



Volume 2 Issue 1

Fall 2006

BRANCH CHAIR'S MESSAGE - MIKE BRADSHAW

2006 is rapidly drawing to a close, and the Oil & Gas Branch has seen much progress throughout the year. Our website is up and running, we are publishing our newsletter regularly, we sponsored our first paper at the ASSE's Professional Development Conference (PDC), and our membership has increased to more than 170 members. This progress would not have occurred without the hard work of the Advisory Committee and membership.



ASSE Oil & Gas Branch Chair
Mike Bradshaw

I thank those of you who have contributed to our success. If you would like to help make 2007 an even greater success, we have a place for you. We need technical papers for sponsorship at the PDC and technical articles for our newsletter. Please e-mail me at mbradshaw@danos.com if you would also like to assist with our website, write for our newsletter or recruit new Branch members. SH&E professionals in the oil and gas industry have a lot of experience and expertise to share with the safety profession and with ASSE. I look forward to working with you in 2007.

Michael Bradshaw
Michael Bradshaw, CSP, CHMM

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API Preparing Study on Hexavalent Chromium

The American Petroleum Institute (API) is preparing the final draft of a report detailing findings from an air sampling survey conducted to evaluate inhalation exposures to hexavalent chromium during seven types of hot work: carbon arc cutting (CAC), flux-cored arc welding (FCAW), gas metal arc welding (GMAW or MIG), grinding, gas tungsten arc welding (GTAW or TIG), oxyfuel gas cutting (OFC or torch cutting) and shielded metal arc welding (SMAW or stick welding).

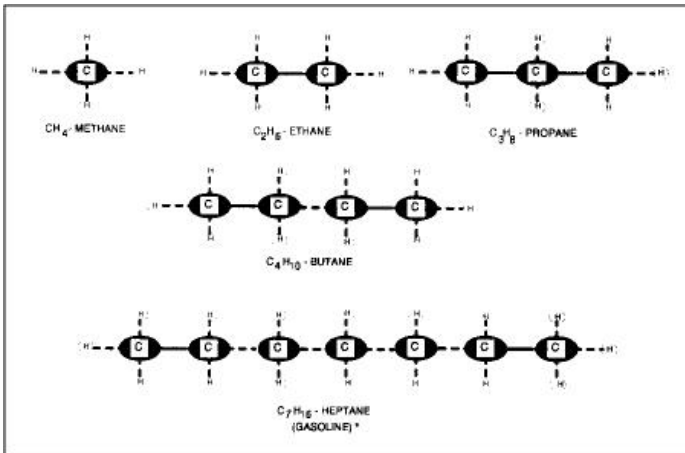
The survey was conducted during October and November 2005 at two different sites during maintenance turnarounds by API member companies and during April-June 2006 at three other company sites. API's Industrial Hygiene Task Force is editing this study. The final report should be of interest to many within the Oil & Gas Branch.

Natural Gas Basics

Natural gas is gaseous at any temperature over -258°F (-161°C). Since this is a very cold temperature, we normally consider natural gas a gas. Natural gas boils at atmospheric pressure and a temperature of -321°F (-161°C), exactly like how water turns into a gas (steam) at 212°F (100°C).

The composition of natural gas is never constant. However, methane is by far the largest component, its presence accounting for about 95% of the total volume. Other components are ethane, propane, butane, pentane, nitrogen, carbon dioxide and traces of other gases. Very small amounts of sulfur compounds are also present. Since methane is the largest component of natural gas, we generally use the properties of methane when comparing the properties of natural gas to other fuels.

Methane is a simple hydrocarbon, a substance consisting of carbon and hydrogen. There are many of these compounds, and each has its own number of carbon and hydrogen atoms joined together to form a particular hydrocarbon gas or fuel gas.



Methane is a very light fuel gas. If we increase the number of hydrogen and carbon atoms, we have progressively heavier gases releasing more heat, and therefore, more energy when ignited. For this reason, the heat content of butane, for instance, is greater than that of propane, and propane has more energy than methane per unit of volume.

Specific gravity of a gas is defined as the weight of a given volume gas compared to the weight of the same amount of air at the same temperature and pressure.

- Specific gravity of air = 1.00
- Specific gravity of methane = 0.55
- Specific gravity of natural gas = typically 0.60
- Specific gravity of propane = 1.56
- Specific gravity of butane = 2.00

This means that natural gas will rise if it escapes and dissipate from the site of a leak. This important characteristic makes natural gas safer than most fuels.

Natural gas does not contain any toxic component; therefore, there is no health hazard in handling of the fuel. Heavy concentrations, however, can cause drowsiness and eventual suffocation due to oxygen displacement.

Chemical Properties

The air-to-fuel ratio indicates the amount of air relative to the amount of fuel used in combustion.

For natural gas, the LEL is 4%, while the UEL is 14%. This means that a natural gas mixture ignites within a range of 25:1 to 7:1 air-to-fuel ratio by volume. By comparison, a propane mixture ignites within a range 2% LEL to 10% UEL.

Burning speed is the speed at which flame travels through an air-fuel mixture. Burning speed is also called ignition velocity or flame velocity. Hydrogen gas is the fastest with 9 ft per second at atmospheric pressure. Natural gas has a very slow flame velocity—less than 1 ft per second at its highest.

An air-natural gas mixture of 0-4% is too lean to burn, thus the burning speed is zero. A mixture of 15-100% is too rich, so the burning speed is again zero. Only when we enter the range of flammability (4-14%) can good combustion efficiency be achieved.

