

IOCL Terminal Automation System Upgrade, Delhi



The Delhi Terminal of Indian Oil Corporation Limited, is located at Bijwasan in Delhi. The terminal is a key installation for supply of white oil products in and around Delhi and to the Indira Gandhi International Airport.

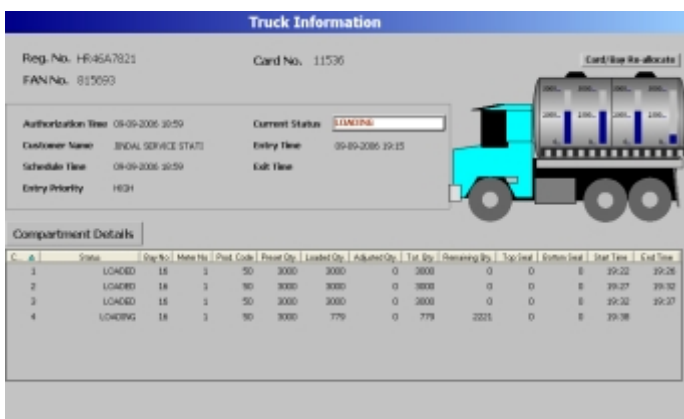
The terminal consists of a Truck-Lorry Filling gantry of 30 bays with a total of 32 loading positions, tank-farm area of 17 tanks, 12 dispensing pumps, online densitometers, and pressure, temperature transmitters. IOCL also operates a pipeline to the international airport for transfer of Aviation Turbine Fuel. IOCL has its own business operation system from SAP.

Three different systems existed at site - truck-lorry filling system - supplied by Teltech India, pump-house automation system - supplied by Honeywell, and tank-farm management system from SAAB. Truck-lorry filling system was based on batch controllers of make Microcompt from Alma, France and plant control PLC from Mitsubishi. Pump-house automation was based on Allen-Bradley PLC-5 over ControlNet. Rotork's PAKSCAN-based MOV control system was integrated with the plant PLC.

The major factors responsible for IOCL to upgrade the automation system were -

- Obsolescence of existing computer hardware and operating system
- Lack of facility to make modifications in software to adjust to changes in the terminal configuration
- Requirement of integrated working of the three systems

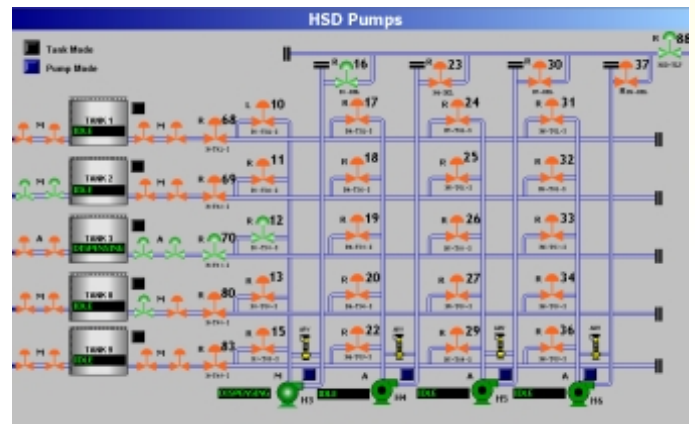
Synergy Systems & Solutions were assigned the task of upgrading the existing automation system, and also to integrate the three independent systems into one for better and efficient control and monitoring.



As part of the upgrade philosophy, it was envisaged to re-utilize as much possible existing hardware. Hence, no changes were made in the batch controllers, card readers, PLCs, and other system. The upgrade consisted of replacing existing PC hardware, with latest configuration-based machines running on Windows XP operating system. Synergy Systems & Solutions, ITAS was deployed to integrate all the automated facilities in the terminal.

ITAS not only provided a better and robust system for operational purposes, but also helped IOCL automate most of their operations that could be realized within the infrastructure that existed. The upgraded system thereby is more reliable with lesser human intervention than before, and with better facilities.

In the new system, dual redundant Load Rack Computers (LRC) are installed, with three operator working positions. The LRCs are equipped with multi-port serial interface cards for interfacing with the batch controllers, card readers, Mitsubishi PLC. Connectivity with A-B PLC5 is achieved via a dedicated dual media ControlNet card. The tank-farm management system is integrated with ITAS using OPC.



The new system offers facilities like -

- A comprehensive integrated development environment for complete terminal configuration
- Re-configuration of bays, loading positions, tanks, pumps, as per change in product allocation
- "Intelligent" bay-allocation algorithm for efficient use of loading positions
- Handling of mixed product loads
- Automated valve alignment operations
- Automated operation of tank valves based on mode of operation
- Automated operation of pumps based on pump-demand
- Manual top-up in case of error in meter dispensing
- MIS Reports
 - Daily Product Dispatch
 - Customer-wise Product Dispatch
 - Product-wise Dispatch
 - Batch controller-wise Dispatch
 - Bay-wise Product Dispatch
 - Tank Loss/Gain Report
 - Tank Inventory Report
 - Pump Operations Report

The project scope included design, engineering and supply of redundant ITAS Software licenses, computer hardware.

The project was successfully commissioned in September 2006.