

Transforming upstream floating offshore operations

Digital, resilient and future-ready
FPSO automation powered by Honeywell



Floating offshore operations trends

Floating offshore projects face unprecedented pressure to deliver faster, operate leaner and remain resilient—all while meeting stringent safety and cybersecurity requirements.

Modern FPSO operations

Floating production storage and offloading (FPSO) vessels allow for mobile offshore production in extensive and often remote locations. They are critical to offshore operations and, as onshore exploration declines, are increasingly vital to the oil and gas industry.

FPSO operations have provided companies with incredible flexibility in exploration and extraction (i.e., upstream), but now modern operators are facing new challenges.

CAPEX and OPEX Pressure

Owners and engineering, procurement and construction (EPC) companies face ongoing pressure to reduce both capital and operational expenditures.

Traditional control system architectures typically require large physical footprints with heavy cabinets, driving up installation and integration costs.

In addition, high power consumption, cooling demands and space requirements increase operating costs, while offshore commissioning and travel remain expensive and logistically complex.

Complex Projects with Compressed Schedules

FPSO projects are increasingly complex and are often executed under highly compressed schedules. Long engineering and commissioning timelines place pressure on project teams, while late-stage design changes frequently result in rework and costly delays.

Operational Risk and Reliability Demands

FPSOs operate in harsh offshore environments where reliability is non-negotiable. Systems must withstand extreme conditions while maintaining continuous operation, yet there is limited tolerance for redundancy failures.

Regulatory scrutiny is also a factor, with stricter compliance requirements from classification societies and regulatory bodies placing additional demands on system design and operation.



Cybersecurity and Remote Access Risks

As IT and OT systems become more interconnected, the cybersecurity attack surface continues to expand. Secure remote access is now essential for operations and support, but it remains difficult to implement and manage safely.

Workforce Gaps

The offshore workforce is shrinking, with fewer personnel available in the job market and a growing loss of experienced operators. This reality is driving the need for remote expertise, connected workers and digital tools that enable knowledge sharing and operational support from onshore locations, without compromising safety or reliability.

The Need to Be Digital, Resilient and Future-Ready

Modern FPSO operations require an integrated system of automation, digitalization and remote operations capabilities that is purpose built to meet these challenges across the full FPSO lifecycle.

Integrated upstream FPSO automation

Honeywell delivers a fully integrated, digital-first automation and operations portfolio for floating offshore assets, designed to reduce CAPEX and OPEX, compress project schedules and increase operational resilience across the FPSO lifecycle—from design and commissioning through operations and support.

Redefining the offshore frontier

Honeywell addresses the complexity of modern FPSO projects by delivering integrated automation and safety within a single, unified platform.

Honeywell enables FPSO owners, EPCs and operators to move beyond incremental improvement and achieve meaningful performance outcomes:

- Accelerated engineering and commissioning with virtualization and automated workflows.
- Improved production uptime through advanced control and predictive analytics.
- Lower lifecycle costs driven by energy rationalization and asset performance management.

By integrating licensed process technology, sensing and measurement, automation, digitalization and rotating equipment into a cohesive system, Honeywell helps reduce execution risk while unlocking long term operational value.

With secure, standards-based platforms and deep offshore domain expertise, Honeywell also supports compliance, cybersecurity resilience and the transition toward remote and autonomous operations—helping FPSOs remain productive, safe and competitive for decades.

Integrated FPSO Automation

- Lower CAPEX through reduced hardware and footprint
- Faster schedules via digital engineering and automation
- Lower OPEX through virtualization and remote operations
- Higher availability, safety and cyber resilience
- A future-ready platform for autonomous offshore operations



Integrated FPSO automation

Licensed Technology
Acid gas removal and dehydration
Crude stabilization and hydrocarbon processing
Integrated licensing and automation readiness
Single-source delivery from FEED to operations
FLNG liquefaction and cryogenic processing

Compressor Equipment
Turbomachinery train improvement services
Centrifugal compressor equipment

Licensed technology for FPSO

Honeywell UOP delivers proven offshore gas processing technologies engineered for FPSO environments. These licensed solutions remove contaminants and condition gas streams in compact, modular configurations—reducing footprint and weight while ensuring reliable operation across variable feed conditions.

Acid Gas Removal and Dehydration

Honeywell acid gas removal and dehydration technologies—such as the UOP Amine Guard™ FS Process, SeparALL™ acid gas removal and UOP MOLSIV™ molecular sieve dehydration—ensure consistent, on-spec gas treatment for FPSOs. These proven processes protect downstream equipment, reduce corrosion risks and support stable operations despite feed variability and space constraints offshore.

