Industry Overview

Honeywell

Marine & Offshore

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The marine and offshore industry can be characterised by the operations that take place. The offshore industry comprises upstream operations include discovery, recovery and delivery of oil and gas to a point of storage, ready for onward distribution to chemical, oil and gas processing industries, i.e. downstream operations, for conversion to final products such as petrol and plastics. The marine industry can be split into pleasure craft (cruise ships) and bulk transportation. For example tankers and LPG/LNG carriers.

There are many different types of vessels operating in the Marine and Offshore industry. Safety and operational requirements are controlled under international guidelines. Operations are underwritten by insurance companies and compliance is verified by third parties such as ABS (American Bureau of Shipping), LRS (Lloyds Registers of Shipping) and KRS (Korean Register of Shipping) amongst others. Further rules and regulations may apply for vessels operating in territorial waters that are dictated by local authorities. For example, Coast Guards may demand specific safety requirements be put in place. Gas detection requirements vary subject to intended operation of the vessel.

Market Drivers

Platforms that are currently in use have been subjected to de-manning exercises (as seen within the Southern North Sea Sector) with minimum manning levels becoming the norm within the industry.

Deepwater development fields e.g. West Africa, Gulf of Mexico and Brazil that would have necessitated vast capital expenditure can now be exploited using floating, production, storage & offloading (FPSO) technologies.

Equally FPSO designs may be used in environmentally aggressive areas such as West of Shetland, Russian and Canadian fields where more traditional fixed platform design would have experienced difficulties with ice flow patterns and extreme weather patterns.

Marginal field developments are oil and or gas fields that have delivered the expected yields, but are no longer profitable without additional processes. Gasification, injecting HC gas into the well to deliver oil flows, or water injection to maintain oil / gas pressure and therefore flow can be used to exploit such fields to the full but do not warrant permanent installations. By using jack-up, semi-sub or floating solutions, marginal field development becomes cost effective and therefore viable for oil and gas companies.

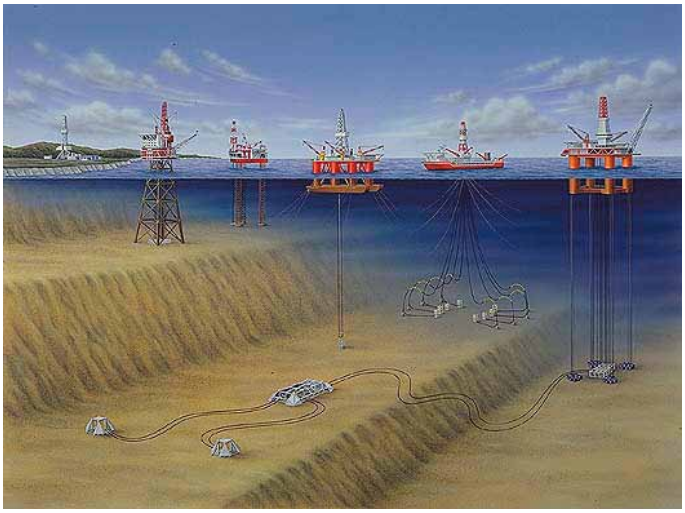
However, the major issue with water injection is that in using water, a chemical reaction between the HC gas / liquid and the water takes place and Hydrogen Sulphide is produced.

For platforms that have been designed for “sweet gas” only (i.e. those with no Hydrogen Sulphide content), the costs involved in changing HVAC patterning and instrumentation are significant.

Safety Integrity Levels as derived from the IEC79 series have began to reach a level of recognition with end users. Probability of Failure Upon Demand, FMEA and other product related data will become a more familiar request.

Safety System Design practices with respect to Point and Open Path Gas Detection are being reviewed. A recent trend (within the last 12 months) has been to specify a very limited number of Point Gas Detection, and to increase the number of Open Path Gas Detection systems.

Potential Applications



Application 1:

Exploration

Different types of drilling vessel are used for the exploration of new and expansion. of existing oil and gas fields. Subject to the location and depth of the area to be explored, different types of drilling vessel can be used.

At $50,000 / day to hire a vessel for sample drilling, expenditure on safety is minimised. Areas likely to be protected include H2S Refuge, Well Deck, Mudlogging Room, Geologists Laboratory, Control Room, Accommodation Deck and Power Plant. Safety systems usually require the minimum acceptable technology, i.e. catalytic bead flammable gas detection and electrochemical toxic gas detection.

There are a number of common types of offshore structures in use, however the type of operational vessel chosen is very often determined by the depth of the water in which it will be operating, the water state and field potential i.e. size of prospect.

