



**Yokogawa Middle East and Africa
2026 Corporate Profile**

For Our Planet's Future

At Yokogawa, we are focused on achieving a future in which people and our planet thrive and live in harmony.

In the Yokogawa's Purpose statement, we declare as follows:

Utilizing our ability to measure and connect,
we fulfill our responsibilities for the future of our planet.

To live up to these words, we have created a roadmap for the future and are carrying out our role to the best of our ability.

Our world today is undergoing changes that are global in scale. As a result, the achievement of sustainability is a critically important environmental, societal, and economic issue. To fulfill our responsibilities for the future of this planet, we are leveraging our core competences in measuring and connecting to address pressing social issues. We measure things, grasp and analyze their state, and add value through the information that is derived. Connecting refers to how Yokogawa not only combines valuable information, but also builds trusted relationships with customers in various industries and brings together businesses and industries, giving resonance to the value that we create. Through this, we contribute broadly to society.

In keeping with our vision for society in the year 2050, Yokogawa has set Three Goals for sustainability, and we continue in our efforts to take on challenges and present solutions to a broad range of difficult issues that the world faces today. With the goals of realizing net-zero emissions, well-being, and a circular economy, Yokogawa is focused on making contributions in six key areas.



Areas where Yokogawa contributes

- Achieving carbon neutrality
- Improving efficiency in society & industry
- Optimizing plant lifecycle & protecting environment
- Improving health & safety
- Creating a resource-recycling ecosystem
- Creating workplaces where people can fulfill their potential

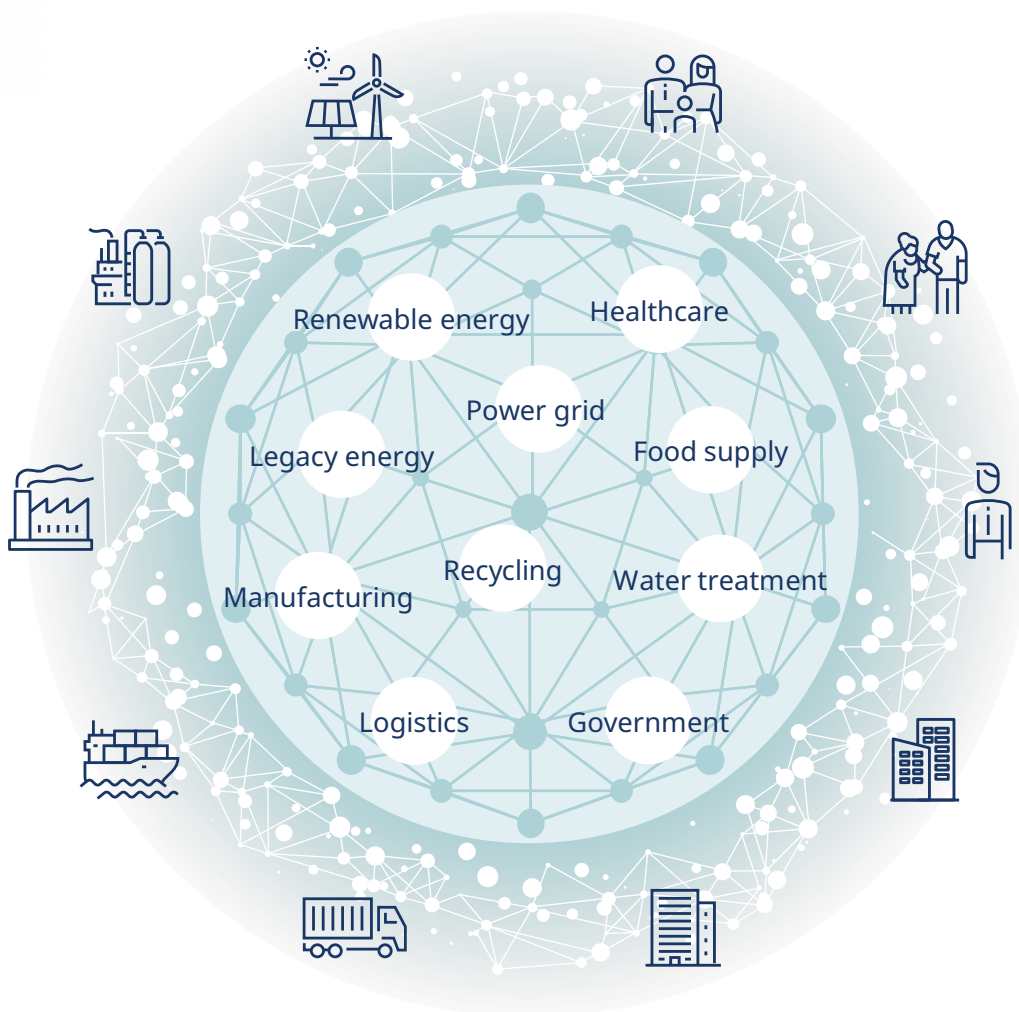
Yokogawa delivers sustainable value by applying our ability to measure and connect.

Addressing Social Challenges through System of Systems

In recent years, a growing trend has emerged in which independently operating systems are increasingly interconnected and collaborate toward shared goals, a concept known as "system of systems" (SoS). Some of these connected systems extend to the enterprise level and even beyond, encompassing partner organizations, other companies, industry clusters, and society as a whole.

Through SoS, Yokogawa promotes collaboration among stakeholders and delivers synergies and emergent value. These efforts contribute to solving complex social and environmental challenges that are difficult for a single company to address alone.

Within this trend toward SoS, as a trusted partner to our customers Yokogawa supports sustainable success by drawing on strategic insight, promoting collaboration, and applying the Industrial Automation to Industrial Autonomy (IA2IA) approach, which advances autonomy within and between these systems.



Addressing Social Issues

Drawing on our ability to measure and connect, Yokogawa collaborates with customers. Making full use of our expertise in measurement, control, and information technologies that we have acquired over the years, Yokogawa addresses social issues through our business activities. To attain these goals, the core industrial automation and control business has been divided into three segments: energy and sustainability, materials, and life. Yokogawa's measuring instruments business and new businesses also significantly contribute to the advancement of industry and technology.

Industrial Automation and Control Business

Energy and Sustainability Business



Given the expected surge in global energy demand, the renewable energy market is primed for growth. In the increasingly diverse energy and water sectors, Yokogawa's energy and sustainability business is working across the entire value chain – from production and supply to use, disposal, recycling, and maintenance – to support safe and efficient operations. The business segment aims to protect the environment by achieving a sustainable, carbon-neutral society.

Main Markets

- Renewable energy
- Oil & gas (upstream)
- Refining, petrochemicals (downstream)
- Power
- Energy management systems
- Energy storage
- Water & wastewater, industrial water

Materials Business



Among the requirements in this segment are efficient energy use, recycling, and the use of raw materials that have a low environmental impact. Drawing on our expertise in ecological solutions and digital technologies, Yokogawa is striving for a world that maintains a balance between comfort and sustainability. Our materials business is critical to achieving a circular economy that can exist in harmony with the environment.

Main Markets

- Specialty and fine chemicals
- Biochemicals
- Fertilizer
- Mining & metals
- Mobility
- Electrical machinery, electronics & semiconductors
- Iron & steel
- Pulp & paper
- Fibers & textiles

Areas for exploration: Disaster prevention, space, and ocean

By presenting solutions for applications such as the observation of changes in sea level and the verification of technologies that could point the way we are working to mitigate the effects of global disasters and working toward the achievement of a recycling-oriented society.

Yokogawa proposes solutions to global challenges.

Life Business



The growing global population is putting a strain on the production and supply of food. Demand for pharmaceuticals is also rising steeply. Yokogawa's life business supports the supply of medicines and food so that people everywhere can live safely and enjoy good health.

Main Markets

Pharmaceuticals

Healthcare

Food & beverage

Measuring Instruments Business



Often considered to be the mother tools of modern industry, measuring instruments have been an integral part of Yokogawa's business since the company's inception. Taking advantage of our expertise in the precision measurement of power, voltage, light, pressure, and other physical quantities, we are pursuing decarbonization by helping our customers in such areas as vehicle digitization and electrification, renewable energy, environmental measurement, next-generation communications technology, and plant maintenance.

New Businesses, etc.



Setting our sights on easing the use of the industrial internet of things (IIoT), Yokogawa provides the necessary hardware, software, and cloud solutions.

way to the use of hydrogen on the lunar surface,

Transforming Businesses

Many customers are transforming their businesses so that they can help to make the world a better place. Yokogawa has a proven record in optimizing value chains and helping customers get the most out of their facilities over the entire plant lifecycle. That is why Yokogawa's products and other solutions continue to be preferred.

Industrial Automation and Control Business Energy & Sustainability

We provide products, services, and solutions that span every from the collection of data generated in the field to the of corporate management.

IT
Information
Technology

Level 4
Corporate
management



Level 3
Manufacturing
execution
control



Level 2
Production control
and safety system



Distributed control systems

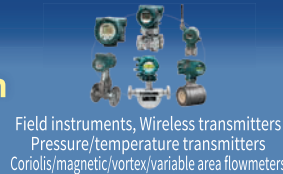


Safety instrumented systems

Yokogawa

OT
Operational
Technology

Level 1
Data generation
and collection



For our customers, we present solutions that resolve issues and maximize value over the entire lifecycle of their

Consulting

Design & engineering
System integration

Installation

Training

Yokogawa supports customers who are redefining themselves to take on social issues.

Materials Life

OpreX™

OpreX is the comprehensive brand for Yokogawa's industrial automation and control business.

level of activity, optimization

- Energy and carbon management optimization
- Operational risk management
- Security

Collaborative Information Server

Cloud Industrial cloud applications and solutions


- Programmable logic controllers
- Film/sheet thickness gauges
- Distributed temperature sensors

business assets.


→ **Lifecycle services** →

Life Business (Life science)


This business segment supports bio-related food and pharmaceutical research & development through the provision of products and solutions that aid cell analysis.



Nano-point delivery/sampling unit



Subcellular sampling system

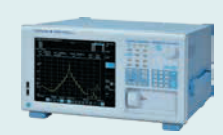


High-content analysis system

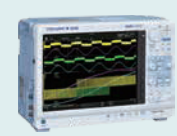
Measuring Instruments Business

This segment offers a broad range of measuring instruments and services that are essential for the benchmarking and optimization of customers' products and technologies.


Products of Yokogawa Test & Measurement Corporation



Optical spectrum analyzers



ScopeCorders



Precision power analyzers

New Businesses, etc.

Businesses in this segment include IIoT-based services.

Products and services of amnimo Inc.



AI edge gateway



Edge gateway (outdoor type)

Moving Forward with Customers

Since our inception in 1915, Yokogawa has been providing cutting-edge industrial products and solutions that contribute to the advancement of society, based on our expertise in measurement, control, and information technologies.

Upholding the belief that growth comes from our own transformation, Yokogawa is tirelessly creating new value for our customers.

Founded

1915

The company traces its history back to the establishment of an electric meter research institute on September 1, 1915.

