

Yokogawa in the upstream industry

Yokogawa in the oil & gas supply chain

Yokogawa provides maximized value in the upstream sector.

Yokogawa is your most reliable partner.

Upstream

Fossil fuels will still be dominant in primary energy demand till 2040, with oil and gas accounting for over 50%. Solutions for the oil and gas business are essential for a sustainable society.

Yokogawa has rich experience in the upstream oil and gas sector.

Long-term partnerships

Founded in 1947, NAM is the Netherlands' largest natural gas producer, with more than 175 fields. Yokogawa's Maglog 14 ASD system, which relied on magnetic logic technology, was first introduced in the 1960s. Yokogawa stopped selling this system in the late 1980s, and ended support for it at the end of 2014. In December 2011, NAM decided to migrate to Yokogawa's latest safety platform, the ProSafe-RS safety instrumented system.

Project execution

We have a wealth of experience in project execution. In the online migration (hot cut-over) of the Escravos gas plant control system with Chevron Nigeria Ltd., the contracted work was scheduled to be completed in 90 days, but the work was successfully completed 48 days ahead of schedule. In addition to saving time, an estimated US\$2.3 million was saved by not having to shut down gas plant operations for the full 90 days.

Midstream

Pipelines play a critical role like blood vessels, sustaining society day to day. It is crucial to use the pipeline network effectively while maintaining it in good condition. Well-managed pipelines make it possible to optimize supply and demand.

Yokogawa is committed to the pipeline industry with over 20 years of experience.

