STEEL ASIA MANUFACTURING CORPORATION

COMPANY DESCRIPTION

Steel Asia Manufacturing Corporation (SAMC), a joint venture with TATA Steel from India, is located in Bulacan in the Philippines and produces reinforcing steel bars (also referred to as rebar) for use in construction. The plant was commissioned in 1996 and currently has 400 employees. Annual production is 360,000 tons of steel bars compared to its 400,000 tons annual designed capacity, which is mostly consumed by the domestic market. The company participated in the project to sustain their effort to improve the operation, cut down on production cost through energy efficiency and cleaner production and prepare for an application for Integrated Management System (ISO 9001, ISO 14001 and OSHAS 18000) certification.

PROCESS DESCRIPTION

- ***Preheating***: Steel billets are received and charged directly in a re-heat walking hearth furnace through the charging door of the furnace. They are reheated for 75 minutes to 1100ºC using Bunker C (Type #6) fuel oil. The furnace can reheat billets at a maximum rate of 65 tons per hour.
- ***Rolling***: Once billets reach the required temperature for rolling, they leave the furnace through the discharging doors and are rolled along a series of 18 tandem (horizontal/vertical) continuous rolling mill stands to obtain the desired size and shape. Each rolling stand is controlled throughout the process by a computerized control system.
- ***Cutting and Testing***: The bars are then cut to lengths required by customers. Samples are subjected to physical, mechanical and chemical tests in a fully equipped laboratory certified to ISO 17025. Instruments used for quality control include a spectrometer and two universal testing machines.
- ***Bundling and Tagging***: Finally, the product is then bundled and tagged before being placed in a storage facility.

METHODOLOGY APPLICATION

The draft *Company Energy Efficiency Methodology* was used as a basis for the plant assessment to identify and implement options to reduce energy and other materials and wastes. Some of the interesting experiences are:

- ***Task 1b – Form a team and inform staff***

The company is preparing for an Integrated Management System Certification and recently created an Energy Management Committee that oversees the energy costs and savings. This committee also became the Team for the GERIAP project so that efforts are integrated in the wider management system.

Lesson learnt: By using an already existing team as the Team for the energy assessment it is easier to integrate energy management into wider business management systems later.

- ***Task 2d – Quantify inputs and outputs and costs to establish a baseline***

The company has no water metering system or any means to measure the allocation of water used by different production processes. This makes it difficult to establish a water baseline from which to measure water savings after the implementation of water conservation options.

Lesson learnt: It is not always possible to establish a baseline for resource and energy consumption.

- ***Step 5- Implementation and monitoring of options***

Implementation: The company modified some of the options recommended for better monitoring of operation such as use of steel curtain, which have longer life, and use of water metering system with more accurate results.

Lesson learnt: If external facilitators are involved it is important that the company checks if any modifications of options are needed, as they know the plant better than anyone

Monitoring: The energy savings and greenhouse gas emission reduction resulting from the insulation of the furnace was calculated based on measurement conducted on surface wall temperature. If these savings would have been calculated based on their production data, the actual consumption of bunker fuel would have increased due to a change in the billet feed. However, a relatively larger increase would have been measured if the insulations were not repaired.

Lesson learnt: Where possible, use actual measurements to monitor energy reductions to avoid the influence of changes in production input and changes in production processes on monitored results. Calculated savings assumes that similar parameters are maintained other than the options being implemented.

- ***Step 6 – Continuous improvement***

The company will continue with energy efficiency making using of already started initiatives:

- A Productivity Improvement Program aimed at saving fuel and reducing costs by plant staff who are given by cash incentives for good ideas
- The Energy Management Committee which will oversee the continuation of energy efficiency
- The Integrated Management System Certification, which will ensure that energy efficiency is fully integrated into the environmental management system

Lesson learnt: It is not always necessary to start new initiatives to ensure continuous energy efficiency improvement.

OPTIONS

- The focus areas selected for the project were (1) Walking Hearth Reheating Furnace (thermal) (2) Air compressor motors and other electric motors and (3) water system
- The Team identified a total of five energy and waste minimization options, among which four options were implemented, while the rest are still to be implemented.
- For the four options implemented, the total investment was US$ 3,179, annual cost savings were US$ 158,528 and the payback period was 5 months.
- For the three options implemented, annual energy savings were 684,001 liters of bunker fuel and 4,594 kWh
- For the three options implemented, annual GHG emission reductions were 2,055 tons of CO_2 equivalent. The percentage of GHG emission reduction for the entire plant's emissions could not be calculated.

Table 1: EXAMPLES OF OPTIONS IMPLEMENTED AND PROPOSED

FOCUS AREA AND OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Walking Hearth Reheating Furnace /Installation of ceramic fiber insulation inside the furnace wall at recuperative zone side *(see case study)*	Good housekeeping	▪ Investment: US$ 180 ▪ Cost savings: US$ 2,410/yr ▪ Payback period: 0.9 months	▪ Fuel savings: 5,514 l/yr ▪ GHG emission reduction: 16.54 tCO_2/yr	Improved work conditions around the furnace and reduced pumping cost for bunker.

FOCUS AREA AND OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Electric motors/ Change of transformer tap settings of electric panel at scale pit pumps *(see case study)*	Production process/ equipment modification	▪ Investment: none ▪ Cost savings: US$ 6,806 /yr ▪ Payback period: immediate	▪ Electricity savings: 3,761 kWh/yr ▪ GHG emission reduction: 3 tCO_2/yr	Results are calculated results only
Water system/ Measurement of water holding tank volume and/or installation of water meters to monitor water consumption *(see case study)*	Good housekeeping	▪ Investment: US$ 454 ▪ Cost savings: US$ 1,284/yr ▪ Payback period: 4 months	▪ Electricity savings: 833 kWh/yr ▪ GHG emission reductions: 0.19 tCO_2/yr ▪ Water savings: 2,015 m3/yr	Water metering system was installed (instead of measurement water holding tank refills)
Walking Hearth Reheating Furnace /Installation of heat resistant cloth canvass on charge and discharge door of furnace to reduce heat loss *(see case study)*	Good housekeeping	▪ Investment US$ 2,545 ▪ Cost savings: US$ 148,028/yr ▪ Payback period: one week	▪ Fuel savings: 678,487 l/yr ▪ GHG emission reduction: 2,035 tCO_2/yr	Expected results only as yet to be implemented. Improved work conditions around the furnace.
Motors/ Replacement of inefficient and oversized motor at the cooling tower with a downsized standard or high efficient motor *(see case study)*	New technology/ equipment	▪ Investment: not given ▪ Cost savings: US$ 91/yr	▪ Electricity savings: 196 kWh/yr ▪ GHG emission reduction: 0.16 tCO_2/yr	Not yet implemented, since no replacement motor is available at plant

FOR MORE INFORMATION

GERIAP National Focal Point for the Philippines
Dr. Alice B. Herrera
Officer-in-Charge, Fuels and Energy Division
Industrial Technology Development Institute
Gen. Santos Ave., Bicutan, Taguig City, Metro Manila Philippines 1631
Tel: +632 837 2071 ext 2190
Tel fax: +632 837 2071 ext 2204
E-mail: aherrera@dost.gov.ph, abherrera@pacific.net.ph

GERIAP Company in the Philippines
Ms. Belen W. Yao
AVP – Gen Plant Services
Steel Asia Manufacturing Corporation
090 Ciudad Industria, Bo. Bahay-Pari, Meycauyan, Bulacan, Philippines