

WORKPLACE

Material Handling & Safety

Oil & Gas 2020



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Oil and Gas Industry: Recognizing Hazards

By: **Shelby Jenuwine**, Contributing Writer

Potentially one of the most hazardous industry sectors in the U.S., the oil and gas industry employs over 9.8 million workers. Indeed, these workers are engaged in various industrial processes needed to successfully extract oil and natural gas—processes that frequently require the use of specialized equipment, hazardous materials and skilled work crews. This frequent use of specialized machinery and hazardous materials poses a threat to the industry and its workers under the dangerous conditions within the working environment.

Recognizing Hazards

Recognizing and controlling safety and health hazards in the oil and gas industry is critical to preventing injuries and fatalities on the jobsite. The leading cause of injury and death within this industry is overwhelmingly due to vehicle accidents due to the workers and equipment being required to be transported to and from well sites. Wells are often located in remote areas and require traveling long distances to get the various work sites. Roughly 40% of workers killed on the job in the oil and gas industry are killed as a result of a highway vehicle incident.

Other common safety and health hazards associated with oil and gas extraction include:

- Struck-by, caught-in, caught-between;
- High-pressure lines and equipment;
- Explosions and fires;
- Confined spaces;
- Falls;
- Ergonomic hazards;
- Electrical and other hazardous energy; and
- Chemical, gas and vapor exposure.

Struck-by/Caught-in/Caught-between Hazards

According to the Occupational Safety and Health Administration (OSHA), three of every five on-site fatalities in the oil and gas industry are the result of

struck-by/caught-in/caught-between hazards. Workers are often exposed to struck-by/caught-in/caught-between hazards from multiple sources, including moving equipment and vehicles, falling equipment and high-pressure lines. Struck-by hazards may be created when the connections securing high-pressure lines fail.

Internal erosion of high-pressure lines may result in leaks or line bursts, exposing workers to high-pressure hazards and compressed gases. Workers exposed to a wide variety of equipment, including:

- Top drives and kelly drives;
- Drawworks;
- Pumps and compressors;
- Catheads;
- Hoist blocks; and

- Belt wheels and conveyors.

Injuries can occur if workers are struck-by or caught-between the unguarded machines.

Confined Spaces

Oil and gas workers are also often required to enter confined spaces, such as petroleum and other storage tanks, mud and reserve pits and other excavated areas around a wellhead. Safety hazards associated with confined spaces include the ignition of flammable gases, such as well gases, vapors and hydrogen sulfide, which can be released from wells, trucks and production and surface equipment. The most catastrophic disaster workers face is the risk of fire and explosion caused by the ignition of these gases. Between the high use of electricity and fuel to run the different machinery, a tiny spark could have devastating consequences. Ignition sources can include:

- Static and electrical energy;
- Open flames;
- Lightning;
- Cigarettes;
- Cutting and welding tools; and
- Hot surfaces and frictional heat.

Confined spaces that contain, or have the potential to contain, a serious atmospheric hazard must be classified as permit-required confined spaces, tested prior to entry and continuously monitored.

Falls, Slips and Trips

Another notable leading causes of injury and fatality are due to falls, slips and trips, which can occur when workers access platforms and equipment located high above the ground. OSHA requires fall protection to

prevent falls within the industry. Two common types of fall protection equipment include the fall arrest system and a fall restraint system. The fall arrest system consists of a vertical lifeline, connectors, lanyard and harness with an anchorage point overhead, serving to arrest the fall of a worker. The fall restraint system consists of a harness, lifeline and/or lanyard, and a 5,000 lb. capacity anchor which keeps the worker from reaching a fall point.

Ergonomic Hazards

Individuals may also be exposed to ergonomic hazards from lifting heavy items, bending, reaching overhead, pushing or pulling heavy objects, working in uncomfortable body positions and performing the same or similar tasks repetitively. Risk factors and the resulting injuries can be minimized or, in many cases, eliminated through interventions such as pre-task planning, use of the correct tools, proper placement of materials, and early recognition and reporting of injury signs and symptoms.

