HMI Replacement With No Downtime

AUSTIN, TEXAS — Emerson Process Management's migration engineering services and DeltaV Connect™ technology have enabled Groupement Berkine to upgrade their aging control room at their Hassi Berkine South oil field site located in the Berkine Basin, in southeast Algeria, without any downtime or lost production. It has been estimated that this saved the company $25 million over a conventional solution.

Groupement Berkine, a joint operating venture between Anadarko Petroleum Corporation and Sonatrach, the Algerian National Oil Company, was formed to co-develop and produce a number of oil fields in the deserts of Algeria. From its Hassi Berkine site, Groupement Berkine produces 250,000 barrels of oil per day, equating to almost one quarter of Algeria's daily oil production.

The existing Bailey® Human Machine Interface (HMI) system at Hassi Berkine was aging and the ongoing maintenance costs – due to the limited availability of parts and dedicated maintenance resource – were projected to be unacceptably high. The consoles are critical to the smooth running of the plant and any failure could have caused an unscheduled shutdown resulting in a loss of production.

"If the control room screens are off, we are effectively blind," said David Fraser, the project engineer in charge of the Hassi Berkine South oil field site. "So it is imperative that we have a reliable solution that can be maintained and easily upgraded without fear of the system failing."

The main challenge for Groupement Berkine was to replace the existing HMI system without requiring any downtime, which would cost the plant around US$25 million per day in lost production. It was also essential that the upgrade would not have a detrimental effect on the DCS running the plant. The existing legacy Bailey consoles and over 800 extensive graphic displays were migrated to DeltaV workstations over a nine-month period

Emerson was awarded the contract to upgrade the HMIs because it was able to meet every technical requirement required by Groupement Berkine including compatibility with the existing Bailey INFI 90 DCS, a single system database for all the oil treatment lines, a ten year guarantee for the life cycle of equipment, as well as engineering services and after sales support.

Emerson's DeltaV Connect Solution for Bailey Systems was used to seamlessly connect new DeltaV operator stations with existing Bailey controllers and I/O. The DeltaV Connect Solution is an interface designed to communicate with tags in the Bailey Process Control Units so that operators perform the same tasks from DeltaV

Operate workstations as they did from the Bailey consoles. The system installs and starts up with no downtime, enables redundancy, and requires no modifications to the Bailey DCS.

The existing Bailey INFI 90 DCS contained over 16,000 tags that all needed to be migrated and commissioned while the plant remained online. Over 800 graphic displays had to be designed to closely match the existing screens in order to minimise any operator training difficulties during the switchover.

“We selected the five most comprehensive and complex graphics used within our automation process. We knew that if the company tendering for the project was able to reproduce them flawlessly, then the rest would not be a problem,” explained Fraser. “One of the most convincing arguments for Groupement Berkine was Emerson’s ability to automatically convert many of the Bailey graphics into the DeltaV system.”

Combining the expertise of Emerson’s engineering staff with the use of an automated conversion utility, it was possible to generate DeltaV operator interface displays with the same primary objects, layout, and toolbars for one-click navigation to other displays. Using Emerson’s engineering services it was possible to greatly reduce the time, effort and risk associated with the display development.

“Our operators appreciate the DeltaV system’s user friendly interfaces, the workstation features, screen management, ease of use of the alarm and trending tools, as well as the auto report generation and manual report generation tools,” said Fraser.

Emerson also provided Groupement Berkine with services to generate Bailey console tag database conversions for immediate use in the DeltaV Connect solution. The database conversion generated 100% of the modules needed in the DeltaV Connect solution interface. Emerson personnel, familiar with both systems, oversaw and checked all the conversions. This process, and particularly the automated conversion tools, greatly reduced the opportunities for error during interface configuration.

Two months before the final migration, two workstations and one DeltaV Connect server were installed for operator training and process simulation. The DeltaV simulation capability provided a multi-node training system on site to get operators familiar with the process before it went online. This guaranteed that the change over was as smooth and efficient as possible. To handle the important scope of the total inputs and outputs, Emerson installed two redundant servers with the DeltaV Connect licence with 10,000 tags each.

“We were especially pleased with the methodical and professional way the project was handled by Emerson. This included strong integration of the operator’s team during the factory acceptance test. In just two weeks, 100% of the graphics had been validated with almost no discrepancies identified,” said Fraser.

The DeltaV based architecture eventually included eight control room work stations,

three remote work stations located in technical rooms, two DeltaV Connect redundant servers, a Server Professional, and a data historian.

During the migration phase of the project, the individual Bailey consoles were turned off at 4-hour intervals enabling possible anomalies to be identified and to ensure a smooth transition.

“The most beautiful thing about Emerson’s technology is that it is an interoperable solution. It is good to know that nothing ties us to one single source for further migrations or installations,” concluded Fraser.

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