

## Occupational Health

# A Systematic Approach to Health Risk Management in Oil And Gas Industry

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Oil and gas sector in India are subjected to legislation and regulation concerning Occupational Health and Safety. With the increase in legislation and the drive for ever-greater efficiency and accountability, health and safety in oil and gas is becoming an increasingly important subject. This article covers the essential health issues that apply specifically to Oil and Gas industry, including the nature and causes of occupational injury or illness, relevant occupational health legislation applicable in India and occupational health risk management for the industry.

According to the WHO Health for All principles and ILO Conventions on Occupational Safety and Health (No. 155) and on Occupational Health Services (No. 161) every worker has the right of access to occupational health and safety services, irrespective of the sector of the economy, size of the company, or type of assignment and occupation.

It is estimated that unsafe work conditions is one of the leading causes of death and disability among India's working population. These deaths are needless and preventable. ILO estimates that around 403,000 people in India die every year due to work-related problems.

Occupational health aims at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risk resulting from factors adverse to health; the placing and maintenance of workers in an environment

adapted to their physiological and psychological capabilities.

The ultimate objective of occupational health is a healthy, safe and satisfactory work environment and a healthy, active and productive worker, free from both occupational and non-occupational diseases.

The oil and gas industry is potentially more hazardous than many other industries as it has many diverse activities, including processes, operations and materials which can pose risks to health, safety and the environment. As the result of these, workers are exposed to large number of hazards such as Physical, Chemical, Biological and Psychological hazards that can pose a potential risk to health and wellbeing.

## Applicable OH Legislation for Oil & Gas Industry in India

Most countries reinforce Occupational Health and Safety by implementing laws, which regulate the measures the companies have to take with regards to health and safety. In

India, the applicable regulations on Occupational health for oil and gas industry broadly fall under:

The Petroleum and Natural Gas (Safety in Offshore Operations) Rules, 2008 Provides regulation of health and safety in offshore oil and gas exploration, exploitation, production/ drilling and matters connected therewith.

**Mines Act 1952**

Provide regulations relating to the health, safety and welfare of workers in oil mines.

**The Factories Act 1948**

Regulates health, safety, welfare and other working conditions of workers in factories.

**Health Hazards in Oil & Gas Industry**

Virtually all the health hazards common to industry are present offshore. They include: chemical hazards (toxic, corrosive, irritant and sensitizing substances and possible

Phases	Employee health effects	Community health effects
Geological Survey	<b>Biological and Physical agents</b> <ul style="list-style-type: none"> <li>• Infectious disease</li> <li>• Food/Water borne illness</li> <li>• Wild life and Vector induced illness</li> <li>• Noise</li> </ul>	<b>Biological and Physical agents</b> <ul style="list-style-type: none"> <li>• Infectious disease</li> <li>• Food/Water borne illness</li> <li>• Wild life and Vector induced illness</li> <li>• Noise</li> </ul>
Drilling	<b>Physical agents</b> <ul style="list-style-type: none"> <li>• Drilling Mud</li> <li>• Petroleum products</li> <li>• Radioactive sources</li> <li>• Noise</li> <li>• Ergonomic</li> <li>• Psychosocial</li> </ul>	<b>Physical agents</b> <ul style="list-style-type: none"> <li>• Drilling Mud</li> <li>• Petroleum products</li> <li>• Noise</li> </ul>
Production	<b>Chemical and Physical agents</b> <ul style="list-style-type: none"> <li>• Drilling Mud</li> <li>• Petroleum products</li> <li>• Radioactive sources</li> <li>• Treatment chemicals and metals</li> <li>• Temperatures (Hot/cold)</li> <li>• Silica/asbestosis</li> <li>• Noise and vibration</li> <li>• Solvents</li> <li>• Ergonomic</li> <li>• Psychosocial</li> </ul>	<b>Biological and Physical agents</b> <ul style="list-style-type: none"> <li>• Drilling Mud</li> <li>• Petroleum products</li> <li>• Metals</li> <li>• Noise</li> </ul>
Refining	<b>Chemical and Physical agents</b> <ul style="list-style-type: none"> <li>• Petroleum products</li> <li>• Treatment chemicals</li> <li>• Metals</li> <li>• Temperatures(Hot/cold)</li> <li>• Silica/asbestosis</li> <li>• Noise and vibration</li> <li>• Solvents</li> </ul>	<b>Chemical and Physical agents</b> <ul style="list-style-type: none"> <li>• Petroleum products</li> <li>• Metals</li> <li>• Load</li> <li>• Noise</li> </ul>