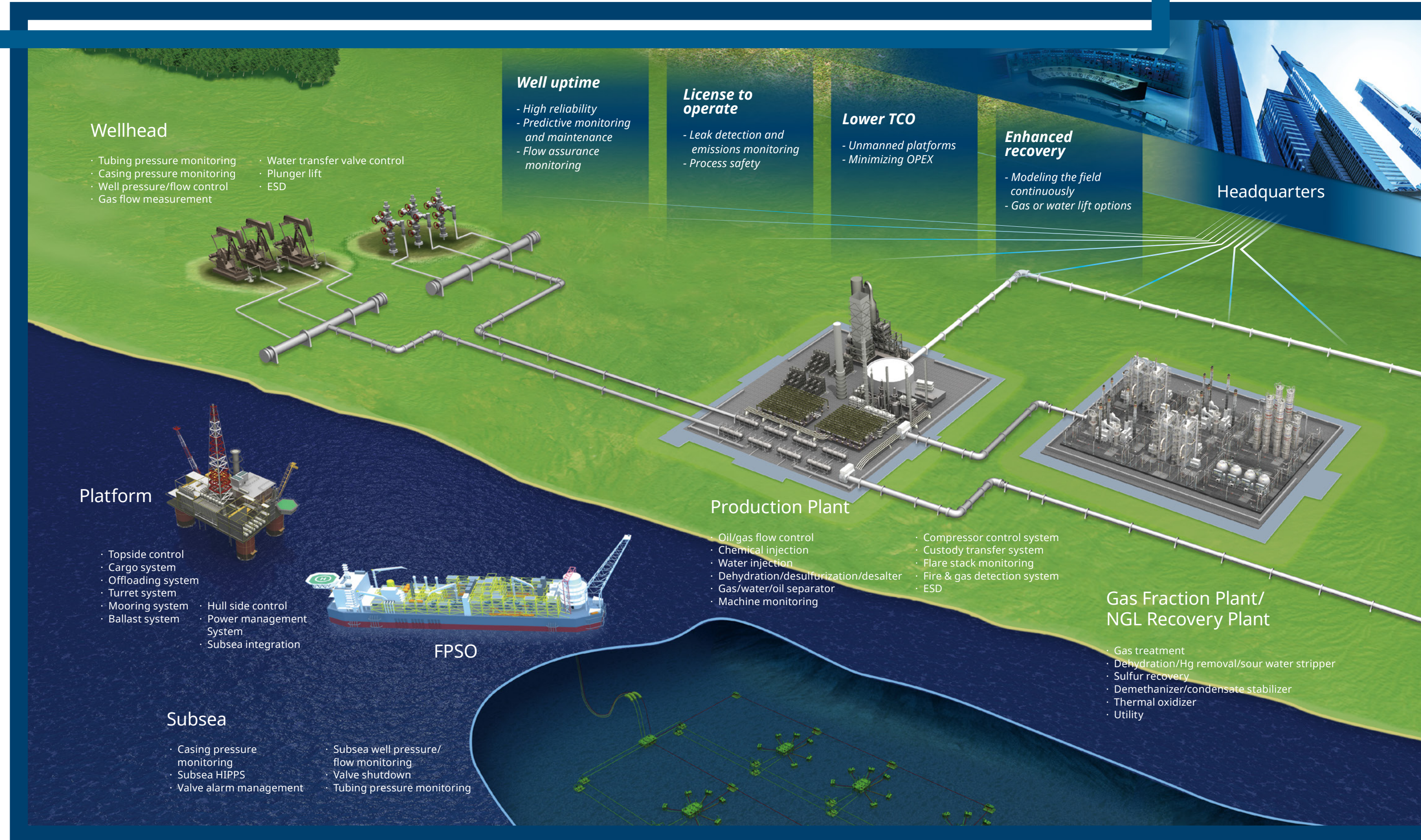
Downstream

The downstream sector is one of the largest and most important industries in the world. It is integral to many industries, and is of critical importance to many nations as the foundation of their industries.

Yokogawa provides comprehensive solutions in the downstream sector.



Yokogawa in the upstream sector



Enterprise automation solution

Enterprise automation solution delivers real-time and historical automation information from the plant or field to the enterprise level for analysis, research, asset monitoring, and control of the distributed automation system. The tightly integrated system changes the way of working and enhances the quality and speed of decision-making.

Real time dashboard and data integration platform

Upstream companies have several sites such as platforms and FPSO. Integrated operation between sites and the office is increasingly important for efficient operation. Real time dashboard & data integration platform is a production and operations management solution that is seamlessly integrated with its automation system. The suite of applications improves situational awareness and visibility of what is really happening in the process.

Data sharing for oil and gas wells

Yokogawa provides a cloud-based Data-as-a-Service (DaaS) solution that collects relevant data from an operating company according to their data and security standards, and serves it to their partners according to each partner's own individual data and security standards without any direct connection between the systems and networks of each company.

Modular automation solution

Yokogawa's well control package changes the approach for gas well control. A pre-packaged control unit for onshore wells is extended to an overall upstream solution. The customer can just install it at the well site, then production can start immediately.

Net Oil Solution

(ROTAMASS Total Insight / STARDOM)

Accurate measurement of total production from a well is essential for lease allocation and well performance monitoring. Yokogawa's Net Oil Solution is a unique solution that incorporates both the Net Oil Computing (NOC) and the Gas Void Fraction (GVF) functions.

OmegaLand

OmegaLand is one of the leading Operator Training Simulator (OTS) solutions. OmegaLand connects people, knowledge, expertise, experience, and the virtual world in a variety of forms by utilizing modeling technology and dynamic simulation technology.

MIRROR PLANT

MIRROR PLANT, a plant simulator based on physical modeling, precisely simulates dynamic plant behavior, and predicts possible conditions which may cause alarms. The operator can run the actual plant much more safely by eliminating such potential alerts.

Maximus / Multiflash

Maximus can be used as both a production forecaster and a flow assurance tool on projects. Multiflash is the only PVT and physical properties package providing reliable solutions to process and flow assurance engineers, from the reservoir to the refinery. These software packages are invaluable for production facility design and verification during field development.

Plant Resource Manager (PRM)

PRM is a plant asset management software tool. With PRM and intelligent field devices, operators and maintenance personnel can monitor the condition of plant assets remotely and promptly detect signs of performance deterioration.

DTSX

DTS upstream applications include temperature monitoring, well monitoring, SAGD (Steam Assisted Gravity Drainage) monitoring and so on. Yokogawa's DTSX can measure up to 50 km with high resolution and industry-leading performance.

High-Integrity Pressure Protection System (HIPPS)

Yokogawa has supplied many HIPPS with the solid-state ProSafe-SLS system, certified for applications up to safety integrity level SIL-4. It is proven to be the most reliable solution for high-integrity safety systems or rugged environments such as subsea.

