YOKOGAWA ◆

Co-innovating tomorrow ™

Plan Your Journey for
Digital Transformation with
Yokogawa Digital Solutions

Co-innovating tomorrow™

Since its foundation in 1915, Yokogawa has contributed to society by providing leading-edge products and solutions centering on its measurement, control, and information technologies. To ensure that it continues to meet changing needs and stays on track for another century of steady growth, Yokogawa has instituted reforms and is now working to transform itself in a number of ways.

Under the corporate brand slogan of "Co-innovating tomorrow," Yokogawa seeks to establish greater levels of trust with its customers and to work with them to create new values for a brighter future, both for its customers and society.

THE YOKOGAWA PHILOSOPHY

As a company, our goal is to contribute to the realization of a sustainable society through broad-ranging activities in the areas of measurement, control, and information.

Individually, we aim to combine good citizenship with the courage to innovate.

Yokogawa Middle East & Africa B.S.C. (c) (YMA), headquartered in Bahrain, is a wholly owned subsidiary of Yokogawa Electric Corporation of Japan. The company serves as Yokogawa's regional HQ, supporting users through a team of over 1,400 professionals operating from our network of local offices spread across the Middle East and Africa. Yokogawa executes Process Automation, Advanced Solutions and Telecom Solutions projects locally, providing engineering, commissioning, training and Lifecycle Maintenance Services.
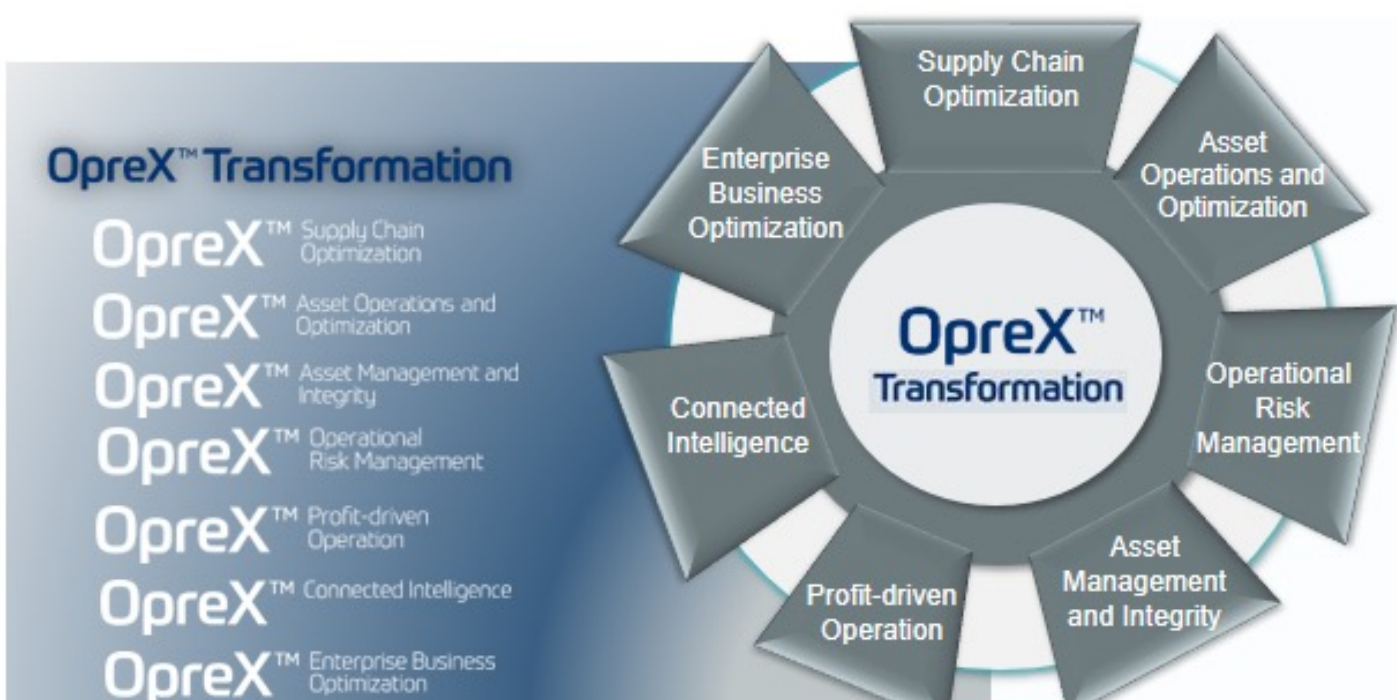
Yokogawa Digital Solutions

Yokogawa Digital Solutions provide production/safety/asset excellence solutions and innovative technology to support customers in achieving optimized production, security, safety, efficiency and overall plant performance.

