Hazardous Substances in the Offshore Industry

The offshore industry operates in some of the most dangerous environments in the world. Hazards are expected in this environment and must be controlled.

Most countries regulate hazardous materials by law, and they are subject to several international treaties as well. Laws and regulations on the use and handling of hazardous materials may differ depending on the activity and status of the material. For example, one set of requirements may apply to their use in the workplace while a different set of requirements may apply to spill response, sale for consumer use, or transportation. Most countries regulate some aspect of hazardous materials.

The European Union has passed numerous directives and regulations to restrict the usage of hazardous substances, the most famous being the Restriction of Hazardous Substances Directive and the REACH regulation.

European law distinguishes clearly between the law of dangerous goods and the law of hazardous materials. The first refers primarily to the transport of the respective goods including the storage, if caused by the transport. The latter describes the requirements of storage (including warehousing) and usage of hazardous materials. This distinction is important, because different directives and orders of European law are applied.

The U.S. Occupational Safety and Health Administration (OSHA) regulates the handling of hazardous materials in the workplace as well as response to hazardous materials-related incidents, most notably through HAZWOPER (Hazardous Waste Operations and Emergency Response) Regulations.

The main legal duties of employers under any directive or country specific legislation cover risk assessment, prevention or control of exposure, use and maintenance of controls, monitoring exposure, health surveillance, and provision of information and training.

The fundamental requirement of any chemical handling legislation is that exposure of persons to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled. This requires prevention or adequate control of exposure by methods other than the provision of personal protective equipment (PPE). Only when all options for prevention have been implemented should attention turn to possible methods of control. There are many aspects of control to be considered - for example, exposure to substances allocated exposure limits as defined by local guidelines must be reduced to a level which demonstrates the 'so far is reasonably practicable' premise.

Improvements in technology, workforce involvement, maintenance and procedures have led to recent reductions in injuries and incidents but, it is recognised that more still needs to be done. It is important that all personnel, especially new starters, have the necessary awareness and basic skills training to recognise and avoid exposure to hazardous substances.

Worker exposure to hazardous substances in the offshore industry can be affected in various ways by environmental concerns. The substitution of less environmentally hazardous substances can introduce substances that are potentially more hazardous to human health. An example of this is the removal of various ozone-depleting chemicals under the Montreal Protocol which led in some cases to changes to more hazardous or asphyxiating, fire-fighting gases (such as carbon dioxide and nitrogen). With recent restrictions, tetrachloroethylene has been suggested as a replacement for Arklone for oil-in-water tests.

It should also be noted that a policy of substitution has led to the removal of some substances directly toxic to workers, as well as to the environment, from materials used in the offshore industry (e.g. cadmium, lead, polychlorinated biphenols). However, the greatest impact of this policy has been on the nature and use of chemicals in drilling.

The design of offshore facilities should reduce exposure of personnel to chemical substances, fuels, and products containing hazardous substances. Use of substances and products classified as very toxic, carcinogenic, allergenic, mutagenic, teratogenic, or strongly corrosive should be identified and substituted with less hazardous alternatives, wherever possible. For each chemical used, a suitable and sufficient risk assessment should be available and readily accessible on the facility.

Author's Details:

Steve McCrorie
BSc(Hons) BOHS Dip Occ Hyg,

Head of Occupational Health and Hygiene,
Sypol Ltd

Reader Reply Card No 109

ELDS™ Open Path Gas Detector Technology Presented at ISA '09

Senscient recently presented its ELDS open path gas detection technology and ELDS™ (Enhanced Laser Diode Spectroscopy) Series detectors at ISA Expo in Houston

In addition to demonstrations of the company's innovative ELDS line-of-sight open path gas detectors Jean Berthold, Senscient CMSO, presented "Principles of Open Path Gas Detectors for Toxic Gas Hazards using Enhanced Laser Diode Spectroscopy" in the ISA Safety & Security Exchange X-Pod Theatre

ELDS gas detection technology is cited as the first and only system capable of detecting both combustible and toxic gases selectively with discreet communications outputs from one line-of-sight gas detection system for up to 60% reduction in capital expenditure. Current configurations are available for Methane + Hydrogen Sulfide in Sour Gas and Low Level Methane for all applications in the Oil and Gas industries.

Reader Reply Card No 110

First Hosted Software for Managing Gas Detectors

Industrial Scientific (USA), has introduced iNet Control as the first hosted software application for managing gas detector fleets. This service is included with every iNet subscription, providing visibility into alarms, maintenance and usage.

When alarm events happen, iNet Control shows which gas detectors had an alarm, when the alarms happened, and where they happened. It also tells what the gas hazards were and how much gas was present. This data can show users if employees are at risk from exposure to harmful gases. Equally important, it helps in identifying and monitoring high-risk areas. Providing visibility into gas detector maintenance can help keep a program in top working order. iNet uses Industrial Scientific DS2 Docking Stations to automatically perform gas detector testing, calibration and bump testing. iNet Control provides assurance that these functions are performed as scheduled. Users also know when gas detectors were last calibrated; if a sensor is about to fail or expire; and when calibration gas is low, empty or expired.

Visibility into equipment usage helps eliminate operator mistakes that may compromise safety. iNet Control shows team leaders if any gas detectors were used without a bump test or calibration. It shows if any team member turned off their gas detector in alarm conditions. It also shows if any alarm settings or datalog intervals are not set correctly.

Users may view trend graphs for a quick overview of the health of their program or sensor-level detail for each gas detector. These tools help safety professionals identify the source of potential problems and take steps to save lives. iNet Control also allows users to compare their program to industry averages. Or, users can customise their data to measure performance to internal standards. Because iNet Control is hosted over the Web, it does not require organisations to install any hardware or software. All ongoing upgrades are included; when a new feature is added, iNet subscribers will have instant access to it the next time they log in.

Reader Reply Card No 111

Gas Leak Detection Simulation Tool

Gassonic (Denmark) has developed the World's first gas leak simulation tool. The new Simulator can be accessed in a trial version on Gassonic's website www.gassonic.com/simulator. The Simulator makes it possible to experience why ultrasonic gas leak detectors are widely used for quick gas leak detection in challenging conditions found on most outdoor oil and gas installations on- and offshore.

As the Simulator shows, the major advantage of implementing ultrasonic gas leak detectors for fixed detection of high-pressure gas leaks is the fact that the system responds to the distinctive ultrasound created by the leak. This means that the detectors pick up gas leaks at the speed of sound without having to wait for the gas to accumulate and physically enter a point sensor head (conventional point detector) or within a narrow beam (open path gas detector). The acoustic detection method is thereby also unaffected by unknown factors such as wind conditions, gas dilution, and leak direction.

Reader Reply Card No 112