

Unit Profile

Gujarat Alkalies And Chemicals Limited (GACL)

(Promoted by Govt. of Gujarat)

- GACL commenced operations as a Caustic Soda Producer during the year 1976 with 100 TPD at Vadodara. Since then company has significantly expanded its caustic soda production to 425 TPD and diversified into number of value added products like Potassium Carbonate, Chloromethanes, Hydrogen Peroxide, Sodium Cyanide at Vadodara Complex as per the Product Flow Chart appended here to.
- GACL's entire production of chlor-alkali is from state-of-the-art energy efficient and environment friendly **membrane cell technology** of UHDE , Germany adopted in two phases in 1989 & 1994 maintaining its leadership with 16.9% market share at present. (AMAI- report)
- GACL has been able to maintain capacity utilization above 100% while country's chlor-alkali industry is at 77%, due to forward integration to produce value added products like Sodium Cyanide with PCK , Germany technology, Hydrogen Peroxide with UHDE, Germany technology, Chloromethanes with Shin-et-shu, Japan technology and Caustic-Flakes with Bertrams, Switzerland technology.
- GACL Vadodara has achieved **ISO 9001:2000** for quality standards by Bureau of Indian Standards since 1995 . and **ISO 14001:1996** for its care and concern for the environment valid up to Sept., 2007 accredited by BIS, New Delhi.



Sr. 8. Simple schematic diagram showing production process of the entire unit.

Sr. No. 16: (iii) Project – Appraisals 2003-2004

Sr. No.	Project Back- Ground	Observations Made	Technical & Financial Analysis	Impact of Implementation
1.	<p>Electrical Energy consumption for production of Caustic Soda is dependent on the life/aging of imported membranes in electrolysis. The cost of imported membrane is prohibitively high to change every three years in a very highly fluctuating market for Caustic Soda. GACL had to run plants with old and inefficient membranes (5 yrs. old) till 2003-2004 with better financial condition the same have been replaced.</p>	<ul style="list-style-type: none"> • Voltage Drop across electrolyser has decreased after remembraning. • The Heat-loss from electrolyser has decreased as heat generated has also decreased. • Rectiformers are off-loaded from the extra power-loss in the electrolyser. 	<ul style="list-style-type: none"> • Technically Power Consumption has been reduced with better electrical efficiency of electrolyser with next membranes replaced. It has saved 235 lakhs kWh in the year. • Financially it have saved about 779.38 lakhs in the year with Investment of Rs. 1700 lakhs with simple payback period of ---months. 	<p>* Membrane Replacement has improved Company's Productivity and Profitability.</p>
2.	<p>Year 2002-2003 was declared as a Water Year for Water Conservation by Govt. of India. GACL made Water Management Plan as a part of which two projects of recycling of water were implemented.</p>	<ul style="list-style-type: none"> • Sealing Water from vacuum pumps of Caustic Evap. Unit was re-circulated which was going to drains/effluent earlier. This was by construction of a special pit and necessary pumping system. 	<ul style="list-style-type: none"> • Effluent load has decreased saving its pumping energy. • Water Consumption has decreased by 30660 M³/year. • Financial saving is Rs. 7.1 lakh @ Rs. 15 M³. 	<ul style="list-style-type: none"> • Process/ Operational people had suggested this saving and they feel happy & proud to see that scheme is implemented. • Our water bill has decreased.

3.	<p>Installation of two VFD on Cooling Water Pit. Two 37 KW water pumps were used for recycling of process water back to Cooling Tower from a pit with level-control close loop. The control valve was observed to remain throttled by about 30% on DCS of the plant. We had two spare VFDs in our stores as surplus of a project. So, we utilized the same to study the power saving and train our people for operation & maintenance of VFD-controlled loops.</p>	<ul style="list-style-type: none"> • VFD based level control is better than with control valve from response time and performance point of view. • Any abnormality in pump/ motor gets easily detected by looking at the trend graphs of speed for the VFD, on DCS. • Motor gets less heated, and running at required load speed has increased bearings life. 	<p>Energy saved was to the temp of 213 600 units with cost saving of Rs. 69800 Rs./Year. Since surplus VFD's more used no fresh investment was done.</p>	<p>People of Production & Maintenance are convinced about better performance of VFD based control system than control valves based system. We may decide to go for "No Control Valve" based control system for future projects.</p>
4.	<p>Upgrading DCS for monitoring of high current control Motor.</p>	<ul style="list-style-type: none"> • DCS facility of "Trending" has been utilized by motor current monitoring for high current rated Motors (100 KW or more). These "trend-graphs" given in production about change in energy consumption. 	<ul style="list-style-type: none"> • "Current Monitoring" by trend graphs reveals abnormal loading operation of plant/motor. • Predictive Maintenance can be planned on study of such graphs. 	<ul style="list-style-type: none"> • DCS facility is exploited without any additional cost. • "Energy Conservation" Aptitude is getting cultivated by such information.



