

# Occupational Safety and Health in Oil and Gas Industry in Kuwait

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**Abstract:** This essay will discuss the risks, safety concerns, and related operating procedures in the oil and gas sector. While drilling a well in the oil and gas industry, several implicit dangers could arise and put the workers in danger. Workers in oil and gas wells may be exposed to hazardous gas or implicit fire. Keep an eye out for potentially toxic gases, make appropriate preparations, and implement training programmed for personnel as the three common procedures to assist prevent damage and death (foreign employees working at a remote oil and gas field site located in **Kuwait**). Workers in the oil and gas industry who are not protected from the hazardous compounds produced there may get occupational diseases of the lungs, skin, and other organs. This essay will also focus on potential risks and life-threatening catastrophes connected to **Kuwait's** onshore and offshore oil and gas drilling operations. To avoid mishaps like fire explosions, well blowouts, uncontrolled wells, helicopter and sea catastrophes, the maintenance of drilling equipment needs to include more health and safety checks at every usage.

Date of Submission: 01-11-2022

Date of Acceptance: 12-11-2022

## I. Introduction

No matter where they work in the world, it is thought that all employees are protected equally. An organization named SHE has been founded to make sure that all staff members are trained continuously to the necessary level so they can combat any potential threats that may arise on the site (onshore or offshore).

Occupational safety and health management is a major concern and a practical issue in the oil and gas industry. Because of the nature of the labor, it is regarded as a high-risk industry. Because they have an impact on human life, workplace risks (whether onshore or offshore) warrant investigation, and there are numerous measures that can be taken to lessen those impacts. As a result, the industry is known in **Kuwait** for having high rates of risks and injuries, particularly those involving physical injuries. Some employees in the oil and gas industries frequently experience stressful situations or brief physical pressure.

On the other hand, most industrial locations have combustible materials, which increases the risk of fire. The materials used in the oil, gas, and petrochemical industries are a blend of hydrocarbons and chemicals, some of which may be modified by a process.

There are certain methods used to determine, assess, and examine the safety of designs as well as revisiting current operations and

processes in the chemical, pharmaceutical, and oil and gas industries. These methods include the following:

- 1- Hazard and Operability study (HAZOP)
- 2- Event Tree Analysis (ETA)
- 3- Fault Tree Analysis (FTA)

A Hazard and Operability (HAZOP) Study is a planned, systematic examination of an operation to identify, assess, and manage potential risks in both planning and execution. A team of engineers conducts this research, looking at each node or component of a system, plant, or operation (node), taking into account probable deviations from intended functioning and analyzing the effects of such deviations in comparison to any existing safeguards. The effects of the identified risks on property, safety, and the environment are evaluated. The safety result construct has been measured using a wide range of methods in numerous safety climate research.

- Self-reported safety behaviors in the workplace are one of these techniques.
- Safety performance evaluations from managers, authorities, and supervisors.
- Accident statistics provided by businesses to investigate workplaces with factories that have both high and low accident rates.
- Workplace occurrences and accidents that were self-reported.

All of these techniques have positives and negatives. Construction companies' workplace accident data

could be affected by arbitrary activities, making the method susceptible to differences in reporting. Accidents might not be reported to the proper authorities. Statistics produced by a company may ultimately be useless due to insurance concerns, rivalry, and low variance. Due to reporting bias, self-reported metrics, however, could also be rendered useless. As opposed to company-generated statistics, Yule (2003) argued that gathering such reports anonymously may be advantageous since they may be more likely to reflect the actual situation. According to Mearns et al. (2003), self-reporting of incidents is a trustworthy method of evaluating injuries and accidents within businesses.

The self-reporting of incidents in **Kuwait's** construction sector needs more attention. It is a sector that experiences frequent, rapid change, which makes it difficult to use traditional assessment techniques. Furthermore, the majority of **Kuwaiti** construction firms lack recorded data, and even those that do withhold it out of concern about insurance issues and competition (Al-Humaidi& Tan, 2010; Al-Tabtabai, 2002; Kartam&Bouz, 1998; Kartam et al., 2000).

#### Challenges to oil and gas workers' health

The eight components of an oil and gas company's health management system are managed using a percentage tool, according to the International Petroleum Industry Environmental Conservation Organization (IPIECA), the international oil and gas industry association for

environmental and social issues. The percentage is based on a self-evaluation each organization completed to determine the degree of compliance with each element's standards. The tool is filled out with the percentage of the organization that complies with each level from 1 to 4. 100 percent must be added to the total.

Level 1: A process that is being developed.

Level 2: The process is in place, but it hasn't been properly entrenched and applied.

Level 3: The system is operational, the process has been put in place and is being followed, and results are being tracked.

