RTP Solutions for the Hydrocarbons Industry

Application

Distributed Control, Emergency Shutdown, and Fire & Gas systems for the Mexican Oil & Gas Company Pemex at its refinery located in Cadereyta City, Nuevo Leon State, Mexico.

Benefits

- ➢ Only one type of equipment for all systems
- ➢ Very High Speed Redundant Host Network, TÜV certified
- ➢ Embedded Device Security Assurance EDSA-300, Level 2
- ➢ Unlimited number of installations and number of tags, No Annual Maintenance Fees
- ➢ Ten Year Warranty

Overview

The Hector R. Lara Sosa refinery is located in the city of Cadereyta, some 40 km east of Monterrey in Nuevo Leon, Mexico. The facilities at the 7+ square km site receives crude from throughout the northern region via thousands of km of pipelines. Producing over 270 thousand barrels per day of various types of gasoline and diesel fuels, the Cadereyta refinery is one of Mexico's more productive and important plants.

The incoming crude goes through a desalination unit before moving on to thermally combined atmospheric and vacuum distillation units. Oil distillates are captured, while gases are passed on to gas stabilization and fractioning units. Residuals are reprocessed, and others sent to treatment units. The combined distillers, reduce operating costs by improving production yields within the established specifications.

In 2014 the refinery's technical and commercial staff decided to upgrade their equipment, after their PLC manufacturer obsolesced their equipment, leaving the installation with no product support. By early 2015, a public tender was held to select the supplier that could offer the best technical and cost effective solution with the best ROI in the medium and long term. Of the five companies that were invited to bid, including the plant's original equipment manufacturer, RTP was chosen to supply control and safety systems using their proven RTP 3000TAS.
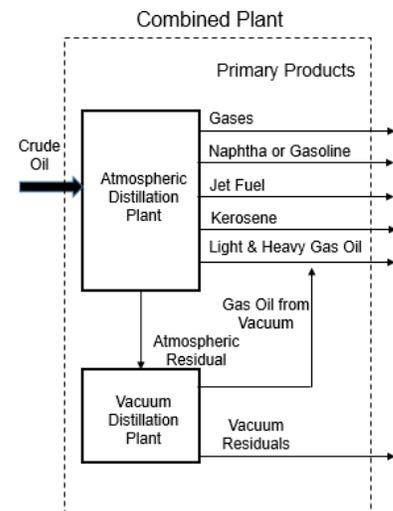
Once the contract was awarded, an additional challenge was imposed. The client requested RTP to drastically reduce the equipment manufacturing and delivery time that was originally agreed, so that the installation and commissioning of the systems could occur during a scheduled major plant maintenance shutdown.

RTP responded positively to its customer, and delivered 100% of the equipment in a record time of four weeks. Simultaneously, local contractors were able to quickly develop their system and HMI applications thanks to RTP's advanced software suite which allows for application testing without the hardware.

Control and Safety Solution

Three separate SIL-3 redundant networks for the DCS, ESD, and F&G, were requested by the refinery technical staff.

The supplied DCS has four RTP 3000TAS redundant nodes, and uses I/O cards from the low cost 3200 series to handle about 3000 field signals. Three operating and two engineering stations and two historical data servers, are connected to all DCS nodes.

The ESD system, has redundant nodes in distributed chassis. With two operating and one engineering stations. While the F&G system has two triple redundant nodes. One operation and one engineering stations.

Distributed Control System Architecture

4 Redundant Nodes, I/O Cards for 3000 signals

3000TAS systems can do control and safety solutions within the same system. Common module use between systems lowers ownership costs by saving on operator training and maintenance, and lower spare counts.
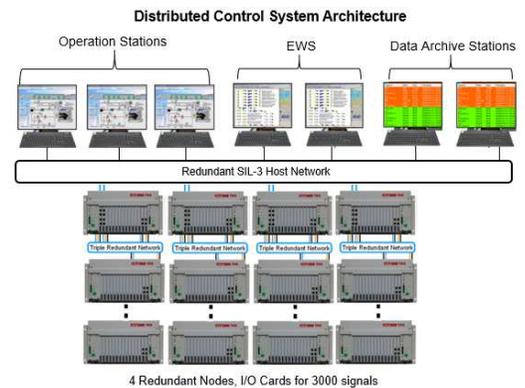
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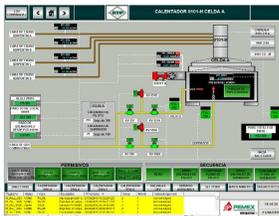
As all the operators and maintenance technicians in the refinery speak Spanish, all graphics were developed in Spanish language.
About 170 operator's screens for all three systems were created to allow easy operation of the plant.

Due to the extensive diagnostic capability of the RTP controller, the plain text fault diagnostic messages, and the use of Spanish characters on the screens on the Operator's stations and Engineering Workstation, faults are easily identified and technicians can be directed to the cause of the fault reducing repair time and allowing for ease of maintenance.
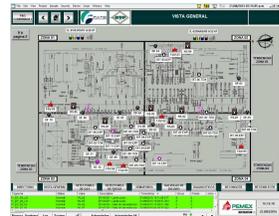
Rapid application development with graphical development environment. Uses common tool set for all system types. Included software simulator allows for offline application testing without affecting running systems.

Some of the benefits that the operation and maintenance engineers have experienced are:
- Distributed redundancy and multiple faults supporting, eliminates single point of failure
- Easy to configure
- High availability of all three systems
- Fast and easy way to locate failures in the field instrumentation
- Fast response time

Conclusion

RTP provides the most highly integrated DCS and SIS available today. Software skills and hardware components are interchangeable between the DCS and the SIS. Whether one system is used for both functions or the functions are divided between two systems, users will find lower cost associated with using RTP over other systems.