Wireless Gas Detection System

The Wireless Gas Detection System consists of the ProSafe-RS safety instrumented system, field wireless network devices, annunciator panels, and GasSecure GS01 or GS01-EA wireless gas detectors, which are the only devices of this type in the industry that achieve SIL-2 risk reduction.

Plant Security Lifecycle Services

Plant Security Lifecycle Services are a cyber security lifecycle approach to help customers reduce security risks and manage plant security throughout its life. The Yokogawa Security Solution Portfolio is a comprehensive suite of indispensable security solutions that ensure the sustainability and efficiency of your control system.

Availability

Operation

Enterprise

Safety
&
Security

Enterprise Solution



Exaquantum

Plant Information Management System

Exaquantum can integrate and organize process data, alarms and events into timely, accessible and actionable information available across the enterprise.

CI Server

SCADA

The FAST/TOOLS package provides optimized performance for upstream applications. Among its features, it is designed to deliver high availability and performance.

InsightSuiteAE

Asset Analytics

InsightSuiteAE's reporting and consulting services enable customers to implement condition-based maintenance and facilitate asset management decisions.

CENTUM VP

Distributed Control System

Yokogawa started selling DCS in 1975, for the first time in the world. CENTUM systems have been installed in over 27,000 projects in more than 100 countries all over the world. All of Yokogawa's legacy CENTUM systems can be controlled and monitored from a newer CENTUM system.

STARDOM

PLC/RTU

The low power consumption model (FCN) meets the demanding requirements at inhospitable remote locations which lack power. FCN-RTU is not just a Remote Terminal Unit (RTU), but can also be used as a high-spec PLC.

ProSafe-RS

Safety Instrumented System

Having a fully redundant configuration for ultimate robustness, ProSafe-RS can be completely integrated with the CENTUM series and SIL-3 certified by TUV in single module installation.

ProSafe-SLS

Hardwired Safety System

You never have to choose between safety and availability again. ProSafe-SLS is a high-integrity safety system, providing 100% cyber-security and safety up to SIL-4. It will keep your most critical processes safe without downtime or maintenance.

Control & Safety System



DPharp EJX and EJA Transmitters

Due to the excellent elastic properties of silicone material, the DPharp sensor exhibits greater linearity and repeatability, with no inherent hysteresis.

ROTAMASS Total Insight Flowmeters

Yokogawa has more than 100 years of experience in various flowmeter technologies, including differential pressure, vortex, magnetic and Coriolis. Yokogawa continues to lead innovation in flow measurement.



Field Wireless

Yokogawa developed the world's first field wireless device based on ISA 100. Our concept of a wireless stable network is called "Sky Mesh." Sky Mesh is an innovative design method for wireless devices to communicate using a 2.4GHz wireless network in plants.

GC8000

Analizers

Since the first GC was shipped in 1959, Yokogawa has been committed to providing reliable and precise process analytical solutions. Yokogawa's GCs have continued to evolve to meet the ever-changing needs of the industry.

* GC: Gas Chromatograph

Field Instruments & Process Analyzers





Yokogawa has developed a methodology for integrating a huge amount of knowledge accumulated through project execution (delivery excellence), cooperation with engineers worldwide (smart engineering), and advanced technologies.