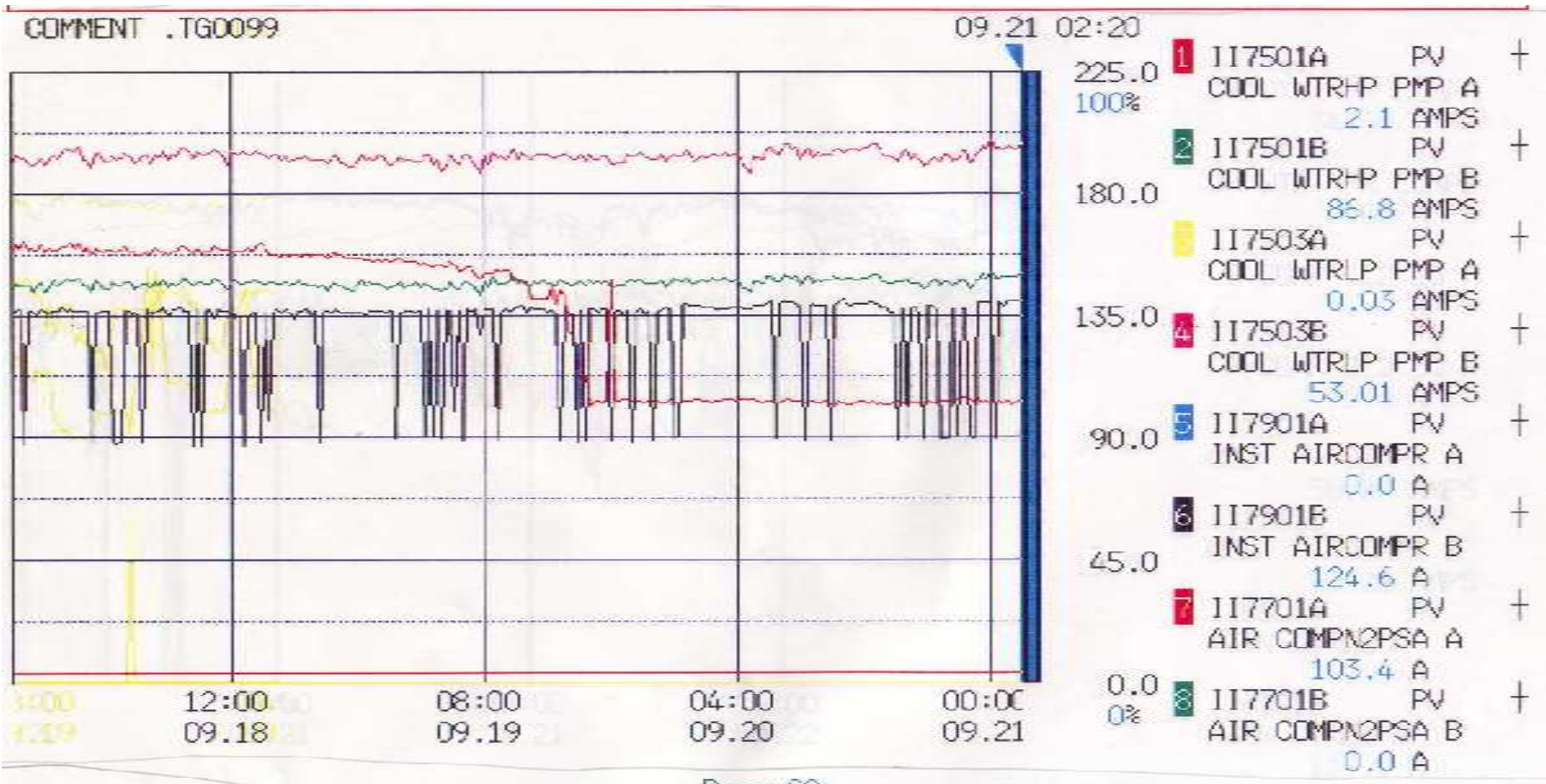
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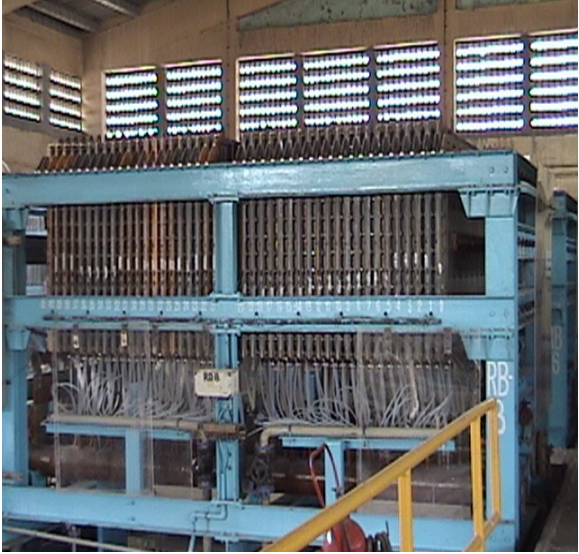


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Upgrading DCS for monitoring of high current control Motors :- As seen above the graph of air-compressor motor with tag number 117901B 9 in black colour indicates the current fluctuation due to loading/unloading air compressor. We see a scope of reducing unloading time by reducing of unloading air pressure setting for the above graph of 80 hours duration as per our study/analysis of the graph.

PHOTOGRAPHS WITH BRIEF WRITE UP FOR ENERGY EFFICIENCY WITH LOCATIONS



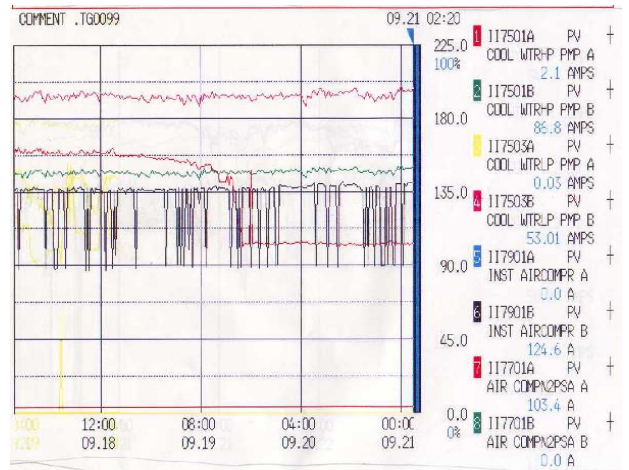
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