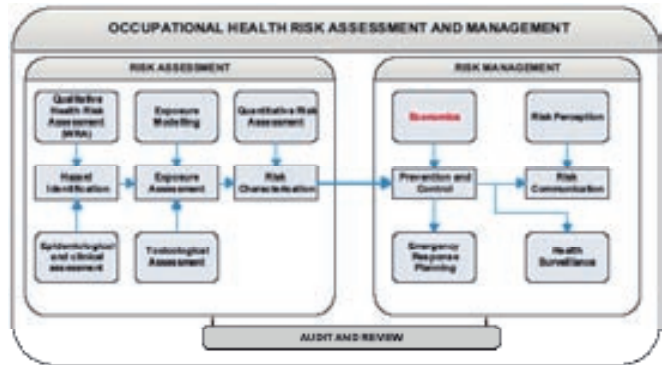
Table 1

carcinogens); physical hazards (noise, vibration, various forms of radiation, thermal extremes); biological hazards (food poisoning, Malaria); ergonomic hazards (manual handling activities, workstations, VDUs); and psychosocial hazards associated with either the work (Isolation, hours of work, tours, shifts, work load and content, fatigue, etc all of which can contribute to psychological stress

The below table illustrates the health hazards during various phases of operations in Oil and gas industry.

**Managing Occupational Health Risks in Workplace**

Occupational health risk management is a logical and systematic method of identifying, analyzing, assessing, mitigating, monitoring and communicating health risks associated with an activity, function or process in a way



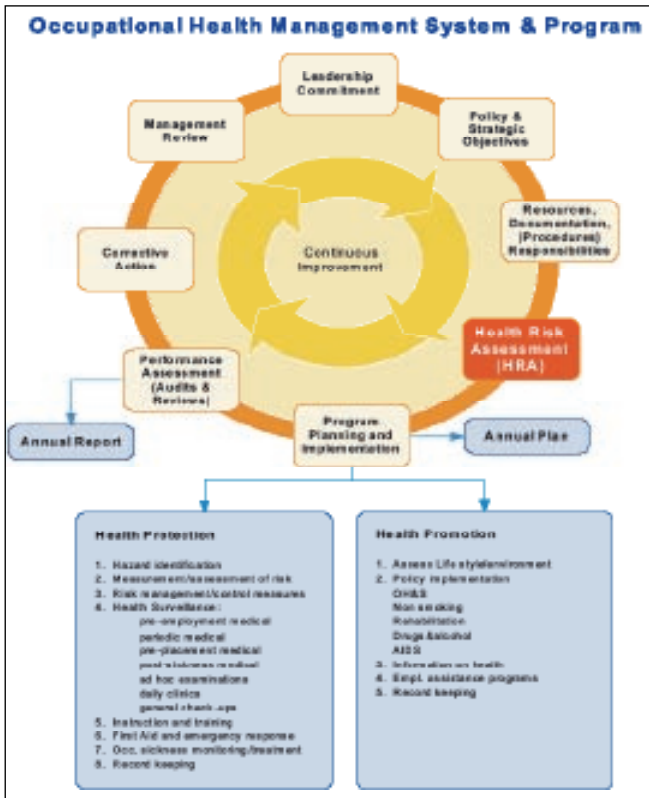
that will enable organizations to control health risk. It is an integral part of any management process as illustrated in the diagram.

**Occupational Health Management System (OH-MS)**

The management system for occupational health provides the framework for the process of identifying hazards, assessing associated risks, taking action and reviewing the outcome. Like any modern management system it conforms to the kind of management system as it was developed for quality management (ISO9000). OH-MS shares with other quality management systems and has to be integrated into the existing management systems with a goal of continuous improvement of performance through review of activities at all stages.

The following diagram illustrates the elements of a management system for OH-MS and programs

OH-MS objective is to prevent occupational diseases and to promote the employees health. In occupational health the deliverable is the absence of occupational diseases resulting in a healthy and productive worker.



Following elements are necessary to establish an effective Occupational Health Management System

OH-MS Elements	Requirement
Leadership and Commitment	Commitment of the top management to good OH practices
Policy and Strategic objective	Organizations appreciation of all significant OH hazards for planning, hazard identification, risk assessment and risk control
Organisation & resources	Organisation of people, resources and documentation for good OH performance
Health Risk assessment	Identification and evaluation of OH risks for the activities, products and services and development of risk reduction measures
Planning and Implementation	Planning and conduct of work activities including planning for changes and emergency response. Broadly the programs can be classified into Health protection and Health promotion programs
Monitoring and corrective actions	Performance and monitoring of OH activities and corrective action as necessary
Auditing and reviewing	Audit program and procedures for periodic audits to determine and review whether the OH management system conforms to the planned arrangement for OH-MS and commitment to continual improvement.

