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Date: **March 3, 2011**

To: **All Branch Managers**

From: **Gene Maddox**

Subject: **Branch Office Monthly Safety Meeting – March 2011**

Company policy requires that each branch office hold a minimum of one safety meeting each month with the documentation of the material covered and the attendance being recorded on the "Monthly Safety Meeting Minutes and Attendance Record" (see attached form). **Please detach this form, fill out and mail or fax *a copy* to Lynn Eldridge.** *Please keep the original for your records.*

Note: ONLY the Monthly Safety Meeting Minutes and Attendance Record is to be sent in.

To assist you in complying with this requirement, the following subjects are for your Monthly Safety Meeting, for the month of March 2011. You may add topics, **but please document the following topics**:

1. News Briefs!!! (OSHA revisions on Cranes and Derricks & FMSCA Proposed Changes)
2. Safety Meeting: (Cathodic Protection for Underground Propane Tanks) (4 pages)

It is recommended that you thoroughly read this material prior to your meeting.

It is strongly recommended that you use the 3-ring binder to store all of your "2011 Monthly Safety Meetings"!!! This material may be referred to or used to train new employees. This manual should be kept in an area of the office that is easily accessible to all employees.

Be Smart.... Be Safe and Be Courteous!!!

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PROPANE
EXCEPTIONAL ENERGY

NEWS BRIEFS!!!

(This monthly "column" will include short newsworthy topics, which will serve as a friendly reminder to us all)

OSHA Revises Regulations on Cranes, Derricks

On August 9, 2010 OSHA published a final rule revising its regulations of cranes and derricks used in construction activities. It addresses advances in the designs of cranes and derricks, related hazards, and the qualification of employees needed to operate them safely.

Some of the major changes:

- New ground condition requirements.
- Increased inspection requirements.
- Qualified riggers and signal persons.
- Certification or qualification requirements for selected crane operators.

Of special interest to the propane industry is the requirement that operators of cranes be certified or qualified. The requirement does not include the operation of sideboom cranes, derricks, and equipment with a rated hoisting or lifting capacity of 2,000 pounds or less. Individuals operating these equipment types must meet the minimum criteria for expertise.

Setting a tank at a new installation or as a replacement often requires the use of a crane, and as such, the new OSHA regulations could apply to the propane industry. The National Propane Gas Association had argued that these activities did not fall under the agency's construction regulations but under its general industry regulations. OSHA noted that the placement of a new tank at a construction site would require compliance, but replacement of a tank does not.

There are several options for compliance, including certification through a third-party testing agency, certification through an audited employer training program, licensing obtained through the U.S. military, or licensing obtained in a state or local government requires a crane operator license, the crane operator must be licensed accordingly to meet OSHA requirements.

The effective date of the new regulations was November 8, 2010, but there is a four-year phase-in period for the operator qualification and certification requirement. The compliance deadline for this is November 10, 2014. In the meantime, the propane industry plans additional follow-up with OSHA to obtain more clarification of the applicability of the rule to the industry.

PHMSA/FMCSA Propose Change to Highway-Rail Grade Crossing Safety Regulations

The Federal Motor Carrier Safety Administration (FMCSA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA) **are proposing to amend the Federal Motor Carrier Safety Regulations** (FMCSRs) and Hazardous Materials Regulations (HMRs), respectively, through a Notice of Proposed Rulemaking published January 28, 2011 in the Federal Register. **The amendment proposes to prohibit a motor vehicle driver from entering onto a highway-rail grade crossing unless there is sufficient space to drive completely through the grade crossing without stopping.** Though the proposed rule would not explicitly prohibit motor vehicles from using certain grade crossings, it might have that effect where the clear storage distance between the train tracks and the next traffic control device is less than the length of the vehicle. To proceed through such a grade crossing, a motor vehicle driver would either have to ignore the traffic control device or comply with the traffic control device but violate the proposed rule by driving onto the grade crossings without having sufficient space to drive completely through the crossing without stopping. Generally, the grade crossings where the physical storage distance is less than 100 feet would present the greatest challenge to motor vehicle drivers. This action is in response to section 112 of the Hazardous Materials Transportation Authorization Act of 1994. The intent of this rulemaking is to reduce highway-rail grade crossing crashes.

MARCH 2011 SAFETY MEETING

CATHODIC PROTECTION FOR UNDERGROUND PROPANE TANKS

Why Tanks Corrode

Underground steel tanks corrode due to an electrochemical reaction between the tank and the surrounding soil. The process of corrosion occurs due to small voltage differences on the steel surface that result in the flow of DC current from one location to another. Where current flows from the tank into the soil corrosion occurs. This location is called the anode in a corrosion circuit. Where current flows from the soil to the tank, no corrosion occurs. The progress of corrosion is determined by the amount of current flowing between the anode and the cathode and whether the locations of the anode/cathode remain constant over time. Corrosion rates are generally higher in wet soil environments since the conductivity of the soil promotes the flow of DC current in the corrosion circuit.

