

LNG Carrier  
Integrated Automation System



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[www.yokogawa.com/](http://www.yokogawa.com/)

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The clear path to operational excellence

**YOKOGAWA** 



# Protect Customer's Assets with Reliability

## Integrated Automation System



**CENTUM VP**

CENTUM VP is the core platform of IAS operations in LNG carriers. With its flexibility and super-reliability, every automation in the vessel can be optimized to maximize operational performance. To sustain the vessel's integrated operation for its lifetime, trust and comfort are built-in to the hardware and software upon nearly 40 years of Yokogawa's IAS history.

## Yokogawa IAS Solution Overview

The reputation of the Yokogawa system comes from its high reliability and integrity.

- CCR and ECR Consoles
- Human Interface Stations
- Extension VDUs
- Large Screen Monitor
- Cargo Field Control Stations
- Machinery Field Control Stations
- ESDS, PMS, GMS Functionalities
- Distributed Remote I/Os
- Redundant Network
- UPS, EAP, Patrolman Alarm, etc.

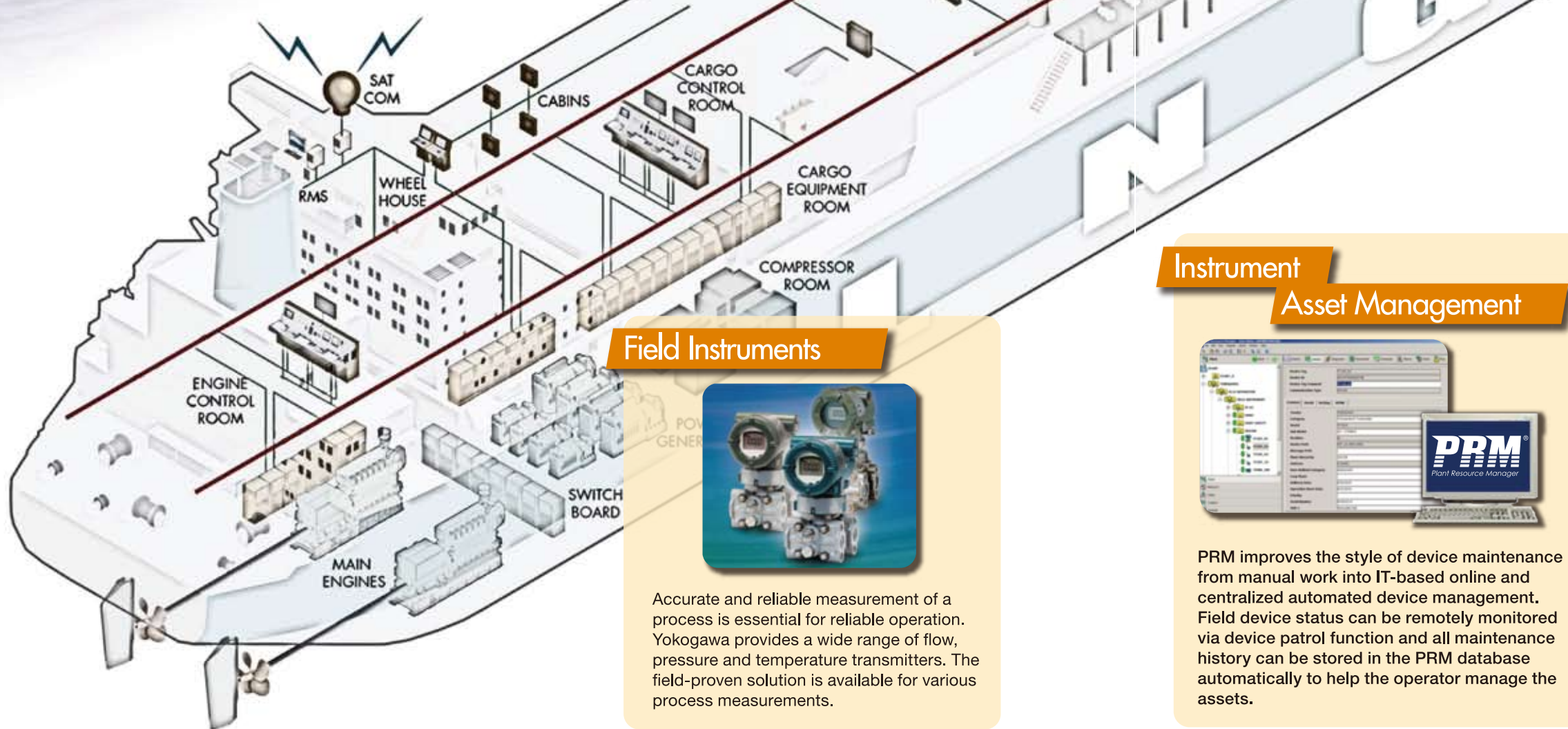
## Vessel

## Performance Management

**Exaquantum**



Exaquantum provides business benefits to officers in fleet operation. Onboard real-time process data in IAS can be transformed into usable, high-value and actionable information such as KPI reports. Mirrored Exaquantum server can be located at the fleet management office, so onboard real-time and historical operational information will be accessible by any authorized user in the office.



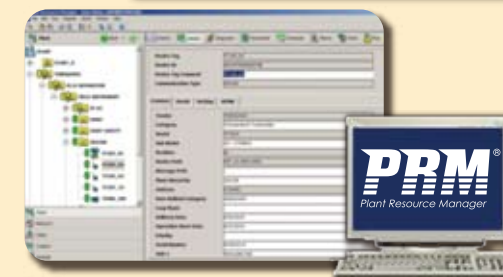
## Field Instruments



Accurate and reliable measurement of a process is essential for reliable operation. Yokogawa provides a wide range of flow, pressure and temperature transmitters. The field-proven solution is available for various process measurements.

## Instrument

## Asset Management



PRM improves the style of device maintenance from manual work into IT-based online and centralized automated device management. Field device status can be remotely monitored via device patrol function and all maintenance history can be stored in the PRM database automatically to help the operator manage the assets.

