

Case Study

Phillips 66 Alliance Refinery Upgrades to Experion® Ratio Controller (ERC)



“Honeywell gave assurance that we could meet our blend upgrade schedule deadlines, which was important in helping us to complete the work during a planned outage in 2015. The system was returned to operations ahead of schedule.”

- Ronnie Langlois, Experion & Blending Engineer, Phillips 66

Background

The Phillips 66 Alliance Refinery, a 247,000 barrel-per-day (BPD), single-train refinery, is located 25 miles south of New Orleans, Louisiana. The refinery began operations in 1971 and was an early adopter of Honeywell’s Experion® Blend Controller (EBC).

Benefits



The Phillips 66 Alliance Refinery is located south of New Orleans, Louisiana.

The Experion Ratio Controller (ERC) runs on the Experion Process Knowledge System (PKS) architecture for distributed control of the field equipment used in blending and movement. It offers the following capabilities:

- Blend equipment and flow control
- Blend report generation
- Blend header pressure control
- Integration with Honeywell applications
- Property analyzer interface
- Interface with non-Honeywell application via OPC and XML

Key features of ERC include:

- Automatic start-up, operation and shutdown of the blender and associated equipment
- Recipe validation
- Master flow rate control
- Blend flow rate and volume control
- Pacing of the blend flow rate
- Blend header pressure control
- Maintenance of component percentages and additive concentration as per blend recipe
- Blend report generation
- Redundant operation

ERC includes several improvements over the previous EBC solution. Primary changes include the use of Custom Algorithm Blocks (CAB), reduction in the number of blocks per control module (CM), reduction of Supervisory Control and Data Acquisition (SCADA) points, and future upgrades only requiring updates to the CAB library. The software change was seamless to operations.

Challenges

The Phillips 66 Alliance Refinery needed to upgrade the Experion PKS DCS to a newer version since Microsoft® was retiring the Windows® XP operating system. The new system (EPKS R410) requires Windows 7 and Server 2008. The current version of EBC was incompatible with EPKS R410.

Solution

The Alliance site decided to upgrade Experion PKS R310.3 to R410.4 using On Process Migration (OPM). The configuration includes a hardware platform change, replacing the Dell 2950

server with the Dell 320, and upgrades to operator console stations, C300 and C200 process controllers, and Process Manager I/O (PMIO).

The EBC upgrade to ERC R410.3 was an off-process migration, which affected three gasoline headers, two diesel headers, and blend instruction.

Both upgrades were coordinated to minimize downtime and reduce impact on production.

The upgrade was planned for a scheduled outage in 2015. The project kickoff meeting occurred in April 2014, with development through November 2014. After Factory Acceptance Testing (FAT) in November 2014 and a trial upgrade on a testing system, the system upgrade took place in January 2015. Site Acceptance Testing (SAT) concluded in February 2015.

To prepare for “going live” with ERC, the project team tested each header using process equipment, completing five headers without issue. The system was returned to operations ahead of schedule.

In minimizing blender outage, the project team attributed their success to several steps:

- Planning
- FAT
- Testing
- Removal of EBC a day ahead of the server migration
- Completion of server/controller migration in four days (OPM)
- Initiate ERC installation immediately following EPKS migration

- Beginning SAT following ERC installation

The project team offered the following recommendations for sites considering this type of upgrade:

- Planning – the first step in any successful upgrade
- Examination of the current system – in anticipation of issues and preparation for upgrade
- Data gathering – ensuring that all appropriate information is collected, understood, and communicated among the team members
- Team knowledge of EPKS and ERC – choosing the “right” team members is a key element in preparing for success
- Simulation and testing environment – including FAT and on-site staging

The team outlined the following lessons learned:

- Staging on simulation is of great value – Pre-configuration can be completed and used for the live upgrade, graphic changes can be verified, and validation can be conducted.
- Maintain a list of parameter links to change – The use of CAB changes many parameter references, including displays, scripts, and control modules.
- Find the unexpected in the dry run, not during commissioning.
- Document – The order of execution for the live upgrade, including steps followed during the simulated upgrade and identifying changes only applicable during the live upgrade.

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