Honeywell’s Solution for LNG Vessels
Integrated automation systems for LNG vessels.

Honeywell is the leading supplier of Integrated Automation Systems (IAS) for LNG carriers and newer generation, flexible LNG vessels. Honeywell has the experience and expertise in LNG transportation, along with proven IAS technology, to keep ships running safely under harsh conditions.

Honeywell was the first company to achieve the internationally recognized quality standards of ISO 17894 certification in IAS. This certification assures the quality and dependability of Honeywell systems.
Integrated automation solutions from Honeywell

Honeywell offers solutions that span the entire spectrum of LNG operations, from liquefaction, shipping, regasification and beyond. Honeywell solutions integrate production, processing and transportation operations, and link them with security, safety, commercial, regulatory and environmental functions. As a result, customers can improve productivity, lower operating costs, capitalize on key business opportunities, improve asset utilization and boost profitability.

Honeywell’s Marine Solution Helps Manage Vessel Functions Such as:

- Propulsion systems — traditional steam boilers, Dual Fuel Electric (DFE) and slow speed diesels
- Orbital gasification systems
- Orbital liquefaction systems for LNG emergency control and floating LNG production
- Power management
- Integrated business/operations management system
- Broad scope of instrumentation including traditional and wireless devices
- Machinery monitoring and control
- Cargo and ballast control including cargo gas systems
- Extension alarm system
- Digital video/motion detection
- Maintennance systems
- Remote service systems
- Fire and gas system including detectors and devices
- Diagnostic systems
- Control of complex systems
- Full integration with field instruments including wireless
- Integration of all vessel subsystems to provide a single operator interface window
- Data logging of all instrument measurements, alarms, operator actions and events
- Software applications that capture and share process knowledge for better decision making
- Cargo and ship systems reporting, and data hand-off to head office
- Safety and security management controls, security system
- Ship classification type approval (ABS, DNV, LR, NK, K&I)
- Emergency shutdown
- Full function extension video display units (XDU)
- Host management via satellite communication
- Systems that fully integrate with each other, legacy products and third-party suppliers

Honeywell’s Marine Solution provides a single system to automate and integrate vessel subsystems for efficient, safe and reliable operation. Honeywell’s IAS goes beyond traditional control systems in how it optimizes operations and maintenance, and automates routine activities.

Honeywell’s Unisim® simulation technology offers dynamic, high-fidelity modeling capabilities. This software is used by process design engineers for the design of onboard gas management systems and validation, and by Honeywell engineers to enhance the design, validate the approach and confirm control strategy functions in a closed-loop environment.

Honeywell’s global project management methodologies ensure high-quality, consistent engineering and professional documentation. Honeywell’s implementation locations in Japan, Korea and Norway have extensive LNG vessel application knowledge and work closely with the equipment and major equipment suppliers such as engine, boiler, requalification and QOD. Honeywell’s engineers ensure the maximum benefit is realized from automation. Global resources are mobilized to address the toughest challenges. Some of the latest vessel control systems engineered by Honeywell, for example, incorporate requalification controls transferred from extensive LNG terminal experience.

Honeywell’s worldwide expertise in base-load LNG liquefaction and FPSOs is poised to engineer the newer floating LNG solutions.

Onboard Liquefaction and Dual Fuel Diesel (DFE)

Honeywell has ongoing projects in LNG ships with onboard requalification and re-gasification. Dual Fuel Electric and traditional steam type ships, with development work underway for HFO Engines with Gas Injection (IGI) vessels. Honeywell is the only supplier to be working on both QFlinx and QMax size ships for Qatar projects.

Honeywell’s integrated solution for onboard liquefaction systems helps ship owners to realize savings by adopting alternative propulsion systems. For example, Honeywell’s integrated solution offers a 10% fuel savings, which is comparable to the efficiency of liquid fuel systems. This 10% fuel savings on a $30 billion ship can result in a net benefit, which can be realized from automation.

Honeywell’s simulation technology is tightly integrated into the IAS for the first LNG RVs to market. Honeywell’s simulation technology, as well as detailed integration of Honeywell systems, will play a critical role in eliminating maintenance, alignment and configuration errors. Honeywell’s scope of automation includes the requalification process, for example, the suction drums, pumps, vaporizers, heaters and gas send out systems. Also included are important systems such as compressor management, launch mooring, positioning, ballast control, emergency shutdown, and fire and gas systems.