Hazardous Energy Exposure

Electrical current exposes workers to a serious, widespread workplace hazard. Many workers in the oil and gas industry are exposed to electrical and other hazardous energy while completing their daily responsibilities and may be unaware of the potential hazards present in their work environment, making them more vulnerable to the dangers. Exposure to uncontrolled electrical, mechanical, hydraulic, or other sources of hazardous energy can occur if equipment is not designed, installed, and maintained properly. During the servicing and maintenance of machines and equipment, the unexpected startup or release of stored energy can result in severe injuries or death to workers.

Workplace safety covers a large and assorted set of procedures, conditions and environments, ranging from personal safety, which protects the individual worker, to operational and process safety, which focuses on procedures and the equipment that keeps hydrocarbons and other hazardous materials properly contained.

Understanding the best safety practices and being trained in the tasks to be performed prior to reaching the job site is essential to ensure the safety of the worker and those around them. Many companies within the oil and gas industry use the Job Safety Analysis Process (also referred to as a JSA, Job Hazard Analysis, or JHA) to identify hazards and find solutions.



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Are You Too Protected To Do Your Job?

When you work in oil and gas, ensuring you're safe at work can be a real challenge. Whether upstream, midstream or downstream, undoubtedly you'll need fire-resistant clothing. And that's just the bare minimum - depending on the hazards specific to your particular job function you might need to pile on a whole host of other protective gear.

No one wants to be on a job site without the proper protection, but sometimes protection makes it difficult to actually do your job. From too much bulk to wearing heavy materials in sweltering heat - staying safe in oil and gas can sometimes be an uncomfortable experience.

At Superior Glove, we recognize that personal protective equipment (PPE) is only effective if you're wearing it, and you'll only be wearing it if it's comfortable and allows you to perform your job.

That's why we design our innovative safety gloves with safety and comfort in mind.

Leveraging Technology for Better Protection and Comfort

Known for our innovation in glove design, we leverage technology to equip our safety gloves with the protection you'll need in a glove you'll want to wear.

Chemical Protection

If you need chemical-resistant gloves that can also stand up to the rugged conditions of an oil rig, then check out our Chemstop Impact-Resistant PVC Gloves. These award-winning gloves offer protection from chemical hazards as well as cut, abrasion, puncture and impact hazards - talk about gloves that can do it all!

Despite all this great protection, these gloves still offer the best flexibility and dexterity in their class.

Cut Protection

There's cut protection and then there's cut protection. Our extreme-cut gloves are so comfortable and dexterous you won't believe they offer the highest level of cut protection possible - ANSI Level A9.

But that's not all! Our specially designed liner not only protects you from cuts but also from punctures to an amazing ANSI Level 5. The rugged goatskin leather shell offers great protection from abrasions, and our exclusive Oilbloc treatment ensures your gloves stay impermeable to oils and liquids.

Fingertip Protection

Did you know that your fingertips are one of the most sensitive parts of your body? Makes sense, right? You rely on your fingertips for the vast majority of your tactile sensory experiences, but all this heightened sensitivity means it'll hurt that much more when you get injured. Fear not; our PinchGuard technology was designed specifically to protect you from painful fingertip injuries.

Hidden comfortably in the fingertips of your gloves, PinchGuard technology is barely noticeable but there when you need it to protect against devastating crush and pinch injuries.

The best part? These comfortable gloves are jam-packed with other essential protections for work in oil and gas, including impact protection and Oilbloc treatment.

Get Your Hands in a Superior Glove

Designed with you in mind, Superior Gloves are rugged enough for the demands of the oil and gas industry yet comfortable enough for all-day wear.

Contact [Superior Glove](#) today to start a trial of our innovative safety gloves at your facility. Business.development@superiorglove.com | 1.800.265.7617



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OSH Leadership Helps Deliver Strong Business Outcomes

By: **Diana Stegall**, CSP, CFPS, ARM, SMS, CPCU, President, American Society of Safety Professionals

The oil and gas industry accounts for most of the world's energy generation. Those market demands create significant operational stress and present many risk factors that impact every worker and every aspect of the broader business. Common threats to workers include chemical exposure, falls from height, confined spaces, remote locations, and the fact that the oil and gas industry has more deaths from fires and explosions than any other private industry.

Needless to say, a company that makes occupational safety and health (OSH) a priority experiences widespread benefits.

