SUN Petrochemicals Nagothane

UNIT PROFILE

SUN Petrochemicals is promoted by a highly respected industrial group promoters having a thrust on R & D. SUN commenced production of Acetylene Carbon Black in the year 1999 at Nagothane near Mumbai (Bombay).

The Production process is based on thermal decomposition of Acetylene gas. The plant is set with a Technical assistance from Karbochem, S.A. The plant capacity is designed to meet global demands.

The Production process is monitored through a high degree of instrumentation, including a state-of the art Distributed Control System (DCS) to the offer consistent product characteristics.

Acetylene Gas received through pipeline is cracked in Retorts at high temperature to produce Acetylene Carbon Black (ACB). The ACB from each retort bank is pneumatically transported using atmospheric air primary cyclones and heavy carbon cyclones where the ACB and transporting air are separated. The ACB is then passed through product cyclones and is collected in product bins, while the air is passed to bag house filters where the remaining ACB particles are removed and recycled to the product bins. The clean air from the bag house filters is vented to atmosphere.

ACB from the product bins are passed through belt presses to be compacted to the required bulk density. The ACB is then bagged and weighed. The bags are sealed and placed into bag formers to obtain a rectangular shape and stored in the warehouse.

ACB is mainly used as one of the raw material in Dry Cell productionPolymer compounding production has started since June 2003. In compounding process

polymers like LDPE, LLDPE are mixed with carbon black and additives. The Polymer compounding material is produced on the extruder and is fully PLC controlled. The Extruded product is pelletized in the presence of water and air. The product is packed in pelletized form. The products produced are thermoplastic product is extruded in twin screw.

The major application of the product is in cable industry in high-tension and medium voltage cables.

ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP

Sun Petrochemicals Considers Energy savings as important business goal in order to remain competitive in global market. Sun Petrochemicals, hence want to remain world's best in terms of quality of the product and its cost effectiveness. This goal can be achieved by optimum utilisation of all the resources like raw material, energy manpower resources etc.

Sun petrochemicals team believes that process optimisation is energy conservation on demand side as well as energy efficiency on supply side have equal roles in energy efficiency of any product. Sun Petrochemicals therefore, have multiprong approach towards optimisation of all energy consuming point in their factory. Our energy conservation strategy therefore, is different than conventional energy conservation activity in industry which goes to root cause instead of looking at problem at superficial level and is as described below

METHODOLOGY FOR CARRYING OUT ENCON EXERCISE

The methodology outlined below is equally applicable to any type of energy conservation, manpower rationalisation, or for that matter, any resource maximization efforts in the organisation. This methodology is only a step by step procedure of auditing the operations. This technique has been used at Nagothane factory to achieve good results.

As applied to Electrical Energy Conservation, the step by step procedure is as follows.

a. List out all the electrical drives, compile data in following format and sort them in the descending order of their power consumption.

Sr.No.	Drive Description	Tag No.	kW rating	Actual Amps	Actual Power Kw	Run time hrs/day	Power Cons. KWh/day

b. Pick the first drive and investigate whether it exists with a useful purpose or without any useful purpose. That is, can this be eliminated without Company loosing on production, safety, environment, personnel conveniences etc. ?.

If yes, justify and eliminate it. Make it redundant. Put it aside as idle asset not to be operated.

If no, go to next step

c. See whether the purpose for which it is operated is reduced in its scope. In other words, if not all, atleast some of the purpose for which the drive and the system is operated may be worthless and purposeless and described above.

If yes, follow the sequential steps given below.

- Eliminate the worthless load and thereby, reduce the total load on the system or the drive.
- Redesign the system afresh for the reduced scope.
- Check whether it is economically attractive to (a) replace or swap the drive or the entire system with that of an appropriate design with best available efficiency in the market. Or (b) modify and de-rate the drive or the system for reduced scope eg. Trimming the pump impeller, providing variable frequency drive, reducing RPM by changing gear box ratio or pulleys etc.