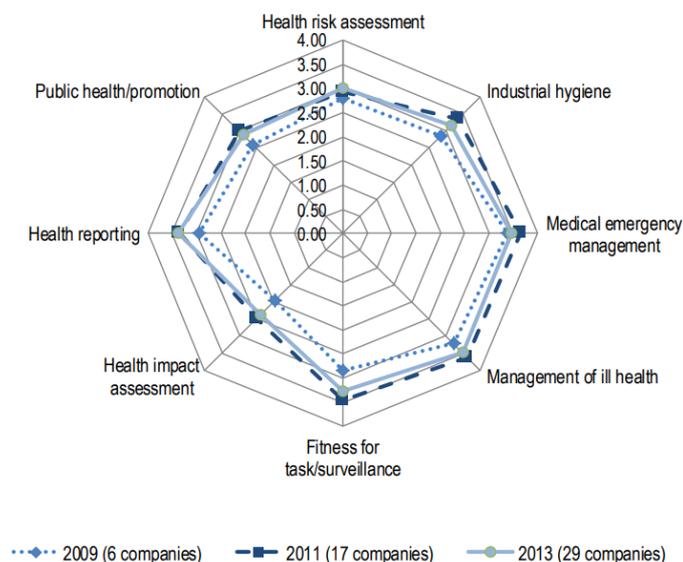
Level 4: Process established and put into practice; system maintained and supported by continual process of improvement.

The percentage tool's results are presented as a radar chart with levels 1-4.

The results from the companies that participated in the percentage tool data collecting for the most recent years are shown in Figure 1 (six companies in 2009, 17 in 2011, and 29 in 2013). The graph demonstrates how businesses have gradually improved their health and safety performance measures throughout the years. Companies should put more effort into enhancing their performance in the following areas, in particular: health impact assessment, health risk assessment and planning, public health interference and promotion of good health, industrial hygiene and control of workforce exposure, and health reporting and record management.

**Figure 1**

Source: IPIECA and OGP: *Health and safety performance indicators: 2011 data and 2013 data, Report No. 2011h of Oct. 2012 and Report No. 2013h of June 2014.*



### Drilling accidents for oil and gas

Thousands of workers are injured and hundreds of workers die each year while carrying out their duties in the oil and gas drilling and production industries. Numerous chemical, safety, environmental, and ergonomic hazards have been reported for decades throughout the world due to the unpredictable and dangerous nature. Whereas, number of fatalities and life severe injuries has been indicated during onshore and offshore drilling and maintenance operations round the globe. There are several underlying causes of huge desasters.

### Oil and gas drilling hazards classification

Due to the complex and potentially fatal activities and occurrences, oil and gas drilling is consistently regarded as one of the most difficult and dangerous processes in nature.

However, both onshore and offshore oil and gas drilling operations include a number of potential risks. As stated below, the majority of them fall into four main categories: safety, chemical, ergonomic, and environmental dangers.

#### 1. Safety risks

In practically every industrial context, safety hazards are among the most prevalent and often occurring workplace dangers.

Safety risks are listed as one of the most prevalent risk categories in oil and gas exploration operations at onshore and offshore drilling domains. Additionally, the following risks were listed by safety and health professionals as being present during oil and gas drilling activities: slipping and falling, falling from a height, dropping objects, getting stuck in equipment, being electrocuted, and being in a confined space.

#### 2. Chemistry dangers

Due to inappropriate handling of hazardous drilling fluids during the oil and gas drilling process, numerous injuries and catastrophic burns are reported each year. The well drilling procedure is a step in the oil and gas exploration process.

#### 3. Ergonomic dangers

Because the drilling crew must do various physical activities during each task, the oil and gas drilling process is strongly linked to ergonomic risks. While the majority of lifting and handling tasks are now carried out using sophisticated technology or cranes, the rate of ergonomic injuries is still rising as a result of poor handling and lifting techniques. When ergonomic risks were identified at both onshore and offshore drilling sites due to inappropriate lifting of drilling pipes, poor posture while handling, awkward or rapid motions, repetition of the same activities, and the application of excessive force during jobs.

#### 4. Ecological dangers

One of the main issues facing the global upstream oil and gas sectors is environmental risk. However, compared to onshore drilling, the rate of accidents caused by environmental concerns was significantly higher. Additionally, during offshore drilling operations, these environmental dangers have impacted maritime and helicopter operations. Additionally, a major worry that poses a considerable risk to the offshore environment and marine life is the substantial oil spill that occurs throughout the drilling and production processes.

## II. Conclusion

Numerous drilling crew members encounter risky and difficult conditions each year as a result of health and safety concerns at oil and gas drilling sites. Oil and gas drilling operations are therefore thought to be three times more dangerous than the construction sector and twice as dangerous as other industries.

In order to identify these potential risks and dangerous oil and gas drilling operations at onshore and offshore drilling locations, a thorough literature study that is based on work that has been published over the last 18 years was done.

According to the overall conclusion of this review article, it has been stated that both onshore and offshore drilling operations are dangerous. While in both the drilling and maintenance domains, maintenance work was strongly linked to safety, ergonomic, environmental, and chemical risks.

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