Paid-in capital*

43.4 billion yen

Shareholders' equity ratio*

65.1 %

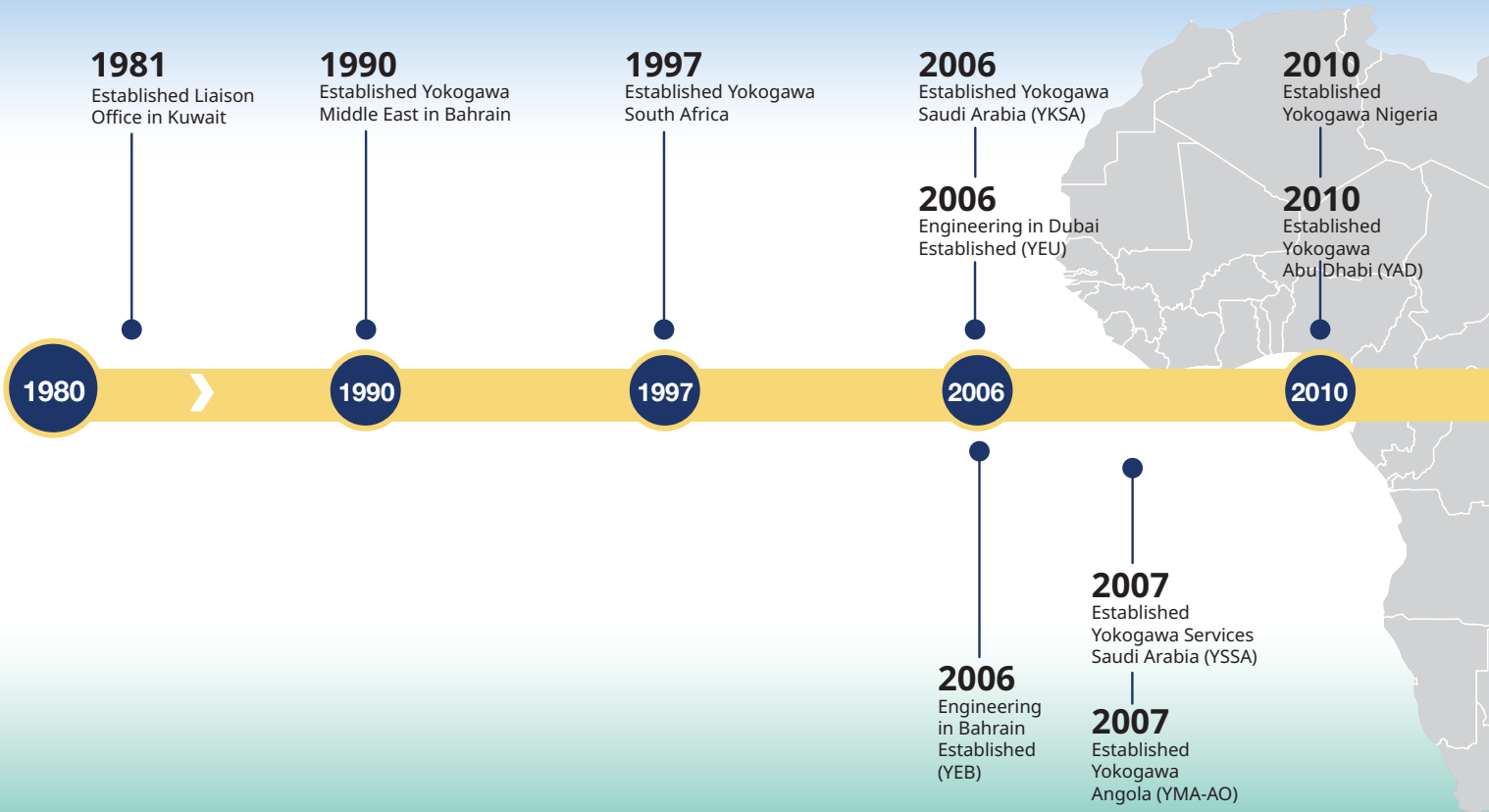
Consolidated net sales*

562.4 billion yen

Overseas sales ratio*

74.4 %

Over 30 Years of Excellence in Middle East & Africa

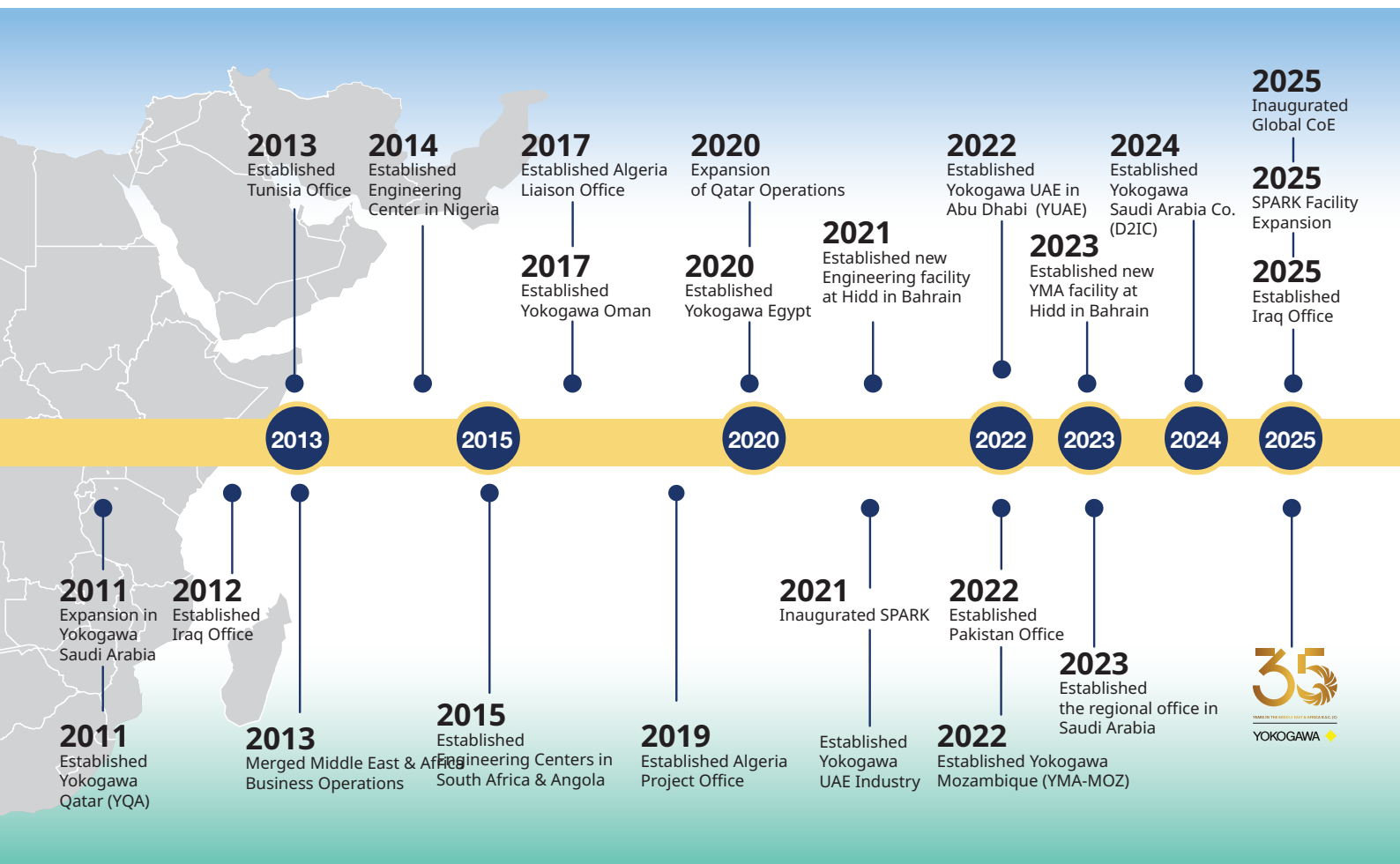
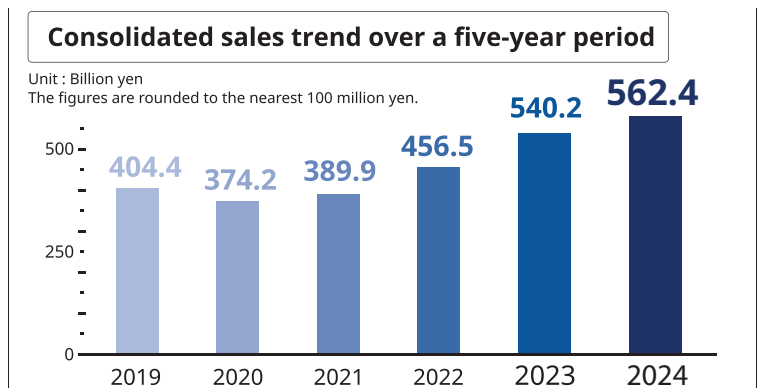
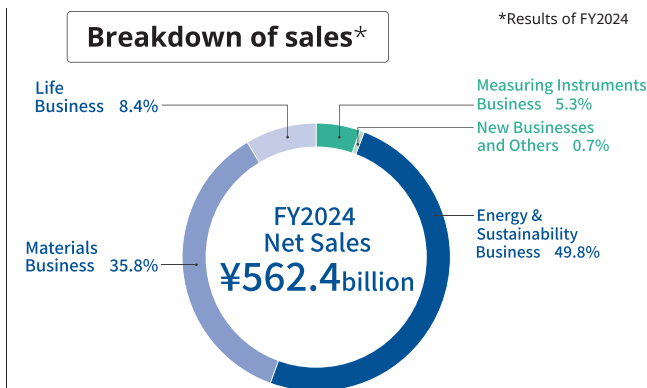


The Yokogawa Group is constantly creating new value for our customers.

Company name: Yokogawa Electric Corporation

Director, President & CEO, Representative Executive Officer: Kunimasa Shigeno

Headquarters: 2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, Japan



Our Project Execution Capabilities

OpreX Agile Project Execution



Realize CAPEX and OPEX Efficiencies with OpreX Agile Project Execution OpreX Agile Project Execution (APEX) merges innovative project execution processes with enabling hardware and software technologies in order to remove automation from the critical path in a greenfield plant project.

APEX improves time management, minimizes project expenses, reduces risks in project execution and delivery, and ultimately maximizes the value of the automation system throughout the plant lifecycle.

APEX Project Implementation

Predictable, Reliable, High Quality Project Execution

- Deterministic cost and schedule
- Scope clarity in terms of deliverables and services

Change Management

- Minimized impact of late changes
- Standardization instead of customization

Cost and Schedule Reductions

- Improved engineering efficiency
- Automated commissioning
- Optimized lifecycle costs

Flawless Start-up

- Replication - design once, deploy often
- Fit for purpose, high quality products and services

Front End Engineering Design "FEED"

Front End Engineering and Design (FEED) plays a critical part in the pre-project planning process of a new project or plant upgrade. The FEED study serves as a conceptual design phase of a project, aiming to streamline project management by identifying opportunities for maximizing efficiency during project execution.

Yokogawa offers FEED studies in which our analytical engineering experts work directly with the customer to identify opportunities for minimizing costs and enhancing efficiency during project execution. We provide pre-project planning guidance that includes hands-on support and comprehensive expertise to help create for clients a conceptual outline of their project, including a review of the most effective technology available and the expected time and costs associated with project execution.

Yokogawa FEED studies deliver:

- Comprehensive review of client specifications
- Clear definition of project scope
- Evaluation of the most effective current technologies
- Conceptual design sketches and drawings
- Budgetary cost analysis

Greenfield Projects

We take upon ourselves everything a Greenfield Project needs such as basic and detailed engineering, system hardware assembly and wiring, procurement of non-Yokogawa products,

system engineering, complete integrated testing at factory, installation, site acceptance testing, commissioning, hand over and maintenance.

Main Automation Contractor "MAC"

The MAC approach involves earlier involvement in the project, which reflects a greater influence over the costs and benefits of a project.