Fuel Gas	Relative Density	Higher Heating Value MJ/m ³	Req'd Air/Gas Ratio -m ³ of Air to m ³ of Fuel	Flame Temp. °C	Flame Speed m/s	Limits of Flammability
Manufactured Gas	0.5	18.62	5	1982	0.66	5 - 40
Natural Gas	0.6	38.6	10	1954	0.290	4 - 14
Propane	1.52	93.13	25	1967	0.460	2 - 10
Butane	1.95	119.20	32	1973	0.870	2 - 9
Acetylene	0.91	53.94	12	2632	2.667	2.5 - 81

Physical and chemical properties of commercial fuel gases used in Canada

Ignition velocity of other gases varies with air-gas mixture in the same way. Peak flame velocities occur in stoichiometric mixtures. The percentage of these gases in air is different than natural gas. Burning speed increases when air-fuel mixture is heated.

The energy content of a gas is the amount of British Thermal Units (Btu) per unit of volume at the same pressure and temperature.

A Btu is the amount of heat required to increase the temperature of one pound of distilled water 1°F at 70°F. The more carbon and hydrogen atoms in the molecule of a hydrocarbon-based fuel, the higher its energy content. Natural gas has an energy content of about 1,000 Btu per cubic foot at atmospheric pressure. By comparison, propane is 2,500 Btu per cubic foot, and butane is 3,200 per cubic foot.

RP 1162: An Overview

In June 2004, the U.S. Department of Transportation's Research and Special Programs Administration (RSPA) and the Office of Pipeline Safety (OPS) proposed a rule that requires all gas and hazardous liquid pipeline operators to develop and implement public education programs that comply with the American Petroleum Institute's (API) Recommended Practice 1162 (RP 1162). The recommended practice, developed as a consensus industry standard, is intended for use by natural gas pipeline operators, hazardous liquid pipeline operators, operators of gathering lines and local distribution companies.

The final rule, implemented in June 2005, calls for pipeline operators to develop and implement public education programs that address key stakeholder audiences. For each stakeholder audience, RP 1162 defines requirements for public awareness programs, including the message delivered to each audience, the frequency of message and the methods and vehicles for delivering the message.

The overriding purpose of RP 1162 is to assist pipeline operators in developing an effective yet flexible framework for managing a public awareness program and for analyzing and gauging the effectiveness of their public education efforts.

Each operator must develop and implement a continuing public education program that follows the guidance provided in API RP 1162.

The Audience

- The Affected Public in areas where we operate
 - Residents living near our pipelines
 - Individuals working near our pipelines
 - Places of congregation such as businesses, schools, hospitals, prisons, etc. near our pipelines
- Emergency Response Officials in areas where we operate
 - Fire departments and other state and local emergency management personnel
 - Law enforcement agencies
 - Emergency medical personnel
 - Hazardous materials response teams

- Public Officials in areas where we operate
 - Mayors
 - City, town or county managers or commissioners
 - Planning boards or committees
 - Zoning boards or committees
 - Licensing departments
 - Permitting bodies
 - Building code inspection or code enforcement departments
- Excavators in areas where we operate
 - Construction companies
 - Excavation equipment rental companies
 - Public works officials
 - Highway departments or other road construction or maintenance bodies
 - Landscaping firms
 - Fence-building companies
 - Timber companies
 - Well drilling operations
 - Homebuilders
 - Land developers
 - One-call centers
 - Surveyors/engineering firms
 - Other utilities

The Message

- The Affected Public
 - Awareness that they live or work near pipelines
 - Hazards associated with any releases
 - Overview information of steps our company takes to prevent incidents and mitigate the impact in the unlikely event that they occur
 - How to recognize and notify our company about a pipeline emergency
 - What protective or response actions to take in the unlikely event of a release or other operational incident
 - How to assist in preventing emergency situations by following safe excavation and digging practices and reporting any unauthorized activity
 - How the safety of pipeline ROW can be impacted by encroachments
 - How to inform our company of questions or concerns regarding public safety, Integrity management issues, emergency preparedness, public awareness or land use practices
- Emergency Response Officials
 - How to get detailed information regarding our pipelines
 - Emergency contact numbers for our company
 - Information about potential hazards with our pipelines

- How to notify our company in an emergency or if there are questions or concerns
- How to safely respond to a pipeline emergency
- An overview of steps our company takes to prevent incidents and mitigate any negative impacts in the unlikely event of one
- How to inform our company of questions or concerns regarding public safety, integrity management issues, emergency preparedness, public awareness or land use practices
- Local Public Officials
 - Pipeline purpose and reliability
 - General information about pipelines that cross their area of jurisdiction
 - How community or governmental decisions regarding land use may affect our pipelines and ultimately public safety
 - Hazards associated with any releases
 - Overview information of steps our company takes to prevent incidents and mitigate their impact in the unlikely event that they occur
 - How to inform our company of questions or concerns regarding public safety, integrity management issues, emergency preparedness, public awareness or land use practices
- Excavators/Contractors/Land Developers
 - Education and awareness that digging or excavating near our pipelines and along our ROW may impact our operations and ultimately public safety
 - Hazards associated with any releases
 - Information regarding damage prevention requirements for the particular jurisdiction, including one-call notification procedures
 - Information about safe excavation practices in association with underground utilities
 - How to notify our company in an emergency or if there are questions or concerns
 - Emergency contact numbers for our company
- One-Call Centers
 - Pipeline location information
 - Other requirements of the applicable One-Call Center
 - How to inform our company of questions or concerns regarding safety, integrity management issues, preparedness, public awareness or land use practices
 - One-Call system performance feedback (as applicable)
 - Suggestions for improvements (as applicable)

Communication Vehicles

- Company website

- E-mail
- Public service announcements
- Paid advertising
- Printed pieces—bill stuffers, brochures and letters
- Community events, public meetings, neighborhood newsletters
- Scheduled meetings with county or multiple county officials
- Personal contact
- Telephone calls
- Emergency exercises
- Videos and CDs
- Facility tours or open houses
- National Association of State Fire Marshals/OPS emergency response training program
- Group meetings
- One-Call Center outreach
- Pipeline markers
- Membership in appropriate One-Call Center
- Requirements of the applicable One-Call Center
- Maps

For mapping information concerning transmission pipelines, visit the National Pipeline Mapping System at <https://www.npms.phmsa.dot.gov/>.

