



## **COROMANDEL CEMENTS LIMITED**

### **Reduction of Speed of Circulating Air Fan in the Coal Mill through Replacement of AC Motor with DC Motor**

#### **SUMMARY OF THE OPTION**

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Coromandel Cements Ltd, a small cement manufacturing plant in South India made provision for additional hot air duct from coal furnace to the bottom of coal mill table feeder and the insulation of bare hot air duct. The unit plans to modify and expand their plant system and equipment capacities gradually in two phases. The first phase modification plans includes installation of Gas Conditioning Tower and Electro Static Precipitator, which would result in reduced power consumption. In the second phase, modification of Precalculator, Grate cooler, Cyclones and Cement mills would take the plant capacity up to 900 TPD.

It was observed that the coal mill Circulating Air (CA) fan evacuates gases from the coal mill dust collector bag filter exit and discharges clean air into the atmosphere. The coal mill CA fan before modification was driven by an AC induction motor and air flow being higher than required, had to be adjusted as per process requirement, using inefficient damper control.

The fan drive was replaced with a direct current (DC) motor, which enabled speed reduction with ease to match actual flow requirement without using damper to throttle fan airflow. (The use of VSD was not considered taking into account the cost economics involved since the motor under consideration was of a low capacity 28 kW, also the O&M of VSD would be very high in comparison to DC motor)

This measure resulted in reduced power consumption by the coal mill CA fan motor to the tune of 5 kW totaling 18600 kWh per year worth Rs. 69,066 annually (US\$ 1,605). The associated annual GHG reduction was of the order of 17 tons. The investment towards the purchase and installation of a new DC drive motor for the coal mill CA fan amounting to Rs. 69,575 (US\$ 1,622) was paid back in about 13 months. The capital was drawn from the unit's own funds.

#### **KEY WORDS**

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India, Cement, Fans and Blowers, Coal mill

#### **OBSERVATIONS**

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The coal mill CA fan before modification was driven by an AC induction motor and air flow being higher than required, had to be adjusted as per process requirement, using inefficient damper control. The following observations were made:

- Coal mill exhaust fan suction damper was always kept closed (more than 60 %)
- Speed of the motor was always constant

#### **OPTIONS**

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The need for throttling Coal Mill CA fan flow to match process requirements (by damper) was eliminated by replacing the existing Coal mill CA fan AC drive motor, by a new DC drive motor and operated at reduced rpm and full flow.



## **RESULTS**

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### **Financial benefits**

- Investment: US\$ 1,622 (Rs. 69,757)
- Annual cost savings: US\$ 1,605 (Rs. 69,066 = 18600 kWh X Rs. 3.71/kWh)
- Payback period: 13 months

### **Environmental benefits**

- Annual electricity savings: 18600 kWh (= 5kWh X 12hr/day X 310days/year)
- Annual GHG emission reduction: 17 tons of CO<sub>2</sub>/yr, (= 18600 kWh X 0.000893 tons of CO<sub>2</sub>/kWh)

## **FOR MORE INFORMATION**

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