Table 2

### Occupational Health Management Programs

The organization should have a documented OH-MS (strategies and plans of actions) to achieve its policy and objectives. Broadly the programs can be classified into health protection and health promotion programs

#### A. Health Protection Programs

##### ● Health Risk Assessment

Health risk assessment has been broadly defined as the methodology to predict unwanted health effects from work, other activities and the environment. HRA consists of (1) hazard identification (2) risk evaluation (3) risk control and (4) risk reduction measures.

##### ● Health Impact Assessment

To assess the potential health risk and benefits to the population with regards to the operations. The Health impact assessment offers an opportunity to identify health hazards in advance and mitigate any negative effects.

##### ● Occupational Health Surveillance and Fitness for Task Assessment

A program of periodic medical history and examination, and relevant tests of exposed workers, to ensure that the employee is not harmed by the work they do, or the environment they work. Also health surveillance is required as part of national and local occupational health regulation.

Fitness for task assessment is to ensure that the individual working for an organization are able to do so without risk to themselves and others.

##### ● Emergency Preparedness and Response

The organization should actively assess potential accident and emergency response needs, develop plans, procedures and processes to cope with them, test its planned responses, and seek to improve the effectiveness of its responses.

#### B. Health Promotion Programs

Health services aimed at promoting the health of employees on identified health issues at work. This includes

##### ● Assessment of Risks Related to Life Style and Environment

To identify key employee health issues and develop programmes to educate around prevention, harm reduction. Where appropriate these programmes needs to be extended beyond the workforce and into the community; examples might include HIV, tuberculosis, smoking, obesity, heart disease, malaria and vaccination programmes.

● **Management of Ill-health in the Workplace**

To provide access to health care to mitigate the effects of ill health on their ability to work effectively, post illness or injury to facilitate employee rehabilitation and return to work. Have a system to provide access to primary, secondary and emergency medical facilities as well as appropriate counseling and employee assistance as and when required.

**Conclusions**

The approach towards occupational health in oil and gas sector has to be set in the context of the challenge of working in a remote and hostile environment where attention to health and safety is integral and vital for the business to operate smoothly and efficiently. Top management commitment is a pre-requisite to the success of occupational health management. Health risk assessment determines the

required occupational health program; standards for this can be adopted from local laws and or industry or international codes. Successful implementation of occupational health program requires competent personnel.

Occupational health is an important strategy not only to ensure the health of workers, but also to contribute positively to productivity, quality of products, work motivation, job satisfaction and thereby to the overall quality of life of individuals and society. ■



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## U.S. Maritime Administration Issues Record of Decision for TORP’s Bienville Offshore Energy Terminal

**Washington, DC:** Maritime Administrator David T. Matsuda on Friday signed the Record of Decision approving the deepwater port application submitted by TORP Terminal LP for a license to own, construct and operate the Bienville Offshore Energy Terminal, an LNG regasification facility located in the Gulf of Mexico, 63 miles south of Dauphin Island, Alabama in a water depth of 425 feet.

“This is another important step in making the Bienville Offshore Energy Terminal a reality,” said Joe Berno, CEO of TORP Terminal. “In addition to the Bienville Terminal’s innovative technical solution, we plan to transform the way that regasification capacity has been offered to the industry. Our goal is to provide the lowest annual cost of holding regasification capacity in the United States.” According to Lars Odeskaug, CEO of TORP LNG, “This Record of Decision proves that smaller terminal developers can introduce innovative solutions, both

technically and commercially, to offer long term access to the world’s largest natural gas market at very attractive terms. Similarly, we have developed the EasyLNG technology, which is designed for use in protected waters and offers the lowest re-gasification rates for small to medium volumes. We have already received interest from clients in South America, Asia and Europe that would benefit from this technology.”

The Bienville Offshore Energy Terminal will use the award-winning HiLoad Technology and a floating re-gasification unit with no permanent offshore structures. The Terminal will also utilize closed-loop ambient air vaporization, which is a preferred solution of the Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA) and environmental groups. The Terminal will have a peak LNG sendout capacity of 1.4 Bcf per day and be able to accommodate any

LNG carrier without modification to the incoming vessel. The Bienville Terminal’s location in the northeastern Gulf provides ready access to markets in the U.S. Southeast, as well as those in the middle and eastern portions of the nation. Other benefits include the proximity to underground natural gas storage facilities and existing pipelines to Florida while avoiding the congestion along the Texas-Louisiana border.

TORP Terminal LP has offices in Houston, Texas and Mobile, Alabama. The company is a limited partnership owned by TORP Technology Inc., TORP LNG AS and Siemens Financial Services, Inc. The Bienville Terminal uses air for heating the LNG, saving fuel costs and reducing environmental impacts. For more information on TORP Terminal LP, go to [www.BienvilleLNG.com](http://www.BienvilleLNG.com) TORP LNG AS is a privately owned Norwegian company specializing in LNG terminal development and LNG loading technology.