

Guangdong Esquel Textiles Co, Ltd

Visit to the Facility

Date of Visit: 12 September 2006

General Information on the Facility

Nature of Business: Textile/apparel manufacturing in Guangdong province

Working Hours: Office: 8:30am – 5:00pm (Monday to Friday)
Production Workshops: 24 hours (7 days a week?)

Number of Staff: Approximately 26,000 (total)

Age of Building of the Facility: Information not available

Duration of Occupation of the Facility: Information not available

Description of Operation and Observations during the Visit

Esquel is a leading manufacturer of cotton apparel, producing about 60 million pieces of garments each year, and the largest exporter of woven shirts in China. Esquel adopts a vertically integrated production system, which starts from its own cotton farm in Xinjiang to the cotton fabric and garment factory in Guangdong province. The total site area of the facility is about 700,000 m², including the main plant, the new plant, the power plant and the wastewater treatment plant. The visit covers the office, the power plant, the wastewater treatment plant and the workshop.

Power Plant

Owing to the high demand for electricity and steam in its manufacturing process, Esquel operates its own power plant to ensure an adequate supply of steam and electricity. The coal-fired power plant has been operating since August 2004. The generating capacity of the power plant is 30MW, with a monthly coal consumption of about 18,000 tonnes. The sulphur content of the coal is about 0.4-0.7%. Three boilers are installed and each boiler is equipped with an electrostatic precipitator (ESP) to remove particulates. The boiler temperature is about 800 – 900 °C. Desulphurization is implemented by the injection of lime into the boiler. The sulphur dioxide formed during the combustion of coal reacts with the injected lime to reduce the level of sulphur dioxide in the exhaust gas. A continuous emission monitoring system (CEMS) is installed to monitor the emissions (nitrogen oxides, sulphur dioxide and particulates) in the exhaust gas. The exhaust is discharged via a 150m high chimney. A review of the CEMS monitoring results obtained on 11 September 2006 indicates that the concentrations of NO_x and particulates are well within the statutory requirements (500 mg/m³ for particulates and 650 mg/m³ for NO_x) but the concentration of SO₂ barely met the standard (1300 mg/m³) and the removal efficiency is about 20 – 50%. The steam generated from the power plant is supplied to the factory through the above ground steam-pipeline (underground while crossing roads). Steam was observed leaking from the pipeline during site visit.

Workshop

Seven oil-fired boilers are installed at the workshop as a backup supply of heat and/or steam for the manufacturing process. When these boilers are in use, they consume about 500 tonnes of heavy oil per month. The sulphur content in the heavy fuel oil is about 2-3%. The stack, which stands at about 4 m above the rooftop of the workshop, is designed with a scrubber system that uses alkaline waste effluent from the process stream for desulphurization of the exhaust gas before discharge. The Environmental Protection Bureau (EPB) checks the stack emissions at quarterly intervals and it is reported that the emissions meet with the relevant standards.

The process of sizing will produce particulates. A wet scrubber is installed to remove the particulate matters before discharge into the atmosphere.

"Nano-reflective" plates have been installed in the lighting fixtures of the workshop to reduce the number of fluorescent tubes required to achieve the required level of brightness. With the "nano-reflective" plates, many of the twin-tube fluorescent lamps can reportedly be reduced to one tube. The cost of "nano-reflective" plate (each piece of 1.5m length) is about RMB\$140 and the electricity cost of the tube is RMB \$150. Therefore, using 1 "nano-reflective" plate can replace 1 fluorescent tube. Hence, the extra cost of these plates can be paid back by the savings in energy in approximately one year for this particular workshop.

Office

- The lights are switched off during lunchtime.
- An energy audit was conducted in July 2006 by a Singaporean company.
- The office temperature is set at 26°C and it cannot be adjusted by the staff.

Identification of Good Practice Adopted

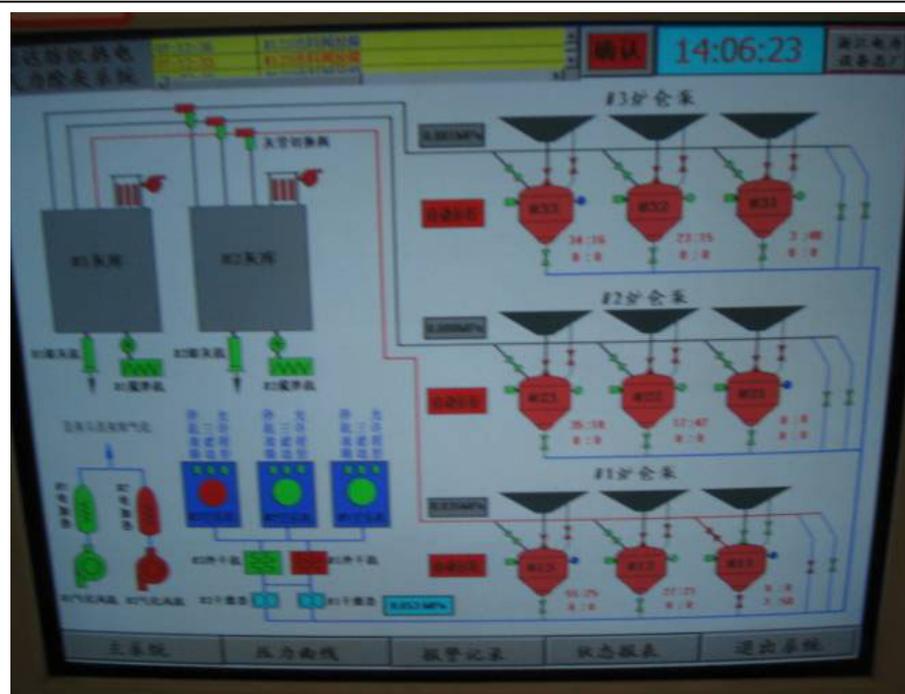
- "Nano-reflective" plates are used to reduce the number of fluorescent tubes used. The adoption of "nano-reflective" plates brings savings in energy and costs.
- Office lights are switched off when not required during lunchtime to help in saving energy.
- The office temperature is set at 26°C, which is above the recommended 25.5 °C and helps to maintain the energy consumption at a reasonable level.
- Continuous emission monitoring system is employed for the monitoring of air pollutants and process performance of the power plant.

Areas for Improvement and Recommendations

- The sulphur removal efficiency of the desulphurization process in the power plant is not very high (about 20-50%) and some of the monitoring records from CEMS indicate occasional exceedance of SO₂ emission standard. It is recommended that a separate flue gas desulphurization (FGD) system be installed after the electrostatic precipitator to allow more efficient removal of SO₂ in the flue gas. Typical FGD system such as limestone FGD system can be used to increase the SO₂ removal efficiency to a level of as high as 90%



Stack with Scrubber System at the Workshop



Continuous Emission Monitoring System at the Power Plant