Even so, [surveys have indicated](#) that top executives might not fully understand the value of keeping workers safe. Some business leaders perceive workplace safety simply as a compliance-driven requirement or feel-good initiative that unnecessarily costs their organizations money. Many don't understand how they could maintain a profitable business by valuing safety above everything else. Too often the emphasis is placed on recovery from adverse events instead of designing safety into the system from the beginning.

That's where OSH leadership comes in, helping businesses in every industry manage risks and realize the benefits of a proactive commitment to keeping workers safe. That doesn't mean incorporating a few safety elements, but creating a culture where safety exists throughout the organization. High-performing companies – especially those in the oil and gas industry – see real returns when they integrate experienced safety professionals into operations and continually identify, analyze and evaluate risks.

When an organization creates a safe and open environment in which workers feel valued and engaged, employees tend to come forward with innovative ideas that make the company an even safer place to work with higher productivity. As a result, every dollar earmarked for safety gets multiplied and returned to the bottom line.

According to the U.S. Bureau of Labor Statistics, [more than 5,000 workplace fatalities](#) occur in the U.S. each year. Another 2.8 million workers sustain non-fatal injuries and illnesses. These numbers demonstrate that businesses have room for improvement.

Employers that invest in safety will reduce injuries, illnesses and fatalities, resulting in cost savings in many areas, and that boosts profitability. Safety leadership has the knowledge and experience to implement [safety and health management systems](#) that provide an innovative framework to reduce risks, decrease incidents and the need to train replacement employees, lower workers' compensation costs and medical expenses, avoid costly litigation, and prevent penalties for non-compliance.

Companies in the oil and gas industry worldwide are adopting safety and health management systems to better understand and address the gaps in their programs and implement what is needed to reduce hazards to their employees.

It all comes together when quality and productivity can flourish in a designed system that manages all operational components and eliminates hazards. A safe company is a successful company.



Looking further at the parallels between OSH leadership and financial performance, here are more ways that a strategic focus on worker safety and health can lead to improved profitability:

- A positive public image is attractive to customers and investors who want to be associated with organizations that are viewed as safety minded, health conscious and sustainable.
- Major incidents that result from a culture in which safety is not ingrained can lead to costly disaster mitigation projects. Management's commitment to safety at all levels ranks as the most important factor in distinguishing between organizations with high and low incident rates.
- Major incidents also can halt production lines and lead to extended downtime that could have serious financial implications.
- Improved employee satisfaction leads to higher productivity that drives short-term revenue growth and supports long-term sustainability.

- Recruiting and retaining top talent is easier for organizations that provide safe and comfortable workplaces, demonstrate care for employee well-being and protect the environment. Workers are the lifeblood of any industry, and having top talent increases the ability to generate healthier profit margins.

Simply put, OSH leaders understand how to transform safety programs from compliance-based cost centers to corporate sustainability initiatives that save lives and boost profits. They help executives develop a business model that anticipates risk, is based on industry research, and has safety ingrained into its DNA. And they understand the value of following [industry consensus standards](#) that promote best practices and technologies, and help companies exceed mere regulatory compliance.

From a broad perspective, OSH leadership strengthens company culture by including safety as a matter of course and not as a stand-alone function. This approach improves any modern business operation. Safety is far more than an employee perk or recruiting

tool. Truly valuing workplace safety helps define a company's mission and plays a significant role in guiding the business strategy and delivering positive outcomes.

About the Author:

Diana Stegall is the 105th President of the [American Society of Safety Professionals](#), serving a one-year term that ends June 30. Stegall is Executive Vice President of Rivendell Safety Consulting. She was the first woman named ASSP's Safety Professional of the Year in 2005 and is a two-time recipient of the Society's Charles V. Culbertson Outstanding Volunteer Service Award. She resides in Oro Valley, Arizona.



124 Years of Quality

Tingley provides protective apparel and workwear for the petrochemical industry, including safety toe boots, steel toe boots, neoprene boots and overalls, jackets and suits. Because you're tough and hardworking... we need to be, too.

Tingley understands that your work is as demanding as it is important, and you deserve to be safe, comfortable and protected in any environment.

Mud, rain, chemicals, traffic, wind, darkness – the elements and hazards are no match for the durability, reliability and protection that Tingley boots and apparel provide.