Benefits

- a) Total project management including sub-contractors' management.
- b) Total instrumentation and installation design and engineering.
- c) Total Control and Safety Systems, SCADA/RTU design, Engineering, Testing including communication with subsystems;
- d) Total Cyber Security Solutions for Integrated Control and Safety Systems
- e) Total Plant information and Asset Management Solutions
- f) Integrated Operator and Training System
- g) Integrated Supply Chain Management System through Yokogawa worldwide network
- h) Single responsibility/single window enabling Design Standardisation
- i) Advanced solution engineering, testing and commissioning through Advanced Process Control, Artificial Intelligence (AI) control applications.
- j) Asset Health Insight (AHI) for Prediction and Anomaly detection by providing Dashboard solutions on cloud for diagnostics of Plant machinery and equipment and through integration of Yokogawa proprietary wireless Sushi sensors installed on remote Plant areas and equipment using LORAWAN network technology.
- k) Value added solutions for Plant Operational excellence which include Advanced Operator Graphics, Alarm management and Alarm rationalization solutions.
- l) Design, engineering, testing, installation, commissioning of wireless field instrumentation system which comprises of ISA100 compliant devices.
- m) Shorter delivery time.

Functional Safety Management System

Yokogawa implements a compliant Functional Safety Management system certified by TÜV Rheinland for the realisation of SIS (Safety Instrumented System) solutions in accordance with the latest IEC 61511:2016 and IEC 615108:2010 safety-related standards. Yokogawa is the first TÜV Rheinland FSM system certified organization in the Middle East covering full phase responsibility for SIS design, configuration, application program development, assembly, test, and safety loop calculation.

The company currently has three FSM-certified engineering facilities (Saudi Arabia, Bahrain and Abu Dhabi) for delivering SIS Logic Solver solutions, up to and including Systematic Capability 3 (SC3) and Safety Integrity Level 3 (SIL3). The current maturity level classified by TÜV Rheinland for all three locations is at Level 4 Quantitatively Managed.

Digital Solutions

We have a dedicated team of specialist engineers who develop solutions for Manufacturing Engineering Systems (MES), Cloud Solutions for data integration, Integrated solutions for

subsystems (video walls, Dashboards with high performance HMI interfaces, KVM solutions), Telecom, CCTV, Industrial Access control solutions and Robotics.

Plant Energy and Operation Optimisation Solutions

Our Real Time Optimization team apply AI/ML and Digital Twin technologies to provide the required solutions for Plant Energy and Operational optimization programs thereby supporting sustainable development goals.

Analyser Solutions

Design, engineering, testing, installation, commissioning of Analyser shelters for various Analyser applications including Gas Chromatographs and integrate the Analyser systems to control system using Analyser Management Data and Acquisition through industry standard communication protocols.

Brownfield Projects Systems Migration/Replacement Projects (Hot/Cold Cutover)

For "Lifecycle Excellence" initiatives, Yokogawa provides solutions for replacement, revamp and/or migration of legacy systems (DCS/SIS/F&G) without timeframe constraints or interruption of plant operation. Our team approach ensures easy migration or expansion of earlier versions of CENTUM and ProSafe-RS. Other vendor's obsolete system(s) can also be replaced by Yokogawa's latest systems (DCS/SIS/F&G/PIMS/AMS/CyberSecuritySystem) using tools developed for engineering such replacements.

Our team of experts specialize in site works related to transfer of control loops, safety loops, instruments and systems based on hot or cold cutover methodologies, cutting risk and downtime.

The Service Projects team focus on providing upgrade solutions for the installed base systems for improving the system availability through Technology refresh projects through phased upgrade program. Using such upgrade opportunities, we also provide technology solutions, Alarm Rationalization solutions, Cybersecurity etc which will enhance plant operational efficiency, reporting and addressing the obsolescence of the system. We also provide expansion and modification solutions and implementation of such solutions online without disturbing the plant operations. This is carried out after meticulous risk assessment and gathering extensive information on the existing system design and constraints.

Yokogawa helps customers increase profits via energy savings and operational efficiency improvements. It aims to realize next-generation productivity improvements in efficiency, thereby adding value and continuing to grow alongside our customers.



Manufacturing, Engineering and Service Facilities

Yokogawa ensures the best-in-class customer support by providing manufacturing, engineering and service facilities closer to where the customers' operations are. This enables easier access, quicker responses and proactive support.

Yokogawa walks the talk. We invested in state-of-the-art manufacturing facilities in the Kingdom of Saudi Arabia and the United Arab Emirates (UAE) the two most important Yokogawa customer hubs in the Middle East. Our investment in creating a best-in-class manufacturing unit at the prestigious King Salman Energy Park (SPARK) in the eastern province of the Kingdom of Saudi Arabia is a major part of the Yokogawa commitment to expand local investment and technical infrastructure. The unit not only fulfills our objective of strong customer support on the ground but also provides local talent to build successful careers within their domain. In FY24, we furthered our investment to increase the Integration area of our Analyzer System facility at SPARK.

We consider it a privilege to be aligned with the objectives of the Kingdom's Vision 2030 – a knowledge-based economy that supports export-orientated growth of sectors other than oil and gas.

Our facility at SPARK will manufacture Analyzer Systems, Transmitters and Control System Panels. Yokogawa's expertise in automation technologies combined with this new manufacturing unit will further facilitate oil, gas and chemical production industries in the region. This will serve the domestic and the global markets well.

Yokogawa has further strengthened its investment in the Saudi Arabian market with the addition of approximately 17,000 square meters of new space to its existing facilities, establishing a state of the art manufacturing center at King Salman Energy Park (SPARK) in the Kingdom's Eastern Province.

This expansion reflects Yokogawa's long term commitment to the growth of the Kingdom of Saudi Arabia and aligns closely with the objectives of Saudi Vision 2030, which emphasizes the development of a knowledge based economy and increased local content.

The new facility will double the manufacturing capacity of Analyzer Systems, Transmitters, and Control System Panels. In addition, it will support the local manufacturing of complex Gas Chromatographs, making Yokogawa the first original equipment manufacturer (OEM) in the Middle East to produce Gas Chromatographs within the region.

By combining Yokogawa's extensive expertise in automation and analyzer technologies with this advanced manufacturing capability, the facility will contribute significantly to enhancing oil, gas, and chemical production operations across the Middle East.

Yokogawa's manufacturing centers in Saudi Arabia serve not only the local domestic market but also global projects. Customers across the Middle East and Africa (MEA) region will benefit from faster delivery times, improved supply chain responsiveness, and strong local technical support—enabling better control over cost, schedule, and project execution.

Analyzer System Integration Manufacturing

The manufacturing center at the King Salman Energy Park (SPARK) in Saudi Arabia provides localized Analyzer System Integration facilities capabilities for customers across the Middle East & Africa region.

The expansion will facilitate staging more than 35 analyzer shelters simultaneously (doubling the existing capacity) and will enable customers to conduct Integrated FATs with Process Analyzers running on real process samples. This allows for comprehensive validation of analyzer performance under conditions closely resembling real plant operation

While the DCS system creates a Digital Twin, the SPARK Analyzer Integration Center creates a near plant condition with a Physical Twin, replicating real world operating conditions to ensure higher reliability, seamless integration, and reduced commissioning risks at site.

Yokogawa offers a comprehensive range of analyzer system integration services at its SPARK facility, including:

- Integration of Area classified Analyzer Houses, Process Analyzers, CEMS cabinets, and analyzer racks complying to International and Local Standards
- CEMS package integration, complying with EPA and Regulatory Authority (RC) reporting
- Design and fabrication of engineered sample conditioning systems
- Custom HVAC integration for analyzer houses and cabinets
- Engineering and supply of custom electrical equipment suitable for hazardous area applications
- Third-party equipment integration with Yokogawa systems

- Conduct of site surveys
- Installation and site supervision services
- End-to-end services covering engineering, fabrication, consulting, training, FAT, SAT, start-up, and maintenance
- Covering complete Product Lifecycle Services



Transmitter Manufacturing

A pioneer in Pressure and Temperature Transmitters Yokogawa can manufacture around 40,000 transmitters annually at its SPARK manufacturing facility in Saudi Arabia.

The Yokogawa SPARK Manufacturing Center provides rapid response and emergency support, including fast turnaround and localized availability of transmitters, helping customers minimize downtime and maintain operational continuity.

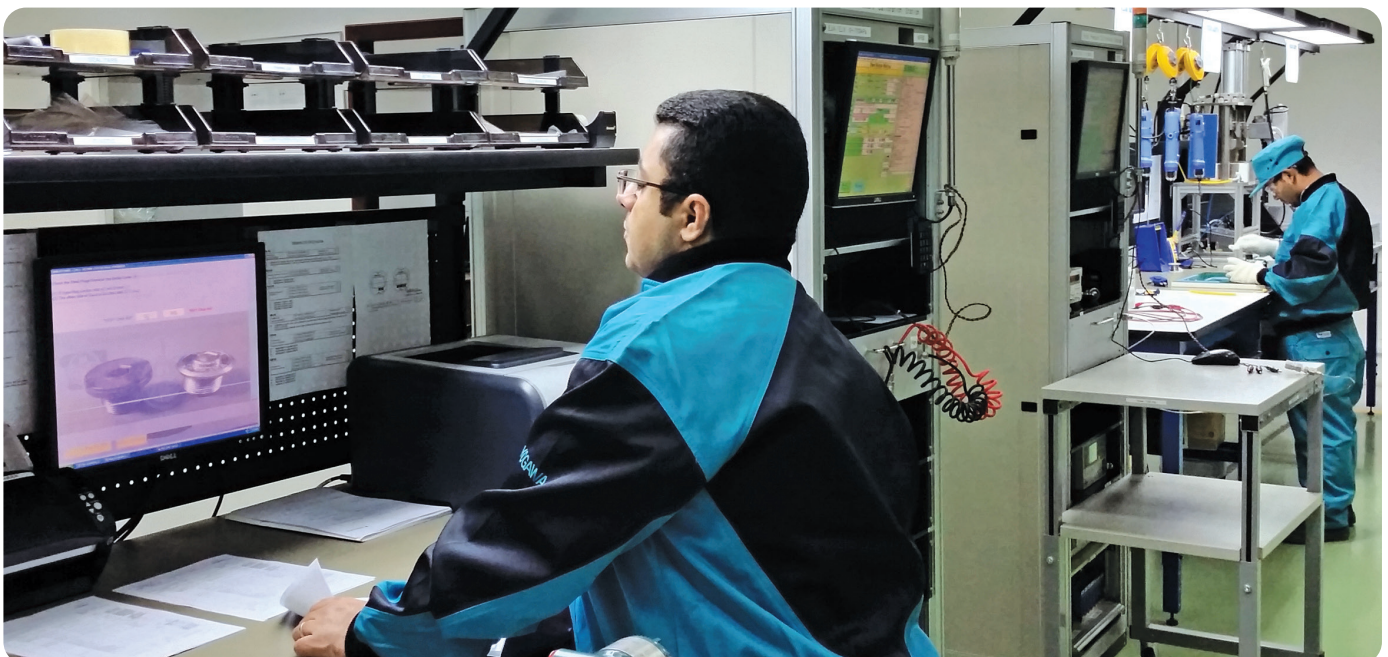
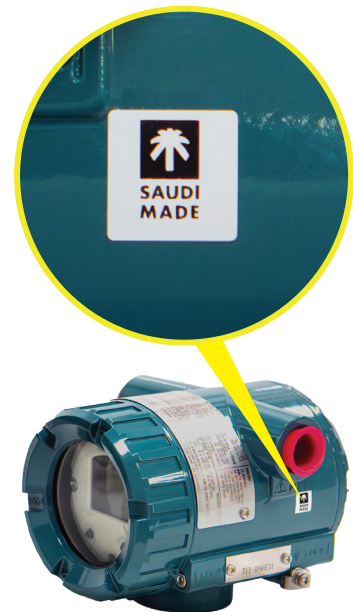
The transmitter production line covers the entire range of pressure transmitters, including absolute, gauge, differential pressure, and ultra high pressure applications. These transmitters are available in all major metallurgy options and configurations, including direct mount, flange mount, and remote seal designs, ensuring suitability for the most demanding process conditions across oil, gas, chemical, and industrial applications.