Hypothermia

Mark D. Hansen

In the oil and gas industry, we are exposed to the elements, and during the winter, it is cold weather. As you might imagine, hypothermia can and does kill. We are designed to function normally at a body temperature of 37°C (98.6°F). Hypothermia is defined as a core temperature (internal organs in the body) less than 35°C.

Employees suffer from hypothermia when they lose body temperature in cold weather as a result of exposure. This can occur at temperatures that many would not think of as threatening. Most hypothermia cases develop in air temperatures between 30°C and 50°C. Most cannot believe that temperatures in this range are dangerous, but these temperatures can be fatal.

It is important that you understand hypothermia and how to treat it. This is essential to your survival and to the survival of those working with you. Hypothermia is possible in many work environments and also during recreational activities such as hunting and fishing.

Causes of Heat Loss

The body loses heat in the following ways:

Radiation—Loss of heat to the environment due to a temperature gradient (ambient temperature less than 98.6 °F).

Conduction—This occurs through direct contact with objects. It is the molecular transfer of heat energy. Water conducts heat away from the body 25-30 times faster than air because it has a greater density. Generally, conductive heat loss accounts for only 2% of overall loss. However, with wet clothes, the loss is increased by five times.

Convection—A process of conduction in which one of the objects is in motion. Air moving over your body draws heat away from your body. Wind chill is an example of convection.

Evaporation—This occurs when water is converted from a liquid state to a gas.

Respiration—This is from inspired air raised to body temperature and then exhaled.

Recognition of Signs and Symptoms of Hypothermia

Impending Hypothermia

Due to physiological, medical, environmental or other factors, the person's core temperature has decreased to 36°C (96.8°F). The person will increase physical activity in an attempt to warm up. The skin may become pale, numb and waxy. Muscles become tense, shivering may begin but can be overcome by activity. Fatigue and signs of weakness may begin to show.

Treatment

Get the person out of the cold, windy or wet environment. Place them in a warm environment like a doghouse, control room or other protected enclosure. Provide the person with a hot drink (no alcohol, coffee or tea). Halt further heat loss by insulating the person with extra clothes, etc. With this treatment, a victim should recover quickly.

Afterdrop

In this situation, the core temperature actually decreases during re-warming. This occurs when peripheral vessels in the arms and legs dilate when they are re-warmed. The dilation sends very cold, stagnate blood from the periphery to the core and further decreases core temperature, which can lead to death. In addition, this blood is also very acidic, which can lead to cardiac arrhythmias and death. Afterdrop can best be avoided by not re-warming the periphery. Re-warm the core only, and do not expose a severely hypothermic victim to extremes of heat.

Hypothermia is a potentially dangerous exposure during extremely cold wintry environments. Understanding, recognizing and treating hypothermia when it occurs can provide a safer place to work for employees in these environments.

CSB to Conduct Full Investigation of Fatal Oilfield Incident at Partridge-Raleigh

The following message is from the U.S. Chemical Safety Board, Washington D.C.

Washington, DC, June 14, 2006—The U.S. Chemical Safety Board (CSB) announced it would pursue an investigation into the June 5, 2006 fatal oilfield incident at Partridge-Raleigh Oilfield in Raleigh, Mississippi, sixty miles southeast of Jackson.

Around 8:30 a.m. on Monday, June 5, 2006, three workers died and one worker suffered broken bones while attempting to install new piping to connect two 400-barrel-capacity oil production tanks and one saltwater tank to a 500-barrel-capacity power oil tank. All four workers were employed by Stringer Oilfield Services.

CSB investigators arrived at the oilfield on Tuesday, June 6, 2006 to conduct an assessment of the incident site. They conducted interviews with eyewitnesses, who described the four workers standing on top of the production tanks to prepare for new piping installation



Damaged oil tanks involved in the June 5, 2006 explosion and fire at Partridge-Raleigh Oilfield.

just before the incident occurred. As one worker lit a welding tool, explosive vapors in two of the tanks likely ignited, causing two rapid explosions that threw one worker over twenty-five feet from the tank and scattered debris as far as 130 feet away. Emergency responders found the welder, the sole survivor of the blast, hanging from one of the oil tanks. He used fall protection equipment prior to starting his work.

The CSB has investigated similar incidents involving flammable vapors in aboveground storage tanks and welding tool use at a wastewater disposal facility in Daytona Beach, Florida, where two workers died earlier this year, and in 2001 at an oil refinery in Delaware City, Delaware, where one worker died. The agency also

assessed an incident in Palestine, Texas in 2003 in which three teenagers were killed while standing on top of an oil tank that exploded. They were using a cigarette lighter to see inside an oil tank filled with flammable oil distillate.

The agency has also investigated incidents involving explosions and fires at oilfields in Louisiana in 1998, which resulted in four worker fatalities, and in Texas in 2003, which resulted in three worker fatalities. In each case, a lack of hazard recognition played a role in the worker deaths.

Failure to recognize the hazards posed by use of welding tools in a flammable vapor environment likely contributed to the incident at Partridge-Raleigh. Failure to manage those hazards with well-established, safe work practices could also have contributed to the incident.

...the Board does not issue citations or fines but does make safety recommendations to plants, industry organizations, labor groups and regulatory agencies such as OSHA and the EPA...

During initial interviews with CSB investigators, Stringer and Partridge-Raleigh employees stated that they regularly tested for flammability in oil tanks by lighting and inserting torches into open hatches on tanks prior to welding. The CSB investigation of this incident will discuss appropriate flammability testing equipment and procedures.

