

# GAS PRICES & WORKER SAFETY

By Gigi Klaiber

**As gas prices continue to drop across the U.S., occupational safety standards may also decrease to reduce production costs and increase profit margins. Current trends include seeking new ways to most efficiently maintain occupational safety standards without the burden of increased cost.**

**Is the value on production** outweighing the value on worker safety? This article examines the correlation between decreased prices of oil and gas and decreasing safety for workers in that industry.

## Increasing Operational Efficiency

According to the U.S. Energy Information Administration, the average retail price of regular gasoline in the U.S. on Aug. 29 last year was \$2.24 per gallon: the lowest price on the Monday before Labor Day since 2004 (Hamilton, 2016). Despite robust gasoline consumption in countries such as India, China and the U.S., growth in supply has steadily outpaced consumption since 2015. Refineries have the ability to adjust petroleum product yields by improving production processes and upgrading their equipment.

In 2015, refineries increased production of gasoline to take advantage of high margins. As a result, gasoline production exceeded the growth in demand, which was followed by the excessively high gasoline inventory levels that remained steadily above 5-year averages and caused the drop in gasoline prices.

Today, one conundrum for experts is how to increase operational efficiency without increasing expenses. The recent collapse of oil and gas prices was followed by attempts to decrease operational expenses by spending less on safety equipment. Oil and gas refinery operation is a complex downstream industrial process that involves a wide range of equipment and materials that create potential dangers for workers. Identifying these hazards and making fundamental changes to ensure safety is critical for preventing injuries and deaths at work.

## Safety Wake-Up Calls

Unfortunately, fires, explosions and gas leaks are still common at oil rigs and refineries. For example:

- 2015: Oil rig inferno in Upton County, TX. Reason: absence of personal hydrogen sulfide monitors and not wearing flame-retardant clothing.

- 2013: An ExxonMobil refinery caught fire in Beaumont, TX. Reason: employer failed to remove residual stored hazard-

ous energy from the E-1 exchangers to allow for a safe opening of the equipment.

- 2012: Black Elk Energy Offshore Operations LLC oil platform in the Gulf of Mexico. Reason: insufficient fire hazard activities at the inactive oil platform.

- 2012: Chemical release and fire at Chevron Corp. in Richmond, CA. Reason: failed to upgrade the piping.

- 2010: A catastrophic BP oil rig explosion in the Gulf of Mexico. Reason: a series of mechanical failures and human errors, valuing production over safety.

- 2009: A deadly incident at Valero Energy's refinery in Texas City, TX. Reason: a boiler explosion.

These oil rig and refinery incidents were caused by failure to follow OSHA guidelines, usage of outdated equipment, a lack of organizational safety policy or adherence to such policies, or by negligence.

Safety must be a core value and a main concern in the oil and gas industry. People's health and lives are priceless. In addition, it makes great financial sense to keep workers and the environment safe. Eliminating consequences of incidents is much more expensive than preventing them.

## Occupational Safety Trends

A number of current trends in safety approaches may hold the key to maintaining occupational safety with a focus on production efficiency. Creating a new safety model should involve the general public in emergency planning and air quality control, as well as giving surrounding communities access to information and data.

## New California Regulation

New regulations to strengthen workplace safety in oil refineries were recently proposed by California's Department of Industrial Relations, California EPA and the Governor's Office of Emergency Services (Brelsford, 2016). The Department of Industrial Relations commissioned a study to assess the impact.

The costs and benefits to implement the regulation are addressed in two categories: those to the industry and those to society. These initiatives were driven by the fast-changing situation in the oil and gas industry and were sped up by the recent major fire and chemical release in California. Their main purpose is to



Decontamination of containment boom used in the 2010 Deepwater Horizon oil spill.

prevent incidents at refineries and protect workers and nearby communities against exposure to health risks.

For years, many companies have implemented exactly the same safety measures and performed exactly the same safety activities, trying to improve safety without taking into consideration rapid advancements in technology and changes in the economy and the environment. In current market conditions, companies should start working together with government agencies to implement the highest possible level of safety culture. To maintain profitability, companies must focus on ensuring consistently safe operations to avoid compliance violations.

## New OSHA Regulation

In 2015, OSHA announced important changes to regulations regarding severe injury reports. The 1-year impact evaluation report on the implementation of 2015 OSHA regulations, which require employers to report severe injuries within 24 hours, shows that employers and employees are more likely to increase efforts to make their work environment safe when they are collaborating with OSHA. Today, instead of sending inspectors to the site where injuries occurred, OSHA responds by providing all the necessary materials to allow employers to perform or conduct their own investigation and find a solution to the problem.

Reports filed by industry sectors in 2016 show that among the major sectors the oil and gas industry has the lowest hospitalization rate of 3% and amputation rate of 4%. However, based on the number of filed claims and compensation received, OSHA officials believe that only about 50% of severe injuries have been reported. Many employers, especially small and medium companies, prefer to hide the problem rather than fix it. Oil and gas industry data show that safety is the number one priority for the oil and gas industry and, in many cases, safety measures are being implemented successfully.

## European Safety Model

Adopting the European approach to occupational safety could be another trend in the future of occupational safety in the oil and gas industry. "U.S. regulators should adopt the approach taken by the U.K. and Norway, in which oil producers are required to prepare detailed analyses and plans prior to obtaining drilling permits," suggests Tom O'Connor, executive

director of Council for Occupational Safety and Health (COSH). A European safety model would be based on community and worker education and involvement. This new approach emphasizes the importance of the general public's involvement in emergency planning, which could be achieved by providing full access to relevant data and information.

