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Automation Sentinel enables cost-effective HMI evolution Qatar Petroleum, Doha, Qatar

Images courtesy of Qatar Petroleum

The Company

Qatar Petroleum (QP) is a state-owned public corporation responsible for all phases of the oil and gas industry in the State of Qatar. The principal activities of QP, its subsidiaries and joint ventures are the exploration, production, local and international sale of crude oil, natural gas and gas liquids, refined products, synthetic fuels, petrochemicals, fuel additives, fertilizers, natural gas liquids (NGL), steel and aluminum.

Qatar Petroleum's natural gas liquids (NGL) plants are located in the NGL complex at Measieed Industrial Area around 50 kilometers south of Doha in Qatar.

The Natural Gas Liquids Plants (NGL 1) and (NGL 2) process associated gas produced from Dukhan onshore field and the two offshore oil fields, while NGL 3 and NGL 4 plant process gas produced from the North Gas Field, off the north-east shore of the Qatar peninsula. All these NGL plants produce propane, butane and NGL condensates controlled by an ABB control system.

- NGL plants 1 & 2 the main processes are flare mitigation, storage and loading
- NGL3 - The main processes controlled are Condensate fractionation, Molecular sieve dehydration, DM plant, boilers, separator drum, HP/LP flares, Booster compressors, sulphur recovery unit
- In NGL4, the main processes are Pig receiving, fractionation, Adip treating, (Stork design) and water wash, Merox treating, product dehydration and cooling, refrigeration, flare HC liquid disposal and fuel gas, effluent water treatment.

Customer challenge

The Process Portal B (PPB) HMI used in these plants was based on the Windows 2000 platform, which Microsoft had obsoleted and no extended support was available from Microsoft. End of support means that customers no longer receive upgrades or security updates to the operating system or get technical support from Microsoft.

PCs running obsolete Windows operating systems are targets for malicious software taking advantage of newly discovered vulnerabilities in these systems, now even more than before since no Microsoft security patches are available to protect against such threats. This could put entire control systems and personnel at risk and unsupported operating systems will affect stability and reliability of the whole plant.

To secure their control systems and keep them up-to-date with the latest software and firmware versions, Qatar Petroleum turned to ABB for a cost-effective way to upgrade the existing HMIs. This upgrade should also extend the plant lifecycle and allow Qatar Petroleum to keep up with increasing production demands.

ABB solution

The ABB response to Qatar Petroleum requirements was to offer a system evolution of the existing Process Portal B (PPB) Human Machine Interface (HMI) to System 800xA Operations Version 5.1 FP4. ABB Process Portal B operator stations can be evolved to System 800xA Operations offering complete integration with the existing Harmony controllers. Features include Operations, Asset Optimization, Information Management, and Batch Management. Existing graphic displays are being converted to the 800xA Process Portal format for minimal impact to operations personnel.

With ABB's long standing "Evolution without obsolescence" strategy of backward compatibility, the customer was able to protect their intellectual property investments made in their Symphony Harmony / INFI 90 HMI. This solution allows Qatar Petroleum to utilize the existing Harmony/Infi90 control system hardware assets and continue to use their existing knowledge base without re-training.

The step-wise evolution approach gives the customer the flexibility to maintain or improve the plant operations over time. ABB worked closely with Qatar Petroleum starting with a detailed evolution plan to testing and commissioning, enabling a smooth execution and a successful completion within a short timeframe.

Customer benefits

- System 800xA Operations offers complete integration with the existing Harmony controllers protecting the intellectual property investments achieved of many years
- True system evolution allowing Qatar Petroleum to build on their strong DCS foundation by providing the flexibility to implement new functions in an incremental stepwise fashion
- Upgrade had minimal impact to operations personnel
- Qatar Petroleum receives control software technical corrections, service packs, software revisions, updates and upgrades to continually optimize the control system supporting customer business goals
- Qatar Petroleum receives Microsoft® security patches and 3rd party Antivirus files verified by ABB for relevance and system compatibility to secure their systems against cyber threats
- Operators and plant management have access to relevant information related to the installed control systems through My Control System, a secure web-based platform
- Increased system stability and availability for continuous operations with extended lifecycle

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