

The Travancore-Cochin Chemical Limited, Udyogamandal

PROCESS MODIFICATIONS FOR ENERGY CONSERVATION

2004 – 2005.

1. Electrode recoating, Replacing existing membranes with high efficient Membranes in 125 tpd AGC Plant: Achievement in of energy savings per year basis in electricity 85.43 kwh. The amount works out to 228.11 Lakhs. And the investment incurred for the project was 832 lakhs.
2. Process Re-Engineering: The stage – 1 conversion as part of replacement – further to closing down of Mercury cell plant – was commissioned in August 2005. The average kwh/MT of caustic soda production in the Mercury cell plant at the time of full load production January 2001 to December 2001 was 3855 kwh/MT.
3. Use of Alternate fuel – Hydrogen: We had utilized a portion of our byproduct Hydrogen for firing in our Caustic Concentration and Flaking plant instead of Furnace oil. Achievement of energy saving for the year 2004 – 2005 in fuels used is thus; Furnace oil-201.6 KL equivalent to 1953.5 Mkal and savings in Rs. Is 26.52 Lakhs.

2005 – 2006

1. The stage – 2 conversions as part of replacement – further to closing down of Mercury cell plant was commissioned in August 2005. The average kwh/MT of caustic soda production in the Mercury cell plant at the time of full load production January 2001 to December 2001 was 3855 kwh/MT. The average consumption rate for UHDE – II Membrane Plant, for the year 2005 – 2006, was 2483 which gave a net saving of 1385 kwh per ton of caustic produced. The saving in cash is $1372 * 3.70 = 5076.4$ per ton. The total savings for the year 2005 – 2006 was $5124.5 * 5599 = 286.9$ lacs.
2. Process Modification: Conversion of Air degasification to vacuum degasification, We were using a 30kw drive for separation of chlorine from brine in the air degasification system. This was replaced with vacuum degasification system which required only an 11 kw drive. Thus saving 21.2 KW of power. Electricity saved per year in lakhs kwh =1.56. total saving in Rs is 5.47 Lakhs.
3. Reduction of material consumption: Process consumption of NaOH was reduced from 35 kg/MT to 30 kg/MT.
4. Reduction fo Brine dilution time: Whenever a shutdown occurs for more than 1 hour, the brine dilution is to be done prior to next start up for equipment safety; necessitating the operation of a 22 KW motor taking 21 KW for 200 minutes. By process modification, this time was reduced to 40 minutes saving 56 KWH in every shutdown.
5. Hydrogen firing: we have utilized a portion of our byproduct Hydrogen for firing in our CCF Plant instead of Furnace oil. The net equivalent saving achieved in Furnace oil was 319.19 KL. The fuel equivalent in Mkal=2937.68 and net saving in Lakhs Rs.47.46.

2006 – 2007

1. Process Engineering: The stage – 3 conversions as part of replacement – further to closing down of Mercury cell plant was commissioned in August 2006. the average kwh/MT of caustic soda production in the Mercury cell plant at the time of full load production January 2001 to December 2001 is 3855 kwh/MT. The average consumption rate for UHDE – II Plant, for the year 2006 – 2007, is 2470 which gives a net saving of 1385 kwh per ton of caustic produced. The saving in cash is $1385 * \text{Rs.}3.70 = \text{Rs.}5124.5$ per ton. The total savings for the year 2006 – 2007 was thus, $5124.5 * 5658 = 289.94$ lacs.



Fig: 1, 2, 3, 4. – 25 TPD MEMBRANE CELL PLANT – PHASE III



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2. Hydrogen firing: we have utilized a portion of our byproduct Hydrogen for firing in our CCF Plant instead of Furnace oil. The net equivalent saving achieved in Furnace oil was 439 KL. The fuel equivalent in M kcal = 4253.6 and net saving in Lakhs Rs.71.51.



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SYSTEM FOR HYDROGEN UTILIZATION IN CAUSTIC CONCENTRATION PLANT.

1. Hydrogen Blower,
2. Burner Assembly,
3. Control System
4. Hose connection Control system to Burner block.