Completely Integrated Solutions
for Vessels

SISHIP^{CIS} IMAC for LNG carriers

Powerful and cost-effective
integrated automation solutions

SIEMENS

Industrial Solutions and Services

Your Success is Our Goal

SISHIP^{CIS} – Completely Integrated Solutions for Vessels

As a comprehensive industry-specific solution for seagoing vessels, our SISHIP^{CIS} product family integrates all the products and services you need for sustained maximization of your ship's performance.

For each particular task, a solution has been defined that

- horizontally improves all of your ship's operations
- vertically integrates the ship's information and security management end-to-end, helping to make better-founded decisions
- and, at the same time, is designed for optimal vessel-specific maintenance and comes with assured further development over the whole life cycle.

Due to this unique combination of horizontal, vertical and life-cycle dimensions, our solutions all carry the genes of an exhaustive and sustained ship performance in their very core.

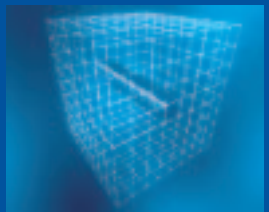
For More Efficiency. More Performance. More Power.

Completely Integrated Solutions from Siemens.

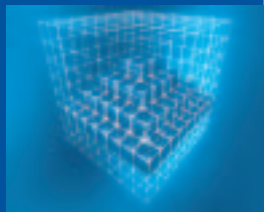
Seven good reasons for SISHIP^{CIS} IMAC for LNG tankers:

- **One system platform for cargo and machinery automation**
- **Human-machine interface is very user-friendly**
- **Redundant system features industry-proven hardware for excellent reliability**
- **Advanced technology ensures high availability**
- **Modular structure enables tailor-made system configuration**
- **Decentralized system configuration allows cable network optimization**
- **System saves money by requiring only a few spare part modules**

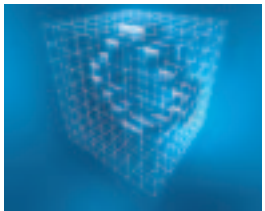
Horizontal Integration

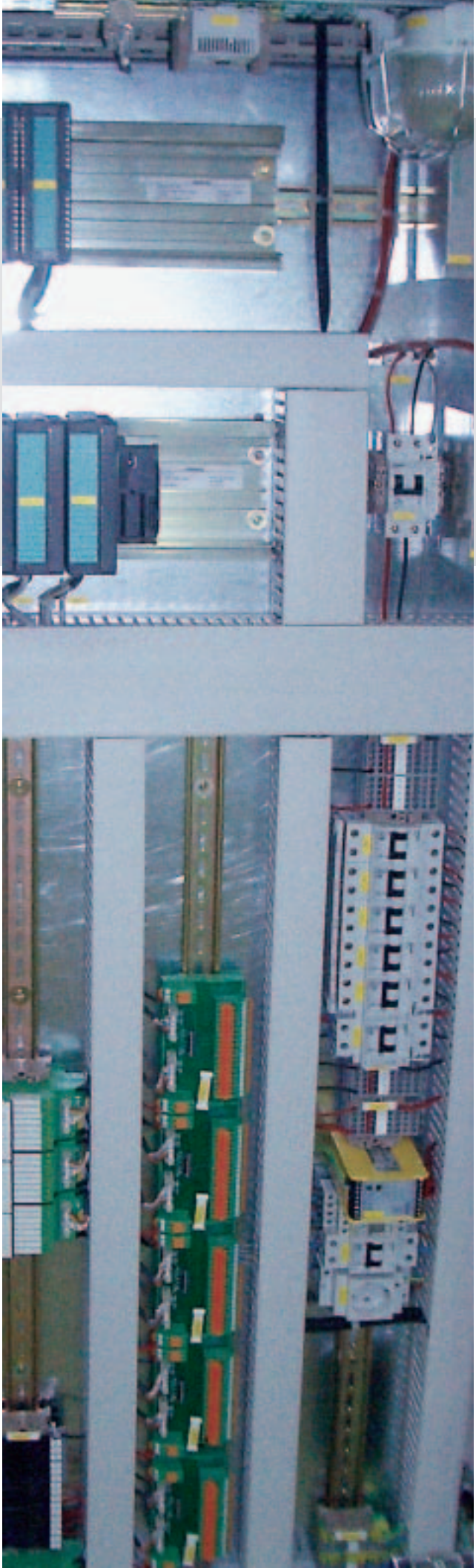


Vertical Integration



Life-Cycle Integration





In the highly competitive LNG carrier industry, maximum safety and high cost-efficiency are key. Engine rooms require an intelligent and powerful automation system to operate properly while unattended. And because LNG can be dangerous, a reliable monitoring system is essential. Automation technology today is moving toward distributing process control among small intelligent units that operate locally and are connected via LANs, reducing cabling costs and increasing safety.