Compressor Management

Honeywell’s compressor automation integration includes suction flow control, liquid and seal oil control, anti-surge control and more. Honeywell has worked with many compressor manufacturers in integrated specific compressor maps and control algorithms to provide the best efficiency and high availability in a low footprint architecture.

Newer Generation LNG Storage and Gasification Vessels

Honeywell’s integrated solution for power management systems controls the diesel generators and handles the power generation for the vessel. Honeywell’s integration of power management systems with the balance of the engine, utility and auxiliary control systems is the key to optimizing LNG carriers’ power system performance. The power management system is tightly integrated into the IAS architecture providing one common window for simplified operation.

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Established Global Marine Support Network

Honeywell’s managed automation support includes:

- 24/7 emergency call center with customer-accessible call management software
- Central coordination and global availability for spares, services and training
- Parts management to reduce onboard spares
- Remote system diagnostics and technical support via satellite link
- LNG-specific training courses
- Worldwide service personnel has access to electronic copies of ship documentation

Honeywell’s IAS is powered by the Experion® Process Knowledge System (PKS), which embeds three decades of Honeywell process control, business management and domain expertise, combined with Six Sigma methodologies, into a unified architecture.

Honeywell’s Marine Solution is tightly integrated into the IAS architecture providing one common window for simplified operation. The ship owners and crews are trained in the use of the system, including the U.S., Russia, Korea, China and Japan. The centers are located near shipbuilding ports for easier access. Customized courses are offered upon request.
Honeywell offers solutions that span the entire spectrum of LNG operations, from liquefaction, shipping, regasification and beyond. Honeywell solutions integrate production, processing and transportation operations, and link them with safety, security, commercial, regulatory and environmental functions. As a result, customers can improve productivity, lower operating costs, capitalize on key business opportunities, improve asset utilization and boost profitability.

Integrated automation solutions from Honeywell

Honeywell’s global project management methodologies ensure high quality, consistent engineering and professional documentation. Honeywell’s implementation locations in Japan, Korea and Honeywell have extensive LNG vessel application knowledge and work closely with the extensive LNG equipment suppliers such as engines, boiler, reliquefaction and QCI. Honeywell’s scope of execution is determined by the integration performance of automation. Global resources are mobilized to address the toughest challenges. Some of the latest vessel control systems engineered by Honeywell, for example, incorporate reliquefaction controls transferred from extensive LNG terminal experience. Honeywell’s worldwide expertise in basic-load LNG liquefaction and FPSO is poised to pioneer the newer floating LNG solutions.

Onshore Liquefaction and Dual Fuel Diesel (DFE)

Honeywell has ongoing projects in LNG ships with onboard reliquefaction and regasification, Dual Fuel Diesel and traditional steam type ships, with development work underway for ships with engine with Gas Inlet (IGI) systems. Honeywell is in the only supplier to be working on both QMax and QShale size ships for Qatar projects. Honeywell’s integrated solution for onboard liquefaction systems help ship owners to realize savings by adopting alternative propulsion systems. The ability to control reliquefaction allows the diesel engine to be increased the amount of LNG delivered to the engine without emitting pollutants into the environment. Honeywell has strong and extensive experience in liquefaction, working closely with major manufacturers of LNG reliquefaction systems and manufacturers of large-scale liquefaction systems for application to LNG FPSO.

Power Management

Honeywell’s integration solution for power management systems controls the diesel generators and handles the power generation for the vessel. Honeywell’s integration of power management systems with the balance of the engine, utility and auxiliary control systems is the secret to optimizing LNG carriers’ power system performance. The power management system is tightly integrated into the IAS architecture providing a common window for simplified operation. Honeywell’s IAS offers network communications protocols that connect systems together from every location in LNG carriers.

Honeywell Service and Training

Assurance of support through the life of the vessel is of utmost importance. This becomes even more critical as technology advances and vessels begin to trade in spot cargoes, visiting ports not established routes. Honeywell’s demonstrated commitment to lifetime support is unmatched in the industry, providing global resources in 95 countries including the U.S., Norway, Korea, China and Japan. The centers are located near shipbuilding ports for easier accessibility. Customized courses are offered upon request.

