



**Rockwell
Automation**

sensia

Rockwell Automation + Schlumberger

The connected floating production vessel

Optimize performance and realize
significant savings from the shipyard
to full production and retirement





More to manage

Floating production storage and offloading (FPSO) vessels are big operations with equally big challenges.

At the project execution phase, time and cost targets can be elusive, forcing many projects in the oil and gas industry to run over budget and over schedule. FPSOs may perform better than average. But their sheer size and scale means that any cost or schedule overrun will have seriously detrimental effects on the project's financial performance.

During the operational life of an FPSO, a wide range of challenges can threaten productivity and profitability.

- **Production losses** can occur because of suboptimal operations, unplanned downtime and operational incidents
- **Assets must be operated to their safe production limits** despite limited maintenance capabilities on board
- **High turnover of operations staff** is common, and new staff must be properly trained to help ensure they work safely and effectively
- **Calls to address social responsibility** concerns put added pressure on your business to better manage safety, security and environmental risks

A comprehensive “connected vessel” strategy can help you address all these challenges – and optimize everything from the project execution to the long-term performance of an FPSO.

The connected vessel: what is it?

A connected vessel combines standardized systems and improved supplier coordination with the power of digital technology.

An end-to-end strategy takes an innovative design and implementation approach to building and managing a connected vessel. It also addresses the entire process – from the reservoir through topside production, vessel management and beyond.

Transform operations

A connected vessel improves efficiencies at every stage of an FPSO's life – from initial project execution to long-term sustainment. More than that, a connected vessel creates opportunities to reimagine what FPSO operations can be. For example, it can help you:

- **Maximize production** by using digital technologies that create better visibility and flow assurance
- **Remotely coordinate** expert support for the life of the vessel from a connected, onshore operations center
- **Make a shift** toward more autonomous operations with connected and automated technologies





Realize significant savings

A connected vessel offers potential savings of up to \$150 million. That's far more than the cost of the technologies and work processes that are required to implement a connected vessel strategy. Savings are realized through:

- Improved project execution that can speed up time to first oil
- Improved overall operations
- Reduced capital costs by using modular engineering and intelligent integrated automation and power systems
- Space savings

SAVINGS IN FOCUS

An OEM MAC can help you reduce wiring and piping, ease system integration, optimize commissioning and more. FPSO owners using this approach have seen installation savings of millions of dollars.

Better project execution can accelerate your time to first oil. For example, on an FPSO designed to produce **100,000** barrels of oil per day at **\$60** per barrel, getting to first oil **4 weeks** faster would yield about **\$168,000,000**.



Improve project execution

Too often, automation and electrical systems become the critical path to FPSO project completion because of regular design changes. Poor project execution can also result in costly changes at the shipyard, leading to commissioning and startup delays.

A connected vessel uses standardized systems and better supplier coordination to help address these challenges. This can help you get to first oil sooner and at a lower cost.

Just consider how production modules are typically developed. Modules are designed and constructed in many locations. Each module is often built to its own supplier's design specifications, and there is usually limited interaction between suppliers themselves and between suppliers and the main systems.

This approach can lead to installation problems at the shipyard and costly re-engineering work during commissioning and startup.

Design changes can be up to 10 times more expensive when they're made at the shipyard instead of during the engineering phase. And they can be up to 100 times more expensive when they're made during commissioning and startup.

Connected production modules

Connected production modules provide consistency and standardization. That's because you have an OEM MAC like Rockwell Automation managing key aspects of the modules, including:

- The system specifications for each of the module suppliers
- The connectivity of each module supplier to the main systems
- The interface management that is key to commissioning and startup

An OEM MAC can standardize software and hardware across the modules. It can also coordinate the delivery and integration of the production modules and systems and final site acceptance testing (SAT).

Rockwell Automation products and services are already used by module suppliers. It only makes sense for us to make these necessary connections between the modules.





Reservoir analysis helped one company achieve a **3% improvement in recovery and 3% improvement in availability**. The company estimates this will help it **generate more than \$2 billion in increased production** over the 20-year life of the field.

Optimize production

In production, a connected vessel strategy can help you optimize an FPSO vessel's performance and realize the true potential of its production assets.

This is achieved through four core connected-technology components:

Connected modules use the latest technologies for asset management, remote support, and obsolescence and spare parts management.

A connected production platform provides secure connectivity and scalability to visualize and optimize production from the reservoir to the production units. Capabilities like reservoir analysis and management can help operators maximize production over the life of the vessel.

Connected workers can use the latest visual and digital technologies to access knowledge-based information and human support and expertise whether it's on-vessel or remote.

This can increase the competency and performance of an operations team. It can also make training programs more efficient and improve transferring knowledge from one generation of workers to the next.

A connected onshore operations center can remotely coordinate the full operation of an FPSO. The center can also enhance access to both internal and external subject matter experts, such as module suppliers and asset and process experts.