Comprehensive monitoring and control you can count on

SISHIP^{CIS} Integrated Monitoring Alarm and Control (IMAC) offers the highest reliability for LNG carriers. SISHIP^{CIS} IMAC is the intelligent automation solution for comprehensive control. For every size and type of LNG vessels, SISHIP^{CIS} IMAC can handle any automation task, including monitoring, alarming, controlling, computing, and providing shipboard management. SISHIP^{CIS} IMAC has a modular design that can easily adapt to a variety of needs, while keeping maintenance costs to a minimum. And with standard industrial components from Siemens that are designed to handle rugged environments, the system achieves a great degree of reliability.

Integrated for maximum efficiency – SISHIP[CIS] IMAC for LNG Carriers

Two-in-one monitoring

Contrary to conventional solutions which rely on separate systems, SISHIP[CIS] IMAC combines the machinery and cargo parts of the LNG vessel in one and the same system.

Machinery System

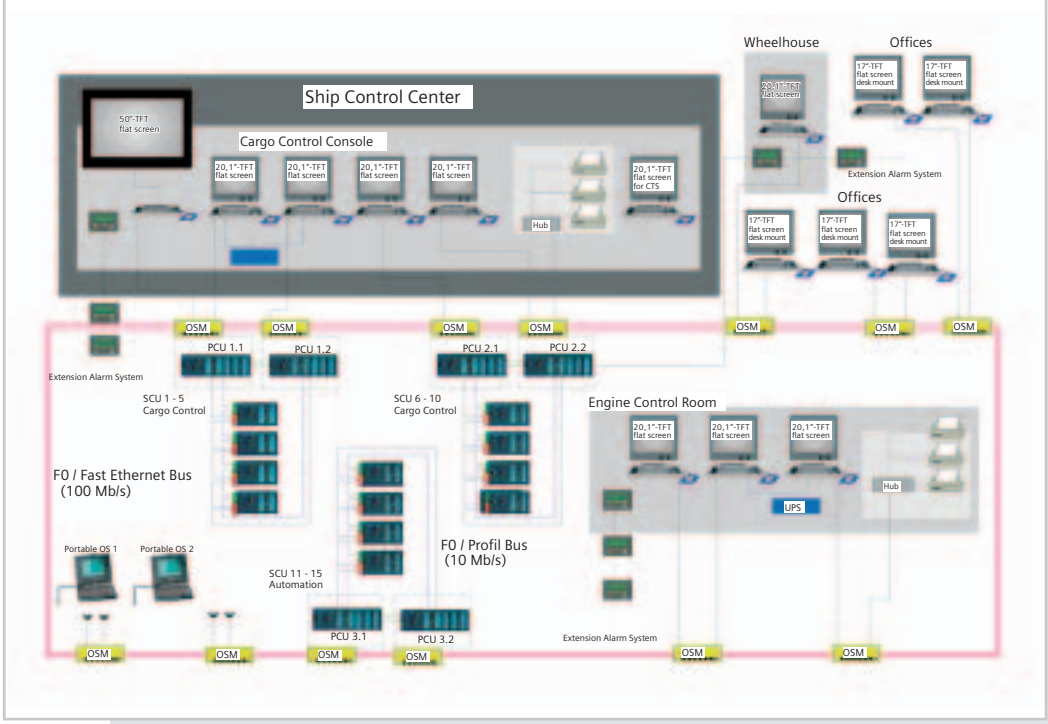
With SISHIP[CIS] IMAC, the entire machinery part of the ship is integrated into the Integrated Automation System (IAS). This is including the propulsion system of the ship. It can consist of dual fuel engines, gas turbines, two stroke diesel engines, or others. With dual fuel engines (e.g. DF diesel engines, DF gas turbines), the IAS includes a fuel management system. All other systems such as bilge systems, ballast systems, etc. are included as well.

SISHIP[CIS] IMAC is designed for unattended engine control room operation. The Extension Alarm System (EAS) is equipped with text display panels, enabling the operator to clearly distinguish the level of incoming alarms.

Cargo system

The cargo control system of SISHIP[CIS] IMAC is integrated into the same hard- and software platform. The cargo system typically consists of:

- Cargo pumps
- HD/LD compressor
- LNG vaporizer
- Vacuum pump
- Nitrogen system
- Inert gas and dry air generator
- Cargo and ballast valve control
- Ballast water management
- Cargo temperature monitoring system
- Glycol water heater system
- Hull ventilation
- Loading computer (integrated via serial line)
- Custody transfer system (integrated via serial line)
- Gas detection system (integrated via serial line)



Typical system configuration LNG IAS. The decentralized configuration allows cable network optimization

Advanced technology: dependable, safe and mobile

SISHIP^{CIS} IMAC guarantees the highest level of safety and reliability on board LNG tankers by employing state-of-the-art fiber-optic technology. In order to minimize electromagnetic interferences and the effect of any field bus damage due to fire or flooding, ring-shaped fiber-optic network buses connect workstations, process control units and subcontrol units. This system structure gives SISHIP^{CIS} IMAC extremely high fault tolerance. Mobility is enhanced by mobile operator stations (MOS) that support direct connection to the data highway from locations all over the ship.