Digital Technologies

- Virtual Reality Operator Training Simulator
- Robotics / Drones Integration
- A.I. / Big Data Analytics

Cybersecurity Management

- Security Program
- Cybersecurity Consulting Services
- IT/OT Security Operations Center

Energy Management

- Energy Monitoring and Optimization
- Enterprise Energy Management

Supply Chain Optimization

- Off-site & Terminal Management
- Terminal Automation
- Supply Chain Scheduling
- Production Accounting

Operational Risk Management

- Operations Management
- Procedural Automation
- Advanced Operating Graphics
- Control Room Design
- Alarm Rationalization
- Control Loop Tuning

Asset Operations and Optimization

- Plant Information Management
- Alarm Management
- Production Management
- Safety Management
- Asset Management
- Advanced Process Control
- Dynamic Real Time Optimizer (RT-OP)
- Laboratory Information Management System
- Operator Training Simulator

Smart Manufacturing

Smart Industry Readiness Index (SIRI) is the world's first independent digital maturity assessment for manufacturers. It was created in partnership with leading technology companies, consultancy firms, industry and academic experts. SIRI comprises a suite of frameworks and tools to help manufacturers, regardless of size and industry, start, scale and sustain digital transformation. It covers three core elements of Industry 4.0: Process, Technology and Organization.

Yokogawa has over 50 certified SIRI assessors globally. We can provide a value add to our customers with digital maturity assessments and thereby developing a roadmap for Smart Manufacturing in line with Industry 4.0 concepts.

Digital Technologies

Yokogawa is a global provider of digital automation technology and associated services. It shares the overall value chain of successful digitalization outcomes with the addition of energy management and supply chain optimization capabilities towards autonomous industrial operations.

According to the IA2IA concept for the IA business, Yokogawa co-innovates with its customers to enable agile and adaptive management. This synoptically brings together organizations' people, systems, data, services, and supply chains, thereby optimizing operations and enabling sustainable value-creation.

Upskilling	Cloud & Edge	Data Analytics	IoT Platform	DCS & SCADA	Safety and Security	Digital Twins

Mobile Automation						Smart Sensors

Robot and drones						5G Wireless

3D Printing	Modularization	AR, VR, MR, & Wearables	Blockchain	Cognition	Artificial Intelligence

Power to Transform

3D/Virtual Reality Operator Training Simulator

Yokogawa has developed 3D/VR OTS that can be used for both operation and maintenance training by integrating

the existing dynamic process simulation technology with the latest 3D visualization technology.

3D/VR OTS immerses the user in a virtual surrounding, primarily through visual, auditory and sensory feedback. VR is typically achieved by wearing a headset like Oculus.


Applications:

- Plant/units start-up and safe shut-down operations and sequences

- High-risk maintenance activities and procedures

- Reports on the operators' training and assessment performances

- Simulate OHS, process safety incidents and response plan training and assessment

Field Work Digitalization

Yokogawa Field Assistant provides operation information on site and recording & management of

site information by utilizing Mobile Augmented reality technology

- Acquire and integrate operation and maintenance information scattered around the plant

- Improve maintenance efficiency and quality (reduce patrol time, maintenance cost, and production loss)

- Analyze the acquired records to improve the plant maintenance management work
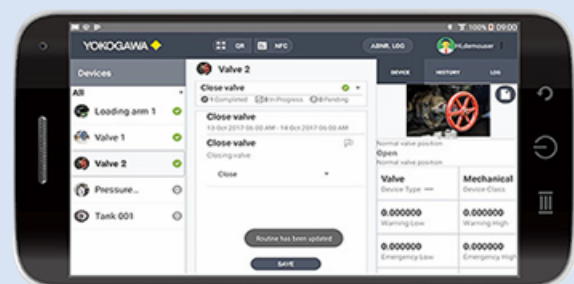
Yokogawa Robotics Integration