Behind every Tingley product is more than 124 years of quality and excellence. The company has been protecting generations since its founding by Charles O. Tingley in 1896. From its humble beginnings as a bicycle tire plug company, this U.S. based, 5th generation family business has innovated and grown to offer a full line of protective, liquid-proof footwear and clothing.

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Ideal Applications: All electric and gas utilities, power generation, pipeline and construction work, T&D petrochemical applications, petrochemical, chemical, offshore drilling, or any applications where flash fire protection is required.

Chemical Resistance: Many acids, oils, alcohols, salts and alkalies.

[Click here to learn more about Eclipse.](#)

- 1 Flame resistant. Self extinguishing with flameout and afterglow less than or equal to 2 seconds after removal of ignition source and char length less than 6 in. Test method ASTM D6413.
- 2 Arc Resistant. Meets ASTM F1891 requirements for Arc Thermal performance. For Arc data please contact customer service.
- 3 Flash Fire Resistant. Meets ASTM F2733 requirements for flash fire rainwear on jacket and overall styles only.

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Chemical Resistance: Fats, oils, certain acids, alkalies, petroleum hydrocarbons and other chemicals.

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we need to be, too.

We understand that your work is as demanding as it is important and you deserve to be safe, comfortable and protected. Fires, collisions, slips and falls – industry hazards are no match for the durability, reliability and protection that Tingley boots and apparel provide.

Protecting Lone Workers in the Oil & Gas Industry

By: **Tae-Yeon Won**

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What do you do when you send a worker out to a remote location, but when it comes time to check in, he's nowhere to be found? Do you know if he's safe? Do you assume he forgot, only to find out that he was overcome by gas hazards and had nobody to turn to for help?

Situations like this are the devastating reality for too many lone workers. Lone workers in upstream and midstream oil and gas face the same hazards as their on-site peers, but they can't rely on a coworker for help in an emergency. When they face danger on the job, it could be hours or even days before help arrives.

Unfortunately, protecting lone workers presents special challenges, even in an era of constant connectivity. Many devices, including gas detectors, have connectivity features designed to automatically relay information from a lone worker back to safety personnel on site. Although connectivity features are helpful in protecting our most vulnerable employees, not all lone worker solutions deliver the protection they need.

Here's what to look for in a lone worker device so your people have the lifeline to safety they need:

- **Integrated Solution** – Many lone worker devices can provide GPS tracking or a panic button or a man down alert or gas detection with live monitoring – but lone workers often need all of these features in one device. The more devices you add, the more likely it is that one will be lost, left behind, or run out of power. When investing in a device, look for one that gives them all the tools they need in one package.
- **Automatic Failover Connectivity** – Lone workers often work in remote areas with little to no cellular coverage. When that happens, your worker is truly alone, and you have no visibility into their safety. If something were to happen, such as an H2S alarm with no response, you would not know to send help. Your lone worker device must have automatic failover connectivity through another method. Cellular and satellite are an ideal combination for even the most remote locations.
- **Live Monitoring and Alerts** – You need live monitoring to see a worker's location at any given moment, but you should also expect real-time alerts. Nobody has time to constantly monitor a map, so look for a lone worker solution that offers instant, attention-grabbing text or email alerts. Those alerts should include the worker's name, location, and reason for the alert – whether the worker fell, triggered the panic button, or was exposed to a gas hazard.
- **Connectivity for Multiple Devices** – Most lone worker devices relay live data through a gateway back to safety personnel on site. Unfortunately, some of these gateways need extra infrastructure for every few monitors. With today's technology, you should be able to connect several devices with one gateway, saving you money.
- **Automatic Connectivity** – Being a lone worker is hard, so don't add the burden of troubleshooting connectivity issues. The best lone worker solutions automatically connect devices in the field to cloud



monitoring systems as soon as they're powered on – no questions asked.

- **No Maintenance** – Look for a lone worker solution with a no maintenance gateway – one that can run from a power supply like a vehicle and won't require charging or cables.

Looking out for the safety of your workers is a huge responsibility, but one you don't have to shoulder alone. If you choose your lone worker solution carefully, you can breathe easily knowing you have complete visibility into what your workers are experiencing, even when they're miles away.

Learn how to protect your lone workers at www.indsci.com/lone-worker.