CSB Chairman Carolyn W. Merritt said, "The Board believes this explosion emphasizes the serious need for thorough written safety procedures and worker training at oil fields and at all facilities where flammable vapors and welding activities may coexist. To ensure worker safety, companies must be vigilant about using safe testing procedures and equipment."

The oil and gas industry experiences one of the highest fatality rates of all major industries, according to a March 2005 paper ("Upstream Oil and Gas Fatalities: A Review of OSHA's Database and Strategic Direction for Reducing Fatal Incidents") authored by government and industry authorities and presented at a Society of Petroleum Engineers conference.

In 2004, the oil and gas industry experienced 43.9 fatalities for every 100,000 workers. This equates to approximately one fatality every four days. This rate is over eight and a half times higher than the average fatality rate for all industries in the United States. In comparison, the coal mining industry had a fatality rate of 29.9 fatalities for every 100,000 workers in 2004. The CSB is an independent federal agency charged with investigating industrial chemical accidents. The agency's board members are appointed by the President and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in safety management systems, regulations and industry standards.

For more information, visit <http://www.csb.gov>.

Calls for Papers

SH&E professionals currently have several options for submitting paper proposals that reflect their successes, experience and challenges in making our industry cleaner, safer and smarter.

The SPE [Asia Pacific Health, Safety, Security and Environment Conference and Exhibition](#) will be held from September 10-12, 2007 in Bangkok, Thailand. Abstracts are accepted through January 10, 2007. The conference theme is "Responsible Performance: Are We Doing The Best We Can?," and the program will demonstrate the importance of health, safety, security and environmental issues in today's oil and gas industry.

Several multidisciplinary industry conferences that typically include environmental/safety sessions also seek paper proposals:

- SPE [2007 Annual Technical Conference and Exhibition](#), November 11-14, 2007, Anaheim, California. Abstracts due by February 26, 2007.
- [International Petroleum Technology Conference](#), December 4-6, 2007, Dubai, United Arab Emirates. Abstracts due by February 5, 2007.
- [Offshore Europe](#), September 4-7, 2007, Aberdeen, United Kingdom. Abstracts due by January 8, 2007.
- [Latin American & Caribbean Petroleum Engineering Conference](#), April 15-18, 2007, Buenos Aires, Argentina. Abstracts due by October 15, 2007.

NIOSH Issues Alert on Mobile Crane Safety

On October 23, 2006, NIOSH announced that it posted an online alert that recommends actions employers, workers and crane rental companies can take to

minimize the risk of injury and death to those who work on or near mobile cranes.

The alert, "Preventing Worker Injuries and Deaths from Mobile Crane Tip-Over, Boom Collapse, and Uncontrolled Hoisted Loads," describes six incidents resulting in the deaths of eight workers and injuries to two others that were either working near or operating mobile cranes. NIOSH stated that in each incident, these injuries or deaths could have been prevented by using proper safety procedures such as not exceeding the crane's lift capacity, following proper set-up, maintenance and dismantling procedures and not working under a suspended load. Along with the case reports, the alert lists current standards under OSHA and the Fair Labor Standards Act, certification and licensure and the ASME B-30.5 Safety Standard for Mobile and Locomotive Cranes.

"Proper training of crane operators in the mandatory use of load charts is important for safe hoisting operations," NIOSH states. "Crane operators need to know and understand how to use load charts provided by the crane manufacturer."

The alert can be accessed at:
<http://www.cdc.gov/niosh/docs/2006-142>.

Safety Alert: Two Injured During Offshore Operations

In two recent separate incidents, persons were injured while participating in offshore operations.

Incident No. 1—After a temporary well-test flare boom was welded to the rig, the crane cables supporting it were slacked off 5 ft. A service company employee walked to the end of the boom to test the welds by jumping up and down, but did not wear fall protection gear. Forgoing fall protection in such situations is a frequent practice because of fear that, if the welds failed, the boom would become an anchor. As the employee jumped on the end of the boom, the welds failed, and the boom dropped until arrested by the crane cables. The employee was thrown off the boom, falling 95 ft into the Gulf of Mexico.

Incident No. 2—Skirting was being removed from the heli-deck of a platform to allow access to the well bay. When the crane lifted a section of skirting, a hole in the deck was created. A contractor employee was positioned next to the skirting lift location. As the skirting was raised, the employee stepped back and fell 23 ft through the newly created opening, striking the wellhead before landing on the grating deck below.

The Minerals Management Service (MMS) concluded the following:

- Lack of proper supervision contributed to both incidents. No procedure was developed for Incident No. 2 nor was a job safety analysis (JSA) meeting held. In both incidents, employees were improperly positioned during operations, resulting in unnecessary personal risk.

- Failure to wear fall protection gear contributed to both incidents. In Incident No. 1, the employee did not wear fall protection because of the perceived lack of a secure connection point.

In Incident No. 2, the employee did not wear fall protection because it was not anticipated that operations would create the need for it.

The MMS recommends the following:

- Operators should ensure that experienced and accountable supervision is supplied by all contractor crews and that proper procedures, including positioning of personnel during critical operations, are reviewed in a JSA meeting prior to conducting operations.

- Operators should ensure that all personnel wear fall protection when necessary and that a secure connection for the fall protection be provided and used.

Source: U.S. Department of the Interior Minerals Management Service (MMS), Gulf of Mexico OCS Region, November 7, 2006, <http://www.gomr.mms.gov>.

Oil & Gas Branch Polo Shirts Available

We have a limited number of black short-sleeved polo shirts with the Oil & Gas Branch logo available. The cost is \$35 plus \$7 shipping. If you are interested, please call Mike Bradshaw at (985) 693-8574 for information.



