Energy Conservation

Environment Management Program (EMP) – 2010-11

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EMP-01  –  Electricity conservation
EMP-02  –  Coal Consumption
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 80m² 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
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

\[((3.5\times24)/15)\times3.1\times6\times333\] + \[((5.5\times24)/5.5)\times3\times6\times333\] = Rs 178541/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.
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 = 34.74KWH *8000*6 =Rs 16.67 Lacs/ year

Status: Waiting for approval

Pending
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 = 850KWH/day *333*6 =Rs 16.98 Lacs/ year

**Status**: Effective from 1 Dec 2010.
1. Reduction in coal consumption by reducing the O2 content in flue gas.

Present: The coal boiler has no provision of monitoring the excess air thus O2 content in flue gas. The air fuel ration has been verified by looking the colour of exit flue gas from chimney.

Proposed: The online O2 analyser has to fit for minimizing the excess air thus O2 content in flue gas. Thus increase the boiler efficiency by 7.6%.

Action taken: Effimax system with online O2 analyser has been ordered from Forbes Marshall. The said item has been received at site.

Investment: Rs. 9.3 Lacs.

Saving: Previous O2 content = 16%  After tuning with portable meter  O2 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.