Key Objectives:

- Fast delivery of Pressure & Differential Pressure Transmitters
- Rapid change order handling with reduced turnaround time
- Local support for customer inspections and special requirements

Manufacturing and quality processes follow Yokogawa global standards, with multi stage inspections at every assembly step. Quality is directly governed by Yokogawa Headquarters, ensuring global consistency.

The assembly line operates under a process centric Quality Management System and is DEKRA (KEMA) certified to modify pressure transmitters in compliance with ATEX & IECEx hazardous area standards.



Panel Integration and Assembly

In the Middle East, Yokogawa manufactures the highest quality control panels built to meet all major international manufacturing standards. These facilities are fully ISO45001, ISO14001 and ISO9001 certified. The highest international standards are followed in our panel design that allows the panel layout to be previewed at every stage of the design process whilst minimizing any impact on the schedule. Our highly skilled engineering team delivers best-in-class industry expertise to conceptualize, design, implement, deploy and maintain integrated control panels for projects executed in the Middle East and Africa through the cabinet manufacturing facilities located at SPARK and in the UAE.

Yokogawa's manufacturing facilities are equipped with high precision tools, automated machinery and a full suite of testing equipment which ensures the highest level of quality.

Within our manufacturing facilities, we provide staging for control system panels, operator consoles and auxiliary consoles. Our primary focus for the manufacturing of cabinets and panels are based on the following types:

- System cabinets
- Marshaling cabinets
- Remote I/O cabinets (Indoor and Outdoor)
- Interposing relay cabinets
- Network cabinets
- Fiber-optic Patch cabinets
- Server cabinets
- Power distribution cabinets
- Well Head cabinets
- RTU Cabinets
- HIPPS Cabinets

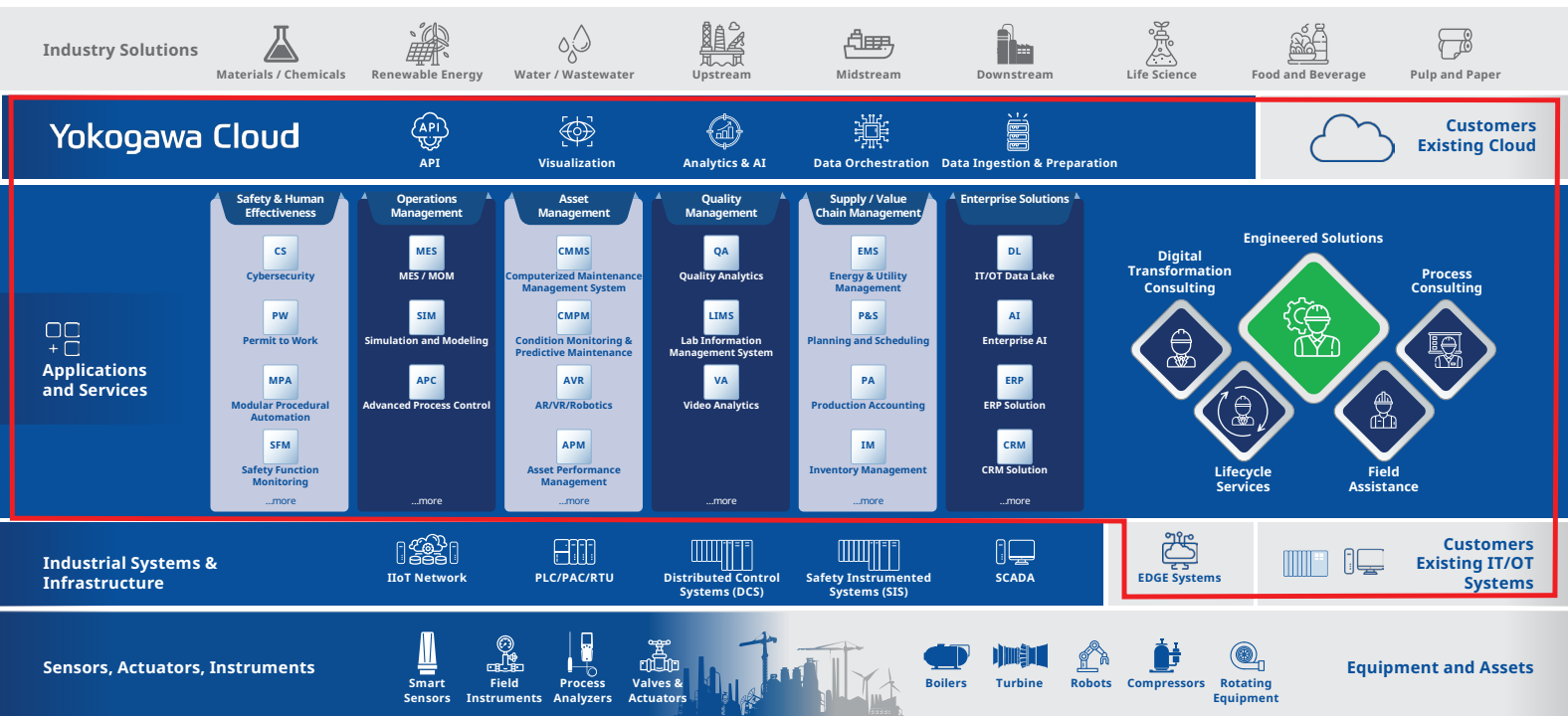


Digital Enterprise Solutions (DES)

A strategic business division that delivers smart, integrated, and secure solutions—leveraging AI-driven and cutting-edge technologies to help customers optimize operations, reduce costs, and accelerate decarbonization. Aligned with Yokogawa’s vision of Industrial Automation to Industrial Autonomy (IA2IA),

the division empowers industries to transition from manual and reactive operations to autonomous, self-optimizing plants—enhancing safety, sustainability, and long-term resilience.

Yokogawa Solutions Portfolio and IA2IA enablers



Focus Area	What It Does
Unified Asset Performance Management (AHI)	Real-time health monitoring, predictive maintenance, and performance analytics
Autonomous Control	AI-based control (e.g., FKDPP)
Carbon & Energy Management	Digital tools for GHG tracking, optimization, and achieving carbon neutrality
Cybersecurity	End-to-end OT cybersecurity, lifecycle services and SOC integration
Smart Manufacturing	Digital twin, SIRI maturity assessment, and factory-wide digital transformation
Robotics & Remote Monitoring	Autonomous robotics fleet management for safety and inspections
Industrial IoT Integration	Seamless data connectivity across devices, systems, and cloud platforms

Value Proposition

- Maximize Operational Efficiency
- Improve Asset Reliability & Lifecycle
- Enable Autonomous & Resilient Operations
- Support ESG Goals & Decarbonization
- Enhance Safety and Cyber Resilience

OpreX Asset Health Insights

AI powered Unified Asset Performance Management Solution for Transforming Operations

Asset Health Insights is an asset performance management and monitoring service that collects, refines, and aggregates data from diverse assets and systems. The service acts as a single source of truth for all asset related data, providing a unified platform for real-time monitoring, advanced analytics, and actionable insights.

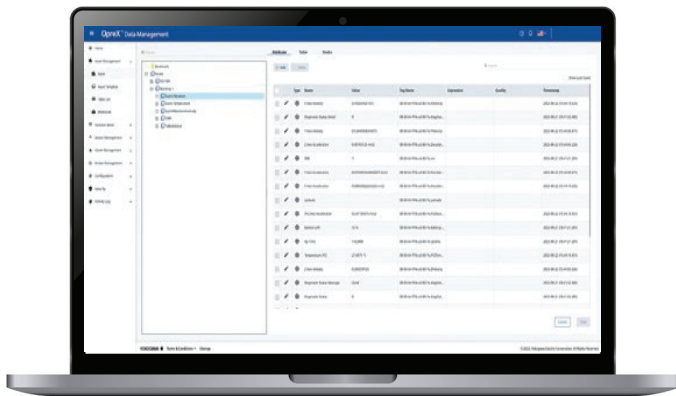
Yokogawa's OpreX AHI consists of 3 core modules that are fully integrated within a unified platform for intuitive and secure operations.

Data Management

Key Features:

- Link and organize asset data sources
- Connect to industrial assets
- Process data for Performance, Alarm Management, Calculation & Analysis

Integration & Calculation



Data Insight

Key Features:

- Widget-based for easy viewing
- Real-time data visualization
- Single source of truth for assets

Visualization & Report

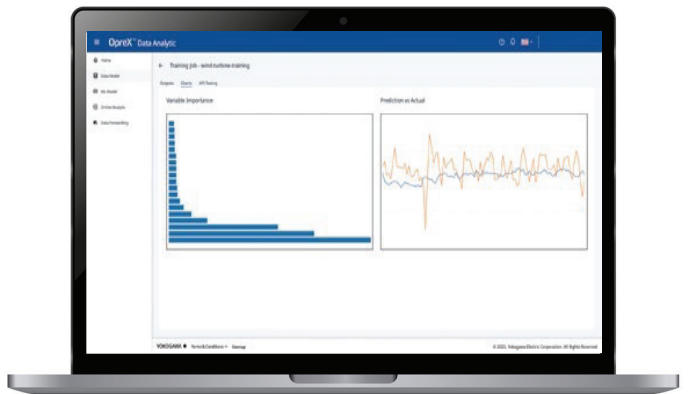


Data Analytics

Key Features:

- Real-time data asset and production level monitoring
- Optimized Production
- APR-Advance Pattern Recognition
- Insight led-decision making