Process Knowledge

Operation Principle

Control Philosophy

PJT Execution Experience

Key Products

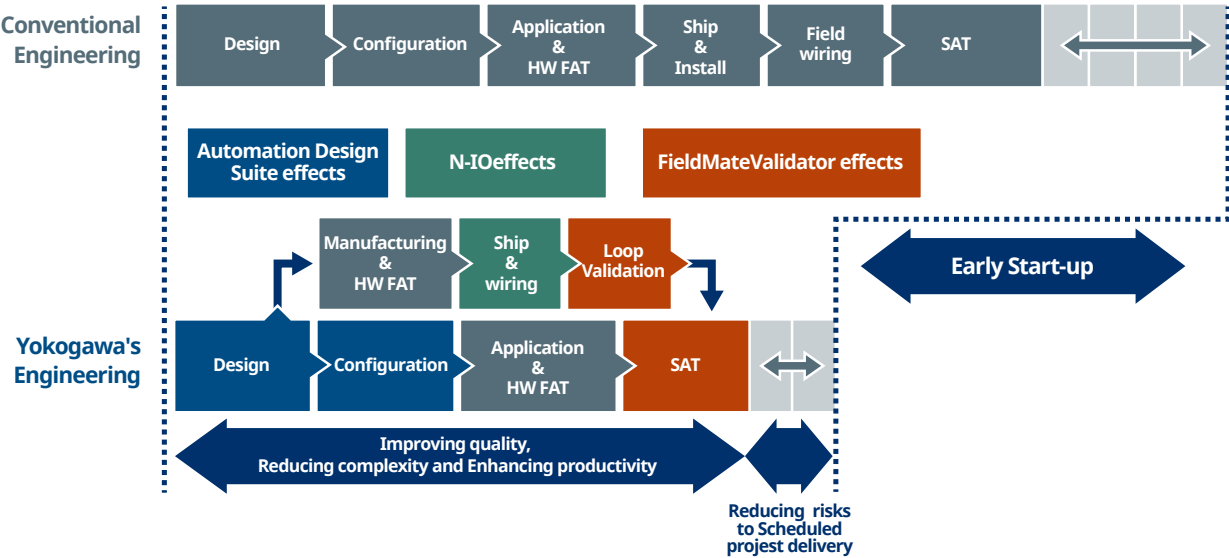
Agile Project Execution provides new engineering possibilities and changes the way projects such as a cloud enabled environment, collaborative engineering and remote testing can be planned and executed, reducing risk and adding flexibility to the schedule.

N-IO (Network I/O) : Software configurable smart I/O
N-IO, the next-generation software-configurable smart I/O, reduces footprint, lowers marshalling costs and allows flexible I/O binding.

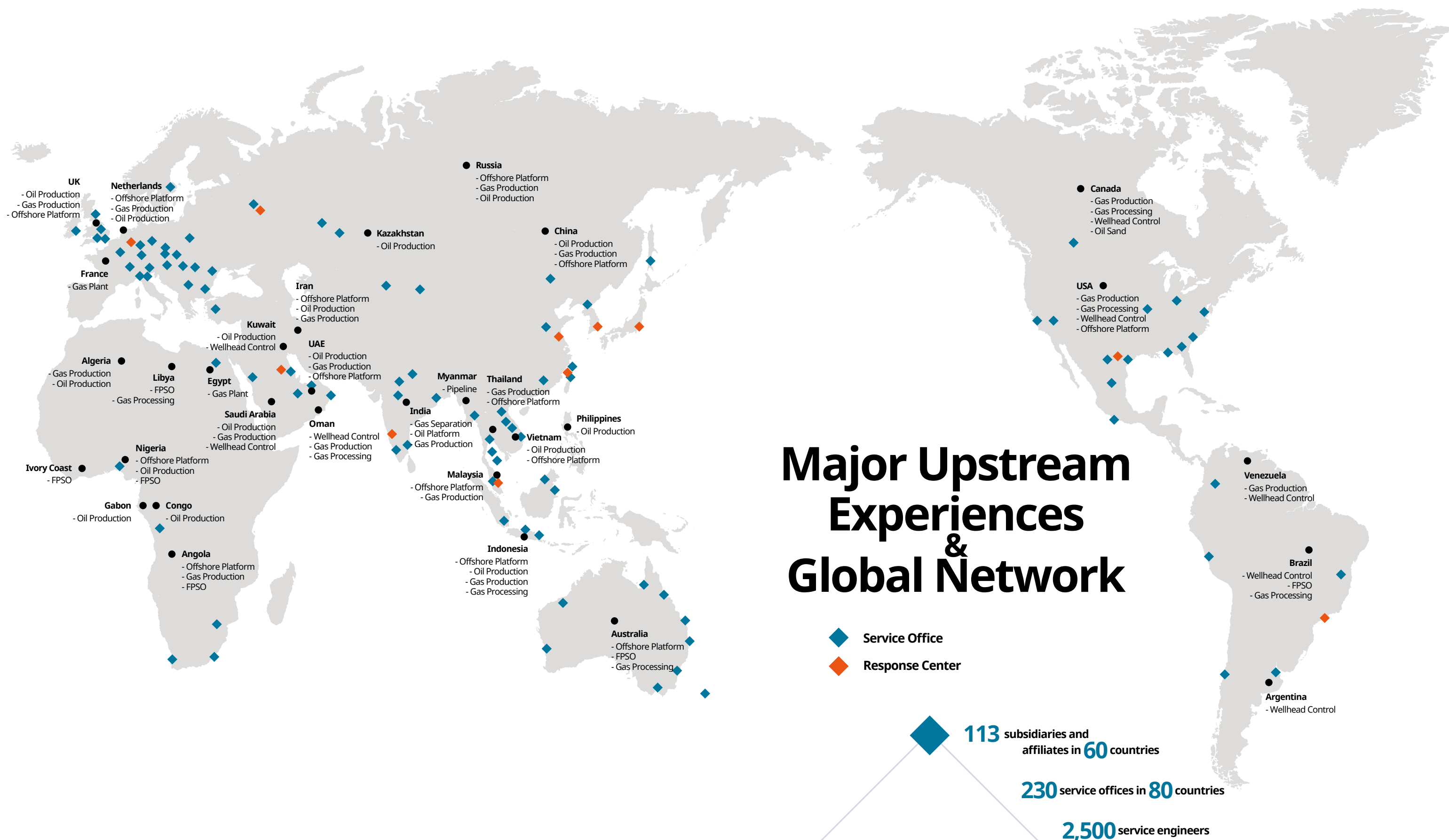
Automation Design Suite (AD Suite) : Engineering environment
The AD Suite provides an engineering environment for configuring and maintaining overall control systems, including plant instrumentation, safety instrumentation, and maintenance management.