Yokogawa has positioned itself to bridge certain robotics technologies into our customer's business process i.e. ICSS and manufacturing/production management systems. This is achieved by:

- Understanding the customers usage case

- Technology evaluation and identification of suitable Robotics/Drone technology

- Partnership with Robotics/Drone technology suppliers

- Development/Implementation of application

- Integrated Smart Data Analytics based on business needs

- Training

- Robotics as a Service (RaaS) for sustainability

Robotics/Drones

Robotics/Drones technology is not new to industrial automation and recent technologies have made it more practical for a wider variety of applications. These new technologies have become cost-effective and easy to use, especially for mobile robots used in industrial plants.
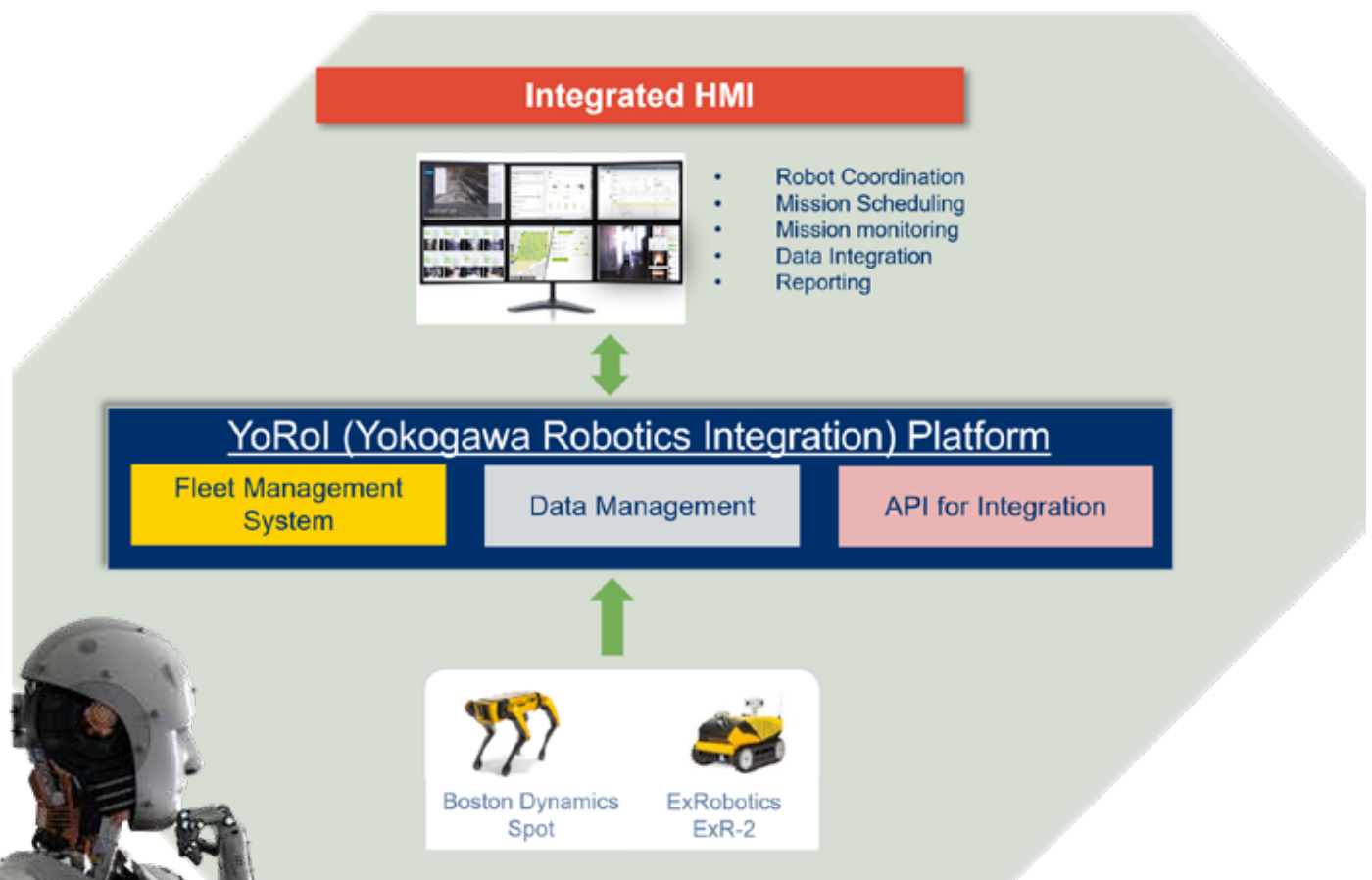
Cybersecurity Management