Crude Stabilization and Hydrocarbon Processing

Honeywell provides licensed hydrocarbon processing technologies that support crude stabilization and separation on FPSOs. These solutions help deliver export-quality crude while safely managing associated gas, enabling faster startup, stable operations, and long-term reliability in harsh offshore conditions.

Sensing & Measurement	
Fire and gas detectors	Metering skids
Measurement instruments	Provers/Fiscal Metering
Tank Gauging	Wireless Transmitters

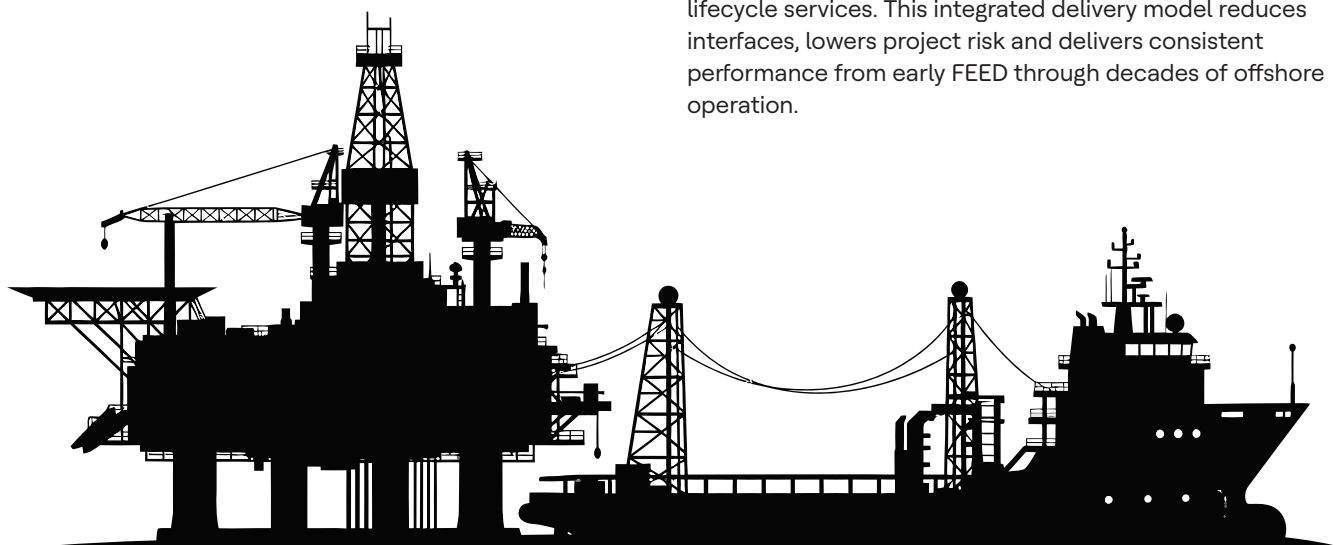
Process Solutions	
Process Automation:	Digitalization:
Integrated Control and Safety System	Operator Training Simulator
Integrated PLC solution for marine/topsides packages	Immersive Field Simulator
Physical Security Solutions	Production Management System
Network and Cyber Security Solutions	Asset Reliability and Production Improvement
Subsea Integration	Remote Autonomous Operations
Integrated Power Management System	Connected Worker
	Energy and Emissions Management
	Lifecycle Support

Integrated Licensing and Automation Readiness

Honeywell uniquely integrates licensed process expertise with automation and digital platforms. Process units are delivered automation ready, with embedded control strategies, advanced process control (APC) seed models, and operator training simulators (OTS) aligned to Honeywell Experion®. This integration helps reduce project risk, accelerate commissioning, and enable increased production from day one.

Single-Source Delivery from FEED to Operations

FPSO operators benefit from single-source accountability across Honeywell-licensed technology, automation and lifecycle services. This integrated delivery model reduces interfaces, lowers project risk and delivers consistent performance from early FEED through decades of offshore operation.



FLNG Liquefaction and Cryogenic Processing

Honeywell delivers integrated FLNG liquefaction and cryogenic processing solutions that combine pretreatment technologies with licensable liquefaction process designs. Enhanced for floating offshore environments, these compact, offshore qualified solutions protect cryogenic equipment, enable stable LNG production, and improve uptime and long term operational reliability for FLNG assets.

Sensing and measurement for FPSO

FPSO operations demand precise, reliable sensing technologies that perform under harsh offshore conditions while supporting safety, efficiency, and regulatory compliance.

Honeywell offers a full range of offshore-qualified sensing and measurement solutions—from fire and gas detection to custody transfer—designed to integrate seamlessly with automation and digital platforms.

Fire and Gas Detection Systems

Honeywell Fire and Gas (F&G) systems are a key component of its Integrated Control and Safety System for FPSOs.