Standard components: proven solutions at low cost

Our automation solutions for LNG tankers are all based on a standard hardware and software platform throughout. The use of standard industrial products leads to low investment costs and low life-cycle costs. Because SISHIP^{CIS} IMAC relies on standard components from the SIMATIC® family of programmable logic controllers (PLCs), you can count on proven system reliability, operating safety, and efficient operation over a long life cycle. Furthermore, the open system approach makes it easy to upgrade to meet future automation challenges.

Human-machine interface: intuitive and powerful

To lighten the operators' workloads, the operator stations feature a highly user-friendly human-machine interface. With a few clicks of the mouse, operators can access all technological areas. Although the human-machine interface is powerful and incorporates a large number of functions, it's clearly structured and easy to operate, with full graphics capability, intuitive user guidance and online help facilities. Important functions can be assigned to function keys for rapid access. Multiple windows can be displayed on screen, allowing the operator to view related information simultaneously for a fast overview. In addition, because SISHIP^{CIS} IMAC uses the familiar MS Windows environment, operators familiar with Windows will already have the basic skills necessary for operation, so they can start working right away with minimal training.

Operator stations: intelligent and flexible

The multi-terminal capabilities of SISHIP^{CIS} IMAC make highly advanced ship operations possible. SISHIP^{CIS} IMAC is a multiuser system for local and/or central operating and monitoring functions, allowing up to 32 operator stations and/or mobile operator stations to be connected. The operator stations, panels and control and monitoring units are installed at the most convenient locations, and each operator station can be equipped with the same hardware and software. Operator stations feature the latest approved computer hardware and flat color monitors for advanced performance. To enhance efficiency, the system automatically prevents more than one operator station from accessing the same process at the same time.

Safety and security: high fault tolerance, protected access

To keep safety a first priority on LNG carriers, SISHIP^{CIS} IMAC has been engineered with fail-safe logic, which ensures that systems affected by a fault remain or are put in a safe state.

Highest availability is achieved by using SIMATIC S7 redundant PLC's. The entire process control logic is located in these PLC's. In case of a failure of one CPU the second CPU will then take over the process control bumpless.

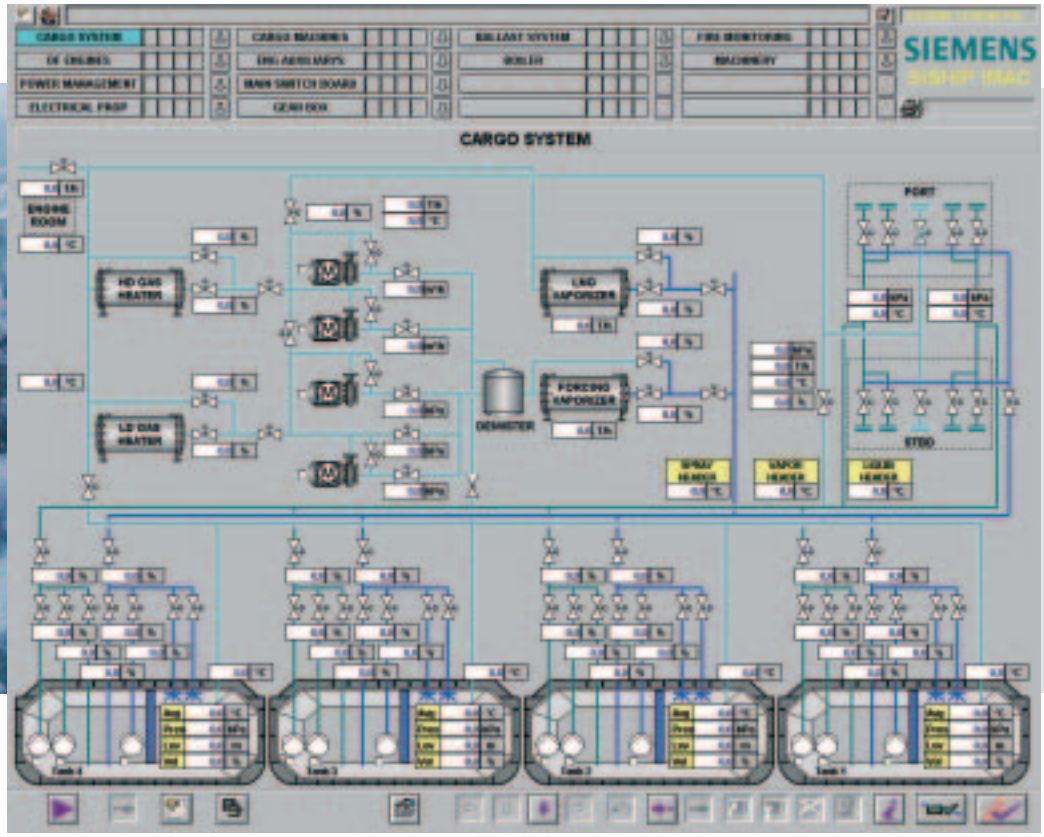
Fault alarm system: fast and reliable reporting of faults