Land Drilling Training Series

Moxie Media, Inc. is currently developing a comprehensive Land Drilling Training series for both new and existing employees. The company is looking for companies to partner with them in order to arrange onsite videotaping at various required land drilling locations. Those who work with Moxie Media may receive either complimentary training sets or sets

available at a reduced price depending upon the level of participation. They will also have the opportunity to see their employees featured in an industry-wide initiative. Moxie Media would also like industry professionals to review the content. Even though the series will include the input of several experts, there is always some incident, practice or policy that can be added. The first script is ready for review.

Moxie Media is starting with three introductory programs and will add more in-depth and advanced training as the series grows.

If you would like to participate in this initiative, please contact Martin Glenday, President of Moxie Media, at glenday@moxiemedia.com.

**Would you like to submit
an article?
Contact Laura Comstock at
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(803) 217-2199.**

BLS Releases

2005 Workplace Fatality Data

The Bureau of Labor Statistics (BLS) has released its annual report, *National Census of Fatal Occupational Injuries in 2005*.

The report is available at <http://www.bls.gov/news.release/pdf/cfoi.pdf>. Key points made in the report include the following:

- Workplace deaths declined from 5,764 in 2004 to 5,702 in 2005.
- In 2005, deaths among Hispanic workers rose to 917 from 902 in 2004.
- Deaths among woman declined by 3%.
- Deaths among African American workers increased to 577 from 546 deaths in 2004.
- Deaths among young workers under 20 years of age rose 18% to 166 deaths. This includes 24 workers under the age of 16 who died in the workplace, up 85% over 2004.
- Agricultural worker deaths rose 23% from 145 in 2004 to 178 in 2005.
- Deaths from heat exposure were up over 150% from 18 fatalities in 2004 to 47 in 2005.

Safety Harness Observations

Several fall protection safety harnesses were confiscated recently due to non-conformance to standards. The harnesses did not have a manufacturer's label and certification data, snap hooks were not double-action and hardware was of pressed metal. The contractor's manager was informed, and immediate action was taken. Below are tips for selecting and inspecting harnesses:

- A tag should show the manufacturer, date fabricated and a unique serial number.
- Check the stitching. Do you see an X in a box or a sideways M with extra side to sides in a box? If you see an X in a box, take it out of service immediately and notify your foreman or safety manager.
- Are straps free of cuts, burns or other damage?
- Some harnesses have "tell-tales" that indicate the harness has had an impact load. If these are out or if you know that the harness has had an impact load, take it out of service immediately.
- Is there a manufacture's name or logo on the hardware?
- Is the hardware free of nicks, bending, cracks, etc.?

Source: Safety Focus, January 18, 2006

OSHA Issues Final Rule on Assigned Protection Factors

August 24, 2006

OSHA has revised its Respiratory Protection Standard to add definitions and requirements for Assigned Protection Factors (APFs) and Maximum Use Concentrations (MUCs). These revisions supersede the respirator selection provisions of existing substance-specific standards with these new APFs except for the 1,3-Butadiene Standard. OSHA developed these after reviewing available literature, including chamber-simulation studies and workplace protection factor studies, comments submitted to the record and hearing testimony. The standard is to be used by employers when selecting respirators for employees exposed to atmospheric contaminants found in general industry, construction, shipyards, longshoring and marine terminal workplaces. This final rule is effective November 22, 2006 and is available at:

<http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/06-6942.htm>

FERC Final Rule on Reporting Damage to Natural Gas Pipelines

August 29, 2006—The Federal Energy Regulatory Commission (FERC) has amended its regulations to require jurisdictional natural gas companies to report damage to facilities as the result of a natural disaster or terrorist activity that results in a reduction in pipeline throughput or storage deliverability. The rule is based on FERC's experience following Hurricanes Rita and Katrina under the existing reporting requirements, which only require pipeline companies to report service interruptions and not significant hurricane damage to facilities in instances where service interruptions were avoided by rerouting gas supplies or other means. The effective date was August 29, 2006.

PHMSA Rule Aims at SCUBA Aluminum Cylinder Risk

August 29, 2006—The U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) has issued a final rule revising the Hazardous Materials Regulations to address a known safety problem with cylinders manufactured of aluminum alloy 6351-T6. The revisions include an inspection and testing program for early detection of sustained load cracking on cylinders manufactured of aluminum alloy 6351-T6 and used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA) and oxygen services. The effective date is January 1, 2007.

U.S. Occupational Safety & Health Administration (OSHA)



[OSHA QuickCard: Safe Driving Practices for Employees](#)

This QuickCard (English on one side and Spanish on the other) offers tips to help ensure that employees stay safe on the road. Print copies of the laminated cards are available from [OSHA's Publications Office](#). The QuickCard is a companion to [Guidelines for Employers to Reduce Motor Vehicle Crashes](#), which OSHA, the National Highway Traffic Safety Administration (NHTSA) and the Network of Employers for Traffic Safety (NETS) issued earlier this year.

[OSHA Safety and Health Information Bulletin: Hazards Associated with All-Terrain Vehicles \(ATVs\) in the Workplace](#)

While most ATV-related injuries and fatalities occur during recreational use, workplace use of ATVs is increasing in some industries. This bulletin identifies 1) the operating conditions and activities that most often lead to ATV-related injuries and fatalities, 2) guidelines and training employers can use to help protect employees and 3) work practices that employees can follow to reduce the potential for ATV-related accidents.

Shifting Gears

Laura Comstock MS, MBA, CSP, CUSA

What is a Safety Culture?

Culture is the predominating attitudes and behaviors that characterize the functioning of a group or organization. Culture is socially transmitted and is the expression of a particular period, class, community, or population. What does that mean in relation to safety?

