

Next Generation Oil & Gas

## Safety First!

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‘Safety First!’, ‘Training Makes A Difference!’, ‘Buckle Up for Safety!...we’ve all seen safety posters like these – and most likely, haven’t given them much thought as we walk by them. Safer work sites are not created by better safety posters, however. If we really want to make safety a priority on the work site, we need to make safety part of the culture.

The oil and gas industry is facing an interesting challenge. It is no secret that energy prices are rising along with demand. This is good news for the industry, but these increases create a need for more workers and for more drill rigs to produce the needed products. Unfortunately, the statistics show that in addition to higher employment figures, accident rates are also increasing. Almost 100 people died in this industry in both 2005 and in 2004, according to the latest statistics from the Bureau of Labor Statistics. Using an estimated US worker population of 310,000, the oil and gas industry has a fatality rate of around 32 per 100,000 workers. This is about the same as coal miners, twice the rate of construction workers, and eight times the national average for all workers. Clearly this number needs to be reduced.

A quick look at fatality reports shows us that the single largest category of accidents in which workers are killed, over one third of the total, occurred when they are driving or riding in moving vehicles. Most of the accidents occurred on highways and involved hitting other vehicles or stationary objects, or when their vehicles jack-knifed or overturned. Moving between work sites seems to be a dangerous business, but working on the rigs themselves is just as dangerous. Workers are caught in or struck by the equipment, fall from the platforms, or are injured by explosions. It is no secret that working on oil and gas rigs is risky, but there are things that can be done to reduce the risk and, therefore, the injuries that workers are experiencing.

### Recent safety improvements

The oil and gas industry is aware of its safety challenges and is working to address safety concerns. The International Association of Drilling Contractors (IADC) and the Society of Petroleum Engineers (SPE) conferences this year have highlighted some innovative ways that the industry is trying to improve safety.

ConocoPhillips, for example, is working toward making safety a core value in the Arkansas, Louisiana, and Texas region (IADC/SPE 98956). A review of Occupational Safety and Health Administration (OSHA) recordable injury incidents revealed an unacceptable increase in injuries, especially for contract workers. ConocoPhillips wanted to change their work culture so that safety

was a primary goal of the operations. Changing culture is not easy, but this program began by providing safety leadership training for first line supervisors, and creating a Safety Leadership Team comprised of operations managers and business owners. The program is several years into its implementation and is showing tangible results, from decreases in the OSHA total recordable rate to improvements in cost efficiency of operations.

Improvements to safety can be made through cultural shifts, as ConocoPhillips did, or can be more narrowly focused on single problems. The high rate of fatalities due to highway motor vehicle accidents was a problem that was addressed in this way. At the SPE International Health, Safety and Environment conference in 2006, Schlumberger safety specialists presented a risk-based driving improvement plan that had been implemented in Qatar. Using detailed data on transportation accidents, researchers were able to identify the root causes of the driving incidents and, with the help of managers, create a safety improvement plan that was presented to the workforce. The safety plan, which relied on training and rewards for improvement, included specific action items that were both measurable and determined to be related to motor vehicle safety. Preliminary findings of the Schlumberger study show that employees' driving performance has improved and that accident rates have declined.

These two examples illustrate important common threads to improving safety. Whether addressing safety issues in general, or safety concerns due to a specific cause, the process is similar. The crucial first step relies on using data to identify problem areas and to understand the current safety issues in the company/region/industry. The next is to engage workers and management, eliciting their input and including their participation in developing a solution. The implementation of the solution or safety plan should be supported from all levels of the companies involved. Finally, data are continued to be collected so that the plan can be assessed and adapted as necessary to address changing needs. Companies with the resources to implement HSE programs are showing improvements using this model.

### **The government is here to help?**

A fact of business is that safety programs cost money. While safety efforts that prevent injuries and reduce safety violations are cost effective over time, small companies often do not have the resources and personnel to create or implement an extensive, ongoing safety assessment and training program. The National Institute for Occupational Safety and Health (NIOSH) is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness, and is part of the Centers for Disease Control and Prevention in the Department of Health and Human Services. NIOSH has a history of working with industry and its regulatory partners to increase safety, decrease injury costs, and create secure and productive working environments.