The fault alarm system is the backbone of the automation systems on a LNG tanker. SISHIP^{CIS} IMAC's fault alarm system is particularly effective, fully able to cope with all aspects of ship operations. It identifies critical operating states swiftly and alerts the crew accordingly. Text display panels make it easy to clearly distinguish the level of incoming alarms.

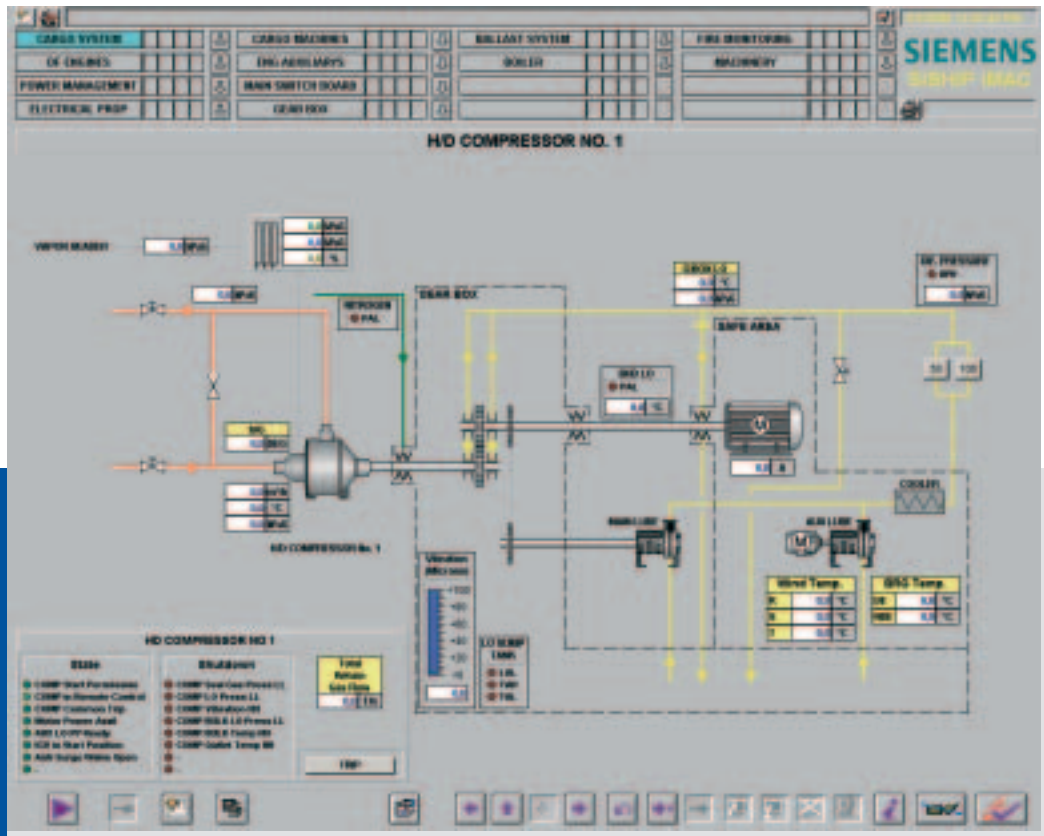
The status of individual measuring points can be assigned to various audible and visual alarm groups. This enables the clear grouping of alarms: for example, the engine area can have its own particular audible alarm group, while the deck has another. Additionally, each measuring point can be assigned its own access authorization, so that only authorized individuals or stations can view certain measuring points, enhancing security and control.

Integrated technology: a unified approach for peak efficiency

Using the same hardware and software platform, SISHIP^{CIS} IMAC integrates all technological aspects of the LNG carrier, such as the cargo system, bilge system, ballast system, and all other machinery systems, including dual fuel engines, gas turbines, two stroke diesel engines and the electric propulsion system for electrically driven ships. This integration results in reduced operating costs and greater efficiency for the shipyard, ship owner, trading partners and crew.



Example of a
cargo system overview
mimic operator interface



Example of a
HD compressor
mimic operator interface

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