The safety culture would be the predominating safety attitudes and behaviors in a group. It is important to note the part of the definition that refers to period, class, community and population. Although it might not be considered politically correct to make this differentiation, it is important in the world of safety. For instance, imagine the difference in safety culture between a period such as the Depression and the 21st century. Imagine the difference in safety culture between the class and community of Mexico and the safety culture in America. Note the difference in the safety culture between your own operational population and your administrative population.

Finally, the definition states that culture is socially transmitted. Defined, transmitted is to impart or convey to others by inheritance; hand down; pass along; communicate. By definition, we would assume that the conveyance of the safety culture does not occur via written procedures but rather that culture is developed and propagated in the work group and handed down in some manner.

What Kind of Safety Culture Do We Want in Our Organization?

In a perfect world, what kind of safety culture would you have in your organization? We talk about changing the safety culture. We know what we do not want the safety culture to be (the current culture), but have you defined what the new culture should look like? What would be the predominating attitudes and behaviors? Which safety attitudes should the workers show? Which safety behaviors would you want demonstrated?

These sound like simple questions, but the answers are a little more complicated. For instance, we want workers to recognize hazards. That is, a cultural issue to look for hazards but a training issue to recognize them. We want workers to be able to address hazards. Isn't that as much of an organizational issue as a safety issue to empower or to authorize employees to take action? We

want everyone to be able to stop the job if something is unsafe.

Changing the safety culture is not as simple as a safety person coming in and making some changes. Changing the safety culture is a broad organizational action that requires the support of a lot of people that do not understand why they have to be involved in a safety initiative.

The Catalyst for Change

Changing the safety culture in an organization is always difficult. The change sometimes occurs as a result of a catastrophic event. As tragic as these events can be, they often bring about management and work practice changes and act as a catalyst for a general culture change. Newton determined that once something is in motion, it tends to stay in motion. When there is no major triggering event such as an explosion or a co-worker getting seriously injured or killed, shifting gears can be more work. In physics, work is defined as the application of force required to move something in the direction of the force. It is difficult to start the culture change when there is a new declaration or renewed commitment from top management to make safety a priority.

If you expect to make dramatic changes quickly by rolling out a new program or incentive plan, prepare to be disappointed. There is no single action that can cause the culture to begin to shift. Remember that for many years, safety has taken a back seat, has been a necessary evil or has been a priority. Having safety as a priority in this instance is a bad thing. Even top management that means well and pushes for positive change continues to use the wrong word: priority.

When a project is implemented, we state that “safety is a priority.” Down the road, when the project begins to fall behind (since the safety considerations are rarely planned into the timeline), then “the timeline becomes the priority.” Where does that leave safety? In the back seat. We will discuss how to make safety a part of your culture and not a changing priority.

To Whom is Safety Most Important?

Managers—A bad safety record can hurt earnings and reflect negatively on the company.

Supervisors—Having injured or light-duty workers makes it difficult to meet the schedule.

Safety Managers—They appear ineffective and do not progress through the organization unless safety improves.

Employees—When employees are injured, workers’ compensation keeps part of the pay coming in, but they still cannot coach the little league team on crutches, they cannot pick up the kids from daycare if they cannot drive, their co-workers have to work longer and harder to cover for them, and frankly, most injuries hurt!

It is human nature to avoid pain unless avoiding it is a bigger deterrent. What could be a bigger deterrent than a broken leg? How about fear of losing your job? What could be a bigger deterrent than severing your finger? What about causing the group to lose their bonus because they did not make the timeline?

Nobody sets out to get hurt.

- 1) People take a calculated risk and lose. Maybe the odds are 10:1 that you can throw those 4x4s without hitting someone up top...and you throw 11 boards.
- 2) People become accustomed to a hazard and cease to see it as a hazard. How many people who tailgate in traffic have actually rear-ended another car? My guess is not many. Those that get “caught” rear-ending a car re-familiarize themselves with the hazard and become cautious again. Those that have not been “caught” after years of tailgating get pretty cavalier about it. They forget the hazard is really there.

So here we are. Managers do not want people to get hurt, supervisors and co-workers do not want people to get hurt, and workers do not want to get hurt.

Why is it So Difficult to Move to a Safer Environment?

Perception. Historically, workers have been told:

- 1) “Here is your safety manager. He knows all the rules and how to keep you safe.” Responsibility is taken from the worker. Message: The safety department will keep you safe.
- 2) “If you have safety concerns, take them up with your supervisor.” The supervisor, with schedule and manpower driving his timeline, does not have time to analyze or call in the correct resources to troubleshoot the situation, and therefore, makes superficial changes (or not) and sends the worker back to the job. Message: The supervisor will keep you safe or we do not care about your safety—we care about the schedule.

Past Practices. There are many programs in place, particularly incentive programs, which work against safety. When you tie incentive pay to the number of accidents, how many accidents do you suppose go unreported? They still occur, they just go unreported. When you tie safety records to work groups, how much pressure is on an individual to not report an injury when reporting it would result in his team not receiving bonus? How many bonuses are tied to tight production schedules? If you make this production level, you will get more money. Do you suppose it is just safety that goes by the wayside, or do you think maintenance and preventive maintenance goes with it? How is it exactly that managers can presume that you can increase safety by reward alone? You do not give the employees any additional tools or training, yet you expect an improvement. That would be equivalent to expecting a car to go faster without beefing up the engine. You still

have the same limitations; you are just pushing the limits harder.

The general consensus among safety professionals is that only workers can keep workers safe since there are workers that can manage to get hurt in spite of the best engineering, the most thoughtfully developed work practices amid the best-kept workplace.

How Do You Put Safety in the Hands of Workers?

