

Importance and need of Fire and Safety in Upstream and Downstream – Oil and Gas Industry

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Abstract

Oil and Gas industry plays vital role in development of country in world. Oil and Gas industry has various challenges in terms of Health, Safety and Environment. It has impact on society as manpower in world are involved in extraction of oil and gas. Hydro carbons in gas is highly flammable which is real time challenge to handle and control to unlikely event. Emergency preparedness is necessary and awareness among the employers and employee's community is spread through training and drills. Many accidents happened in decades which changed the safety measures and requirements emerged. Safety and control systems are modernized in upstream, midstream and downstream sectors of oil and gas. Incidents results in loss of life, loss of asset and affect to society. Emission of fumes and smokes adversely have effect on eco system. Objective to publish this paper is control risk of oil & gas sector industries.

Keywords:

Oil & Gas Industry Fire Safety, Risk Control, Influence of oil & gas industries, Fire prevention and emergency response.

Objective:

- To prevent Fire & Explosion.
- Risk Control in Oil & Gas Sector Industries.
- Increasing profitability.
- Protect Environment.
- Importance of Training.

Introduction

The oil and gas industry have lots of influences to world today. Oil and gas have direct influence on every other commodity in the market. Therefore, it is critical to identify risk and their solutions through technological innovation to maintain global economic balance and need. Oil and gas industry has positive and negative impacts. Positive Impacts is good for environment as well as society and negative impact is bad for environment as well as society. Impact depends upon taken control measure of employer and their employees during different phases of oil & gas production and enforcement of rules and regulation by respective state or country government authority or government.

The oil and gas industry are essentially subdivided into three phases and these include:

- Upstream sector
- Midstream sector
- Downstream sector

Note that the midstream sector is also included in the downstream sector.

Upstream sector: The upstream sector of the oil and gas industry involves processes including the searching for and the recovery of crude oil as well as its production. In the

upstream sector, discovery or exploration of crude oil takes place. This involves intensive and extensive efforts towards ascertaining the actual places where crude oil is located. Exploration is a very difficult process and therefore requires the service of experts in the field. More so, information technology plays active roles in the exploration or searching of crude oil in order to easily discover new grounds where oil is located and therefore take advantage of them.

The upstream sector includes different operations such as the searching for prospective underwater oil and gas fields, drilling of exploratory wells and also making requisite operations on the well so as to bring the crude oil or natural gas to the ground surface.

Downstream sector: The downstream sector of the oil and gas industry involves the refining of the crude oil and/or raw natural gases obtained in the upstream sector as well as selling or distributing the products obtained. Many products are derived from the refining of crude oil and these may include diesel oil, liquefied petroleum gas (LPG), asphalt, petroleum coke, gasoline, fertilizers, antifreeze, plastics, rubbers, pesticides, synthetic rubber, jet fuel and many more.

The downstream sector of the industry is the sector that relates with the consumers. Facilities involved in this sector include petrochemical plants, oil refineries, natural gas distribution companies, retail outlets etc.

The main processes involved in the upstream and downstream oil and gas operation include the following:

1. Exploration
2. Extraction
3. Refining
4. Transporting
5. Marketing

Management of safety in oil and gas production aims at a more proactive approach that combines both health and environment. Safe operations generally result in environmentally prudent practices.

The industry is striving to develop clear corporate policies and objectives that ensure that process standards, guidelines, and procedures are followed. Training of employees is at the core of most safety programs.

Production operation safety is focused toward offshore operations where loss of life and environmental damage can be much more devastating.

The downstream sector of the industry has broad scope and tentacles. These include crude supply, trading, refining, product distribution, marketing and retailing. Lots of products are involved here including conventional fuels such as gasoline and diesel and low carbon fuels such as bio diesel.

Offshore Training: Training is an important part of a safe operation. All personnel need adequate training on their respective discipline to enhance skill and competency. Records are required to be maintained.

Human Factor: One safety area receiving more attention is the human factor that determines if jobs are structured to be within human capacities. An ergonomic checklist is as follows:

- Equipment controls should be easily identified, reached and operated.
- Equipment displays should be easy to read and understand.
- All controls and displays on a platform should be consistent.
- All control and displays should behave in a way personnel expect.

Environmental Pollution: Environmental pollution is a major issue in the upstream oil and gas sector. There is lots of oil and corroded pipelines still used today resulting to oil spill which degrades the environment. This need control measures like policy, procedures and legislations for oil and gas sector and effective implementation to control the spillage, Smoke from flares and chimneys, Vapours and Gas release etc.

Health, Safety and Environmental Security: The safety of the human environment as well as health protection should be the number one priority or concerns in the oil and gas industry. Legislation like implementation of ISO15926 has forced oil and gas companies to comply it. Hydraulic fracturing, a common technique in extracting gas from unconventional reservoirs have resulted to lots of environmental concerns and issues with the water table. Therefore, oil firms should pay greater attentions to health and safety issues with broader operation concerns through the various stages of the value chains.

Fire Prevention and Emergency Response: One of the main concern in upstream and downstream of oil and gas is Fire prevention. Hydrocarbons are highly flammable and also vessels pertaining Crude and gases may lead to explosion in case of failure of relief valves. Adequate sensors, Alarms, Sprinklers, Siren, Emergency and rescue provisions.

Conclusion:

The upstream and downstream value chains of the oil and gas industry face lots of challenges which have been clearly evaluated to protect environment and prevent any future harm. These challenges have constrained lots of activities in the oil and gas industry and crippled lots of processes. However, it has also become quite clear that information technology and automatic devices including robotics are highly needed to solve these challenges in the oil and gas industry as well as every other industry in the twenty first century. Identifying challenges of oil & gas industries, resolving them through technology, Innovation and effective control measure give positive results in economic development of society and protect to environment.

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