

## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

ID to be filled by BEE	Title of the measure	Sector : Petroleum Refineries
Year to be filled by BEE	<b>Installation of VFD in LAB fin fan cooler</b>	Technology .....
<p>Description of the energy conservation measure:</p> <p><b>Introduction :</b>            Linear Alkyl Benzene (LAB) Plant of 120,000 MTPA capacity was commissioned on 14th Aug'04 in Gujarat Refinery. The plant is licensed by M/S UOP, USA and constructed by Samsung Engineering construction limited, Korea on LSTK basis. The LAB plant has six units namely PREFAC, UNIONFINING, MOLEX, PACOL, PEP and DETAL. Units consisting of PREFAC, UNIONFINING, MOLEX are called Front End (FE) section and in the FE section LABFS is processed to separate normal paraffins and the normal paraffins are further processed in Back End(BE) section to produce LAB. Prefac separates C10-C13 Kero as heart cut. The heart cut is hydrotreated in Unionfining unit to remove organic Sulphur and Nitrogen. Hydrotreated heart cut is then processed in Molex to extract normal paraffins.</p> <p>Unionfining unit is Hearcut Kero hydrotreater which is similar to DHDS unit and uses Ni-Mo catalyst to promote Desulphurization and denitrification reactions at 300°C temp. and 80 kg/cm<sup>2</sup> pressure in presence of Hydrogen environment.</p> <p>Reactor effluent after exchanging heat with feed and separator bottoms is cooled to 55°C using air-cooled finfan cooler (2060-EA-001) before reaching separator. The finfan cooler process stream design inlet and outlet temperature is 161°C and 55°C respectively. The finfan cooler has two bundles in single bay. There are two fans (30 KW motors each) with one of them having variable pitch control for controlling the air flow rate, there by the cooler outlet temperature. The design air inlet temperature considered is 42.0°C and the air flow requires to be adjusted to take care the ambient temperature fluctuation (which goes down as low as 15.0°C in winter and also there is a huge variation in ambient temperature between day and night). Since, there are only two fans and one of them with variable pitch control, even after adjusting the pitch to the minimum possible range, the condenser outlet temperature never touches the design value of 55.0°C. Due to this reason the condenser effluent temperature always stays below the design temperature and the actual average for the last 9 months is 44.0°C.</p> <p>By providing the <b>Variable speed motor</b> on the fan, which is not having pitch control, the airflow can be controlled to adjust the required condenser outlet temperature. This will lead to the following benefits</p> <ul style="list-style-type: none"> <li>• Fuel savings furnace due to increased inlet temperature.</li> <li>• Eliminates or reduces the ammonium salt deposition in the reactor effluent – separator bottoms exchanger thereby increased the equipment reliability and run length.</li> <li>• Fuel savings in terms of improved stripper feed temperature.</li> <li>• Power savings due to VSD provision.</li> </ul>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
	Attached separately	
Agency that executed the project (with complete address and email): In-house		
Total investment, Rs.: 5.0 lakh	Year of implementation: May 2007	

First year energy cost savings, Rs.: 10.8 lakh					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before				133 tons	
Energy consumption after	One fan was stopped (30 kw motor)				
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...					
Company complete address: Gujarat Refinery P.O. Jawaharnagar Vadodara - 391320  Contact person who could be contacted for more information:  N.U.Patel Chief Technical Services Manager Gujarat Refinery P.O. Jawaharnagar Vadodara - 391320  Tel No. – 0265-223 7320				We authorise Bureau to use this information for dissemination  Signature  Date	

**Note: Please submit this sheet separately for each Energy Conservation Measure implemented in 2007-2008 and a CD containing the above information may be please be enclosed.**

## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

ID to be filled by BEE	Title of the measure <b>Reduction in water losses</b>	Sector : Petroleum Refineries
Year to be filled by BEE		Technology .....