Yokogawa offers multiple layers of cyber security controls in line with global standards to protect industrial control and safety systems from evolving known or unknown threats. Based on an in-depth defense strategy, Yokogawa's lifecycle approach enables customers to secure, defend, contain, monitor and manage cyber security with advanced security solutions.

Security Assessment & Analysis

Network Security
- Network Hardening
- Zoning and Conduiting
- Secure Network design inline to standards
- Network Access Control
- Network Intrusion Detection System
- Network Monitoring

Advanced Security
- Compliance & Vulnerability Management
- Security Information & Event Management
- Managed Services

CYBER SECURITY CONTROLS

Network Perimeter Security
- Firewalls with IPS for DMZ
- Firewalls with IPS for 3rd Party Segregation
- Data Diode

Business Continuity & Remote Support
- Backup and Disaster Recovery
- Secure Remote Access

Customized End Point Security
- Windows Domain & Account Management Solutions
- Yokogawa Approved Antivirus Solution.
- Yokogawa Tested Windows Patch Update Solution
- Yokogawa Application Whitelisting
- System Hardening.

IT/OT Security Operation Center & Cybersecurity Laboratory

Yokogawa OpreX™ IT/OT Security Operations Center (SOC) helps to manage and secure operational technologies alongside IT for greater control over devices, networks, and users.
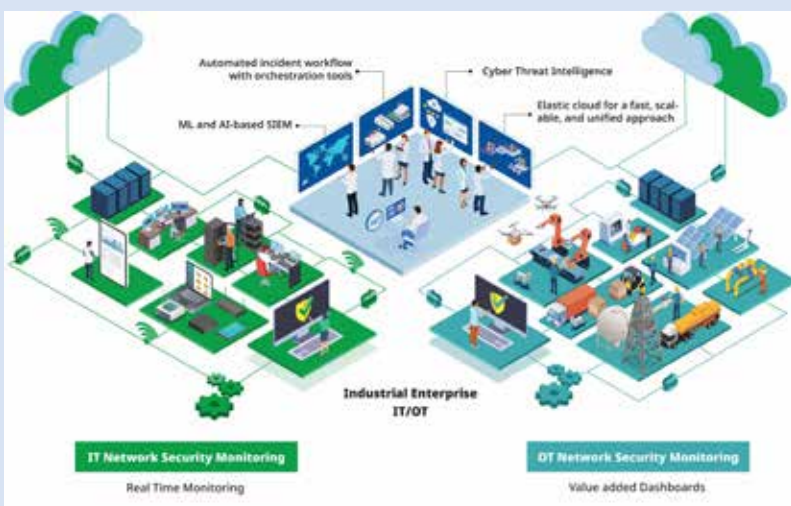
Energy Management

Energy Monitoring and Optimization

Yokogawa/KBC Visual MESA EMS is the world's first integrated monitoring, scheduling, and real-time optimization technology for managing energy systems. It provides insights for effective planning, scheduling, and energy trading. The system takes real-time actions in an open loop (in advisory mode) or closed loop system (acting directly on the control system set-points) to deliver fast and accurate operational decisions.

VM-ERTO/ECLRTO

Visual MESA Energy Real-time Optimizer (open or closed loop) is the leading real-time solution for modeling and optimization of energy systems, including discrete variables.

VM-EM

Visual MESA Energy Monitor offers a set of features specifically built for monitoring energy systems (KPIs calculation, balances, etc.) and optimization of only continuous variables.

