

## Case Study

### Chevron FPSO Vessel Achieves Safe, On-time Startup with Honeywell's Simulation Solution



“The combination of Honeywell’s lifelike simulation training solution and dedication of its engineering team to the successful delivery and installation of the training simulator was a critical component to the success of our project.”

Roger Miyasaki, Senior Modeling Engineer, Chevron

#### Benefits

The Agbami oil field ranks among the largest single deepwater discoveries in the West Africa region. Operated and majority owned by Chevron, Agbami is being developed with a subsea production system tied back to a floating production, storage and offloading (FPSO) vessel built by South Korea’s Daewoo Shipbuilding & Marine Engineering (DSME). With a storage capacity of 2.15 million barrels of crude oil, the Agbami FPSO is one of the largest such facilities ever built.

A major challenge that Chevron and DSME faced was to ensure the project met Agbami’s expectations for a safe and timely startup at commissioning and that all operators were well trained. Part of this challenge involved building the actual vessel while concurrently constructing a simulation of the entire FPSO process including subsea, topside, hull and offloading. Chevron and DSME turned to Honeywell’s UniSim® simulation solution to adapt the FPSO’s design into an operator training simulator. With UniSim, the Agbami FPSO achieved several benefits:

- Verified the integrity of the DCS and safety system prior to commissioning, ensuring that the process ran according to planned design and expectations
- Operators were well-prepared by day one for safe and efficient startup
- Trained operators were key to smooth and reliable daily operations
- Simulated unplanned scenarios helped train operators and engineers on how to respond and reduce potential incidents



Honeywell’s UniSim helped Chevron’s Agbami FPSO vessel achieve safe, timely and cost-effective startup.

#### Background

The \$3.5 billion Agbami oil field project is Nigeria’s largest deepwater development located approximately 220 miles southeast of Lagos and 70 miles offshore of Nigeria. Chevron, through its affiliate Star Deep Water Petroleum Limited, is the operator of the Agbami vessel and has a 68.2 percent interest under the unit agreement.

Built by DSME, the vessel is one of the largest of its kind. Weighing about 30,000 tons, the topsides generate 75 MW of power and have living quarters for 100 personnel. Designed to store more than two million barrels of oil, the vessel took 75 days to tow from the shipyard in Korea to Nigeria and is expected to be on location for more than 20 years.

Chevron Corporation is one of the world’s leading integrated energy companies with subsidiaries across the globe and approximately 59,000 employees.

DSME, established in 1973, is a global shipbuilding and offshore contractor that builds various vessels, offshore platforms, drilling rigs, floating oil production units, submarines and destroyers. DSME employs approximately 1,500 experienced design and R&D personnel and more than 15,000 skilled workers.

Other partners in this project include Texaco Nigeria Outer Shelf Inc. (a ChevronTexaco affiliate), Petroleo Brasileiro Nigeria Limited, Statoil Nigeria Limited, Famfa Oil Limited and the NNPC.

### Challenge

With the size and scope of the Agbami oil field project came the challenge of achieving startup quickly to reach normal production levels in a timely, efficient and reliable manner.

“Operators had to be trained and ready to go from day one and we needed a simulation solution that could adapt to the FPSO process,” said Sung Kak Lyu, Principal Research Engineer, DSME. “We needed an operator training simulator that was customized to our specific needs and would help Agbami achieve its goals.”

### Solution

A unanimous decision was made to partner with Honeywell. Having worked with its engineers on past projects, DSME had built a trusted relationship with Honeywell and was familiar with its capabilities. Chevron was also in favor of the decision due to the international reputation of Honeywell's proven technology, people and processes.

Honeywell and DSME worked closely to develop a simulation solution that met specific vessel requirements. “Because of

### More Information

For more information on Honeywell's simulation solutions visit <https://www.honeywellprocess.com> or contact your Honeywell account manager.

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the highly customized nature of our solution, it was critical that we worked directly with the engineers at Honeywell and tap into their network of R&D professionals,” said Sung Kak Lyu. “Honeywell was always prompt and proactive in meeting our needs and their consistent effort and capability have helped make this project a success.”



Honeywell delivered the simulation solution to Chevron's Nigeria training center for the site acceptance test.

Honeywell's UniSim Operations Suite helps prepare operators for initial and sustained operations. By conducting control room training prior to startup, operators were well prepared for safe and efficient commissioning. “Highly trained operators enable a smooth start and the ability to maintain reliable operations throughout the lifecycle of the project,” said Miyasaki. “With Honeywell's simulator we were able to get operators to experience plant upsets which may never happen, but simulating these incidents in a very real manner prepares them to better deal with these scenarios.”

Unlike other simulation solutions, Honeywell's UniSim Operations Suite also helps to improve profit recognition and business performance which can be measured in terms of additional days of production achieved through safe and reliable plant operations. By rigorous modeling, evaluation and enhancement to asset performance prior to startup and throughout its lifecycle, UniSim provides cumulative cost savings and improved operations with substantial return on investment in less than one year.

“We couldn't have done this without Honeywell's robust simulation solution and training for all our operations personnel both onsite and at our training facilities in Nigeria,” said Miyasaki, “We look forward to the continued use and next evolution of these simulator solutions.”

UniSim® is a registered trademark of Honeywell International Inc.