Preventing Corrosion

Protecting underground tanks from corrosion is easily achieved by the use of two commonly applied protection methods; external coating and cathodic protection. These two methods are complimentary and should be used in conjunction with the other. An effective external protective coating insulates the steel from the soil environment, thus preventing the flow of corrosion current from the anode to the cathode. An effective external coating can protect over 99% of the tank surface area. However, no coating is perfect. Damage from construction or soil stresses create tiny defects, which may result in accelerated corrosion at the defect.

Cathodic protection prevents corrosion at those defects by applying DC current from an external source, forcing the tank to become cathode. Application of sufficient DC current to the tank will prevent any corrosion from occurring. The two general types of cathodic protection systems are sacrificial and impressed current. Sacrificial systems are used when the amount of current required for the protection is small, such as in underground propane tanks. Impressed current systems are more commonly used for large structures such as large diameter pipelines.

Electrical isolation of the tank from metallic piping systems and electrical grounds is critical for the cathodic protection systems' effectiveness.

How Sacrificial Cathodic Protection Works

Sacrificial systems work by creating a galvanic connection between two difference metals. The most common anode material is magnesium, which when coupled to steel results in DVD current flow from the magnesium to the steel. The open circuit potential of steel is about -0.50 volts referenced to a copper sulfate electrode. The open circuit potential of magnesium is about -1.55V to -1.80V. By connecting the two metals together, the difference of 1 to 1.25V volts results in current flow to the tank that overcomes the natural corrosion cells that exist on the tank. With this current available to the tank, no corrosion occurs.

Magnesium Anodes

There are a variety of anode sizes and alloys used for cathodic protection. The two primary alloys are designed as H-1 (or AZ63) and High Potential. The H-1 alloy is produced from recycled magnesium and has an open circuit potential of approximately – 1.55V. This alloy is well suited for protection of underground propane tanks. The High Potential alloy is 99% pure magnesium having an open circuit potential up to -1.8V. This alloy should be used for soil applications over 10,000 ohm-cm resistivity.

The two most common anode sizes used for underground propane tanks are 9lb. and 17 lb. the size designation relates to the metal weight. 10' of #12 TW insulated wire is attached to the anodes. Anodes are then backfilled in a mixture of gypsum, bentonite, and sodium sulfate to lower the electrical resistance of the anode to soil. The mixture is a low cost, nonhazardous, electrically conductive backfill. The anode and backfill is then packaged in a cotton bag and either a cardboard box or paper bag. Actual shipping weight of these anodes with backfill is 27 lb. and 45 lb.

Application Recommendations

Magnesium anodes can protect underground tanks in most soil conditions. The H-1 alloy is generally very effective. The following chart provides size and quantity recommendations for various size tanks based on conservative design assumptions. This chart covers soil conditions up to 10,000 ohm-centimeter resistivity. Resistivities higher than 10,000 ohm-centimeters generally represent very dry soils. Verification of soil resistivity can be performed through soil analysis. Contact us for design recommendations in locations where soil resistivities exceed 10,000 ohm-cm, or if there is no effective external coating on the tank.

The propane service line from the tank to the house also must be considered in the cathodic protection design, unless the service line is plastic. All underground steel pipe should be externally coated with a corrosion resistant material. The service line should be electrically isolated at the house with an insulating fitting or union. If service pipe is less that 50' in length, the tank anodes will provide sufficient current to protect both tank and pipe. For longer lengths of pipe, an additional anode may be required at the house connections.

If another metallic material such as copper is used for service piping, the pipe should be electrically isolated from the tank at the fill pipe connection. Copper and steel create a galvanic couple that will accelerate corrosion of the steel tank when directly connected to copper piping. Generally copper piping does not require cathodic protection.

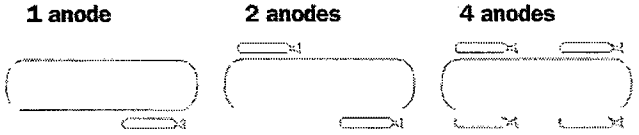
Use this Section ↓

Soil Type	Fertile Soils, Clay, Sandy Loam			Sand, Gravel, Rocky Areas		
Tank Cap.	5 to 5000 ohm-cm			5000 to 10000 ohm-cm		
(Gal)	Size	Qty.	Alloy	Size	Qty.	Alloy
120	9#	1	H-1	9#	1	H-1
150	9#	1	H-1	9#	1	H-1
250	9#	1	H-1	9#	2	H-1
325	9#	1	H-1	9#	2	H-1
500	17#	1	H-1	9#	2	H-1
1000	17#	2	H-1	9#	4	H-1
1500	17#	2	H-1	9#	4	H-1
2000	17#	3	H-1	9#	6	H-1

*Based on 905 effective external coating, 2 ma/ft2 current density, and 30 year anode life.

