HOLCIM BULACAN PLANT

Installation of Variable Speed Drives (VSD) for Motors of Reducer High Pressure Pump and Reducer Low Pressure Pump at Raw Mill

SUMMARY OF THE OPTON

HOLCIM (formerly Union Cement Corporation) Bulacan plant located in Bulacan, Philippines, and produces about 1.9 million tons of cement per year. The reducer high-pressure and low-pressure pumps at the Raw Mill #3 have low loadings of 28% and 51% respectively. The flow rates for these pumps also vary. For this reason it was recommended to install 25 HP and 15 HP variable speed drives for the motors of these pumps. Combined investment costs are US$ 9,877, annual cost savings approximately US$ 3,500, and the payback period 2.5 years. Annual electricity savings of 82,913 kWh per year would result in 16 tons CO2 reductions per year. However, company management decided against implementing this option because of the long payback period when considering the relatively high investment costs.

KEY WORDS

Cement, Philippines, Pumps and Pumping System, Electric Motors, Raw Mill, Variable Speed Drives (VSD)

OBSERVATIONS

An assessment of electrical parameters of 14 motors at the Raw Mill #3 area showed the following:

- Only two motors had loading of more than 75% and the remaining motors had lower loadings. A low loading means that motors are used inefficiently.
- The loadings of motors of two water spray pumps were 26.99% and 24.64%
- The loading of the reducer high-pressure reducer pump was 27.96% and of the reducer low-pressure reducer pump was 51.41%.
- The flow rates of the reducer pumps vary.

OPTIONS

The reducer pumps have low loadings and varying flow rates. This makes them ideal for the application of variable speed drives/inverters (VSD). The following VSDs were proposed:

- 25 HP Baldor inverter for the high-pressure reducer pump
- 15 HP Baldor inverter for the low-pressure reducer pump

VSDs were also considered for water spray pumps, but because the payback period would be longer than three years this option was not further investigated.

RESULTS

Financial benefits

Reducer high-pressure pump:

- Investment: US$ 6,059

- Cost savings: US$ 2,000 (approximately)
- Payback period: 3 years

Reducer low-pressure pump:
- Investment: US$ 3,818
- Cost savings: US$ 1,500 (approximately)
- Payback period: 2 years

HOLCIM management decided not to implement these options because the payback period was still considered to be too high for the relatively high investment costs.

Environmental benefits

Reducer high-pressure pump:
- Annual electricity savings: 41,848 kWh/year
- Annual GHG emission reduction: 8 tons CO_2 (Emission factor: 0.0002 tons CO_2/Kwh)

Reducer low-pressure pump:
- Annual electricity savings: 41,065 kWh
- Annual GHG emission reduction: 8 tons CO_2 (emission factor: 0.0002 tons CO_2/kWh)

Other benefits
- VSD inverters would also improve water flow rates of the reducer pumps as flow rates can be adjusted to demand. This would result in reduced water use by the cooling system of the Raw Mill.

FOR MORE INFORMATION

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