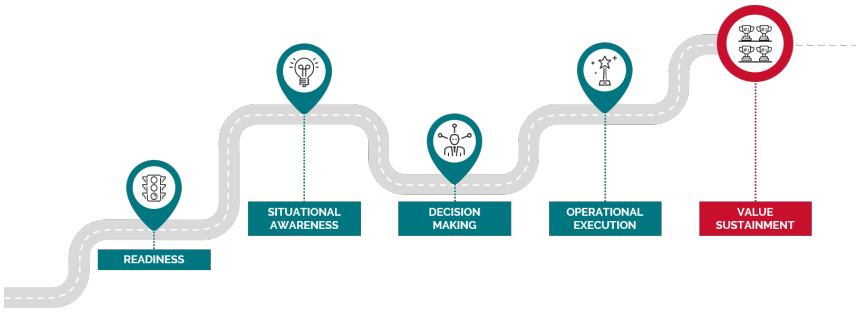
CASE STUDY

KBC
A Yokogawa Company



Digital Twin Boosts Production, Delivers USD 180 Million/Year

Connecting silos enhanced well deliverability to topside power generation

Key Benefits

- Received profits of USD 180 million/year
- Production boost of 9,000 b/d
- No CAPEX investment

Background

- Offshore, West Africa
- Integrated oil major
- Over 20 wells feeding a 'self-powered' FPSO
- Match well deliverability to topside power generation

KBC Solution and Results

- Petro-SIM simulator and OSIsoft PI historian
- Improved engineer productivity by integrating workflow across all disciplines
- Digital combination of data and physics

Client Challenge

An integrated oil major has over 20 wells feeding an 'all-electric' floating product storage and floating unit (FPSO) offshore West Africa. The unit has a processing capacity of 240,000 b/d of oil, 400 MMscfd of gas handling, and a treated water injection rate of 450,000 b/d.

The operator wanted to achieve several things. Their goal was to match well deliverability to the full potential of the topside power generator. They also thought they had lost opportunities in maximizing production.

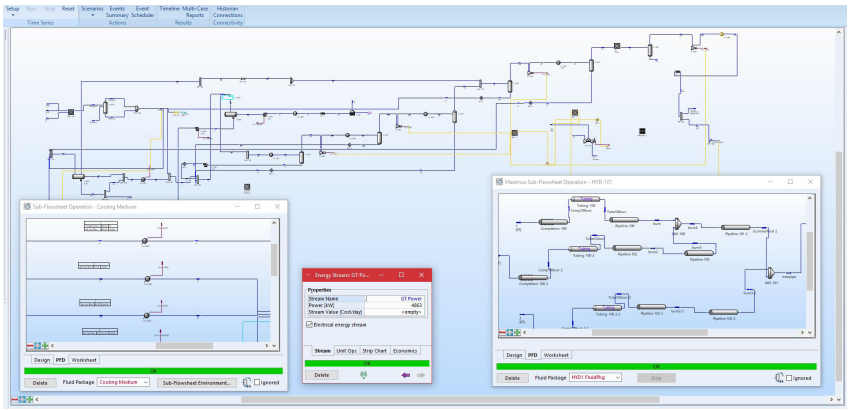
Removing the risk of commissioning and start-up activities, and reducing time to complete the design and transition to profitable operation was another area that they wanted to address.

The Solution

KBC suggested an integrated model digital twin to represent the whole asset from wellhead through topsides facilities into liquefaction plant.

This would integrate workflow across disciplines to improve engineer productivity and efficiency during design. As the engineers made design changes within the facility, they would get real-time feedback of what the performance impact would be to the entire asset.

KBC
A Yokogawa Company



The project team connected the Petro-SIM® simulator to the OSIsoft PI historian. This provided a digital combination of data and physics. The model would write all outputs back into the PI System in real time to amplify the quality of data in the PI System. This constitutes a rich source of process data on which to base other analytics initiatives. The integrated asset model would become a true digital twin driving the operation.

No CAPEX investment was necessary for the operator. The project used onboard equipment, matched sub-surface to surface pressure, flows, and first-time power-production balance.

The 'all electric' constraint in this project meant that close coupling of well deliver to facility processing capabilities was necessary. Optimization here requires control of energy consumption and therefore generating only the quantity of electricity needed to operate the facilities with no flaring of product throughout the life of every well.

Results

Petro-SIM provided an integrated asset model for a single source of the truth across the full stream. With all components combined in one single environment, users save time and reduce errors by avoiding jumping between different products and cutting and pasting data.

The operator was now able to understand how molecules and conditions behave at the unit- and asset-wide level. This gave them insight into production activities for effective decision-making and action. The implementation of the digital twin removed the functional silos allowing for shorter project times and optimized design.

The integrated asset model also helped to support supply chain optimization by having a real-time validated model available. The operator reduced risk of commissioning/start-up activities and shortened the time to complete design and transition to profitable operation. They were able to maximize compressor availability and boost production.

By matching well deliverability to topside power generation, the operator was able to boost production by 9,000 b/d and deliver incremental profits of $180 million per annum.

Houston Regional HQ
15021 Katy Freeway, Suite 600, Houston, TX 77094 USA
T +1 281 293 8200
T +1 800 726 5914

0055-OSWA-IAMbp-CAS-US-052020

All about EXCELLENCE