Using Safety Manager™ and Safety Manager SC controllers integrated with Experion, operators can achieve centralized detection, alarming and mitigation in both process and non-process areas. This unified architecture enables near real-time visibility, consistent alarm management, and automated safety actions—helping operators protect personnel and critical assets while reducing system interfaces and lifecycle risk in offshore environments.

Process Measurement Instruments

Honeywell's SmartLine® family of measurement instruments delivers accurate and stable pressure, temperature, level and flow measurements across FPSO process applications.

Designed for offshore reliability, SmartLine transmitters provide advanced diagnostics, long-term stability and seamless integration with Experion PKS, helping operators improve process visibility, reduce maintenance, and lower total cost of ownership.

Wireless Measurement

Honeywell's SmartLine Wireless Transmitters and the OneWireless™ multiprotocol network enable secure, ISA100-based wireless measurement across FPSOs.

These systems reduce cabling, simplify installation and extend measurement coverage to hard-to-reach areas—supporting faster deployment, lower project costs and improved operational flexibility without compromising data reliability

Tank Gauging and Inventory Management

Honeywell Enraf offers industry-leading tank gauging with accurate level, temperature, and inventory measurement for FPSO storage tanks.



Enraf radar and servo gauging technologies enable precise custody management, overfill protection and near real time inventory visibility—supporting safe operations, regulatory compliance and improved storage management offshore.

Fiscal Metering and Proving

Meet the most stringent accuracy requirements of custody transfer meter proving. Honeywell engineers precise provers and fiscal metering instruments designed for offshore applications.

These systems support accurate measurement, verification and reconciliation of produced hydrocarbons, helping FPSO operators meet contractual obligations, reduce uncertainty, and maintain confidence in transfer measurements.

Metering Skids and Packaged Measurement Systems

Honeywell's integrated metering skids and packaged measurement solutions combine sensors, instrumentation and automation into compact, offshore-ready systems.

At the core of Honeywell's metering architecture is MeterSuite™, a DCS-integrated metering control and flow computation application embedded directly within the Experion system.

This integrated approach provides a single source of truth for operational and commercial data, reduces system complexity and footprint, while simplifying commissioning, operations and lifecycle support for FPSO metering skids.

Process automation for FPSO

Honeywell supplies integrated automation capabilities that enable safe, reliable, and efficient FPSO operations. Built on the innovative Experion platform, these solutions unify control, safety, power, security, and subsea systems into a single operational architecture designed for long life offshore assets.

Integrated Control and Safety System (ICSS)

As part of the Experion system, Honeywell ICSS brings together distributed control, safety instrumented systems, emergency shutdown, and fire and gas functions within a single architecture. This integration improves situational awareness, enables consistent alarm and event management, and reduces system interfaces.

Integrated PLC Solutions for Marine and Topside Packages

Honeywell provides integrated PLC solutions for marine and topside packages using ControlEdge™ PLC and Experion integration.

These solutions enable standardized control of packaged systems—such as utilities, water treatment, compression and auxiliary skids—while maintaining a consistent engineering, operations and maintenance environment across the FPSO.

Physical Security Solutions

Experion Industrial Security (EIS) integrates access control, video surveillance, intrusion detection and mustering into the Experion environment. By sharing information between security and process systems, operators gain unified visibility of safety-critical events across both process and non-process areas—supporting faster response, improved personnel protection and compliance with offshore security requirements.

Network and Cybersecurity Solutions

Honeywell provides OT-focused cybersecurity solutions designed to protect FPSO automation environments across their full lifecycle, including secure Experion architectures, network segmentation and cybersecurity services aligned with industrial standards. Honeywell's cybersecurity expertise spans offshore and maritime environments, helping FPSO operators reduce cyber risk while maintaining system availability and operational safety.

Subsea Integration

Honeywell supports subsea integration by connecting subsea production systems directly into the Experion control architecture. Using C300 based subsea control integration, Honeywell enables centralized monitoring and control of wells, manifolds and subsea equipment from the FPSO—helping improve visibility, reduce interface hardware and support scalable subsea field development over the life of the asset.

Integrated Power Management System

Honeywell Integrated Power Management Systems (IPMS) for FPSOs bring power generation, distribution and load management into the Experion platform. These solutions

Experion PKS – The Digital Backbone of FPSO Automation

Honeywell's breakthrough control system technology, Experion Process Knowledge System (PKS), forms the foundation of advanced FPSO automation architecture, providing a unified platform for integrated control and safety systems, power management, security and subsea operations.

Built on fault tolerant networking and a common data model, Experion PKS enables seamless integration of DCS, safety systems, PLCs, metering and third party packages into a single operational environment—helping reduce interfaces, improve situational awareness, and support safe, reliable FPSO operations over the full asset lifecycle.

support stable power operations, coordinated load shedding and improved energy usage—helping FPSO operators maintain availability, protect critical equipment and improve overall energy efficiency in complex offshore power networks.