Analysis & Optimization

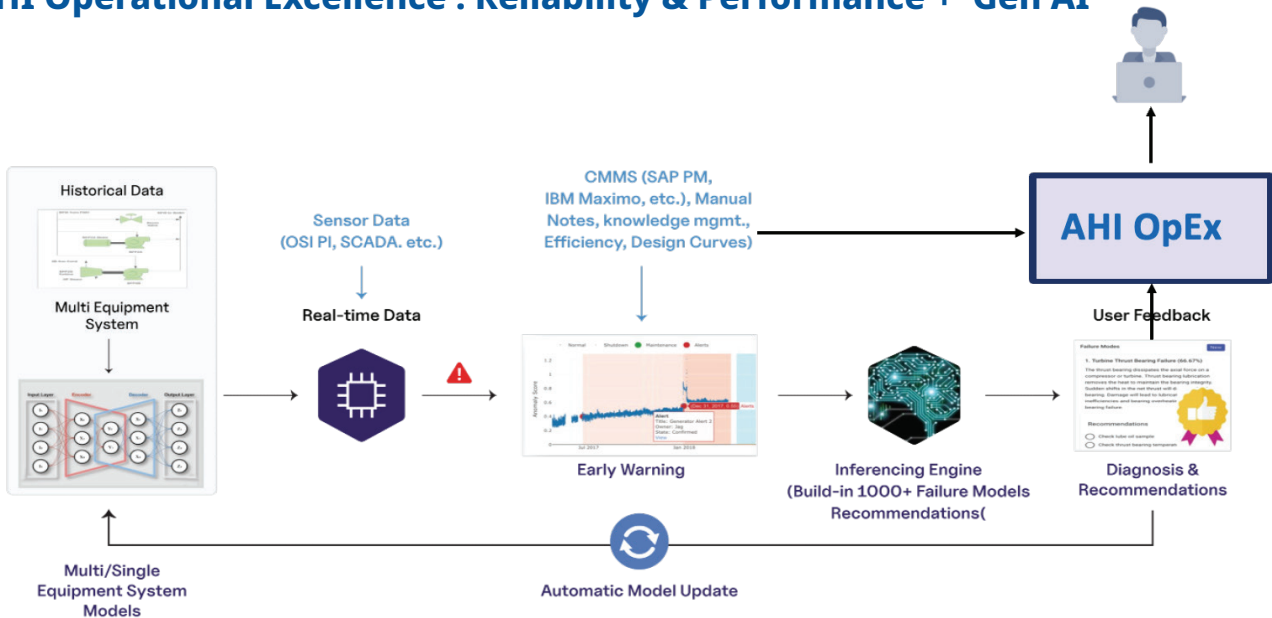


Easy 3-step Implementation Process



Asset Health Insights – Operational Excellence

AHI Operational Excellence : Reliability & Performance + Gen AI

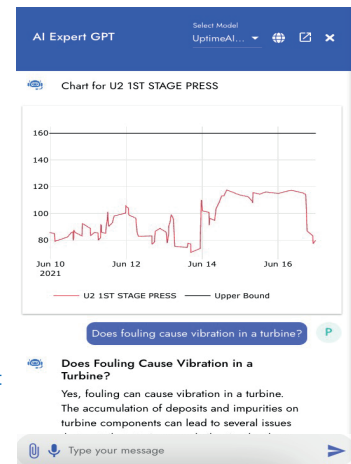


Our Solution Solves in 1 Hr Vs 12 Wks by Thinking and Learning Like an Expert

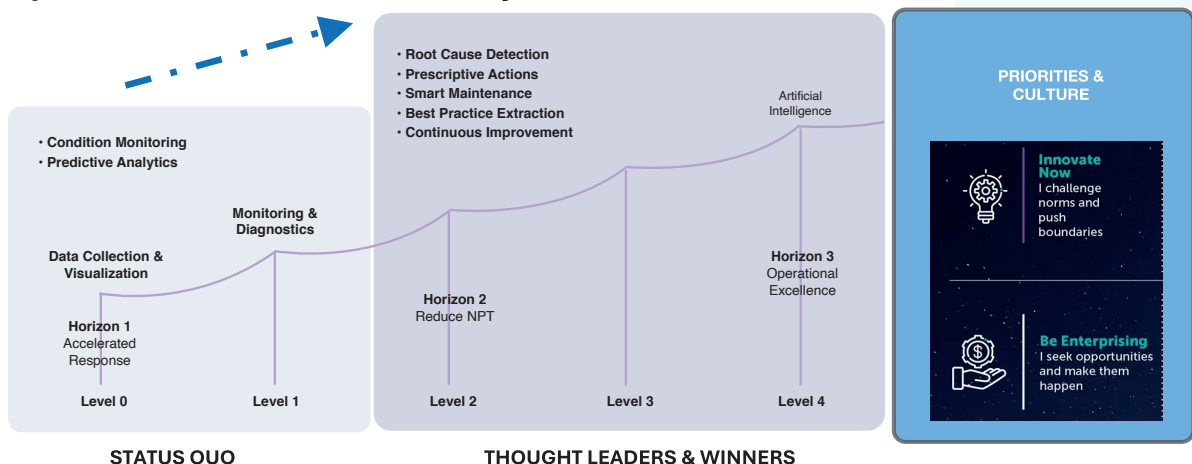
Reliability & Process



Gen AI



Operational Excellence Journey

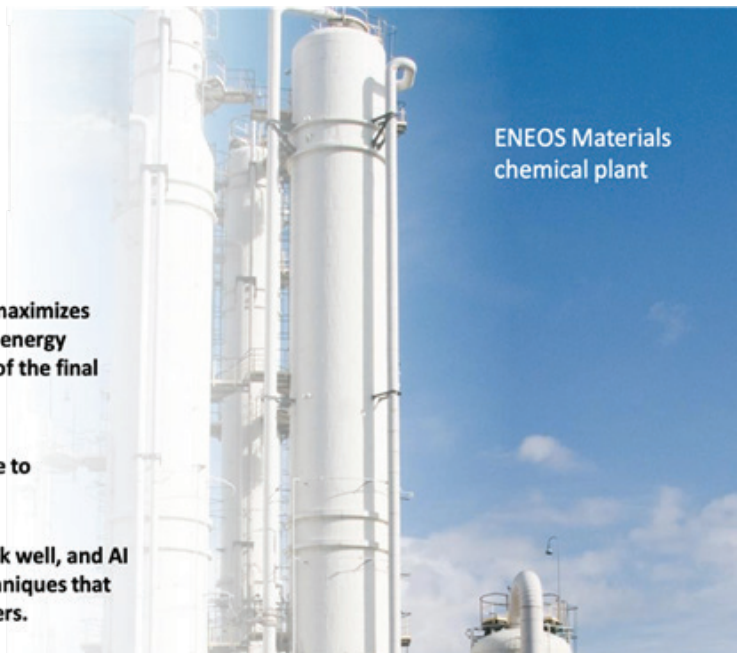


Yokogawa's AI-Based Autonomous Control

Yokogawa's innovative AI-based autonomous control (FKDPP) provides a significant advancement in industrial automation. Traditional industrial control often relies on methods like PID or APC. While effective in many scenarios, these methods can struggle with highly complex, dynamic, or unpredictable processes. FKDPP aims to address these limitations by

enabling systems to learn optimal control strategies through reinforcement learning. The AI control makes autonomous decisions in real-time, adjusting control parameters based on sensor data and changing conditions. This reduces the need for constant human intervention, especially in situations where rapid responses or intricate adjustments are required.

"A world's first" is now routine – ENEOS Materials Successfully Achieves Autonomous Control at a Plant Using AI



Yokogawa AI Capability

① Autonomous operation under complex demand conditions

AI-autonomous operation that maximizes the use of factory exhaust heat (energy saving) and ensures the quality of the final products

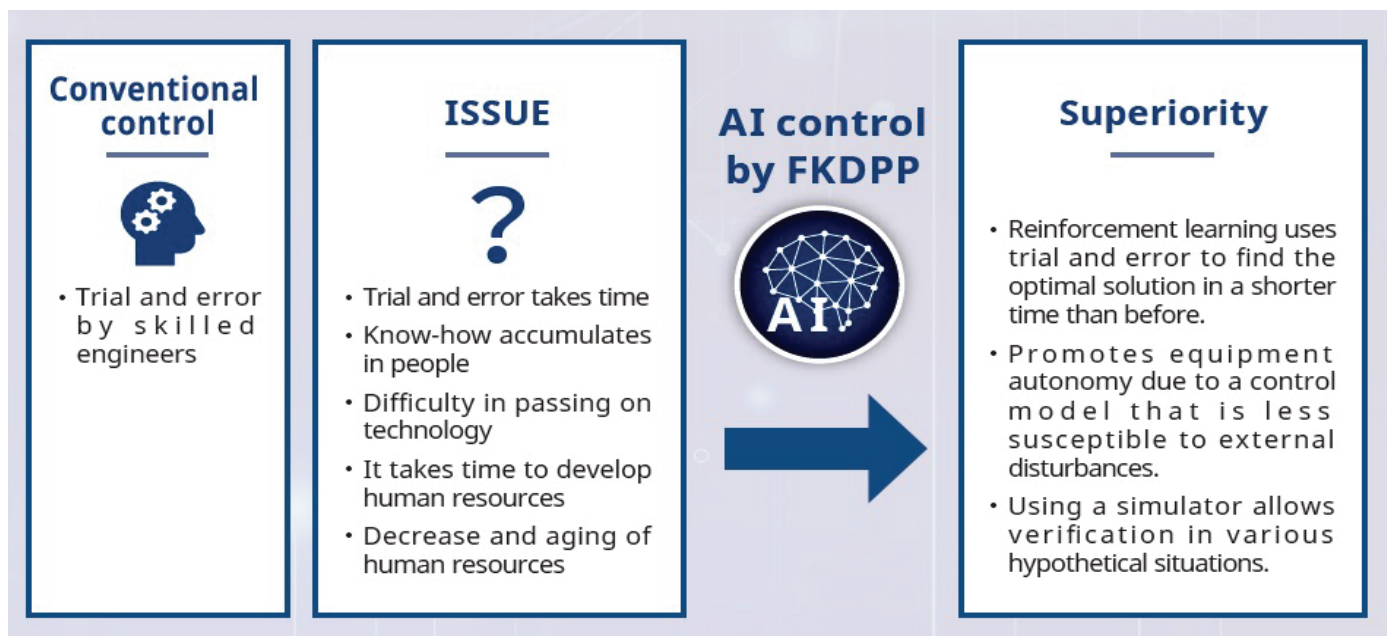
② Autonomous response to real-time changes

Real-time autonomous response to weather conditions, etc.

③ Transfer of skilled technology (Manpower saving)

Existing technology doesn't work well, and AI inherits the manual control techniques that have been used by skilled workers.

FKDPP algorithm has received the highest award, the Prime Minister's Prize, in Japan Industrial Technology Awards.



Explainable AI

The adoption and Sustainability of industrial artificial intelligence solutions still face challenges due to a lack of tools to understand how the AI decides, silo environments, a lack of collaboration tools for data scientists and SMEs to work together to build solutions and a lack of model lifecycle management. Customers need to know How they can trust AI decisions. How to monitor and maintain AI models as per the changes in plant operation. Governments around the world considering regulating AI where it makes critical decisions.

Explainable AI refers to the concept of designing and developing artificial intelligence systems and machine learning models in such a way that the decision-making process can be understood by humans.

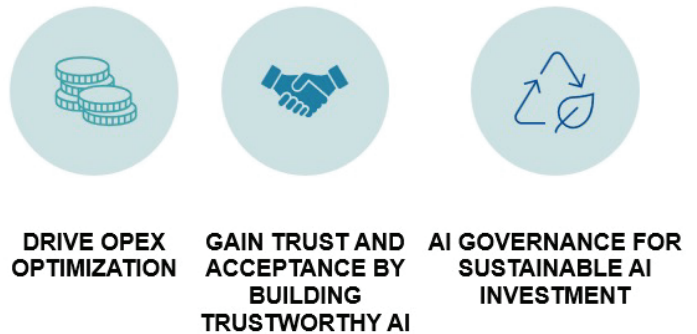


Figure 3 Values of Explainable AI

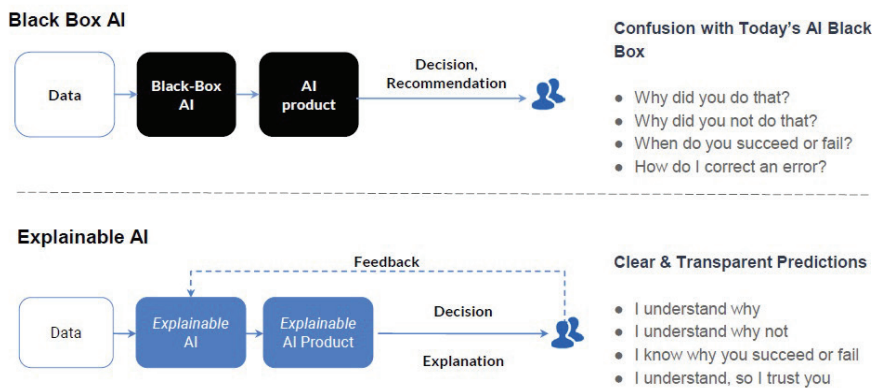


Figure 1 Black Box AI V/S Explainable AI

Yokogawa provides an Explainable AI solution to empower customers to bring out the performance of the real-time of control system data with Explainable AI, gaining valuable quality estimations and anomaly predictions, reducing operating costs, and ensuring easy, long-term AI deployment.

