



ASIAN CHEMICAL COMPANY LIMITED

Install Temperature Sensor to Switch the Fan in Cooling Tower on When Water Temperature Exceeds 28⁰C

SUMMARY OF THE OPTION

Asian Chemical Co Ltd is located in Bangpakong in Thailand and produces 6,000 tons per year of various copper solution products, namely copper sulfate, copper oxide, copper chloride and etching solution.

The company has two cooling towers for the closed-loop water-cooling system of the Ammonium Hydroxide plant. The Team found that there was no temperature difference between the inlet and outlet water used in the cooling tower during the first four hours after the start of the system, i.e. the temperature of inlet and outlet water was 27°C. After four hours, however, the cooling water temperature increased to 35°C. When the cooling tower was closed, the water temperature would increase slightly above 35°C after four hours. As a result, the fan of the cooling tower was operating four hours after each startup of the system, although this was not necessary.

The Team recommended the installation of a temperature-sensor switch for controlling the fan. The temperature sensor probe measures the temperature of the water coming out from the cooling tower. When the water temperature is more than 28°C, a signal is sent to the fan controller to start up.

The implementation of this option cost US\$ 165 for the purchase and installation of the temperature sensor and fan controller. The payback period was seven months. Annual cost saved through reduced electricity was US\$ 282 (4,032 kWh X US\$ 0.07/kWh).

Annual electricity savings were 4,032 kWh, which was calculated as follows:

- Annual electricity consumption before implementation: 9,072 kWh (1.5 kW power used by fan X 0.7 fan efficiency X 8640 hrs/yr)
- Estimated cooling tower's start-up: every 9 hours
- Total annual start-up: 960 times (8,640/9)
- No operation of fan required: 4 hours after each start-up
- Total fan's non-operation: 3,840 hours/year (4 X 960)
- Annual electricity lost due to fan non-operation: 4,032 kWh (1.5 kW power used by fan X 0.7 fan efficiency X 3840 hrs/yr = annual electricity savings after option was implemented)

The GHG emission reduction was 2.49 tCO₂ per year (4,032 kWh X 0.000618 tons tCO₂/kWh)

KEY WORDS

Chemicals, Thailand, Cooling Towers, Fans & Blowers, Temperature Sensor



FOR MORE INFORMATION

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