A black and white photograph of a man in industrial safety gear. He is wearing a white hard hat, safety glasses, and a high-visibility vest over a dark jacket. He has a beard and is looking directly at the camera. An orange VENTIS Pro6 gas detector is clipped to his vest. The background is a blurred industrial setting.

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Safety in Numbers Has a New Meaning

Give lone workers a virtual safety network that dispatches help the moment they need it. Get live location, status, and gas alarm notifications from workers in remote locations to eliminate manual check-in guessing games.

Connect your team at
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Improved Safety for Back of Hand

By: **Joan Mantini**, Chief Editor

From brushing our teeth and driving, to handling heavy machinery and equipment, or even twisting electrical wires—our hands are the most accessible tools we use in endless daily tasks. And, because they're so important in almost everything we do, both on the jobsite and at home, hand injuries can indeed seriously affect all parts of a worker's day-to-day life. Unfortunately, every year, thousands of employees experience severe hand injuries at work.

In 2017 alone, more than 120,000 workers experienced a hand injury while on the job, accounting for almost 8% of all nonfatal workplace injuries. These injuries require time away from work, costing both the employer and employee money.

This is where ANSI/IEA 138 and EN 388 come to play. ANSI/IEA 138 and EN 388 are the U.S. and European standards for industrial gloves that protect against cuts, punctures, abrasions and chemical exposure—the guidelines that were put into place for direction a company can use to properly compare products and help find the best match for their specific application. The new voluntary standard published its first final version in February of just last year.

Turning our focus on to the oil and gas industry specifically, where the dangers workers face on a daily basis can indeed turn deadly, ANSI/IEA 138 has provided a check point for the dangers workers face in reducing back-of-hand injuries. Indeed, this is a step in the right direction, as figures show that in the oil and gas sector, fingers remained the most vulnerable part of the body, in terms of both lost time and recordable injuries.

The ANSI/ISEA 138 standard was designed to establish minimum performance, classification and labeling requirements for hand protection products designed to protect the knuckles and fingers from impact forces. The hand protection also needs to have the ability to perform occupational tasks. The standard evaluates compliant gloves for their ability to disperse impact forces on the knuckles and fingers, and then classify them accordingly.

To simplify, ANSI/ISEA 138 requirements specifically include:

- ▶ define an agreed test method;
- ▶ include defined performance levels;
- ▶ specify a pictogram mark for each of the defined levels for compliant gloves;
- ▶ and require that product be tested in a laboratory having a certificate of accreditation meeting the requirements in ISO/IEC 17025:2017, general requirements for the competence of testing and calibration laboratories.

Classified Information

Ranging from level one for the lowest protection, to a level three for the highest protection from transmitted forces, ANSI/ISEA 138 specifies three performance levels of impact protection that a glove can offer. It is important to know that during testing, if the fingers and thumb only meet performance level one criteria, yet the knuckles get a performance level two rating, the glove will only be rated as performance level one.

The standard defines specific test sites on the knuckles, fingers and thumb, and it requires the sites be marked on the outside and back-side of the glove. The gloves tested and classified will be marked with a pictogram for each of the three levels.

With this fairly new standard now in place to help classify various levels of impact protection, industries now have the opportunity to select hand protection most suited for the specific work needs to help reduce dorsal injuries.

“As a company committed to protecting the hands of workers around the world, Superior Glove is thrilled with the new standard, as it makes it easier for end-users to choose the best level of impact protection for their needs,” said Gerard Ross, Marketing Manager for Superior Glove. “The introduction of ANSI/ISEA 138 has helped to educate end-users and brought greater transparency to the manufacturing and marketing of impact-resistant gloves.

The result is empowered end-users who are now able to make better, more informed decisions about their safety—we think that's something everybody can be excited about.”

A Look at the Glove

It is recommended by OSHA that employers and employees choose gloves based on the employee's job duties, work environment, and the performance and construction characteristics of glove materials best suited to protect hands under specific working conditions. For example, although leather, canvas and fabric gloves may protect hands from dirt, splinters, abrasions, cuts and heat, they are not suited to fully protect against liquids and strong chemicals. However, neoprene, nitrile, vinyl and rubber gloves can protect against liquids and chemical hazards, yet each material here is only rated to protect against certain types of chemicals. Specialty gloves, or impact-resistant gloves, are better equipped for the aforementioned oil and gas industry, as they can be worn to protect against crushing injuries, heavy vibrations and situations where workers can be exposed to several hazards on the worksite.

