OTS PROJECT REFERENCE

ProSimulator

JANA OTS PROJECT

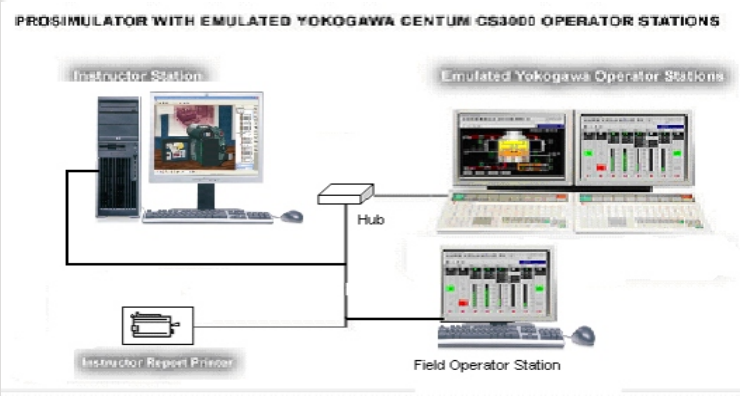
JANA - Jubail Chemical Industries Company situated in the Industrial City of Jubail, Kingdom of Saudi Arabia produces a range of Epoxy Resins - Liquid, Solution and Solid forms for a variety of applications. This is a grass root project to be commissioned during 2007-08 and the major process units are:

- ✓Allyl Alcohol (AAL) unit a - Oxidation of Propylene
- ✓Epi Chlorohydrin (ECH) unit - chlorination & purification of Allyl Alcohol
- ✓Chlor Alkali (CA) unit to provide the requirements of Cl2 and HCl for Epichlorohydrin manufacture
- ✓Calcium chloride (CCL) unit

There are very few AAL/ECH plants in the World and hence training the operating personnel was a major concern for JANA. JANA decided to build custom simulator for their process units so that all the operating personnel can be effectively trained prior to plant commissioning. The simulator was successfully delivered and commissioned during December 2006.

Emulated CS3000 Keyboard

- ✓Simulation hardware
- ✓ProSimulator Instructor station software
- ✓ProSimulator operator station (emulated Yokogawa CS3000 DCS)
- ✓ProSimulator Model development toolkit
- ✓ProSimulator Basic Process models suite
- ✓Custom models



The OTS system has all standard training features like snapshot, backtrack, simulation speed, malfunctions, logging, etc. Besides this, OTS system provides state-of-the-art features like performance evaluation, automatic training, monitoring, multi-training session etc for the purpose of effective training.

The OTS is developed to emulate the actual Yokogawa CS3000 DCS control system for enhanced training. The operator stations have 22" touch Screen CRT and emulated CS3000 keyboards.

All the field devices are simulated in separate FOP pages accessible easily from DCS graphis pages.

The ESD trip systems are fully simulated and the ESD graphics pages are provided as the operator interface on the operator station.

This approach ensures accurate responses in the operations ranging from start-up to normal operation and shutdown. The high-fidelity models can realize efficient and high-level operation training, which means that the operators can acquire a high level of operational knowledge of the plant.

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The unique process developed by Showa Denko (SDK) for manufacturing Epichlorohydrin comprises of 4 sections:

- ✓ Allyl Alcohol unit (AAL)
- ✓ Epichlorohydrin Unit (ECH)
- ✓ Chlor Alkali Unit by AKKIM
- ✓ Calcium Chloride recovery by GEA MESSO

***AAL UNIT* - This unit consists of following sections:**

- ✓ Oxidation reaction
- ✓ CO_2 removal section
- ✓ Flash gas recovery section
- ✓ Hydrolysis section
- ✓ Azeotrope separation and heavy ends removal section
- ✓ Allyl alcohol purification section

***ECH UNIT* - This consists of the following sections:**

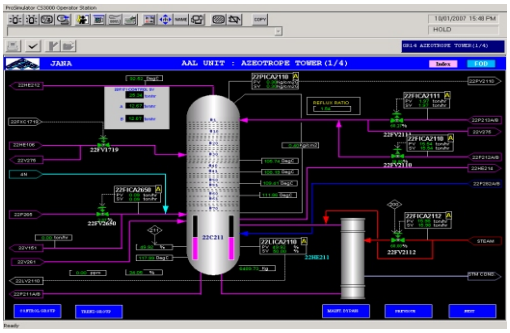
- ✓ Chlorination section
- ✓ DCH purification section
- ✓ Saponification section
- ✓ ECH purification section

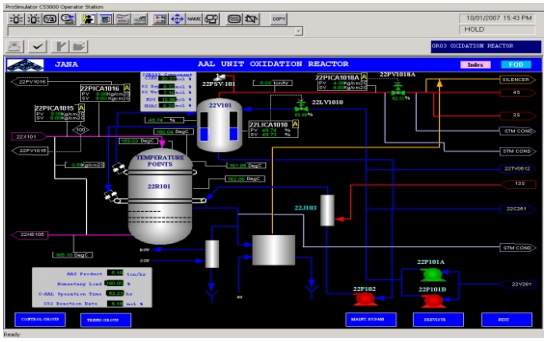
***CHLOR-ALKALI UNIT* - This unit consists of the following:**

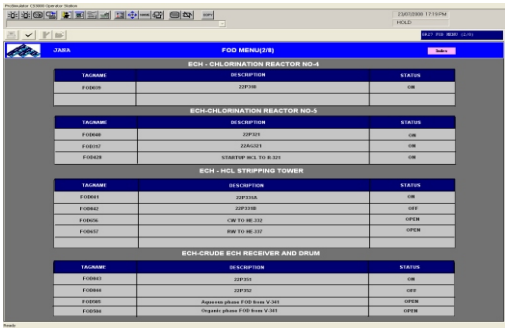
- ✓ Salt handling, Brine saturation & Brine treatment
- ✓ Deionization and Storage
- ✓ Electrolysis
- ✓ Anolyte Circulation And Catholyte Circulation
- ✓ 32% Caustic Storage
- ✓ Caustic Soda Concentration
- ✓ Chlorine Cooling, Demisting And Compression
- ✓ Hydrogen Cooling, Demisting And HCl Synthesis Unit
- ✓ Brine Dechlorination

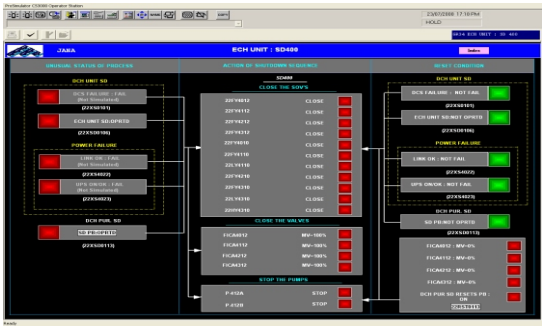
CALCIUM CHLORIDE RECOVERY UNIT
This unit consists of the following:

- ✓ Pre Treatment of feed solution
- ✓ Pre-concentration and crude crystallisation
- ✓ Pure crystallization
- ✓ Dissolution, Granulation, cooling, sieving and air treatment
- ✓ Purification









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