SUMMARY

SBM Offshore
Veolia

Industry

Upstream Oil and Gas

Business Value

- Business Intelligence
- Operational Insight
- Performance Optimization
- Process Controls
- Quality Management
- Predictive Analytics

PI System™ Components

- PI Server™
  - Data Archive
  - Asset Framework (AF)
  - Notifications
  - Event Frames
- PI Vision™
- Connected Services

Injecting Water into Offshore Wells Using the PI System™ and Connected Services

Two years ago, SBM Offshore, a worldwide operator of 14 large floating production vessels (FPSOs), began thinking about new ways of deploying digital technology to improve how it works with its partners and service providers. There was a lot at stake for the Monaco-based group whose fleet of vessels process over a million barrels of oil per day.

One area for immediate improvement was the water treatment and injection facilities critical for deepwater production, a process in which, as the industry saying goes, "water in equals oil out." Working with its partner Veolia to improve water treatment and injection, SBM concluded that both parties needed more accurate, real-time oversight of the highly complex and expensive process where problems can result in costly downtime with hefty contractual penalties.

The High Cost of Failure

SBM had already experienced significant losses due to issues with some of its water treatment equipment. Expensive nano-filtration membranes manufactured by Veolia were being damaged or poorly maintained due to a lack of insight into their actual conditions offshore. When a membrane breaks and the seal is lost, an FPSO may be out of action for an entire day while repairs are made. Assuming the loss of 100,000 barrels of oil per day, the financial impact can quickly run to millions of dollars.

SBM's partner Veolia had made earlier efforts to harness real-time data and improve its service, but the information was often of low quality and always too late. Because of complex, time-consuming procedures required to gather, interpret and publish the data offshore, it could take up to eight weeks before information about equipment conditions reached the head office. The slow, frustrating process was ripe for improvement.

One System, One Version of the Truth

Veolia and SBM, who are both well-established users of the PI System, engaged OSIsoft to see if it could offer a solution. "We wanted one system with one version of the truth across all our regional teams," explained David Lothian, Head of Upstream Services at Veolia, during the 2017 OSIsoft EMEA Users Conference in London.

SBM had the data for the water treatment equipment offshore in their PI System, and Veolia needed that data at its onshore HQ. The answer was simple: deploy the OSIsoft's PI Cloud Connect service to link the two companies together and facilitate the safe, secure sharing of real-time operational data.
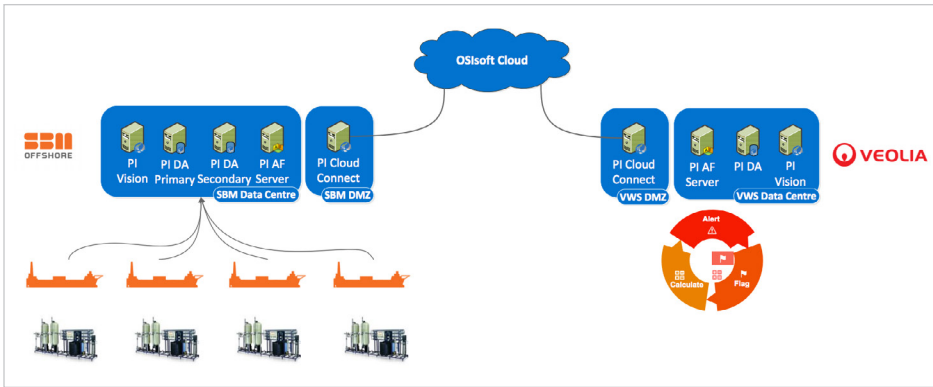
OSIsoft's PI Cloud Connect service created a rich data flow between the two companies, bringing real-time visibility into SMB's offshore equipment to Veolia's engineers onshore.

The result of this creative partnership has been a flow of rich data, enabling both companies to move from reactive to predictive analytics for managing water treatment. The number of contractual penalties for SBM has fallen, and profits improved, because its FPSOs are more productive and their uptime has increased. It's a clear win-win for everyone involved.

Condition-Based Maintenance with Asset Framework and PI Vision

With data flowing between SBM and Veolia, the next step was to build the Condition Based Maintenance system in Veolia's own PI System using OSIsoft's Asset Framework (AF) as the foundation for analysis and workflow automation.

Once Asset Framework was in place to structure the data into a standard hierarchy of assets, PI Notifications could provide real-time updates on issues arising with the water treatment equipment. Using Event Frames, on and offshore crews were able to see the data as meaningful operational activities while receiving insights into critical processes. In one case, an offline system had not been properly flushed, creating a high risk of scaling. With the issue identified as an event, the crew was able to take pre-emptive action almost immediately. PI Vision allowed engineers to put everything up on any screen in real-time to easily quantify the effectiveness of each water injection, clean and measure any improvements, such as the use of alternative chemicals.

As data became available across both organisations, each one saw efficiency gains in the functions of various departments, from setting injection targets by the technical teams to ordering materials by purchasing personnel. Today, the commonality of the data across the FPSO fleet is leading to shared insights and enabling measurable improvements. In the near future, data from the collaboration will be mined to improve the design of mission-critical membranes for the next generation of SBM's vessels.

To learn more about SBM Offshore, Veolia and the PI System, watch the full presentation here.

> "Notifications allows us to do more than what can be achieved with automation systems like PCS, DCS, PLCs. The reason being is that we can do variables, calculations or parameter excursions that these systems are not permitted to do under the design guidelines that we use."
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> — David Lothian, Head of Upstream Services at Veolia

Lothian, David / Teodorczuk, Anthony / Dixon, Alexander. Asset Integrity Services for Water Injection by Means of OSIsoft Connected Services. OSIsoft.com. 18 October 2017. <https://www.osisoft.com/Presentations/Upstream-Water-Injection-Asset-Integrity-by-means-of-OSIsoft-Connected-Services/>