Flexible, Lean Execution meets demanding schedule in India’s largest petrochemical complex

Schneider Electric’s Foxboro Evo was selected to automate and optimize the world’s largest single-site integrated refinery-petrochemical complex, located in India. In August 2013, an order was received for a 12 billion USD capital investment for a phase three expansion adding more than 25 new plants and units in a single shot.

The project is the third step of a partnership that began in 1997 for a grassroots refinery and petrochemical complex. A second expansion order followed in 2006.

Schneider Electric’s technology, execution and services have been applied to a fully integrated manufacturing plant with petroleum refinery, aromatics/petrochemical, power generation, and port and terminal facilities, as well as access to a pipeline network. The crude processing capacity is 1.3 million barrels per day.

The overall duration of the project was 24 months, involving more than 600km of fiber optics to fulfill all networking requirements; engaging more than 130 engineers at peak period; and occupying 55,000 square feet for the staging floor.

The project was completed by the project team, based in five countries, and Schneider Electric’s Global Engineering Management team. Seven EPCs from USA, India, Germany, Italy, UK and France were also involved to provide technologies and process expertise.

India’s largest business house uses Schneider Electric integrated DCS and ESD systems to develop the world’s largest single-site integrated refinery-petrochemical complex.
**Project Description**

The project scope of supply was:

- Distributed Control System (DCS) and Emergency Shutdown (ESD) for DTA Gasification J3 complex
- DCS and ESD for SEZ Gasification J3 complex
- DCS and ESD for Cracker J3 complex
- DCS and ESD for Cracker downstream plants like MEG, LDPE and LLDPE for end user complex
- Offsites Automation for Cracker J3 complex
- Dynamic Simulation Software for Gasification Complex
- Terminal Automation System for C2 complex
- Tank Farm Information System for C2 complex
- Cybersecurity Solution
- Advanced Operators Training
- Site Services including installation and commissioning support
- Upgrades to existing DCS and ESD systems in other end user complexes

The project scale was:

- Total I/O points: 115,000 hardwired and 250,000 serial
- Number of consoles: 35
- Number of cabinets: 2,700
- Percent of buy-out items: 40%
- Number of network nodes: 30
- Total number of project execution man-hours estimated: 260,000
- Site Services man-hours estimated: 60,000

**Flexible, Lean Execution Contribution**

Flexible, Lean Execution was the immediate choice for this project, as Schneider Electric’s project team is known to meet stringent schedules and coordination with dispersed engineering teams.

Every Intelligent Engineering component of FLEX was used for this project: Templates, Rules, Engineering Workbench, Engineering Cloud, and SmartPlant Instrumentation (database) Return. Engineering Workbench contributed to the automatic generation for both control and safety device logic and to the detailed documentation for marshalling and control cabinets. FLEX Templates and Rules played a fundamental role in ensuring that I/O Allocation and Segregation guidelines were respected for each of the 2,700 cabinets, despite a significant number of process data changes.

The process design was executed with multiple EPCs; hence, maintaining engineering standards was a major risk. All tag databases were consolidated using SmartPlant Instrumentation (SPI) tools, which was executed by engineers who had limited experience with SPI data structure. Loop-drawing generation from SPI after returning engineering design data was another challenging commitment undertaken by Schneider Electric for this project.

In relation to other projects of similar nature, this project required multiple iterations and took significant time to return as-built data to the SPI database. Thanks to the SPI return component, made available by FLEX, and the performances of Engineering Workbench, the entire SPI return process established took only a few days to generate 5,000 tags without a single error. Overall, the process was seamless, which helped build the customer’s confidence in Schneider Electric’s commitment.

To learn more about how FLEX reduces the impact of change and time to production, visit: [real-time-answers.com/project-execution/resource-center/](http://real-time-answers.com/project-execution/resource-center/).