## Cargo ESDS



**ProSafe-RS**

Recently, there is a demand to utilize a dedicated safety controller for LNG carrier safety. Yokogawa can provide a Prosafe-RS SIL3 safety controller which can be easily integrated with CENTUM VP. All alarm data can be monitored in the same manner as CENTUM VP Field Control Station. Prosafe-RS is widely used for safety system, fire & gas system, and HIPPS in the offshore industry such as FSRU.



# A Trusted Partner for LNG Carrier Lifetime

Yokogawa's industrial experience provides unique solutions to meet the needs in the marine industry. For several decades, Yokogawa has been delivering IAS to a number of LNG Carriers worldwide. Long term partnership with Yokogawa provides the highest total value of ownership with full lifecycle support.

## LNG Supply Chain

Yokogawa has been committed to innovation in a number of LNG projects worldwide supplying CENTUM series systems. This LNG industry experience has contributed to the LNG carrier operation and maintenance. These days, the knowledge of onshore LNG facilities and LNG carriers is leading Yokogawa to offshore such as FLNG and FSRUs.



LNG Supply Chain

## Global Service

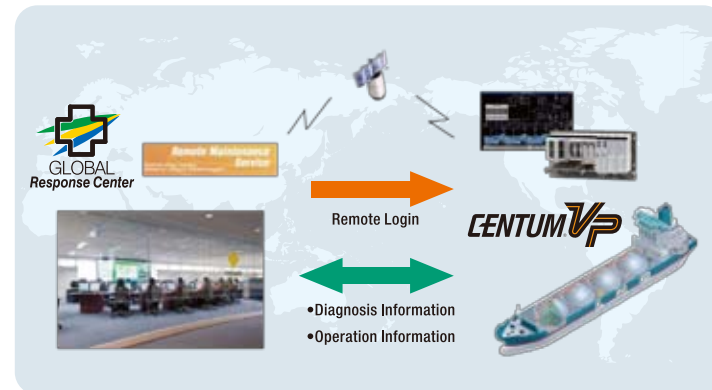
Our service offices provide the first-line of service and support to customers in every location. A worldwide network of Yokogawa Response Centers, 225 service offices, and more than 2000 service engineers provide a prompt response to all kinds of customer inquiries on an around-the-clock, 365-day-per-year basis.



Service Offices

## Remote Maintenance

Remote maintenance is an ideal method to identify the problem onboard, minimizing operator's troubleshooting time. A Yokogawa service engineer can remotely log in to the onboard CENTUM via VSAT. The operator can take immediate and precise action with Yokogawa consultation. The safest security measures are built-in to the onboard connection.