The positive experience of the countries where this safety model has been implemented indicates that their success was based on the presence of several regulatory prerequisites including:

- having a designated governmental unit dedicated to enforcement;
- having a sufficient number of highly competent inspectors for the initial licensing evaluation and audits, who are able to evaluate technical operations, training effectiveness and safety culture;
- establishing a dedicated funding source, which would come from fees paid by the oil and gas industry;
- encouraging refinery operators to adopt policies and practices beyond those that are required under the existing law.

## Investing in New Technology

Another trend is an increased willingness to invest in new technology from adjacent industries. "Unlike in the past, the oil and gas industry now embraces emerging technologies from adjacent industries," says Daniel Choi, Lux research analyst. "Weaker oil prices will likely facilitate the more rapid adoption of new technology, such as fit-for-purpose rigs for onshore drilling," says Mike Mueller, vice president of technology development with Micro-Seismic. "The decline in oil prices could result in companies going either toward doubling down on efficiency imperatives or focusing on technology investment, depending on the exploration and production company's culture, talent, leadership, play circumstances and the regulatory regime under which they operate."

A number of technologies from adjacent industries have the potential to significantly increase the safety of operations in the oil and gas industry including:

- automatic tracking of all procedure specifications and tools status parameters;
- programmable control and security of pump systems;
- automatic security of procedure devices.

New equipment and technologies will require cross-industry employment and the highly skilled, experienced technical professionals to run them.

## New Safety Best Practices

Developing safety best practices that allow new technology to be implemented at lower costs will be critical for future implementation. "Efficiencies have a way of moving through the industry in quicker periods of lower prices," says R.T. Dukes, an upstream analyst with Wood Mackenzie. "Companies are developing best practices at all times and those practices get implemented faster at lower prices." Preventing incidents rather than just improving emergency response is the best cost-saving strategy.

## Facing the Future

Global energy demand is expected to increase nearly 25% by 2040 according to ExxonMobil's 2018 prediction despite efficiency gains. Although alternative fuel sources have been developed, oil will remain the main source of energy in the nearest future. Since energy is fundamental to today's society, the refining will remain crucial to the nation's economy. Therefore, in the contemporary world, policies that influence energy production should be based not only on what is good for the industry, but also on understanding what is best for the consumers and for the environment. The oil and gas industry influencers and the community enthusiasts should combine their forces to create a safe environment around extraction sites and refineries without compromising fuel production efficiency. **PSJ**

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# The Dangers of GAS DETECTION IN COLD WEATHER

By Analisa Harangozo

**For people in North America, especially the northern regions, this time of year marks a shift in weather and working conditions. When leaves start changing colors, people start to gather firewood and homeowners begin winterizing because they know what the temperatures will soon be.**

**In some parts of North America,** temperatures can dip far below 0 °F. Cold temperatures can be unpleasant and inconvenient for people at the best of times, but for natural gas employees, these temperatures can present a real danger for a long time. In some areas of the world, cold temperatures can persist for 6 to 8 months. Portable gas detectors have a lower operating temperature of -4 °F (-20 °C), which can be challenging for natural gas employees who work outside in colder conditions. It is impossible to accurately detect gas leaks or assess air quality in weather conditions that are below the equipment's operational rating, and employees should be cautious in those conditions.

## Wyoming Natural Gas Explosion

One North American natural gas field was the site of a cold weather tragedy on Nov. 22, 2013. It was a cold morning in Wyoming, and five natural gas employees were performing their work as usual. At 10:15 a.m., the workers began welding repairs on a condensate tank. They completed a prejob safety analysis, got a signed work permit and took a lower explosive

limit reading with a calibrated monitor. But a spark ignited gas vapors in the piping and caused an explosion. Four of the five workers were hospitalized and the fire could not be extinguished until 1 p.m.

While the workers did everything correctly given their work and equipment readings, the conditions just were not right for their gas detection equipment. Even though their equipment readings suggested that it was okay to begin working, the atmosphere was too combustible and explosive to consider welding there. The temperature was below the rating of their detection equipment by 9 °F, with a recorded temperature of -6 °F and a wind-chill of -13 °F or lower. At temperatures that low, the workers' gear would not function, and they had no way of being certain of the gas levels despite the levels being far too high for safely welding.

## Gas Detection in Cold Weather

Accurate gas detection readings in cold weather can mean the difference between life and death. Even under optimal conditions, workers cannot rely on their sense of smell or sight to detect gas hazards. Inaccurate gas detection readings can result

in workers being exposed to dangerously toxic or oxygen-deficient atmospheres and becoming ill. Flammable gases like the ones in Wyoming can also result in deadly explosions if they are not detected or planned for.

In general, if it is too cold to stand outside and work for a long time, it is also too cold for the gas detection instrument. Portable gas detectors can be used at lower temperatures for intermittent periods but be mindful that at the -4 °F mark the instrument will become sluggish, and the display could become dim or go blank if frozen. Battery run time is also reduced, sometimes by as much as 30% or 40%.

Before the season gets really cold, start winterizing gas detection equipment. Make sure the unit's case and exterior are intact, and dirty or damaged filters are replaced. Always check the instrument battery before going out to work and charge the battery in temperatures between 32 °F and 122 °F. Store detectors in a humidified area when not using them to prevent the aqueous electrolytes from drying out. If a sluggish instrument with a dim display must be used, bump test it before each use to make sure it is responding. Keep the instrument inside your coat and the tubing near the collar around your nose and mouth to keep it warm with body heat. When using monitors outside for more than 20 minutes, let them stabilize at the ambient temperature for 15 to 20 minutes before using, and zero the sensors in fresh air.

Gas detection equipment can save lives and reduce the risk of incidents on work sites, but only when working in optimal conditions. Be aware of the limitations of equipment and the environment you are working in, especially when working in cold weather. **PSJ**

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