize the transport time in between the oil supplier and the plant. In addition, a regular oil quality check procedure was established at CHICO.



RESULTS

With the improved oil quality, burner blockings in the furnace were minimized. This resulted in an increase in continuous operation and therefore more constant temperatures inside the furnace, less heat loss, fewer rejected billets and increased production

Financial benefits

- Investment: none
- Annual operating costs: none
- Annual cost savings (*note: these savings are in combination with the nozzle and recuperator option*):
 - Fuel oil savings: US\$ 30,000 (150,000 liters/year X US\$ 0.2 per liter of fuel oil)
 - Production improvement: net savings from 15,000 ton/year production increase not determined
- Payback period: immediate

Environmental benefits

- Annual fuel oil savings (*note: these savings are in combination with the nozzle and recuperator option*): 150,000 liters/year, calculated as follows:
 - Specific oil consumption improved from 54.8 liters/ton product in 2003 to 52.8 liters/ton product in 2004
 - Annual fuel oil savings: 75,000 tons product X 2 liters/ton product = 150,000 liters/year
- Annual GHG emission reduction (*note: these savings are in combination with the nozzle and recuperator option*): 416 tons CO₂/year

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*)

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