First remember, when workers say, "That is the way we have always done it," there is a reason it got started that way. Maybe 15 years ago when they started doing it that way, that was the only tool available or they did not work from elevations, so it was not dangerous then. Do not just discard "That is the way we have always done it" as change resistance or bad attitudes. Dig in and find out why. Talk to old-timers, look at old drawings, ask about old technology, processes and work practices. It is possible that years ago, someone tried all the other options, and they did not work then and they will not work now. Alternatively, there might have been what seemed like a trivial business or equipment change over the years that invalidate the reasons for doing it that way.

How Do You Find This Out?

Ask! If your intentions are good, you need only spend time with workers to gain their trust and get them to talk to you. Some will be leery of the questions because Type A managers or unscrupulous engineers have burned them in the past, or they fear that you are looking for a scapegoat. The most success I have had is by assuring them that they are the experts at what they do and I would never presume to tell them how to do their job. Ask them what it was like in the old days and get them going between each other telling stories about "Old Bob" and "Crazy Jake." Someone walking in on that conversation would think that you are just killing time, but in fact, you can learn more about work practices and why they exist from these stories than you ever will from a manual. For instance, "Old Bob" was left-handed and modified several maintenance points to accommodate his left-handedness. Successors assumed it was part of the engineering design and just continued to deal with the pinch-points and knuckle-busters. Go figure...

If after this research, you can find another viable alternative to try, ask them why it will not work. Odds are, they probably know. Better yet, ask them what could be done differently. Once again, odds are, they thought of it in the past but were shot down for some reason and just stopped trying.

The front line employees are much like the rest of us in that they and we get caught in the tunnel vision. Sometimes just an outside question or observation can point out things that are missed or taken for granted everyday.

Find out what resources they have available and determine if there are any obvious resource gaps. Volunteer regulatory information, ANSI standards, OSHA guidance, training materials, OEM manuals, drawings, technical design basis information, loop one-lines, operating manuals, etc.

Ask what they need to succeed safely. This is a really scary question to ask because the answers you get will fall in all areas of the company, but mostly the human resources department. As frightening as it may seem, you may need to get involved and act as their advocate to human resources. Listen carefully to what they say, and then determine how it can impact safety. They say, "If we did not have to spend all this time at safety meetings, we would have time to get this stuff done right." They mean, "We do not have the staff or the time built into the schedule to address the safety issues." Administration personnel say, "Why do we have to sit through the hazard communication training? We don't mess with chemicals." They mean, "Why do we have a one-size-fits-all safety program? I have a different set of safety needs that is not being addressed."

Ask them what's wrong...do not tell them. During a site inspection, if you walk up to an excavation and tell them that the sloping is not correct and there are trip hazards, you may be correct, but you may be missing the real hazards or the real issues. The real issues may be the buried power line that is near the excavation that does not allow proper sloping or enough maintenance space to handle the necessary equipment. After they tell you the problem and some proposed solutions, you can weigh their solutions for validity or offer some other solutions for them to consider.

How Do We Engrain Safety So That it Becomes Part of the Culture?

Realize that safety is not an add-on like an airbag on a car. Safety has to be planned and engineered in as a standard on all jobs. Each job should come standard with anti-lock brakes (to prevent bad things from happening) and airbags (to minimize damage when they do happen). Think of all the things that have to happen to get you to work safely in your car:

- 1) There are speed limits and traffic laws to protect you from your and others' bad judgment. (safety regulations)
- 2) There are windshield wipers to protect you from the elements. (protective work environment)
- 3) Your car is designed so that all you need to operate safely is within your reach. (ergonomic concerns)
- 4) Your car is intended to collapse and absorb the majority of impact. (engineering design)
- 5) Your car has seatbelts to protect you, but it requires your participation. (active safety devices)

- 6) There are highway medians and barriers to protect you. (passive safety devices)
- 7) Your car has an airbag to protect you. (redundant and backup safety systems)
- 8) You are required to have driver education, be licensed and renew your license periodically. (training, certification and refresher programs)

But in spite of all these devices designed to keep people safe, some still manage to be badly injured or killed.

Who is most at risk?

Youth—inexperience and inability to perceive risk

Aged—slowed reflexes

Impaired—bad perception, slowed reflexes, poor judgment

Inattentive—not paying attention to the task at hand

Many people, companies and agencies have worked many years to develop these protective systems for cars. You have a safety department that is expected to do the same, and believe it or not, they are up to the challenge. Given the resources, the safety department can help workers implement the safety concepts developed all over the world.

Conclusion

To begin to engrain safety in your workforce:

- Safety considerations, because they can be costly, must be made during the initial project conception
- Budget must be allowed for the necessary safety systems and increased man-hours to use them
- Allowances must be made in the timeline to allow for proper application of the systems
- Checks and balances must ensure that the safety steps are occurring and that systems are in place to allow them to occur
- Incentives can in no way motivate personnel to circumvent safety systems
- Everyone must be educated on safety considerations since they are responsible for them
- Safety must be kept at the forefront with frequent discussions or safety meetings
- Special care, guidance and mentoring must be given to at-risk personnel
- All personnel should be empowered and responsible for ensuring a safe worksite
- You must have an active drug and alcohol prevention program

Remember that it can be a slow and painful process to bring about the safety culture you desire. Benchmark yourself before you begin and then periodically throughout the process. Just when you think that nothing is changing and you are wasting your time, you will see one employee do one thing that would have never happened before, and you will know you are on your way.

CSB Investigation of BP Texas City Refinery Disaster Continues

Washington, DC, October 30, 2006—In preliminary findings released today, the U.S. Chemical Safety Board (CSB) stated that internal BP documents prepared between 2002 and 2005 revealed knowledge of significant safety problems at the Texas City refinery and at 34 other BP business units around the world—months or years prior to the March 2005 explosion that killed 15 workers, injured 180 others and was the worst U.S. industrial accident in more than a decade. CSB Chairman Carolyn W. Merritt said, "The CSB's investigation shows that BP's global management was aware of problems with maintenance, spending and infrastructure well before March 2005. BP did respond with a variety of measures aimed at improving safety. However, the focus of many of these initiatives was on improving procedural compliance and reducing occupational injury rates, while catastrophic safety risks remained. Unsafe and antiquated equipment designs were left in place, and unacceptable deficiencies in preventative maintenance were tolerated."