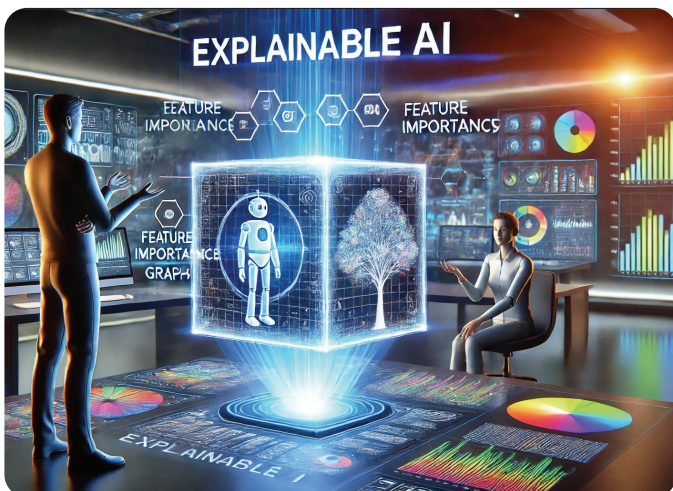


Figure 2 Explainable AI helps humans to understand and manage AI

Application Scenario

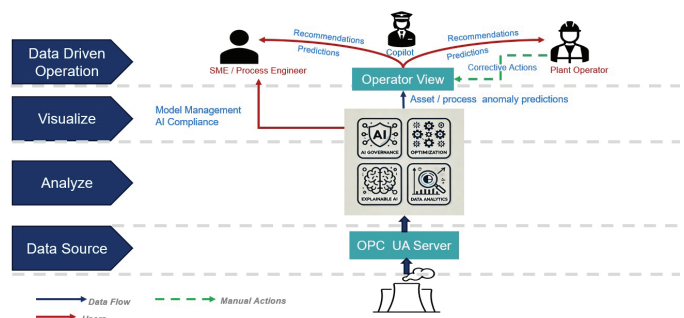


Figure 4 Explainable AI Application Scenario

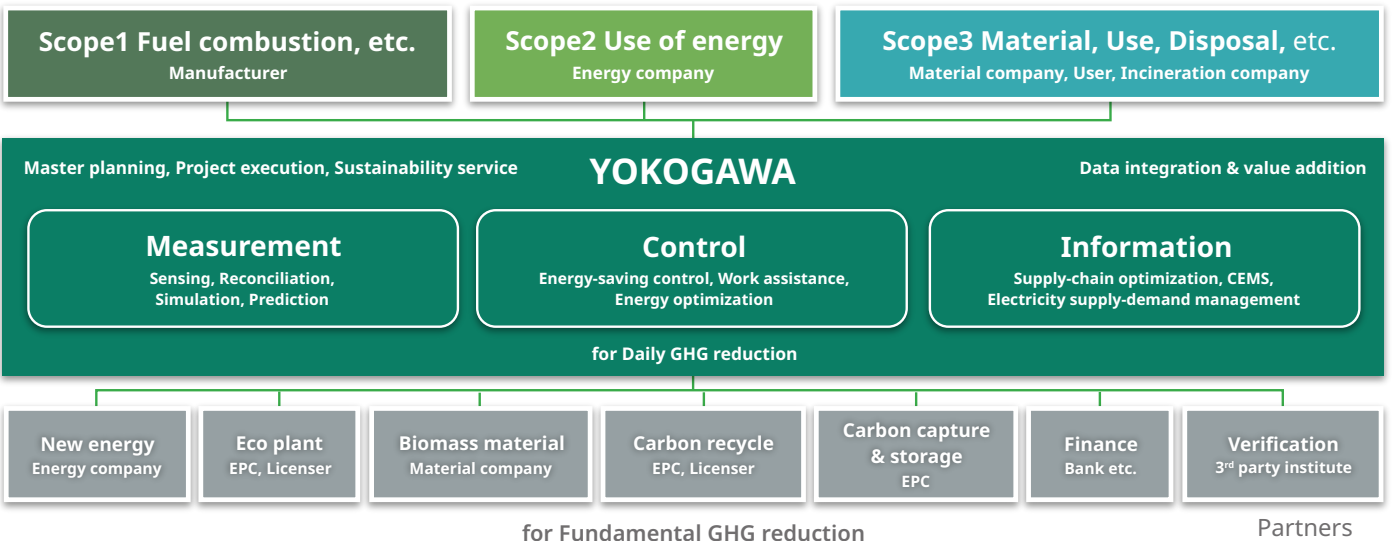
Industrial control systems generate a wealth of data. Our Explainable AI solution helps to turn this data into profit, by making AI development simple. Located near to plant's control system, it acts as a real-time "Co-Pilot" for operators, providing instant quality assessments and predicting potential issues. Explainable AI offers clear, understandable advice on how to correct process problems, allowing operators to react quickly and optimize operations. To ensure reliable results, our Explainable AI continuously monitors and updates the AI models in real time, maintaining their performance.

Carbon Management Solution

Yokogawa partners with clients to co-achieve carbon neutrality across the supply chain, utilizing technology and best practices in Measurement, Control, and Information.

Yokogawa's Carbon Management Solution drives the goals of carbon neutrality, tackling issues and collaborating with our customers to limit GHG emission and shift to inexpensive, reliable, and sustainable energy, using our original technology and know-how.

Yokogawa contributes to the realization of a new recycling-oriented society that can coexist with the global environment.



To become carbon neutral, Yokogawa's carbon management solution offers the following practice and contribution.

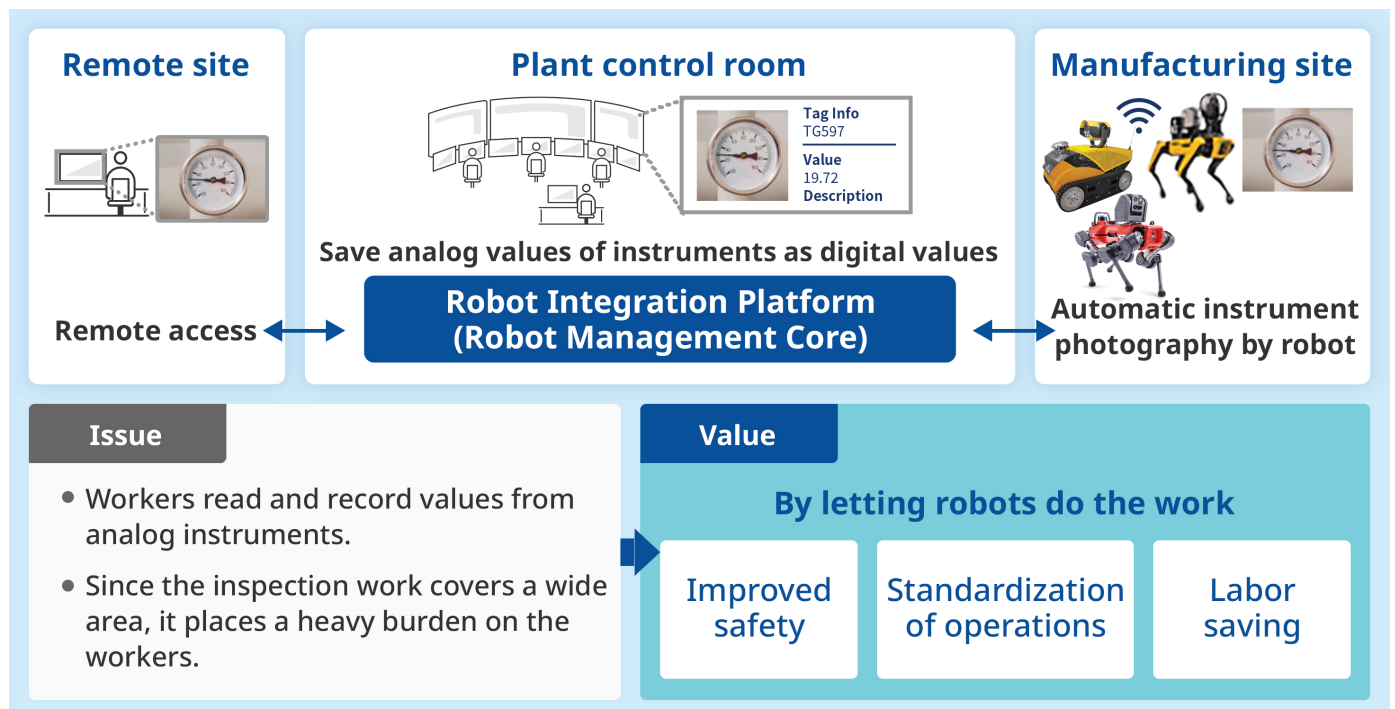
- Supply chain-wide CO2 reduction based on operational and fundamental solutions
- Smooth-for-audit process by highly accurate measurements
- Operational reduction by visualization using a real-time dashboard
- Automated CO2 reduction using predictive and optimal control
- Reduction of management costs by a cloud-based solution from the head office to the site and supply chain across companies
- Carbon management in SCOPE3 using actual data
- Continuous reduction with premium consulting
- Effective maintenance with 24/7 support

Autonomous Robotics Fleet Management through OpreX Robot Management Core



In oil & gas, chemical, and other manufacturing plants, some routine tasks need to be carried out in high-risk locations, such as facility inspection work at heights, in enclosed spaces, and in hazardous environments. The shortage of personnel to operate plant equipment and facilities is also an issue. There