If no, go to next step

d. See whether the purpose for which the Drive or the system is operated is entirely loaded on to another existing and under-loaded drive or a system, having a similar or different purpose. By this way we can operate only one drive or system at full load and efficiency, and shut down the other drive or system and save energy.

If yes, go ahead and do it.

If no, put another group of auditors to go through steps b, c and d, while the first group takes up drive 2 for investigation. It is likely the second group may come out with ideas which the first group of auditors might have overlooked.

ENERGY MANAGEMENT POLICY

- Promote Energy Saving and Conservation of all Resources
- Comply with all environmental and energy legislation and regulation
- Communicate to all interested parties and create awareness
- Take contribution of all employees in activity.

Our Environment policy, Safety & Health Policy, Quality Policy and Organisation set up is enclosed here with.

Title of the Scheme: **Acetylene Compressor Capacity Enhancement.**

Scheme in brief: There were two sets of compressor driven by only one motor. In the design stage the first stage was required to compress gas from 0.04 barg to 0. 4 barg and the second stage was required to increase pressure from 0.3 barg to 0.8 barg.

However after studying the pressure profile of the system the final pressure required at the process plant reduced from 0.5 barg to 0.25 barg. During this study it was observed that the second stage boosting is not required.

Subsequently the second was eliminated as a energy conservation drive. We got one compressor as spare. The motor which was designed to run two stages was driving only one. The fixed losses through motor were almost same.

To meet the higher capacity demand two compressors were required to run.
After doing the piping modification, the spare compressor was converted into the single stage compressor. Both these sets are now driven by one motor.

Investment: Rs. 1,01, 000

Power before modification: 528 kWh/day

Power after modification: 464 kWh/day

Savings obtained : 64 kWh/day = 23,300 kWh/annum ~ Rs. 1,04,850/annum

Title of the Scheme: **Cooling water supply hook-up to intercooler .**

Scheme in brief: There were two sets of compressor driven by only one motor. In the design stage the first stage was required to compress gas from 0.04 barg to 0. 4 barg and the second stage was required to increase pressure from 0.3 barg to 0.8 barg.

However after studying the pressure profile of the system the final pressure required at the process plant reduced from 0.5 barg to 0.25 barg. During this study it was observed that the second stage boosting is not required.

Due to the two stage boosting the temperature requirement was very stringent . Acetylene deflagration is very sensitive to temperature and pressure . Due to the above sensitivity the intercooler and aftercooler was provided with chilled water supply.

After rationalizing the pressure profile the effect of pressure on temperature has reduced drastically. And even for cooling water the temperature are well below the limit. Hence intercooler was hooked up with cooling water.

Investment: Rs. 1,50, 000

Power before modification: 440 kWh/day

Power after modification: 166 kWh/day

Savings obtained : 274 kWh/day = 1,00,000 kWh/annum ~ Rs. 4,50,000/annum

Title of the Scheme: **Replacing Heatless dryer with Refrigerated dryer.**

Scheme in brief: The principle of the heatless dryer is pressure swing adsorption.
The moist air at 7 barg is adsorbed in one cycle and the adsorbed moisture is desorbed by Releasing pressure to the atm in the next cycle. In this cycle the precious air is lost to the atm. The dew point of air achieved is (-40) deg cel. The air consumption is fixed in this type of dryer.

The requirement of the dew point for the instruments and the process is not (-40) deg cel. The refrigerated dryer can give dew point upto (-21) deg . cel. This is acceptable to the instruments and process.

Hence in the said scheme the heatless dryer is replaced by refrigerated dryer.

In the refrigerated dryer the air loss is not there and the misture is condensed by refrigeration cycle.

Investment: Rs. 1,50, 000

Power before modification: 180 kWh/day

Power after modification: 19 kWh/day

Savings obtained : 161 kWh/day = 59,000 kWh/annum ~ Rs. 2,65,500/annum