Merritt pointed to earlier CSB findings that the equipment directly involved in the flammable release on March 23, 2005 was of an obsolete design already phased out in most refineries and chemical plants and that key pieces of instrumentation were either known to be not working or known to be unreliable by unit supervisors.

Merritt said that a final CSB report would not likely be issued before March 2007, but it was important for the public and the rest of the industry to remain informed on what the investigation has found.

Merritt also praised BP's positive moves in the aftermath of the accident. "Since the tragedy, BP has expressed a strong desire to improve its safety performance globally, has made public its own detailed investigation report on the accident, has cooperated with federal investigators, has made organizational changes to better identify and communicate risks and has done extensive positive outreach to the rest of the industrial community. BP has also voluntarily funded and supported the work of an independent panel recommended by the CSB to examine BP's safety culture." That 11-member expert panel, chaired by former U.S. Secretary of State James A. Baker III, is expected to report its findings on the safety of BP's five North American refineries in late November.

These preliminary findings were the first significant update in the Board's investigation since October 27,

2005, when preliminary findings were issued at a public meeting before Texas City employees and residents.

The March 23 accident occurred during the startup of the refinery's octane-boosting isomerization (ISOM) unit, when a distillation tower and attached blowdown drum were overfilled with highly flammable liquid hydrocarbons. Because the blowdown drum vented directly to the atmosphere, there was a geyser-like release of highly flammable liquid and vapor onto the grounds of the refinery, causing a series of explosions and fires. Fatalities and injuries occurred in and around work trailers that were placed too near to the ISOM unit and were not evacuated prior to the startup. Alarms and gauges that should have warned of the overfilling equipment failed to operate properly on the day of the accident.

After the accident, BP admitted that the placement of the trailers was unsafe and supported an industry-wide move to develop safer siting guidelines, following a CSB urgent recommendation in October 2005.

For the entire report, visit <http://www.csb.gov/>.

Actions Taken at BP Texas City Refinery

During the past 18 months, BP has made significant progress in implementing a comprehensive program at its Texas City Refinery that includes investment in people, plant and process. Called *Focus on the Future*, the program encompasses some 600 recommendations and 1,000 specific actions based on findings from BP's internal accident investigation team, OSHA and other external organizations following an explosion and fire on March 23, 2005.

BP has acknowledged serious mistakes were made. It has apologized and accepted responsibility. BP expects to invest more than \$1 billion dollars over the next five years to implement the recommendations. The following is a list of actions taken, completed or underway:

Developing PEOPLE, skills and behavior

- Established a new site leadership team
- Created a new program office to prioritize and track site-wide initiatives
- Simplified the organization and introduced a new accountability standard so that everyone knows what they are accountable for and to whom
- Instituted leadership development and other training programs that will involve a projected 300,000 training hours annually
- Implemented enhanced training programs for all employees, from orientation of new hires to start-up

and distillation training and education on safety and environmental compliance, operations and operator competency

- Improved site communications to raise safety vigilance and encourage feedback on safety-related issues

Investing in PLANT, ensuring safe, reliable equipment operation

- Renovated the site's entire 27-mile steam system
- Completed renovation of major units on the site, safely commissioning about half the facility's capacity
- Isolated or removed all blowdown stacks in light hydrocarbon service
- Constructed and installed a new flare system
- Introduced a new Maintenance Accelerator Program designed to better plan and execute maintenance activities
- Introduced an Inspection Renewal Program that increased the number of inspectors to more than 200
- Conducted a review and enhancement of site notification and alarm systems
- Removed more than 200 temporary structures from the site
- Moved or relocated hundreds of employees and contractors off site
- Introduced a new site-wide transit system, reducing the number of vehicles allowed within the refinery

Investing in new PROCESSES

- Introduced a new control of work process (Integrated Safe System of Work) governing every aspect of how work is conducted on the site;
- Initiated a "**Stop Work If You Think It Is Unsafe**" program as a condition of unit startups
- Heightened oversight by requiring supervisors to be present for all startups, shutdowns and other critical operations and requiring written shift handovers with supervisor present
- Initiated a process to evaluate and manage safety-critical systems
- Implemented a commissioning approach to unit startups, including peer reviews and pre-startup safety reviews with more detailed checklists. No unit can come on line without sign-off
- Expanded safety and emergency response drilling teams
- Significantly expanded the Safety and Environment team

Beyond Texas City

BP also has taken far-reaching actions across the United States and beyond:

- Appointed a new Chair and President of BP America with expanded accountabilities
- Named an independent ombudsman to investigate employee issues and concerns
- Appointed an independent panel under the direction of former U.S. Secretary of State James A. Baker III to review and make recommendations for improvement of safety management systems and corporate safety culture in BP's U.S. refining system
- Created the role of Group Vice President for Health, Safety, Environment and Technology in the Refining and Marketing segment
- Appointed a Group Vice President of Safety and Operational Capability to lead improvements in safety, health and environmental management
- Introduced new BP Group Standards for Control of Work and Integrity Management across the organization
- Clarified and reinforced roles, responsibilities and expectations around startup, operating, maintenance and evacuation procedures
- Prohibited the occupancy of and then removed office trailers within 500 feet of blowdown stacks used for light hydrocarbons
- Created a U.S. Program Office to coordinate change across BP's U.S. refining system.

Source: *BP America Corporate Communications, October 25, 2006*

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