VM-MPO

Visual MESA Multi-Period Optimizer is the energy management tool for optimal scheduling of utility assets.
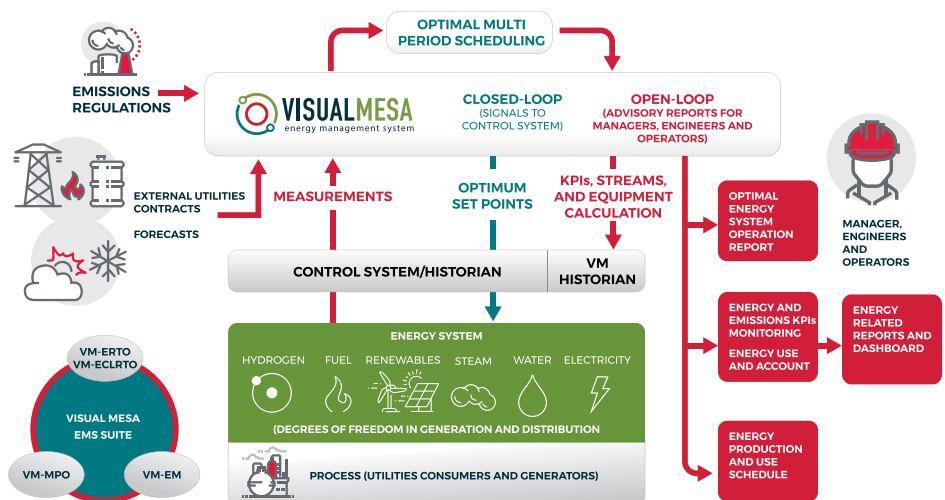
Enterprise Energy Management

Building operations currently account for almost 30 per cent of global final energy use and more than 25 per cent of energy related CO_2 emissions. Worldwide, buildings' energy consumption and CO_2 emissions indicate that they will continue to rise. In this regard, many countries have assigned a high priority in their energy policies to the implementation of energy-efficiency strategies. However, many organizations are facing common challenges dealing with implementation.

Yokogawa's Enterprise Energy Management connects sensors, meters, controllers, building management systems, and other IoT devices through an interoperability framework. With the aggregation and analysis of all energy-related data, EEMS helps energy managers identify underperforming facilities and processes and monitor continuous performance improvement with AI analysis and real-time dashboarding anytime and anywhere.
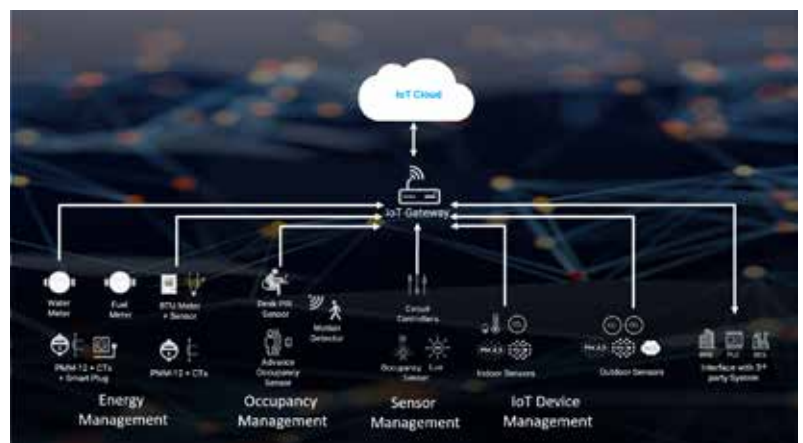
Supply Chain Optimization

Off-site Terminal Management & Production Accounting

The Terminal Logistic Suite performs applications of loading and or unloading trucks, ships and tank cars. In addition, the suite offers solutions in inventory management, master data management, security control, audit trail, and other movement operations such as pipeline transfer. Additional features include truck management, product tracking and jetty scheduling that support terminal customer operations to be safer and more efficient.

Yokogawa has many years of experience providing oil movement control and blending solutions. Yokogawa oil movement, storage blending and offsite solutions focus on providing an integrated advanced technology platform considering aspects of the solution, such as integration and user-friendliness.