Typical drilling vessels

Jack-up drilling rigs are essentially a barge fitted out for offshore drilling with legs that enable them to “stand” on the sea bed. The legs are then fixed to the sea bed and the barge winched clear of the sea to a height above the maximum expected sea. These units can operate in water depths of up to 120m.

Drillships are either purpose built or converted vessels which are used in hostile and remote environments and in water depths of up to 2250m

Semi-submersible drilling rigs were designed in the late 1950’s to provide a stable platform for drilling in water depths greater than those possible using Jack-ups. The Semi-sub design, as implied by its name has a significant draft below the water line, typically around 25m, ensuring stability against long period ocean swells. Semi-subs are typically moored in water depths of up to 500m. In water depths exceeding 500m, dynamic positioning systems are used to maintain station over the subsea.

Application 2:

Production Platforms

Fixed production platforms can be considered a small ‘town’ housing between 200 and 1000 workers. Accommodation blocks, restaurants and even a cinema may be included as well as the production facilities. All areas must be protected against flammable and toxic gas hazards.

Multiple sub-sea wells supply the platform and smaller satellite stations may also feed the central production foundry.

Areas requiring protection from flammable and toxic gas hazards include:

Oil de-watering plant, gas compressors, accommodation blocks (air intakes), turbine / power skids, well heads, temporary refuges, cranes, shale shakers, battery rooms, bottled gas stores and water treatment areas.

In addition, there are confined spaces to be inspected where portable gas detection equipment is required e.g. inspection of storage and support structures such as the platforms’ legs.

20 years ago when catalytic was the only viable technology, the use of 200-600 detectors was quite common. In Norway for example, this could be doubled (due to legislation imposed by the Norwegian Petroleum Directorate). In today’s market with the benefits of infrared technology, the number of points required to deliver a viable safety case has been reduced. Indeed, the current trend is for dramatic reduction of point detection in favour of increasing numbers of Open Path Gas Detectors (OPGD). Both Shell and BP have embarked on significant safety studies leading to removal of point infrared and installation of OPGD’s.

Application 3:

Other Production Vessels

New build or converted super tankers, known as FPSO (Floating Production Storage and Offloading vessels) and variants thereof, i.e. FSO or FPO, provide flexible means by which oil and gas may be extracted, processed, stored and off-loaded easily. These vessels may be operated on a marginal field which would not justify (in terms of output) the use of a static production platform. Such vessels are becoming the norm for new build due to their flexibility.

Gas detection is required throughout the vessel and process areas including the turret (either bow or stern mounted providing the link to sub sea well), moon pool (reception area for gas), topsides (pipework, pump, compressors, separators) as well as accommodation and control room inlets.

Each and every vessel undergoes a hazardous operation survey or study which dictates the safety case for the vessel. This will identify fire and gas detection systems requirements and integrity levels. It is essential that the company responsible for the front end engineering and design (FEED) study be targeted to ensure early specification of gas detection equipment requirements.

Solutions:

What product do we have to offer these markets?

Point Infra Red Gas Detection - Searchpoint Optima Plus

Open Path Gas Detection - Searchline Excel

Cross Duct Open Path Gas Detection - Duct mounted Searchline Excel

Toxic Gas detection - Sensepoint and Apex

780 High Temperature Catalytic Gas Detector

Portable Gas Detection - Impulse, Impulse Pro and Impact

Flame and Smoke Detection equipment

Our Product Range

Fixed Gas Monitoring

Honeywell Analytics offers a wide range of fixed gas detection solutions for a diverse array of industries and applications including: Commercial properties, industrial applications, semiconductor manufacturers, energy plants and petrochemical sites.

- Detection of flammable, oxygen and toxic gases (including exotics)
- Innovative use of 4 core sensing technologies – paper tape, electrochemical cell, catalytic bead and infrared
- Capability to detect down to Parts Per Billion (ppb) or Percent by Volume (%v/v)
- Cost effective regulatory compliance solutions

Portable Gas Monitoring

When it comes to personal protection from gas hazards, Honeywell Analytics has a wide range of reliable solutions ideally suited for use in confined or enclosed spaces. These include:

- Detection of flammable, oxygen and toxic gases
- Single gas personal monitors – worn by the individual
- Multi-gas portable gas monitors – used for confined space entry and regulatory compliance
- Multi-gas transportable monitors – used for temporary protection of area during site construction and maintenance activities

Technical Services

At Honeywell Analytics, we believe in the value of great service and customer care. Our key commitment is providing complete and total customer satisfaction. Here are just a few of the services we can offer:

- Full technical support
- Expert team on hand to answer questions and queries
- Fully equipped workshops to ensure quick turnaround on repairs
- Comprehensive service engineer network
- Training on product use and maintenance
- Mobile calibration service
- Customised programmes of preventative/corrective maintenance
- Extended warranties on products

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