

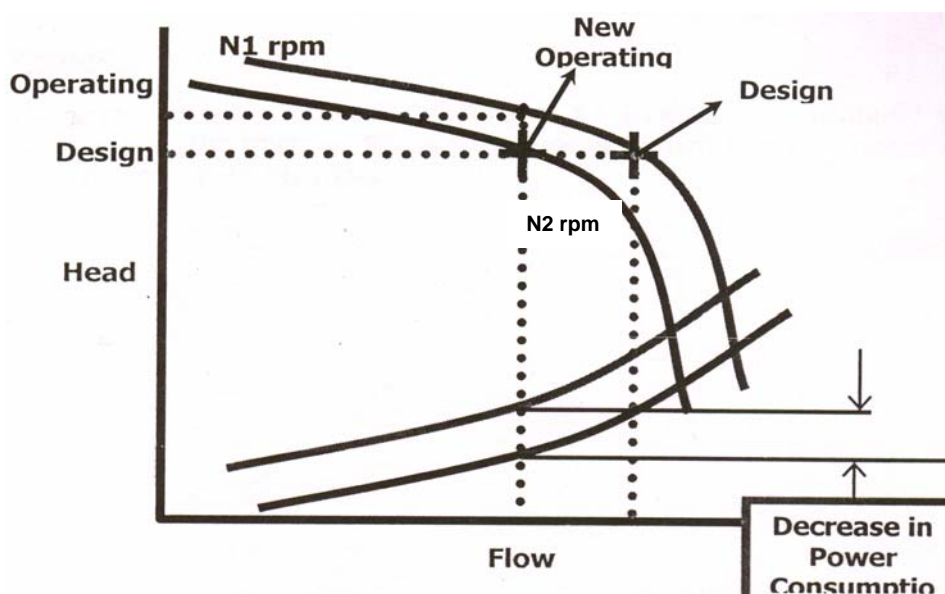
Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure	Sector: Fertilizers
Year to be filled by BEE	Fluid Coupling Installation for Ammonia-I Primary Reformer ID Fan	Technology: Ammonia by Haldor Topsoe Urea by Snamprogetti

Description of the energy conservation measure:

In Ammonia plant, Primary Reformer is one of the major energy intensive equipment. The primary reformer balanced draft, side fired furnace. During normal operation it was observed that the suction damper of ID (Induced Draft) fan is open by only 20 to 25% even at higher loads. Thus the ID fan was running in an inefficient zone due to over design capacity of fan that is driven by electric motor at constant speed. The fan has two drives namely turbine and motor with in between clutch arrangements. Motor drive is preferred to turbine owing to higher efficiency. The rpm of motor and fan is fixed by the frequency (Hz).


The motor power consumption and fan efficiency were 883 Kw and 51.2 % respectively. Normally for these types of fans, 75% of efficiency can be achieved. Too much throttling of Inlet dampers was causing higher pressure drop and inefficiency of fan. So, by operating the fan at optimum speed, the inlet dampers opening can be increased and the fan operating point can be shifted towards the best efficiency point. This also results in less suction pressure drop. The following performance curve explains the concept. It can be seen that for the same capacity, by reducing the speed, the efficiency is brought in line with the design curve.



Though VFDs (Variable Frequency Drives) are ideal for these types of applications, owing to cost implication, it was decided to install a Variable Speed Fluid Coupling.

It was very tough to install the fluid coupling due to space and foundation constrain. However, the installation including the modification of existing foundation, modification of base plate to place Fluid coupling and motor were carried out with the technical expertise available within NFCL. There was no consultant involved at any stage of the project. The commissioning of the equipment was done jointly by NFCL and the Fluid Coupling supplier.

The original speed of the fan was 1000 rpm and after installation of the fluid coupling the speed of fan was brought down to 790 rpm which resulted in considerable power savings in the motor. The power consumption after installation of Fluid Coupling was 683 KW. Thus resulted in power savings to a tune of 200 KW. The Fluid Coupling unit continues to run successfully since commissioning.

Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification					
	 <p style="text-align: center;">Photo Showing the Coupling</p>					
Agency that executed the project (with complete address and email):						
Total investment, Rs.: 18 Lakhs	Year of implementation: 2006-07					
First year energy cost savings, Rs.: 14.14 Lakhs						
First year other savings, Rs.: -						
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other	
Energy consumption before	7920	-	-	-	-	
Energy consumption after	6336	-	-	-	-	
Energy tariff, Rs/ kWh	0.893					
Company complete address: Nagarjuna fertilizers and chemicals limited Nagarjuna Road KAKINADA-533 003, East Godavari Dt. AP State.				We authorise Bureau to use this information for dissemination		
Contact person who could be contacted for more information: Mr Ramshray Singh Sr. GM (Plant Operations), Nagarjuna Fertilizers and Chemicals Limited, Nagarjuna Road KAKINADA-533 003, East Godavari District, Andhra Pradesh Phone: Office: 0884-2360011/2366071 Fax : 0884-2362084/2367075 E-mail : rsingh@nagarjunagroup.com Mobile : 09949994575				Signature Date		

Energy Conservation Measure implemented in 2006-2007

ID to be filled by BEE	Title of the measure		Sector: Fertilizers		
Year to be filled by BEE	Lowering of MS Header Pressure in Urea-I		Technology: Ammonia by Haldor Topsoe Urea by Snamprogetti		
Description of the energy conservation measure:					
<p>The Urea Plant-1 stripper, made up of Titanium tubes was in service from August 1992 to April 2005. The stripper was reversed in May 1996 to extend its operating life as the Titanium material had eroded in the upper zones. In the year 2000, the stripper tube ends were modified by Zirconium bush insertion into the tube and also fixing of 2RE69 adapters to the tube ends. Ferrules were placed / fixed on the adapters unlike earlier arrangement of directly fixing to the tube ends.</p> <p>In view of deteriorating performance of stripper, to achieve maximum stripper bottom temperature, the MS header pressure was being maintained higher than PFD value. The MS extraction header pressure was 24.5 Kg/Cm2(g) and the Titanium Stripper shell side pressure was 23.5 Kg/Cm2(g). The maximum stripper bottom temperature that could be achieved was 198 Deg C for CO2 feed rate of 31,500 Nm3/hr.</p> <p>The stripper was replaced with new Bi-metallic Stripper during May 2005. However, the operation continued with MS header pressure of 24 Kg/Cm2(g) for some period. Based on calculation, the desired Stripper bottom temperature of 204 Deg C could be achieved with a Stripper shell side pressure of 19.8 Kg/Cm2 (g). But the CO2 compressor drive turbine extraction steam low pressure trip was set at 20 ksc. The OEM was consulted and clearance obtained to bring down the low extraction pressure trip setting to 18 kscg. MS extraction header pressure was gradually brought down to 21.5 kg/Cm2(g) at a plant load of 35,300 Nm3/hr. This has resulted in High pressure steam (KS) savings to the tune of 0.355 MT/hr in the CO2 compressor drive turbine.</p> <p>The low MS steam header enabled us to have a correspondingly low supply pressure for the MS steam de-superheating condensate. The reduced MS header pressure permitted us to stop the MS desuperheating pump (MP-104) by making use of the HW header pressure operating at 24 Kg/Cm2(g). An interconnection between De-superheating Pump (P-104) and Steam Condensate Flushing Pump (P-110) was made earlier to cater to the emergency requirement during both P-104 failures. This was utilized to stop the P-104 pump and thereby open the HW to the MS steam desuperheating station. This change enabled us to stop a 30 kW motor and add further to the savings.</p>					
Agency that executed the project (with complete address and email):					
Total investment, Rs.: --		Year of implementation: 2006-07			
First year energy cost savings, Rs.:					
First year other savings, Rs.: -					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm ³	Oil (kL)	Other
Energy consumption before	-	-		-	-
Energy consumption after	-	-		-	-
Energy tariff, Rs/ kWh	-				
Company complete address: Nagarjuna fertilizers and chemicals limited Nagarjuna Road KAKINADA-533 003, East Godavari Dt. AP State.				We authorize Bureau to use this information for dissemination	
Contact person who could be contacted for more information: Mr. Ramshray Singh Sr. GM (Plant Operations), Nagarjuna Fertilizers and Chemicals Limited, Nagarjuna Road, KAKINADA-533 003, East Godavari District, Andhra Pradesh Phone: Office: 0884-2360011/2366071 Fax : 0884-2362084/2367075 E-mail : rsingh@nagarjunagroup.com Mobile : 09949994575				Signature Date	