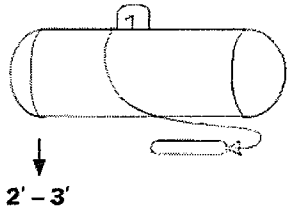
Anode Installation

1. Determine size and quantity of anodes from application chart.
2. When a single anode is installed, it should be located near the tank center on either side of tank.
3 When multiple anodes are installed, space them evenly around the tank. See examples below.

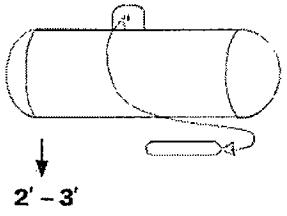


4. Anodes are shipped in either cardboard boxes or multi-wall paper sacks. Remove outer container and bury the cloth bagged anode. If anode is supplied in plastic bag, remove plastic bag before installing.
5. Install anodes approximately two to three feet from the tank and at least as deep as the center line of the tank. Anodes work best in locations with permanent moisture, so generally the deeper the better.
6. After placing the anode, stretch out the anode connection wire and extend over to the connection point on the tank.
7. Cover the anode with approximately six inches of backfill and pour 5 gallons of water on the anode to saturate the prepared backfill. Water is necessary to activate the anode.
8. Connect the anode wire to the tank with a low electrical resistance connection. Connection can be either with a termite weld to a bracket on the tank or by mechanical connectors. Examples are threaded stud on the tank fill pipe or any accessible metallic connection point to the tank. All connections should be coated with a moisture-proof material.
9. Ideally, the tank connection is made in the area of the tank fill pipe within the covered dome. With access to the anode wire, subsequent testing of the tank can include measurement of anode output and verification of performance. Looping the anode wire through the dome will accomplish the same purpose.
10. Verify performance of the anode using an appropriate test procedure.

Welded Connection



Mechanical Connection



Testing Procedure

Measuring Tank-to-Soil Cathodic Protection Potentials On Propane Tanks
Equipment: • Digital Voltmeter • Test Leads • Reference Electrode *(Copper/Copper Sulfate half cell)*

STEP 1 Using a digital voltmeter select the 2 volt DC scale, contact red test lead to the tank test point or an uncoated metallic area of the tank, preferably to the uncoated fill pipe. (Do not connect to shroud.) Note: If using a two-input analog meter, black lead will be connected to tank.

STEP 2 Contact the black test lead from the meter to a charged reference electrode. (See charging electrode below.) Note: If using a two-input analog meter, contact red lead to reference electrode.

STEP 3 Remove protective cap from porous plug at bottom end of electrode. Place porous plug end into native earth directly above buried tank. Moisten soil with water or dig plug into soil if difficulty is encountered obtaining a reading.

STEP 4 Observe meter reading and record. Reading should be at least -.850v or more negative. For other applicable criteria refer to NACE Standards RP0285-95 and RP0169-96, Corrosion Control of Underground Storage Tank Systems and Control of External Corrosion on Underground or Submerged Metallic Piping Systems. Note: It is recognized through NACE that all readings be recorded as negative.

Charging Reference Electrode:

STEP 1 Unscrew and remove porous plug end of new reference electrode. Add deionized or distilled water to the copper sulfate crystals, filling electrode completely. The solution will turn blue in color and there should always be excess crystals at the bottom of the tube. DO NOT USE TAP WATER.

STEP 2 Replace porous plug end of electrode and place in an upright position so that the porous plug end is facing in the down position and let stand for 15 minutes before use. This will allow the porous plug to become completely saturated before use.

Caution: Do not allow electrode to contact oil, road salts, or other substances that may contaminate the solution by absorption through porous plug. Do not allow electrode to freeze.

Distributed by:

MARCH 2011
MONTHLY SAFETY MEETING
MINUTES & ATTENDANCE RECORD

Company Name:_____

City:_____ **State:**_____

Date:_____ **Time Started:**_____ **Time Finished:**_____

Instructed By:_____ **Number Attending:** _____

Subject Covered and Comments:

_____

_____

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By my signature below, I certify that I attended and participated in this Safety Meeting and I understand the material presented.

Employee Name (Please print)	Employee Signature	License Expires*	Endorsements **	DOT Physical Expires ***
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				

* ***List driver's license expiration date in this column.***
** Check licenses for proper endorsements and re-testing. (For example: "HazMat") ***List endorsements in this column.***
*** ***List DOT physical expiration date in this column.***

By my signature below, I hereby certify that the employees listed above have been trained in accordance with the applicable regulations and curriculum for this monthly safety meeting.

Instructor's Signature:_____ **Date:**_____

Mail or fax this sheet only to: Lampton-Love Inc.
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