

# Energy Conservation

## Environment Management Program (EMP) – 2010-11

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- EMP-01 – Electricity conservation
- EMP-02 – Coal Consumption

## EMP - 01

### 1. Cooling tower pumping by one pump only for ATBS plant.

**Present** : Two cooling tower pumps (55KW & 75KW) are used to supply the cooling water to ATBS plant. The major consumer of cooling water was two 80m<sup>2</sup> condenser (of new ACN column) located at 15mtr.

**Proposed** : The cooling water temperature difference across the supply & return was found only 2°C. So it is decided to put both these condenser in series. This will result in reduction of cooling water demand.

**Action taken** : Two condenser cooling water connection are done in series in June2010.

**Investment** : Rs. 10000/-

**Saving** : Previous pumping cost = (55 KW + 75KW) x Rs.6/KWH x 24 Hrs x 333 days  
= Rs. 6233760/Year  
Proposed pumping cost = 75KW x Rs.6/KWH x 24 Hrs x 333 days  
= Rs. 3596400/Year

**Net Saving** : =6233760-3596400 = Rs.26.37 Lacs/Year

Completed

## EMP - 01

### 2. Pumping condensate by steam operated pump instead of conventional electrical driven pump for IB , ATBS.

**Present :** Two electric driven pumps (One for IB – 3.7KW & other for ATBS plant – 3.7 KW) are used for pumping the condensate from plant condensate tank to boiler house deed water tank.

**Proposed :** The condensate can be pumped with help of steam which results in higher pumping temperature with lower pumping cost.

**Action taken :** Two steam operated pumps are installed for both the plants in July 2010.

**Investment :** Rs.5.73 lacs

**Saving :** Previous pumping cost = ATBS Condensate + IB Condensate  
$$(((3.5 \times 24) / 15) * 3.1 * 6 * 333) + (((5.5 * 24) / 5.5) * 3 * 6 * 333) = \text{Rs } 178541 / \text{Year}$$

Proposed pumping cost = 216 T of condensate/day / 3 kg# x Rs.1 x 333 days = Rs 23976/Year

**Net Saving : =178541-23976 = Rs.1.54 Lacs/Year**

# = 1 tones of condensate needs 3 Kg of steam for pumping.

Completed

## EMP - 01

### 3. Reduction in pumping energy in Isobutylene plant

**Present** : We are running P602, P605 & P613 pumps for process. These pumps have characteristic of low flow & high head for which single stage pumps used. These pumps have very low efficiency (11%, 17% & 7% resp.) resulting more power consumption.

**Proposed** : We decided to put multistage pumps with high efficiency (above 50%) which require less power to run for the same capacity & head.

**Action taken** : Grundfos pump quotation has been received & proposal is made & send for approval.

**Investment** : Rs. 5.35 Lacs

**Saving** : Previous total power consumption for 3 pumps = 41.1 KWH  
Proposed total power consumption for 3 pumps = 6.66 KWH

**Net Saving** : =  $41.1 - 6.66 = 34.74\text{KWH} * 8000 * 6 = \text{Rs } 16.67 \text{ Lacs/ year}$

**Status** : Waiting for approval

Pending

## EMP - 01

### 4. Reduction in Electricity for compressor air

**Present :** We have total 3 nos of air compressor (110KW – 1 no & 90 KW – 2 nos). Out of which, one 110 KW & one 90 KW compressor are running continuously. The 110KW compressor is running on no load most of the time (15 to 20 hrs per day) which is wastage of electricity.

**Proposed :** We decided to run 110KW compressor on full load & other 90KW compressor should support as & when demand increases.

**Action taken :** The 90KW compressor load & unload setting are changed from 7 & 6.5 to 6.5 & 6. The load & unload setting of 110KW compressor is unchanged i.e. 7 & 6.5.

**Investment :** Nill

**Saving :** Previous total power consumption for both compressor = 3700KWH/day (18/10/10 to 23/11/10)  
Present total power consumption for both compressor = 2850 KWH/day (1/12/10 to 07/12/10)  
The saving is because of reduction in running hours of 90KW compressor.

**Net Saving :** =  $3700 - 2850 = 850\text{KWH/day} * 333 * 6 = \text{Rs } 16.98 \text{ Lacs/ year}$

**Status :** Effective from 1 Dec 2010.

Completed

## EMP - 02

1. Reduction in coal consumption by reducing the O<sub>2</sub> content in flue gas.

**Present :** The coal boiler has no provision of monitoring the excess air thus O<sub>2</sub> content in flue gas. The air fuel ration has been verified by looking the colour of exit flue gas from chimney.

**Proposed :** The online O<sub>2</sub> analyser has to fit for minimizing the excess air thus O<sub>2</sub> content in flue gas. Thus increase the boiler efficiency by 7.6%.

**Action taken :** Effimax system with online O<sub>2</sub> analyser has been ordered from Forbes Marshall. The said Item has been received at site.

**Investment :** Rs. 9.3 Lacs.

**Saving :** Previous O<sub>2</sub> content = 16% After tuning with portable meter O<sub>2</sub> content = 12.4%.  
Previous Boiler Efficiency = 71.6%, proposed boiler efficiency = 79.3%.  
Proposed saving in coal = 56 Kg/hr.

**Net Saving :** = 56Kg/hr x 24hr/day x 333 day x 4.5 Rs/kg = Rs. 20 Lacs /Year

**Status :** Work is completed in Nov 2010.

Completed