Digitalization for FPSO

Honeywell enables FPSO operators to move beyond traditional automation toward data-driven, autonomous operations. Built on both the Experion and Honeywell Forge platforms, these digital solutions improve workforce competency, asset reliability, production performance and sustainability.

Operator Training Simulator (OTS)

Honeywell's Operator Training Simulator (OTS) uses high-fidelity dynamic simulation aligned with the live control system to train operators in normal, abnormal and emergency scenarios. Integrated with Experion, OTS helps improve operational readiness, reduce human error and accelerate operator competency for FPSO operations

Immersive Field Simulator (IFS)

The Honeywell Immersive Field Simulator uses 3D and immersive technologies to train field personnel on equipment operation, maintenance and safety procedures. IFS can operate standalone or integrated with OTS, helping FPSO operators improve field workforce competency, reduce safety incidents and shorten time to proficiency in complex offshore environments.





Production Management System

Honeywell's Production Management technologies provide near real-time visibility into production, well performance and operating constraints across the FPSO. By consolidating production data within the Experion and Honeywell Forge environments, operators gain improved production accountability, better decision making and increased throughput from reservoir to export.

Asset Reliability

Honeywell delivers Asset Performance Management (APM) solutions through Honeywell Forge, enabling early detection of equipment degradation and proactive maintenance planning. By combining operational data, predictive analytics and domain expertise, FPSO operators can reduce unplanned downtime, extend asset life and improve overall equipment reliability.

Production Improvement

Honeywell's Advanced Process Control (APC) and optimization solutions help FPSO operators stabilize operations, manage process variability and increase production efficiency. Embedded within Experion, these tools enable sustained production improvement while reducing energy consumption and operational disturbances.

Remote Autonomous Operations

Honeywell enables remote and autonomous FPSO operations to support centralized monitoring, remote expert collaboration and increased autonomy—helping operators reduce offshore manning, improve safety and maintain consistent performance across multiple assets.

Why Digitalize FPSO Operations with Honeywell

- Higher asset reliability and uptime through predictive analytics and proactive maintenance.
- A safer, more capable workforce enabled by digital training, simulation and connected worker tools.
- Improved production stability and efficiency using near real time analytics and enhancement.
- Reduced offshore manning through remote monitoring and autonomous operations.
- Lower energy use and emissions with continuous monitoring and emissions management.

Connected Worker

Honeywell's Connected Worker solutions connect field personnel with near real-time data and remote expertise. By digitizing work processes and integrating them with Experion and Honeywell Forge, FPSO operators can improve task execution, reduce errors and enhance workforce safety.

Energy and Emissions Management

Honeywell helps FPSO operators to monitor energy usage, detect losses and manage emissions in near-real time. Integrated within Honeywell Forge, these tools support compliance, sustainability goals and improved energy efficiency across offshore operations.

A360™ Program – Lifecycle Support

Get outcome based lifecycle support for FPSO automation systems through proactive monitoring, expert services and continuous improvement. Honeywell A360 helps protect automation investments, reduce operational risk and ensure long term system performance throughout the FPSO lifecycle.

Compressor equipment for FPSO

Honeywell designs specialized equipment and services that support safe, efficient and reliable operation of critical rotating machinery on FPSOs.

By combining deep turbomachinery expertise with integrated automation and digital solutions, Honeywell helps operators increase availability, protect assets and improve compressor performance.

Turbomachinery Train Optimization Services

Honeywell provides turbomachinery train enhancement services through Compressor Controls Corporation (CCC), a Honeywell company with decades of experience in FPSO and offshore applications.

CCC solutions enhance compressor and turbine trains by delivering advanced control, anti surge protection, performance improvement and lifecycle services.

Integrated with Experion, CCC technologies improve machine reliability, increase asset utilization and reduce energy consumption across complex turbomachinery trains.

Centrifugal Compressors

Honeywell supports centrifugal compressor installations on FPSOs with integrated control, protection and performance capabilities.

Using CCC turbomachinery controls and Experion turbomachinery control solutions, Honeywell enables precise control, surge protection and seamless integration of centrifugal compressors—regardless of OEM—into the FPSO automation environment.



For more information

process.honeywell.com/

Honeywell Process Automation

2101 City West Blvd,
Houston, TX 77042

Honeywell House, Skimped Hill Lane
Bracknell, Berkshire,
England, RG12 1EB, UK

Building #1, 555 Huanke Road,
Zhangjiang Hi-Tech Industrial Park,
Pudong New Area, Shanghai 20120

www.honeywell.com