Established Global Marine Support Network

- Professionally managed automation support includes
- 24/365 emergency call center
- Customer-accessible call center management software
- Central coordination and global availability for spares, services and training
- Parts management to reduce downtime costs
- Remote system diagnostic and technical support via satellite link
- LNG-specific training courses
- Worldwide service personnel access to electronic copies of ship documentation

Honeywell’s Marine Solution Helps Manage Vessel Functions Such As

- Operations and maintenance
- Efficient use of resources
- Compliance with safety and environmental regulations
- Optimization of efficiency and productivity
- Improved asset utilization

Implementation expertise.

- Propulsion systems – traditional steam boilers, Dual Fuel Diesel (DFE) and slow speed diesel
- Onboard automation systems
- Onboard liquefaction systems for BGS, reliquefaction control and floating LNG production
- Power management
- Integrated basin/submarine management system
- Broad scope of instrumentation including traditional and wireless devices
- Monitoring and control
- Cargo and ballast control including engine management
- Extension alarm systems
- Digital video/motion detection
- Maintenance systems
- Remote service systems
- Fire and gas system including detectors and devices
- Diagnostic systems
- Control and process systems
- Full integration with field instruments including wireless
- Integration of all vessel subsystems to provide a single operator interface window
- Data logging of all monitoring systems, alarms, operator actions and events
- Software applications that capture and share process knowledge for better decision making
- Cargo and ship systems reporting, and data hand-off to head office
- Safety and security management control - control system
- Ship classification type approval (ABS, DNV, LR, BV, NKK, & KRI)
- Suppliers supervision
- Full function automation video display units (VDU)
- Real-time system via satellite communication
- Systems that fully integrate with each other, legacy products and third-party suppliers

Newer Generation LNG Storage and Qualification Vessels

These newer generation vessels, also called LNG Regasification Vessels (LNG RV), are a proven alternative for onboard LNG terminals. Honeywell provided the IAS for the first LNG RVs to market including the LNG RV that successfully served the area devastated by Hurricane Katrina in the U.S. with water, naphtha, platforms and terminals where closed. This proved the reliability and robustness of Honeywell systems under any circumstances.

Honeywell’s scope of automation includes the regasification process, for example the suction drums, pumps, vaporizers, heaters and gas send out systems. Also included are important systems such as compressor management, turret mooring, ballast control, emergency shutdown, and fire and gas systems.

Compressor Management

Honeywell’s compressor automation integration includes suction flow control, lube and seal oil control, anti-surge control and more. Honeywell has worked with many compressor manufacturers to integrate specific compressor maps and control algorithms to provide the lowest efficiency and high availability in a low footprint architecture.

Honeywell’s IAS is powered by the System Process Control System (SPS) which embeds three decades of Honeywell process control, business management and domain expertise, combined with Six Sigma methodologies, into a unified architecture.

Honeywell’s IAS provides a single system to automate and integrate vessel subsystems for efficient, safe and reliable operation. Honeywell’s IAS goes beyond traditional control systems in how it performs operations and maintenance, and automates routine activities. Honeywell’s Unity™ simulation technology offers dynamic high-fidelity modeling capabilities. This software is used by process design engineers for the design of onboard gas management systems and validation, and by Honeywell engineers to enhance the design, validate the approach and confirm control strategy functions in a closed loop environment.
Honeywell offers solutions that span the entire spectrum of LNG operations, from liquefaction, shipping, regasification and beyond. Honeywell solutions integrate production, processing and transportation, and link them with security, safety, commercial, regulatory and environmental functions. As a result, customers can optimize operations and maintenance, capitalize on key business opportunities, improve asset utilization and boost profitability.

Honeywell’s IAS is powered by the Sapphire Process Control System (SPCS) which embeds three decades of Honeywell process control, business management and domain expertise, combined with Six Sigma methodologies, into a unified architecture. Honeywell’s IAS provides a single system to automate and integrate vessel subsystems for efficient, safe and reliable operation. Honeywell’s IAS goes beyond traditional control systems in how it integrates automation, and automates routine activities. Honeywell’s Lightning® automation technology offers dynamic, high-fidelity modeling capabilities. This software is used by process design engineers for the design of onboard gas management systems and validation, and by Honeywell engineers to enhance the design, validate the approach and confer control strategy functions in a closed loop environment.