Operational Risk Management

Modular Procedural Automation

Exapilot is suitable for situations that require heavy manual operations on operator stations or on the field, such as:

- Shutdown/Start-up of units
- Check of shutdown valve
- Changeover of pump/compressor
- Change in the quantity of production
- Change of materials
- Grade change, etc.
- Reliable operations by automating the procedure.

- Efficient operations by reducing the execution time of the procedure.
- Safe operations by reducing the incidents caused by human error.
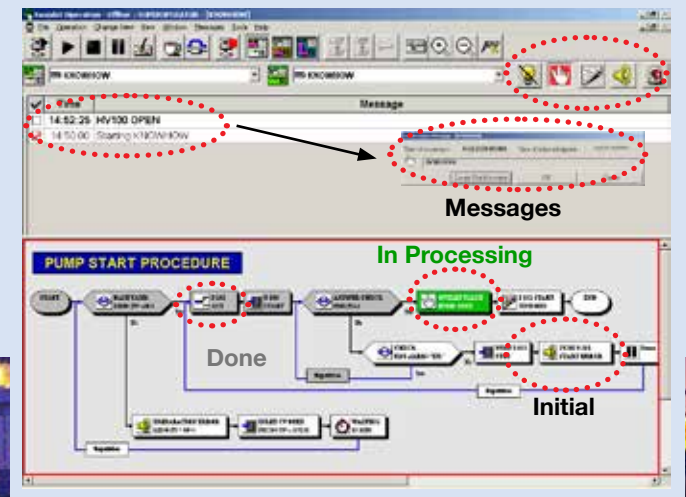
Asset Operations and Optimization

Plant Information Management and Alarm Management

Exaquantum/PIMS:

A plant information management system is a centralized database containing process data, alarms, and events. Exaquantum can acquire data from all facets of a process and transform that data into easily usable, high-value, widely distributed information.

Exaquantum/ARA:

Operator & Area KPIs and reports based on EEMUA191 & ANSI/ISA-18.2.

Exaquantum/SER:

Recording of a sequence of events and trips to find out the root causes and analyze trips.

Exaquantum/AMD:

Master Alarm Database assists in monitoring, assessing and auditing the behavior of alarm set points as part of an alarm documentation and rationalization program.
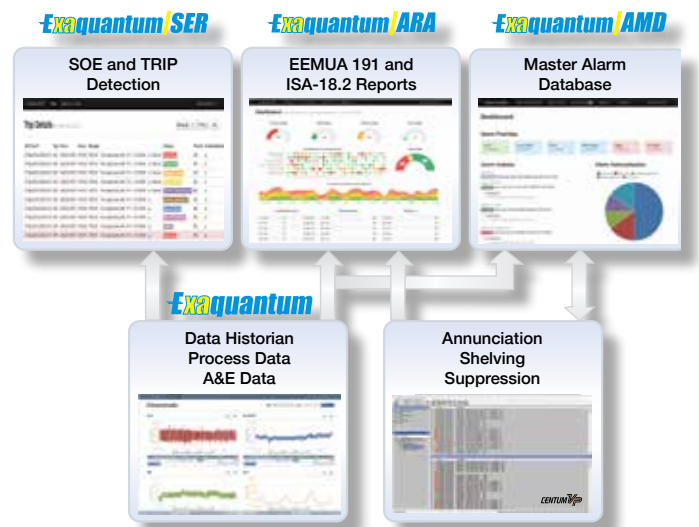
Asset Management

OpreX Asset Health Insights collects, refines, and aggregates operational data from distributed assets using IoT sensors. The service provides a 360° view across operations using real-time data to help make informed critical business decisions.

Energy management
This management system monitors operational efficiency and energy consumption by each asset. It also receives alerts if levels exceed established thresholds, can determine the cause and take action to eliminate excessive energy consumption.

As set benchmarking and KPIs
The system establishes operational performance metrics based on production targets and historical data. It creates alerts to flag underperforming operations and provides recommended insights to improve asset efficiency.

Predictive Maintenance
Predicts operational anomalies and expected next failure time and receives recommendations to reduce the cost of spare parts and supplies. It also enhances safety in the workplace, minimizes the overall time spent on assets, and avoids the production hours lost due to unplanned machine downtime.