Specific centers can also be created for the main areas of a vessel's operation:

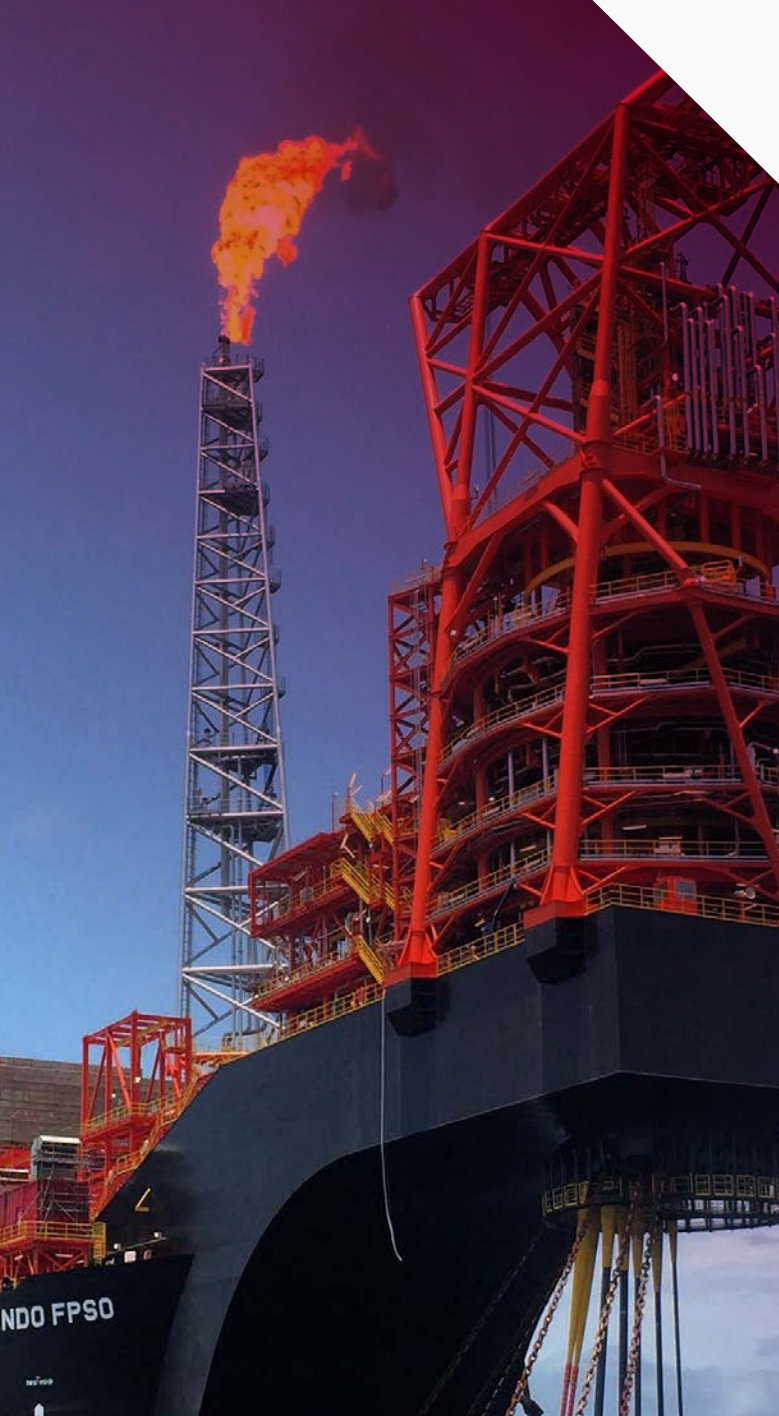
- A connected production center focused on overall production and flow assurance
- Dedicated centers for mission-critical automation and electrical systems
- A maintenance center that includes asset-management solutions
- An OEM module center that gives the operations team access to OEM and OEM MAC expertise

Imagine what's possible on a vessel where:

Inventory and spare parts are managed from startup

Assets are continuously monitored by experts

Obsolescence tracking of key systems is in place from day one



Reduce risk

A connected vessel strategy can help you reduce risk across the life of an FPSO.

Staffing and travel: With an onshore operations center and a connected, multi-skilled staff, you can reduce the number of staff needed on board an FPSO. The connectivity between the onshore and offshore operations centers also reduces the need for specialists to travel to the FPSO, reducing both travel costs and risks.

Cybersecurity: By using the latest defense in depth technologies, you can help protect against an evolving cyber-threat landscape that has shown it's actively targeting oil and gas operations.

Project and performance: Standardized production modules reduce the risk of schedule overruns, especially during commissioning and startup. They can also reduce the risk of containment loss by providing consistent designs, improved maintenance practices and asset management strategies.

Safety: Integrated FPSO fire-and-gas safety and control systems can be tested and validated together, as a single system. This can enhance safety compared to validating the systems separately.

OPEX: By adopting improved maintenance, spare parts and obsolescence strategies, you can reduce your long-term operational expenditures.

When you reduce staffing on an FPSO vessel, you reduce potential exposure to safety incidents. You also reduce transportation costs, CO2 emissions, and other operating expenses.

Extract more value

Rockwell Automation and Sensia are combining our strengths to bring the connected vessel to life. Together, we can help you create a connected vessel solution that addresses the automation, measurement and electrical scope of your FPSO project.

We take a digitalized approach to project execution and vessel operations:

- **Design:** We develop a cohesive digital plan and architect systems to take advantage of digital technologies
- **Commissioning and startup:** Our digital project planning and execution help achieve smooth commissioning and reduce the risk of automation or electrical surprises during startup.
- **Operations:** Our focus is on connecting staff, providing access to process experts and maximizing efficiency. We also use digital twins to validate and optimize operations.
- **Production:** Our digital strategies aim to maximize performance and support continuous production improvement. Digital twins can also help us enhance production goals and lay the foundation for the use of advanced analytics.

Our approach creates the **digital foundation** you need to leverage present and **future technology** advances.



Partner with us.

Our partnership is meant to be with you for the life of the project, from concept through operations and retirement. We can standardize production module systems to achieve seamless integration at the shipyard and help implement a connected remote operations center. We can also help develop and manage maintenance strategies and provide services for spare parts and obsolescence management.

Learn how Rockwell Automation and Sensia can help you bring the connected vessel strategy to life in your next floating production project.

For more information, contact your local Rockwell Automation or Sensia sales representative.



Connect with us.    

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