FieldMate Validator: Commissioning tool for N-IO
FieldMate Validator is a new software package for configuring I/O modules (N-IO) without the engineering environment at field sites. It allows parallel engineering in different locations.

Yokogawa accelerates plant startup and ensures sustainable performance



Yokogawa's vast and in-depth project experience helps reduce TCO
(Total Cost of Ownership)





Digital Transformation for tomorrow

*Digital Transformation is changing the upstream industry,
under the concept called the Digital Oil Field.*

*In order to improve operation efficiency, safety and asset
management, customers make decisions based on diagnosis, analysis
and optimization using data from each field.*

Production Accounting

Managing the amount of production from the reservoir to the process plant is crucial to the upstream supply chain. The production volume at each site is accurately measured by Yokogawa's flow meters and sent to the center using SCADA systems. Yokogawa's production accounting and data reconciliation system assists users by calculating their site-wide daily mass balances, on a tank-by-tank and unit-by-unit level using material and inventory models. It contributes to detecting production losses and custody transfer errors to improve safety and production efficiency.

Remote Operation

The management of oil & gas production is moving towards integrated and remote operations using consolidated information, as each field becomes distributed in harsh areas and each process becomes more complex. Yokogawa's high performance SCADA with network security consulting consolidates field data in one view for effective and secure operations by experienced operators. For asset inspection and maintenance at unmanned sites, Yokogawa's AR and robot technologies are powerful tools for remote patrolling. You can see every corner of the site as if you were there and take agile action before an incident occurs.

Flow Assurance

Ensuring that fluids flow steadily through the supply chain without leaking and clogging is called "Flow Assurance". It prevents unexpected production shutdowns and contributes to stable and safe operations. Yokogawa offers flow assurance solutions using our field-proven integrated production model. Our solutions are integrated into the operation windows, so operators can predict the effects based on simulated hydrate and wax accumulation before actual operations. They contribute to the reduction of operation costs and increase asset availability.

Artificial Intelligence

Upstream data measured by sensors are sent to the data lake for site analysis. To convert those data to useful information requires domain knowledge. Yokogawa offers AI-driven autonomous solutions designed by experienced data scientists. These AI technologies are embedded in edge computing platforms with analogue and digital modules for collecting data from the field. Process optimization offers autonomy in the field and improves the productivity of the connected facilities by linking the remote information to the cloud.



Through the comprehensive OpreX portfolio of products, services, and solutions, Yokogawa enables operational excellence across the enterprise.

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