Critical alerts
Generate and prioritize alerts in different hierarchies from plant and system to the asset. Critical alerts also provide an effective manner of collaboration and problem-solving for multiple teams who are responsible.
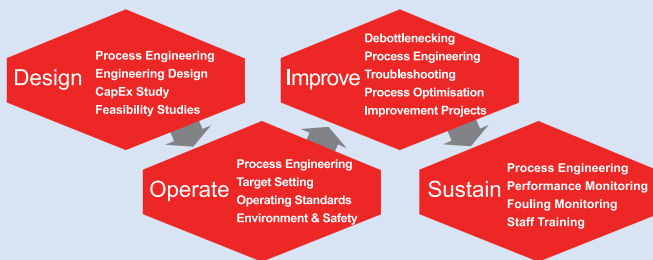
Power to Transform

Multipurpose Dynamic Simulator

Petro-SIM is the leading process simulation software and optimization platform for driving excellence in facility performance and organizational productivity. At the core of Petro-SIM's technology are rigorous process simulation models which generate dependable results in an intelligent, user-friendly environment. Petro-SIM is the go-to simulation platform for upstream, midstream and downstream refinery and petrochemical processes.

Petro-Sim Applications

- Rigorous steady state and dynamic simulation models for upstream, midstream and downstream refinery and petrochemical processes

- Trusted analytical tools for conversion unit monitoring, planning, optimization, and design and engineering studies

- Multi-period optimizer will run in real time for the best possible future outcome.

Design — Process Engineering, Engineering Design, CapEx Study, Feasibility Studies

Improve — Debottlenecking, Process Engineering, Troubleshooting, Process Optimisation, Improvement Projects

Operate — Process Engineering, Target Setting, Operating Standards, Environment & Safety

Sustain — Process Engineering, Performance Monitoring, Fouling Monitoring, Staff Training

Operator Training Simulator

OmegaLand (Integrated Environment for Dynamic Simulation) connects people, knowledge, expertise, experience, and the virtual world (simulation). It is achieved in a variety of forms by utilizing modeling and dynamic simulation technologies in the plant life cycle. The core objective of these solutions is for plant operations to maximize operational excellence through increased reliability, safety, and efficiency without compromising overall security.

Design

Engineering

Integrated Environment for Dynamic Simulation

OmegaLand

Improvement

Operations

Maintenance

OmegaLand OTS Enterprise

OTS Enterprise provides standard emulated PCS functions through Internet or over the company network where applicable

Omegaland Applications:

- Operator Training

- Operation support

- Process Analysis and Examination

- Control assistant and improvements

YOKOGAWA MIDDLE EAST AND AFRICA NETWORK

BAHRAIN

Yokogawa Middle East & Africa B.S.C. (c)

Yokogawa Engineering Bahrain (S.P.C)

SAUDI ARABIA

Yokogawa Saudi Arabia Company- Dhahran

Yokogawa Services Saudi Arabia -Jubail

Yokogawa Services Saudi Arabia –Yanbu

UNITED ARAB EMIRATES

Yokogawa UAE Industry – Sole Proprietorship L.L.C.

Yokogawa Engineering Middle East & Africa FZE-Dubai

QATAR

Yokogawa Qatar QFZ LLC

OMAN

Yokogawa Oman Limited LLC

KUWAIT

Yokogawa Middle East & Africa B.S.C. (c)

EGYPT

Yokogawa Middle East & Africa B.S.C. (c)

SOUTH AFRICA

Yokogawa South Africa (Pty) Ltd.

NIGERIA

Yokogawa Nigeria Limited

ANGOLA

Yokogawa Africa Holding B.V.

CONGO

Yokogawa Africa Holding B.V.

ALGERIA

Yokogawa Middle East & Africa B.S.C. (c)

MOROCCO

Yokogawa Middle East & Africa B.S.C. (c)

MOZAMBIQUE

Yokogawa Mozambique Company

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www.linkedin.com/company/yokogawa

info.deb@yokogawa.com

www.youtube.com/c/YokogawaMiddleEastAfrica

@Yokogawa_MEA

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

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