Electrical Safety Oil and Gas



WHAT'S AT STAKE?

The issue of safety in the oil and gas industry will not likely subside soon. With energy demand in countries in the Middle East, China and Brazil expected to continue growing oil and gas activity worldwide is expected to increase to meet demand. Add to this, the U.S. oil and gas industry ramps up exploration and production of shale resources in the Gulf of Mexico and Alaska.

Arc flashes, fires, explosions occur on shore and off shore operations in the volatile oil and gas industry.

WHAT'S THE DANGER?

What's Arc Flash?

Arc flash, a release of heat energy that includes molten metals, hot metallic oxides and toxic burning smoke, is often violent, and deadly. Arc flash temperatures exceed 35,000 degrees Fahrenheit, hotter than the sun's surface, with 700 miles per hour projectile-producing pressure, which can throw a person across a room.

An estimated five to 10 arc flashes occur each day in the United States, according to a report from the National Institute for Occupational Safety and Health.

Arc flashes pose a particular risk **offshore**, where lower voltage machinery with between 480 and 600 voltages while not recommended is frequently worked on without the machinery being shut down. While no work is or should be done live on medium voltage machinery in general, work done on low voltage motor control centers and distribution boards cannot typically be shut down in a critical operation. Never work on live equipment but the reality is that people sometimes do.

A stumble by a worker or a dropped tool may cause conductors to be crossed, creating a blast. Damaged or overheated equipment, particularly **offshore**, are other factors that can lead to an arc flash.

One arc flash incident can cost up to $15 million, including healthcare costs, workers compensation, replacing equipment, increased insurance premium, and lost production time.

A 2010 report from the International Oil & Gas Producers Association found that 16.1 percent of all fatalities at oil fields were caused by an **electrical accident,**

explosion or burn.

Fires and explosions are the third most common cause of worker death in the **oil and gas industry**. One out of seven occupational fatalities in the **oil and gas industry** results from a fire or explosion. From 2004 to 2008, fires and explosions caused 18.7 percent of worker deaths in the **oil and gas industry**, according to the U.S. Bureau of Labor Statistics.

HOW TO PROTECT YOURSELF

1. Awareness of the risk of arc flashes began to grow significantly as videos of incidents began to be posted online, and studies of security camera footage on offshore and other facilities showed arc flash incidents. The public videos really accelerated the market demand for arc flash safety information. Administration and industry standards groups began seeking to quantify the risk and drive change.

Government-backed research efforts, particularly in the United States (IEEE standards) and Europe (IEC standards) to investigate arc flashes, also led to the release of technical information and specific videos showing the damage that arc flashes pose. Once the manufacturing community and industry standards bodies and customers became more aware of equipment dangers, they recognized the need to quantify the risks.

To quantify the risk, manufacturers have begun labeling equipment showing the arc flash energy that could be released at a particular distance. Customers have also begun training employees to understand the labels. If a piece of equipment could emit a certain level of calories per centimeter squared, they have to wear a certain level of protection equipment or deem the equipment non-approachable.

While workers wearing the right protective equipment can still sustain injury, the risk of arc flash associated with new equipment manufactured has been lowered thanks to information now available. **The lowered risk has been made possible by arc-resistant Personal Protective Equipment.**

2. **Prevention of arc flashes really comes down to education**, and helping workers better understand the risks, as well as identifying risk areas for arc flashes and identifying tools that can mitigate this risk. Operators should have an **arc flash mitigation plan** in place both for existing equipment and new projects.

To prevent arc flashes, companies should evaluate their systems for hazards, determine incident energy exposure and arc flash boundaries, and use warning labels to indicate arc flash hazards.

Other steps companies can take:

- Minimize or preferably eliminate the amount of work done around live equipment.
- Use remote diagnostic and maintenance tools.
- Install devices to reduce energy rather or in addition to containing energy.
- Utilize properly designed and installed equipment for new and existing installations are also critical in mitigating arc flash hazards.

3. As the awareness of arc flash dangers has grown, customers and contractors are standing up and demand change. **North American oil and gas companies** are leading to focus on more awareness of arc flash safety, implementing efforts to address arc flash throughout their operations from workplace safety to the types of equipment they purchase.

Offshore operations get safer as awareness of safety grows in electrical and other aspects of offshore oil and gas operations.

The combination of efforts **by standards bodies, workplace safety initiatives, and equipment design for offshore and onshore rigs, infrastructure, pipelines and refineries** make the oil and gas industry safer for all its workers.

FINAL WORD

The oil and gas is a safer industry efforts of by the combination of STANDARDS Bodies, Workplace Safety Initiatives and Equipment design for off – shore and on shore rigs, infrastructure, pipelines and refineries.