



UREA FERTILIZER FACTORY LIMITED

Installation of Capacitor Bank to Reduce Power Factor and Replacement of Motors and Pumps

SUMMARY OF THE OPTION

Urea Fertilizer Factory Ltd (UFFL) is a government owned producer of ammonia and urea fertilizer in Bangladesh with an installed production capacity of 470,000 tons per year.

This option is partially implemented. The objective of this option is to reduce the electricity consumption of the plant. The plant has replaced many old and inefficient motors and practiced switching of unnecessary fans/motors and AC, where there is no work. As a result, despite about 9% higher production during 2004 period, plant's overall electricity consumption has reduced by 15.72 KWh in per ton urea production. This was achieved due to stable power supply, less shutdown and replacement of old motors. Overall total electricity consumption of the plant has decreased by 5,973.60 Mwh during 2004. As such, they have saved about Tk 17,920,800 (eqv US\$ 298,680) and reduced 3,225 TCO₂ GHG emissions. However, actual contribution of this specific option can not be isolated and as such not quantified.

KEY WORDS

Chemicals, Bangladesh, Electricity, Motors, Capacitor bank, Power factor

OBSERVATIONS

The following observations were made:

- Motor power factor appears to be low (about 0.8)
- Efficiency of pumps and motors very low

OPTIONS

To reduce high electricity consumption of the plant, repairs and checks were carried out of motors and pumps throughout the plant. In the Ammonia Plant, 28 replacements / changes were made, including:

- Replacement of ball bearings of motors and pumps (7)
- Checking and repair of control cables and control stands (5)
- Repair of igniter of boilers and reformers (2)
- Other motors checks and repairs (8)
- Other checks and repairs of boiler, machines, pumps (6)

In the Urea Plant, 27 replacements / changes were made, including:

- Replacement of (ball) bearings of motors (11)
- Repair of igniter plugs and transformers (3)
- Repair of lighting fixtures (1)
- Checking and cleaning/replacing motors, control stands and control cable of motors (4)
- Restoration of temporary power supply (2)
- Checking of control circuits (2)
- Other (4)



In the Utility Plant, 11 replacements / changes were made, including:

- Replacement of bearings, power cables and bearing air filters of motors (3)
- Control circuits checked and repaired (4)
- Oil checking (2)
- Igniter plug testing (1)
- Checking of spring charging motor (1)

The plant still needs to install capacitor Banks to increase the power factor. This requires investment costs that must be approved by several layers of management and can only be implemented during a major shutdown to avoid production disruption.

RESULTS

Financial benefits:

The financial benefits for the replacement of inefficient motors and pumps were:

- Investment: new investment was not required because motors and other parts that had to be replaced were in stock and this option was implemented as part of the general maintenance budget
- Annual cost savings: US\$ 298,680 (=5973.60 MWh X Tk 3,000/Mwh = Tk 17,920,800)
- Payback Period: immediate (because motors were in stock)

Environmental benefits:

The environmental benefits for the replacement of inefficient motors and pumps were:

- Annual electricity savings: 5,974 MWh
- Annual GHG emission reduction: 3,225 tCO₂

The financial benefits for the installation of the capacitor bank were not determined. The installation of the capacitor bank will not result in reduced electricity use or GHG emissions but only a reduced peak load through an improved power factor.

FOR MORE INFORMATION

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