Now that the fairly new ANSI/ISEA 138 guidelines and testing are in place, manufacturers of impact-resistant gloves welcome the challenges to meeting the product requirements. Since it's implication, the new standard has brought on new design elements and materials used in impact-resistant gloves, incorporating materials that protect, but are not rigid, as well as features that can absorb and disperse an impact—while still allowing workers the convenience of dexterity.

Impact-resistant gloves maintain protective features, such as thermoplastic rubber (TPR) or thermoplastic elastomers (TPE); and proprietary foams that protect the back of a worker's hand from unexpected impact, smashes, crashes and abrasion injuries.

Lockout/Tagout: Upgrading Your Safety Within an Oil Refinery

By: **Liz Cuneo**, Contributing Writer

At an oil refinery, or gas processing plant, there are many dangers, both obvious and hidden within the plant, that workers face each day. In fact, according to OSHA, there are numerous safety and health hazards and dangerous conditions that can result in fatalities for oil and gas workers including exposure to hazardous energy.

This energy includes uncontrolled electrical, mechanical, hydraulic, or other sources of hazardous energy. It happens when equipment is not designed, installed, or maintained properly. To prevent this, plan managers and personnel should have the proper administrative controls, such as operating procedures, developed and implemented to ensure safe operations. And, to control hazardous energy, a proper Lockout/ Tagout (LOTO) system must be in place.

“Lockout/Tagout covers the facets for any stored energy situations - when inadvertently released - that can cause harm, damage, injury, or death. Stored energy includes mechanical, hydraulic, thermal, pressure, process control, and even other stored energy such as gravity, springs (at tension),” says Phil Zee, Director of Product Management and Merchandising at Accuform.

When a machine is no longer operational, or is locked out for a variety of reasons, it’s important to communicate that message to employees. Lockout tags keep readers well informed and are designed with safety in mind. Many industries, not just in oil and gas plants, require LOTO, and when utilized properly, it does more than simply relay an important message; LOTO can save worker’s lives.

To ensure companies are in compliance, OSHA outlines specific action and procedures for addressing and controlling hazardous energy during the service and maintenance of these machines. It’s up to the staff and management in these refineries and plants to ensure that the standards are being met.

“Employers are also required to train each worker to ensure that they know, understand, and are able to follow the applicable provisions of the hazardous energy control procedures. Workers must be trained in the purpose and function of the energy control program and have the knowledge and skills required for the safe application, usage, and removal of the energy control devices,” says Lance Endsley, Regional Manager – West, ABUS USA.

But, according to Zee, it’s a practice that many companies need help with.

“Lockout/Tagout violations in the workplace continue to rank in the annual Top 10 Most Cited OSHA Violations, year over year. For 2019 it’s number four with 2,606 reported violations... The results can be severe or fatal injuries,” says Zee.

So, as you consider adding or upgrading your current lockout/ tagout systems to your daily operations, don’t be afraid to ask for help.

“Don’t be overwhelmed by the building of a program, break it up into pieces and really focus on the need for a Hazardous Energy Program. It is to keep your employees and everyone around them safe. There are multiple ways to start a program and endless amounts of companies and information available to help,” says Endsley.

OSHA is the best great starting point if you are looking to learn more about LOTO compliance. There, you can read up on the standards in place, as well as safe practices and procedures. Remember: Proper LOTO practices and procedures safeguard workers from the release of hazardous energy. The OSHA standard for The Control of Hazardous Energy (Lockout/Tagout) ([29 CFR 1910.147](https://www.osha.gov/SLTC/control-hazardousenergy/index.html)) for general industry, outlines specific action and procedures for addressing and controlling hazardous energy during the service and maintenance of machines and equipment. It comes down to proper employee training and cooperation to follow the applicable provisions of the hazardous energy control procedures.

Learn more at <https://www.osha.gov/SLTC/control-hazardousenergy/index.html>.



Many industries, not just in oil and gas plants, require LOTO, and when utilized properly, it does more than simply relay an important message; LOTO can save worker's lives.



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