



UREA FERTILIZER FACTORY LIMITED

Insulation, Steam Traps Repair and Condensate Recovery for Boiler and Steam System

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.

The Team observed several leaks including steam fittings and extensive areas of missing or damaged insulation. The plant replaced many valves and fittings and insulated many pipelines to prevent steam leakages. Due to this leakages removal, despite about 9% higher production, the plant's overall natural gas consumption for steam generation was decreased by 6.29 NM³/ton of Urea. Total investment cost was not quantified as the plant used valves and fittings available in stock. After implementation of this option, the plant saved about 2,333,307 NM³ natural gas, which is worth US\$ 85,165 (Tk 5,109,942). This also resulted in a reduction of 5,052 tCO₂ GHG emissions.

KEY WORDS

Chemicals, Bangladesh, Boilers & thermic fluid heaters, Steam distribution & utilization, Fertilizer, insulation, steam traps, condensate

OBSERVATIONS

The boiler and steam distribution system was selected as a focus area because it is one of the main energy consumers of the plant. The following observations were made during an assessment of the plant's steam system:

- There are several auxiliary and low pressure boilers. These boilers are over thirty years old and all of them have poor insulation, have out-dated and or by-passed controls and operating at low loads.
- There is no insulation of steam pipe fittings such as valves and flanges. In some cases insulation material on steam pipes were absent. Several steam leaks were detected throughout the plant.
- Pressurized steam blowing at different points due to failure of valves, traps, lines, etc.

OPTIONS

To prevent heat and energy losses through steam leakages, the following options were implemented:

- Repair leakages in the steam distribution lines
- Insulate, replace and install (wherever required) insulation on all steam pipelines and fittings

No options was implemented to improve boiler operation, such as replacement of boilers due to high investment costs and insulation of boilers.

RESULTS



Financial benefits

- Investment costs: no investment required because valves and fittings were still in stock and their price could not be established
- Annual operating costs: none
- Annual natural gas cost savings: US\$ 85,165 (Tk 5,109,942, calculated as follows: $M^3/MT \text{ urea} \times 370,955 \text{ MT urea/Yr} = 2,333,307 \text{ NM}^3/\text{Yr} \times \text{Tk } 2.19/\text{NM}^3$)
- Payback period: immediate

Environmental benefits

- Annual natural gas savings: 2,333,307 NM^3 (= 853.66 K Therm)
- Annual electricity savings: not determined
- Annual GHG emission reduction: 5,052 tCO_2 (= 853 K Therm \times 5.919 $\text{tCO}_2/\text{KTherm}$ taken from UNEP GHG calculator: www.uneptie.org/energy/tools)

Other benefits

- Reduce waste water
- Less chemical consumption

FOR MORE INFORMATION

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