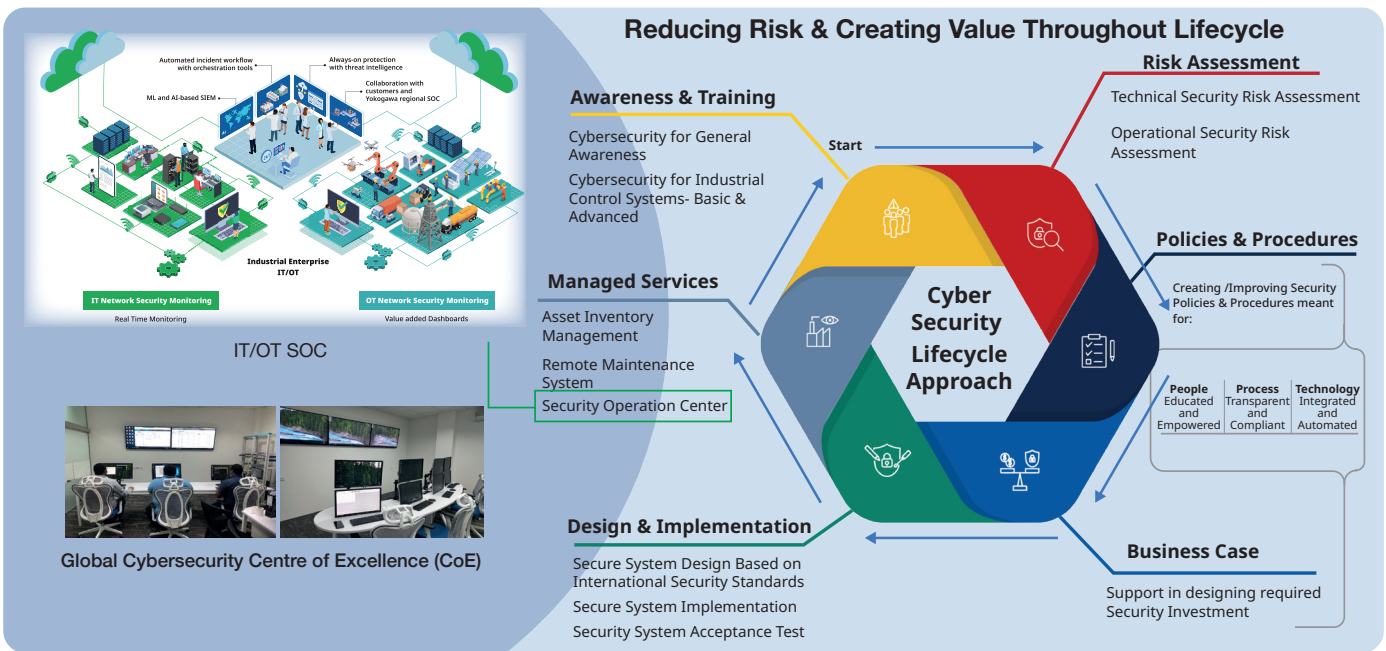
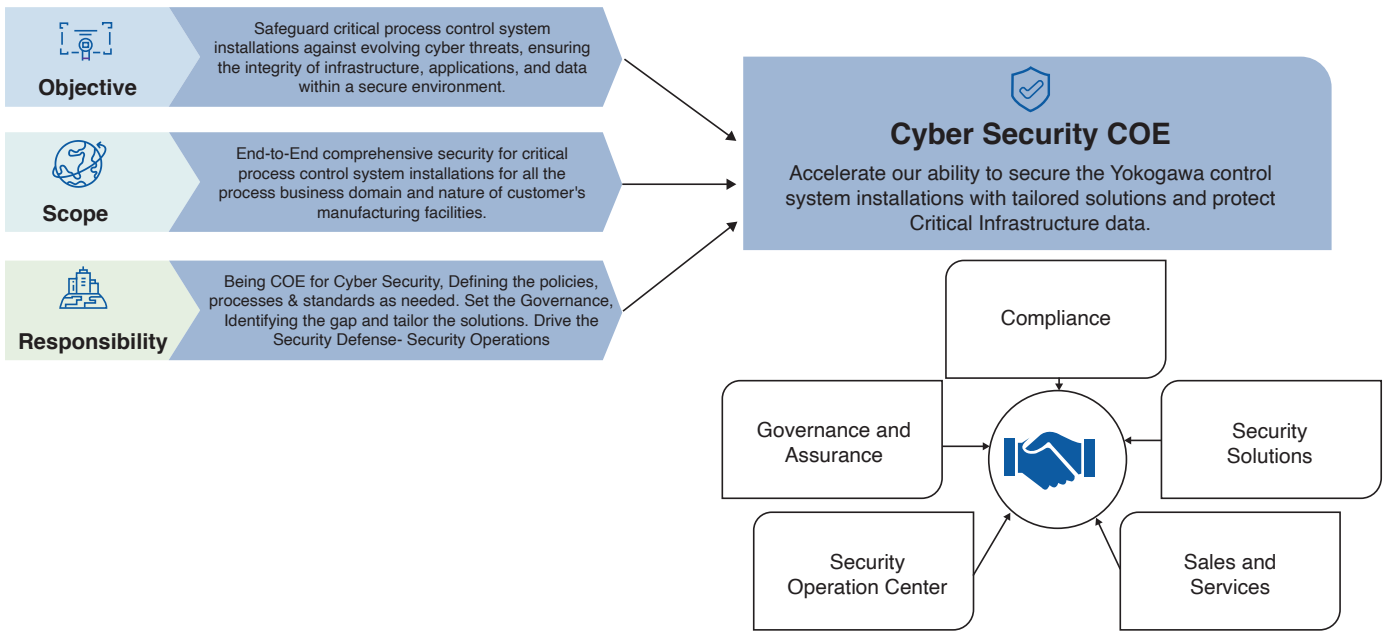
is a growing need for robots that can move autonomously around plants, take over data collection tasks that were performed by personnel, and undertake other tasks that exceed human limitations.



In response to this need, Yokogawa formed an active network of Global Robotics & Drones task team in regional headquarters and developed OpreX Robot Management Core (RMC) which is a centralised platform to host multiple robotics fleet for robotics operations. By integrating operation management of various types of robots that perform plant maintenance tasks conventionally that were done by humans, this software will help customers maintain their facilities in a safer and more

efficient manner, by Utilising Operx Plant Image Analyzer Software (PIA) - AI tool. In addition, when connected to a plant's control and safety systems, it enables the utilization of the manufacturing site data that has been acquired by robots, and the issuing of procedural instructions to robots, thus enabling the first step to be taken toward autonomous plant operations.

Cyber Security Center of Excellence



Our Cyber Security Center of Excellence CoE (R&D Lab+SOC) in KSA provides new opportunities to co-innovate with our customers in the Middle East & Africa. Leveraging on Yokogawa's expertise in the Convergence of Operational Technology (OT) and Information Technology (IT), The center delivers a wide range of cyber security solutions to make safe and sustainable OT environment for our customers by using a lifecycle approach.

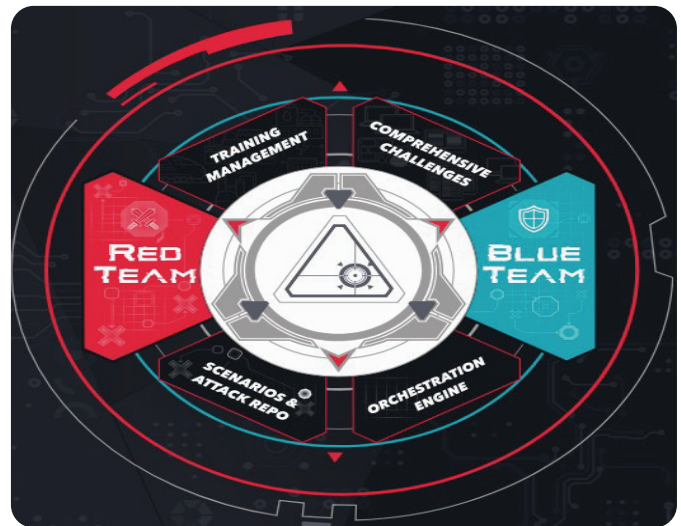
CSCOE consists of two major functions, laboratory and security operation center (SOC). The lab is designed for the latest cyber security technology research (AI-powered solutions, Anomaly detection, etc.), the verification of the technology, and

providing sustainable cyber security solutions for OT systems across the customers' enterprise. The SOC is established for Cyber Security Managed Services for customers to detect, analyze, and respond to cyber security incidents using a combination of technology solutions and a strong set of processes, it has the infrastructure, access monitoring, patch delivery, and helpdesk capabilities.

The SOC is fully capable of direct or integrated operations with customers in KSA and has full expandable capabilities to integrate with other Middle East customers in line with regional governing laws.

Hackgrid Cyber Range: Train, Test and Safe-guarding digital infrastructure

- HackGrid Cyber Range (CR) redefining cybersecurity training with simulation and emulation techniques.
- Enhance skillsets, validate expertise, and tackle real-world challenges efficiently.
- Tailored to individuals and organizations, CR delivers effective, personalized learning pathways. With Cyber Range, training becomes effective, efficient, and tailored to individual and organizational needs.
- The core of the CR includes a platform for managing teams, developing scenario and attack content, simulating user activity and attack traffic, traffic monitoring and analysis, and instructor tools to communicate, replay, and interact with the teams.



Core purposes of a cyber range:

- **Hands-on cybersecurity training**
 - Let's individuals and teams practice defending, attacking, and responding to cyber incidents
 - Supports roles like SOC analysts, incident responders, red team/blue team, and executives (tabletop exercises)
- **Safe simulation of real-world attacks**
 - Recreates realistic scenarios such as ransomware, phishing, DDoS, insider threats, or APTs
 - Allows failure and experimentation with no real-world damage
- **Incident response and readiness testing**
 - Tests on how people, processes, and tools perform during a cyber crisis
 - Measures detection time, response quality, coordination, and recovery
- **Tool and technology evaluation**
 - Validates security products (SIEM, EDR, firewalls, SOAR, etc.) before deploying them in production
 - Compares different solutions under identical attack conditions
- **Team collaboration and exercises**
 - Enables red team vs. blue team or purple team exercises
 - Improves communication between technical teams and leadership
- **Compliance and certification support**
 - Helps organizations meet regulatory, military, or industry requirements
 - Used by governments, defense organizations, and critical infrastructure sectors



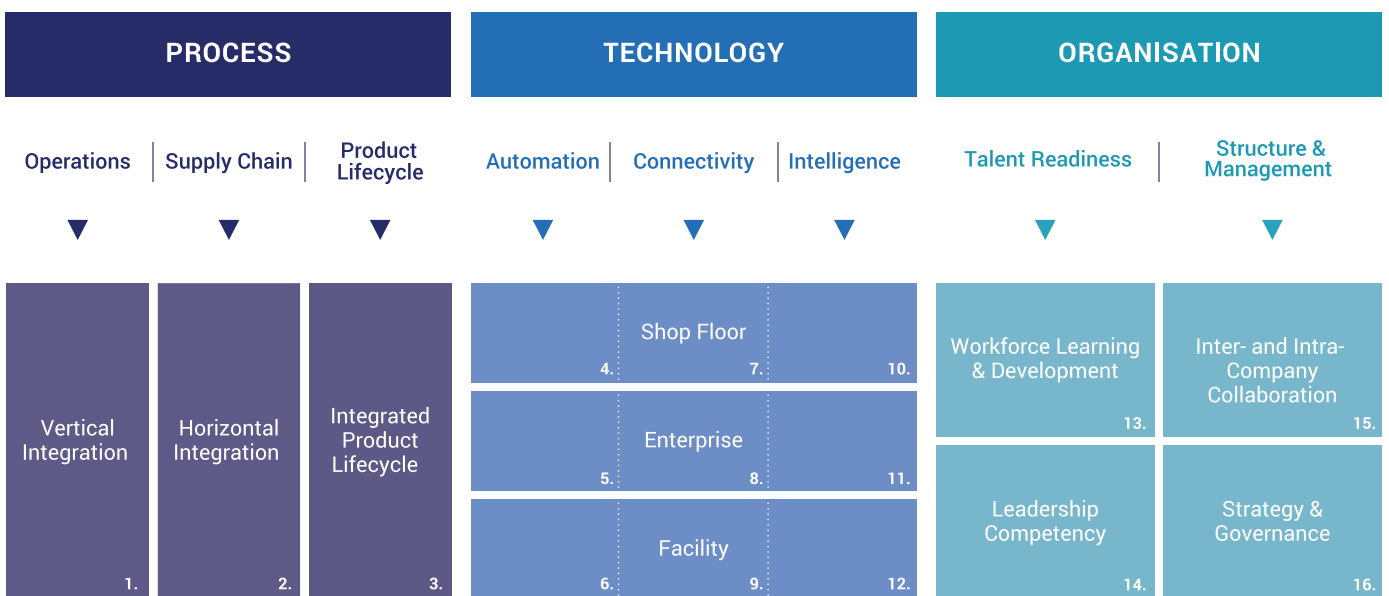
Find YOUR way in Digital Transformation through Smart Industry Readiness Index (S.I.R.I.)