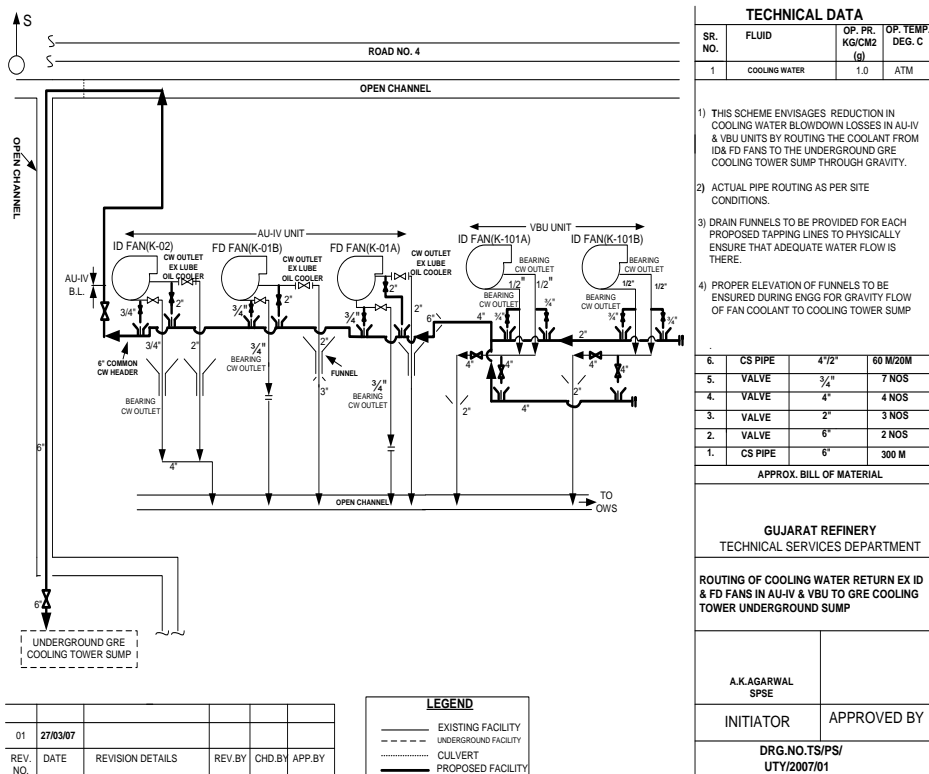
### Provision of routing of coolant from ID & FD fan outlet directly to the underground sump in GRE cooling tower by gravity

There are 2 nos of FD fans (1 running + 1 stand-by) and 1 no of ID fan for balance draft furnace viz F-01 in AU-IV unit. Similarly there are 2 nos of ID fans for induced draft furnace in VBU unit. There is provision of taking either service water or cooling water as fan coolant in these fans. All these mentioned fans normally utilize service water for cooling fan bearing as well as for cooling lube oil (for fluid coupling). These mentioned process units are connected to the GRE cooling water system. After cooling, the fan coolant water is routed to the open channel and subsequently to the OWS through gravity. The same increases the load of CETP unit.

This scheme of routing of fan coolant water from AU-IV & VBU units to the underground GRE cooling tower sump through gravity flow was implemented. This has reduced the load of CETP Unit by 20 m<sup>3</sup>/hr and reduced fresh water consumption to the tune of 25 m<sup>3</sup>/hr.

**Picture/ sketch/ drawing before modification**  
(if available)

**Picture/ sketch/ drawing after modification**



Agency that executed the project (with complete address and email):						
Total investment, Rs.: 8.0 lakh					Year of implementation: May 2007	
<b>First year energy cost savings, Rs.: 44.4 lakh</b>						
First year other savings, Rs.:						
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other	
Energy consumption before					CETP load and fresh water consumption were reduced	
Energy consumption after						
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...						
Company complete address: Gujarat Refinery P.O. Jawaharnagar Vadodara - 391320				We authorise Bureau to use this information for dissemination		
Contact person who could be contacted for more information:  N.U Patel Chief Technical Services Manager Gujarat Refinery P.O. Jawaharnagar Vadodara - 391320  Tel No. – 0265-223 7320				Signature		
				Date		

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First year energy cost savings, Rs.: 80.0 lakh					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before					CETP load decreased by 50m <sup>3</sup> /hr and consumption of fresh water is also reduced
Energy consumption after					
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...					
Company complete address: Gujarat Refinery P.O. Jawaharnagar Vadodara - 391320  Contact person who could be contacted for more information:  N.U Patel Chief Technical Services Manager Gujarat Refinery P.O. Jawaharnagar Vadodara - 391320  Tel No. – 0265-223 7320				We authorise Bureau to use this information for dissemination  Signature  Date	

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