NIOSH has collaborated with some of the most inherently dangerous industries in the United States, with positive results. In late 1996, Congress transferred the health and safety research functions of the former US Bureau of Mines to NIOSH, along with a wealth of engineering experience in dealing with an industry well known for the high risks involved in extracting minerals from underground and surface mines. NIOSH is now well-known in the mining industry for its expertise and its ability to work with industry to solve practical problems using an engineering-based analysis and control approach.

The mining program is responsible for major improvements in safety engineering in mines and for the development of many technologies, devices, and training products that protect miners. More

recently, engineers in the mining program in Spokane, WA have teamed with NIOSH staff in Alaska to work at reducing injuries on commercial fishing vessels in the waters of the Pacific Northwest. The success of this project, which took an engineering intervention from concept to installed prototype in less than four months, demonstrated the effectiveness of this approach to resolving safety hazards in high-risk industries, even when the engineers had no prior expertise specific to the industry. Collaborative activities among the US Coast Guard, the commercial fishing industry, workers, and NIOSH have contributed to a 67 percent decline in the number of commercial fishing fatalities in Alaska between 1990-2005.

Improving safety through research requires that we use data to identify problem areas and to understand the current culture of safety. NIOSH is looking at the oil and gas extraction industry and has discovered a history of cyclical trends in fatality rates. As the demands for oil and gas increase, the fatality rate goes up. While the common wisdom is that these changes are due mainly to increases in the number of new or inexperienced workers, part of the change may also be related to increased demand on existing workers. As the demand for oil and gas rises, the number of active drill and workover rigs also increases. These numbers show the same cyclical annual trends as the numbers of fatalities, and may be a better predictor of risk than the employment figures. It is likely that increased demands on workers and machinery can lead to failures in both.

In preliminary analyses of industry fatality data, NIOSH has discovered two safety issues that individual companies could address to improve injury rates, both involving protective gear. Safety equipment is only protective when it is used. Like the bike helmet swinging from the handlebars, an unbuckled seatbelt is not going to protect you in an accident. Over a third of all oil and gas fatalities in 2005 involved transportation incidents. Wearing seat belts, even on short trips between sites, can save lives. Management can reinforce this message by always wearing seatbelts themselves and by enforcing seatbelt use among workers. The second area is fall protection. OSHA fatality investigation reports for 1996-2000 detail 20 fatal events involving a worker falling from heights. Seven of those workers clearly would have lived had they been wearing the fall protection that was available to them at the time of the incident. Putting the fall protection gear on anytime you are working at heights can save your life.

### **The next steps in improving safety**

Demand for energy in our nation is increasing the pressure on the oil and gas industry to produce. An increase in the number of workers, particularly inexperienced workers, and the corresponding increase in the number of operating rigs are both contributing to rising accident and fatality trends. While companies are truly concerned about the safety of their workers, market demands are increasing. Injuries to oil and gas extraction workers reflect poorly on the entire industry. Unsafe conditions increase costs, both directly through OSHA citations and workers compensation, and indirectly through work stoppages and lowered worker efficiency. The boom cycle in this industry is good for companies, but shouldn't be bad for workers. NIOSH has a history of working collaboratively to improve safety, and looks forward to working with existing HSE programs and providing assistance to companies that lack the infrastructure to have their own extensive safety assessment program. Together we aim to decrease the rate of injuries in this industry while maintaining production capabilities.

NIOSH has identified the oil and gas industry as a priority for improved worker health and safety and has begun the process of data gathering and safety assessment. We invite the participation and expertise of the oil and gas industry in this effort as we look to provide a safer work environment for all workers. We will use our proven expertise in the areas of hazard assessment, development of

safety interventions, and effective communication of findings to industry. To be successful, each step must involve continuous interaction and collaboration with industry, labor, regulators, and other stakeholders. This type of collaboration will ensure that the interventions developed are properly targeted, technologically feasible, and culturally acceptable to the industry and its workers. We look forward to working with industry partners, and to creating safety solutions that will send every worker home safely at the end of every shift.