Honeywell’s global project management methodologies ensure high quality, consistent engineering and professional documentation. Honeywell’s implementation locations in Korea, Japan and Norway have extensive LNG vessel application knowledge and work closely with the stringent and major equipment suppliers such as engines, boiler, refrigeration and GID. Honeywell’s teams ensure the maximum benefit is realized from automation. Global resources are mobilized to address the toughest challenges. Some of the latest vessel control systems engineered by Honeywell, for example, incorporate Refrigeration controls transferred from extensive LNG terminal experience. Honeywell’s worldwide expertise in base-load LNG Liquefaction and FPSO is poised toengineer the newer floating LNG solutions.

Honeywell’s integrated solution for onboard liquidation systems helps ship owners to realize savings by adopting alternative propulsion systems. The ability to control liquidation offers an integrated control option, where the cargo is increased by the amount of LNG delivered to the vessel. This prevents emissions to the environment. Honeywell has strong and extensive experience in liquefaction, working closely with major manufacturers of LNG reliquefaction systems and manufacturers of base-load liquefaction systems for application to the LNG FPSO.

Honeywell’s Marine Solution Helps
Manage Vessel Functions Such as:

- Integration of all vessel subsystems
- Control for all vessel subsystems
- Diagnostic systems
- Control of HVAC systems
- Full integration with field instruments including wireless
- Integration of all vessel subsystems to provide a single operator interface window
- Data logging of all monitoring systems, alarms, operator actions and events
- Software applications that capture and share process knowledge for better decision making
- Cargo and ship systems reporting, and tank hand-off to bollard office
- Safety and security management controls for the vessel
- Ship classification type approval (ABS, DNV, LR, BV, NKK, & KPF)
- Special control synchronization
- Full function extension video display units (VDUs)
- Real-time management via satellite communication
- Systems that fully integrate with each other, legacy products and third-party suppliers

Honeywell offers the entire spectrum of LNG operations, from liquefaction, shipping, regasification and beyond. Honeywell solutions integrate production, processing and transportation, and link them with security, safety, commercial, regulatory and environmental functions. As a result, customers can optimize operations, lower operating costs, capitalize on key business opportunities, improve asset utilization and boost profitability.

Implementation expertise.

Onboard Liquefaction and Dual Fuel Diesel (DFD)

Honeywell has ongoing projects in LNG whisky with onboard-refrigeration and reliquefaction. Dual Fuel Diesel and traditional steam type ships, with development work underway for Hill Engine with Gas Injection (HIG) vessels. Honeywell is the only supplier to be working on both GPH and G2PH sizes ships for Qatar projects.

Honeywell’s scope of automation include the reliquefaction process, for example the suction drums, pumps, vaporizers, heaters and gas send out systems. Also included are important systems such as compressor management, turbin mooring, positioning, ballast control, emergency shutdown, and fire and gas systems.

Compressor Management

Honeywell’s compressor automation integration includes suction flow control, limits and seal oil control, anti- surge control and more. Honeywell has worked with many compressor manufacturers to integrate specific compressor maps and control algorithms to provide the best efficiency and high availability in a low footprint architecture.

Power Management

Honeywell’s integration solution for power management systems controls the diesel generators and handles the power generation for the vessel. Honeywell’s integration of power management systems with the balance of the engine, utility and auxiliary control systems is the key to optimizing LNG carriers’ power system performance. The power management system is tightly integrated into the IAS architecture providing one common window for simplified operation.

Honeywell’s IAS offers network communications protocols that connect systems together from every location in LNG carriers.

Honeywell Service and Training

Assurance of support through the life of the vessel is of utmost importance. Because this is a critical technology, advances and vessels begin to trade in spot cargos, existing ports not established routes. Honeywell’s demonstrated commitment to lifetime support is unparalleled in the industry, providing global resources in 50 countries due to an installed base of over 6,000 onshore installations and in excess of 100 LNG carriers.

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