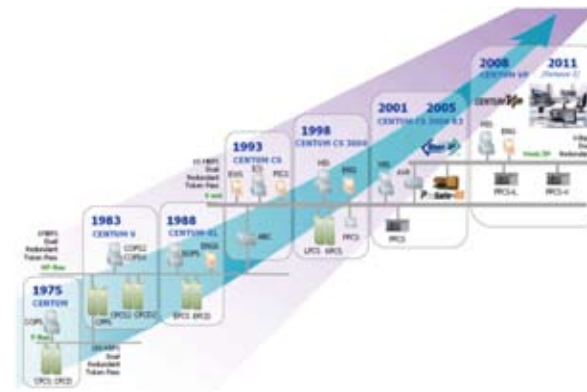
Remote Maintenance

## Lifecycle Dynamic Simulator

Yokogawa is driving the advanced usage of the dynamic simulator which can be used for multiple purposes throughout the lifetime of the LNG carrier. The dynamic simulator is ideal for operator training, but it can also be a useful tool to validate the gas system design by allowing rigorous system testing under all operating conditions



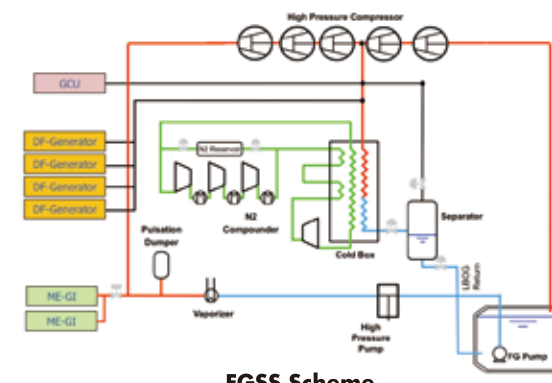
Dynamic Simulator



History of CENTUM



IAS Retrofit using existing cabinet



FGSS Scheme



During FAT

## Backward Compatibility

Consistency and long-term support are the hallmark of Yokogawa's IAS. Yokogawa has maintained exclusive ownership of CENTUM development throughout the history of this product series. The upgrade path for each legacy system is always taken into consideration before a new version is released. Combined with the great reliability of CENTUM systems, customers can enjoy the industry's lowest total cost of ownership throughout the LNG Carrier's lifetime.

## IAS Retrofit and Upgrade

In a LNG carrier life extension program, IAS retrofit/upgrade is one of the key consideration to modernize LNG carrier operations. Yokogawa has been executing many retrofit and upgrade projects of old generation CENTUM IAS, third party IAS, and single loop controllers. Yokogawa's experience proves that any traditional controllers can be integrated by Yokogawa IAS, so that reliable and centralized operation and maintenance can be realized.

## IAS for Various LNG Carriers

Yokogawa has been challenging against the various types of LNG carriers. Integration of Boiler control, DFDE gas management, compressor control, power management, FGSS control, re-liquefaction control, etc., have been integrated in IAS with sophisticated control philosophy. Collaboration experience with various package suppliers throughout LNGC and offshore projects is one of the strengths of Yokogawa.

## Main Automation Contractor

In many cases, industry expertise with skillful project management is necessary to execute a successful LNGC project. Yokogawa can be a single point of contact offering a turnkey solution acting as the Main Automation Contractor.

Yokogawa has been working with customers where we standardized the automation philosophy throughout the company.

# Yokogawa IAS Benefits Summary

## Stable and safe operation with the best-in class IAS

- High reliability achieved by pair & spare CPU technology
- Full redundancy on all levels in a system
- Field-proven IAS in nearly 40 years history

## Efficient operation by its scalability and integration capability

- Unified operation environment for ship systems
- Integrated data handling and alarm management

## Minimal downtime with global service availability

- Global service network 24/7
- Remote support for trouble shooting onboard

## Full lifecycle support with a long-term strategy

- Secured migration pass by ensuring backward compatibility
- Field-proven IAS retrofit engineering capability



## Why Yokogawa?

Yokogawa offers a wide variety of sensors, controllers, data historians, and advanced solutions that are used to operate LNG carriers. Yokogawa products and solutions help improving efficiency and environmental performance, as well as ensure a safe and stable operation.

CENTUM VP is a registered trademark of Yokogawa Electric Corporation.  
OmegaLand is a trademark of Omega Simulation Co., Ltd.

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The clear path to operational excellence

SEE  
CLEARLY

KNOW  
IN ADVANCE

ACT  
WITH AGILITY

VigilantPlant is Yokogawa's automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

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