Yokogawa helps to achieve Sustainable Development Goals (SDGs), organizational goals, and business objectives of customers by working together through initiatives such as autonomous operations, Smart Manufacturing, Digital Transformation (DX), reductions in energy consumption and greenhouse gas emissions. Yokogawa utilizes SIRI, a globally accepted framework to

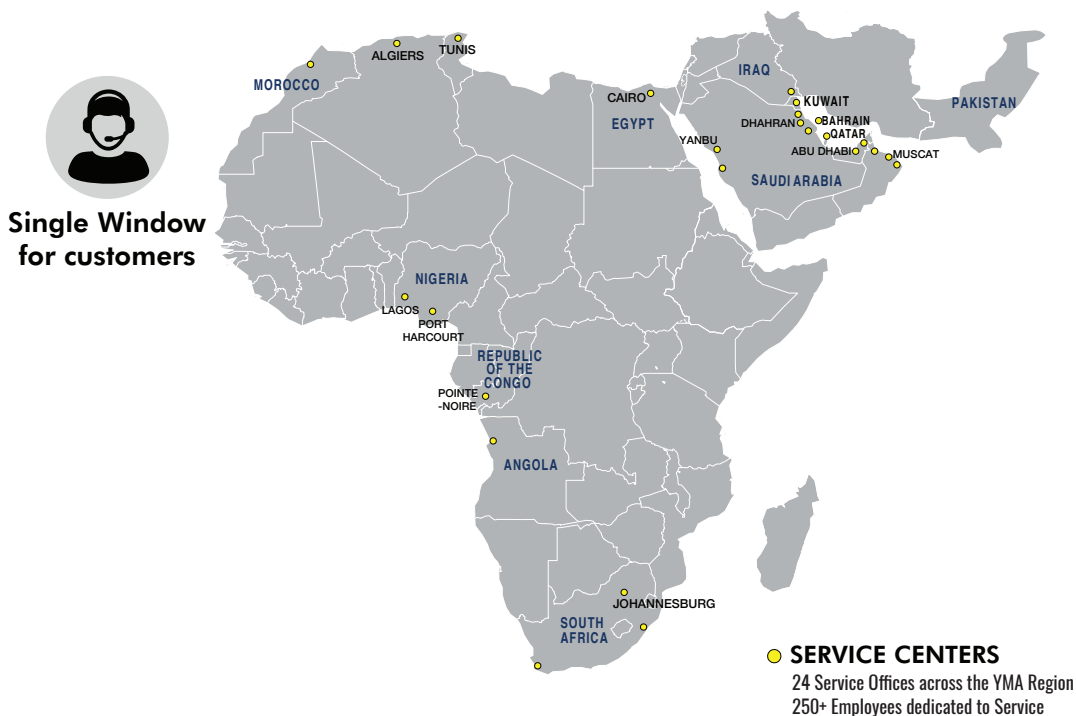
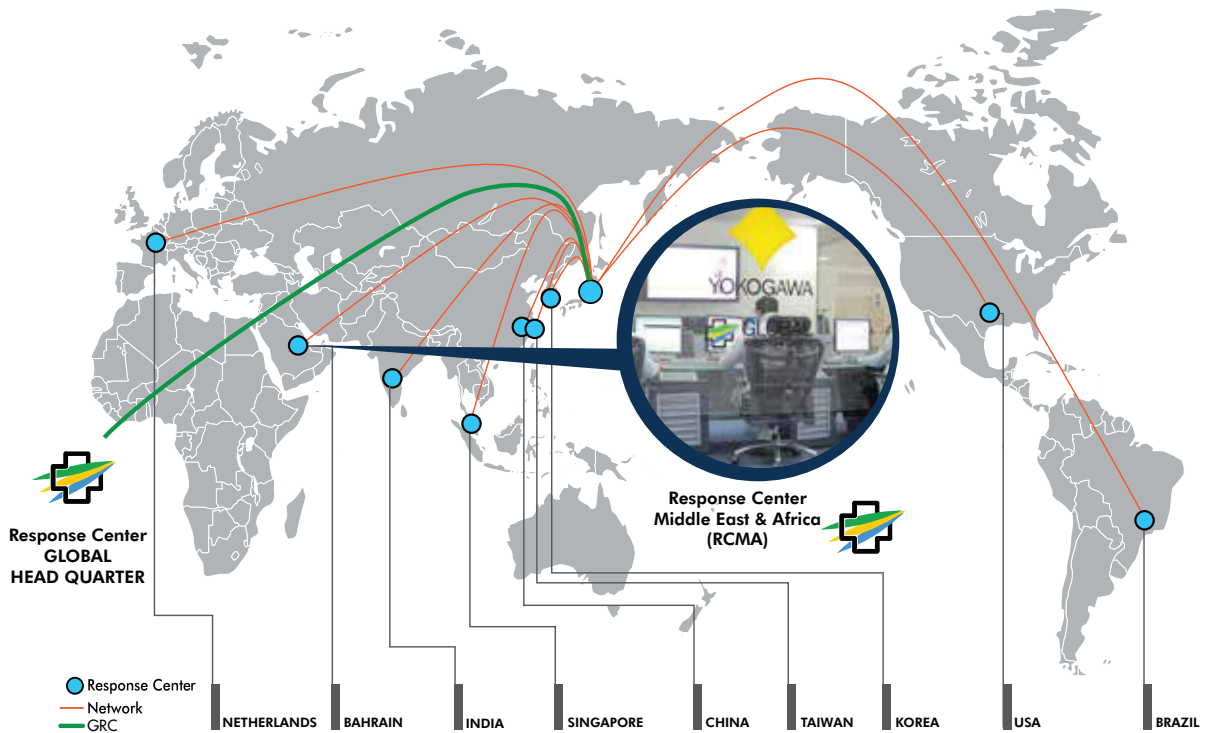
identify current digital maturity level by assessing across 16 dimensions of the business and its operations. Yokogawa's global pool of Certified SIRI assessors with expertise on specific business domains can help customers to accelerate digital transformation efforts in the right direction by utilizing cutting-edge IT-OT technologies, applying domain knowledge cultivated over decades and delivering co-created value.

Smart Industry Readiness Index



Discover our global network of more than 60 certified SIRI assessors – independent and hands-on consultants who help customers eliminate issues faced at implementation phase and ensure smooth and fast implementation of a digital transformation project.

GLOCAL Global Reach, Local Delivery



RCMA Operation Highlights

- System driven support infrastructure
- Single Support window for the entire Yokogawa solution portfolio
- Customer call management
- Quality and timely support/resolutions
- Team of product specialists providing expert consultation
- Remote monitoring and maintenance services
- Customer Data Management and Integrated Customer Portal
- Trouble Simulation
- Advanced Investigation & Analysis
- Warranty management
- Product lifecycle maintenance management
- Customer Support Information Management

Single window for all customer needs

Yokogawa Middle East and Africa's service division's focus and goals are centered on our global concept and ideology called the "OpreX Lifecycle". This assures our customers of the highest level of operational excellence whilst ensuring the best asset cost performance over an entire lifetime. Our service capabilities and maintenance programs allow us to understand customer priorities, operational KPIs, maintenance goals and challenges. Our ultimate goal is to become the "Most Trusted" partner and service provider to our customers, prioritizing their business needs. Our services cater to modern IR4 industry needs while imbibing emerging industry trends and applying new technologies, such as Digitalization, AI and Robotics that go hand in hand with traditional services.

The OpreX Lifecycle ensures stable and continuous operations. Yokogawa not only designs an optimal Lifecycle Plan for the customer's control systems but also monitors, implements, and even redesigns it during the plant lifecycle. Yokogawa's Lifecycle Plan is flexible, taking into consideration system priority, shutdown plans, the installation environment as well as the customer's budget, thereby providing the desired optimal services. Preventive maintenance based on the Lifecycle Plan can reduce potential failures and devastating

cyber-attacks by more than half. As a result, stable and long-term operations at an optimal cost can be realized.

A MAC Life Cycle Agreement with Yokogawa gives customers a "One-Stop-Shop" maintenance service to ensure stable and continuous operation. The customized Agreement solution aims to ensure a balanced total cost of ownership. Yokogawa also provides phase-wise upgrade of systems, ensuring that the initial investment of a customer is protected and the customer enjoys a longer life cycle for their investments.

The Plant Stewardship Program aligns KPIs with asset performance to ensure long-term value and sustainability. Yokogawa's expertise in risk management turns challenges into opportunities, driving operational excellence. The Plant Stewardship Cycle assists to identify, assess, control and review to enhance productivity and maintain industry-leading standards.

Yokogawa also delivers training to its users thus helping in improving skill sets. Yokogawa aims to become an one-stop service solutions provider for all automation and field instrumentation assets.



Services provided by OpreX Lifecycle:

- Sustainable Maintenance Services
- Managed Life Cycle Support (MAC), Upgrade and Migration.
- OpreX Plant Stewardship
- Operation and Maintenance Improvement and Planning.
- Safety and Security (Sustainable SIS, HAZOP studies, Permit management systems).
- Response Centre Support, 24/7 and Emergency Services, Resource Mobilization
- Parts Management Program.
- Secured Remote Solutions with remote Maintenance, Managed Services
- Consulting Services (FEED, Assessment and Audits)
- OpreX Safety and Security Solutions and Support services.
- Environment Monitoring services
- Alarm Rationalization / Asset System Health Monitoring Services
- Shutdown Maintenance Services
- Emission Monitoring Services.
- Analyzer and Field Instrument Services
- Products (Analyzer / PCI / TMI) Comprehensive Maintenance Contracts
- CEMS Relative Accuracy Test & Asset Integrity Test Audits
- Event Analysis (Procedure Analysis for SOP Optimization)
- Energy Management/Optimization Solution services



Response Centre Operation Highlights:

- System driven support infrastructure
- Single Support window for entire Yokogawa solutions portfolio
- Customer call management
- Quality and timely support
- Call Log Tracking facility
- Resolution Time Tracking facility
- Team of product specialists providing expert consultation
- Fast turnaround for complex issues
- Remote monitoring and maintenance services
- Knowledge management
- Continuous competency development
- Warranty management
- Product lifecycle maintenance management
- Comprehensive testing facility
- Customer Portal

Yokogawa Training Overview:



At Yokogawa, we take pride in our commitment to excellence and continuous learning. Our comprehensive training capabilities are designed to empower individuals and organizations to harness the full potential of our cutting-edge technologies and solutions. With a focus on innovation, efficiency, and safety, our training programs cater to diverse skill levels and industry sectors.

1. **Tailored Training Solutions:** Our training programs are meticulously crafted to address the specific needs of your industry and organization. Whether you are in process automation, control systems, measurement instrumentation, or industrial safety, Yokogawa offers tailored courses that align with customers' objectives and challenges.
2. **Expert-Led Training Sessions:** Customers benefit from the wealth of knowledge and experience possessed by our seasoned industry experts. Our trainers bring real-world insights and practical expertise to the training room, ensuring that participants gain a deep understanding of Yokogawa products and solutions.
3. **Hands-On Practical Learning:** We believe in the power of experiential learning. Our training facilities are equipped with state-of-the-art labs and simulation environments, allowing participants to gain hands-on experience with Yokogawa products. This practical approach enhances comprehension and skills application in real-world scenarios.
4. **Cutting-Edge Training Materials:** Customers stay at the forefront of technology with our up-to-date training materials.

From comprehensive manuals to interactive multimedia content, we provide participants with the resources they need to master Yokogawa solutions efficiently.

5. **Flexible Learning Options:** Recognizing the diverse needs of modern professionals, Yokogawa offers flexible learning options. Whether through on-site training, virtual classrooms, or e-learning platforms, participants can choose the format that best fits their schedule and preferences.
6. **Certification Programs:** Our customers are able to demonstrate proficiency in Yokogawa technologies with our certification programs. These programs validate the skills and knowledge acquired through our training, giving participants a competitive edge in the industry.
7. **Continuous Support and Updates:** The learning journey doesn't end with the completion of a course. Yokogawa provides ongoing support and regular updates to ensure that our clients and partners stay informed about the latest advancements in our technologies and solutions.

By investing in Yokogawa's training capabilities, our clients are not just acquiring knowledge; they are continually unlocking the full potential of their workforce, driving operational excellence, and ensuring the long-term success of their organizations.

Benefit by joining us on a transformative learning journey as we shape the future of industrial automation together.

YOKOGAWA MIDDLE EAST AND AFRICA NETWORK



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For customer feedback and complaints, please contact: qltymgr@yokogawa.com

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