

Operations Challenge Safety Event 2017

Situation:

While a facility crew is working, one of the workers collapses inside a manhole. The coworker is found at the bottom of a (confined space) lift station unconscious. It is suspected that he/she has been overcome with an unknown gas or lack of oxygen due to a worn 4" check valve gasket in the station. The in-plant rescue/repair team is immediately called to the scene. Two members of the team will enter the confined space, rescue the downed worker and repair the check valve. Two gate valves will be closed and LOTOed by the entrants, the check valve flapper and gasket will be replaced and the line put back into service. A bag stored in the equipment area will be used to lower tools and equipment.

The designated "**safety supervisor**" calls 911 emergency services immediately. After calling 911, he/she may assist the rest of the team.

Directions:

Four-minute equipment check: The team will be allowed onto the platform to check all competition equipment and supplies for four minutes prior to the actual start of the event. Part of the four minute check will include pre-adjusting harnesses including the victims harness. The head judge will inform the team captain when the four minutes are completed. At this time all team members must immediately move to the starting area. If all equipment problems have not been resolved by this time, they will be addressed with the team in starting position. A delay at this point is cause for a penalty. Judges will not answer team questions during the four-minute inspection time or during the event. All questions will be answered on Monday during the pre-competition meeting. This is done to assure all teams receive the same instructions.

One team member will demonstrate the powering on and initial testing of the Scott Protégé gas meter during this time, by verbalizing the following steps:

- a. Attach hose to bottom of pump.
- b. Press and ***HOLD*** the right button until "**RELEASE**" appears on screen
- c. Verbalize "**GAS METER ON**"
- d. Allow unit to finish power on self test
- e. When screen reads "**Block Pump**" use your thumb to block the end of hose and verbalize "**BLOCKING PUMP**".
- f. When screen reads "**Clear Pump**" release the hose and verbalize "**PUMP CLEAR**"
- g. Remove hose from gas meter and neatly coil hose

All tools required for the check valve repair may be placed / arranged in the tool bag. No other equipment can be pre-assembled or disassembled prior to the start. If anything has been pre-assembled or disassembled, the head judge will instruct the team to disassemble / reassemble the equipment prior to starting. If there is still pre-time left, then no penalty will be assessed; however, if the four-minutes have been used up, a penalty for excessive pre-check will be assessed. All equipment must be placed back behind the line in the equipment storage area at the end of the four-minute equipment check.

All printed and signed names of the entrants and attendants may be made on the permit at this time; names must be legible. Fill out the lockout tags. To avoid subjectivity, the judges will verify legible handwriting at this time. The power for the gas detector and blower will be left in the off position at this time.

At the end of the four-minute time all team members must immediately move to the starting area:

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- 1) Team members will start behind the designated starting line
- 2) The team captain will start the event by yelling, "Start"
- 3) One team member, "**safety supervisor**", will immediately proceed to call 911. ***This team member cannot assist in any other part of the event until 911 has been called.***
- 4) The entrants will put on full body harnesses.
- 5) One team member, "**qualified entrant**", will simulate turning on the gas detector and will then test the manhole atmosphere for 30 seconds using a gas detector and provided stopwatch.
 - a. Attach hose to bottom of pump.
 - b. Verbalize "**GAS METER ON**"
 - c. Use your thumb to block the end of hose and verbalize "**BLOCKING PUMP**".
 - d. Release the hose and verbalize "**PUMP CLEAR**"
 - e. Insert the hose into the confined space, making sure that the hose is inserted to a point between the two black marks.
 - f. Begin monitoring the space for 30 seconds.
 - g. At the end of 30 seconds, record gas readings on your form and verbalize "**GAS READINGS GOOD**"
 - h. Remove the hose from the unit.
 - i. Attach gas monitor to entrant. Unit must be attached to either the entrant's harness or another area outside the entrant's uniform (a clip of some form will be provided to facilitate this). **THE MONITOR CANNOT BE PLACED IN A POCKET OR INSIDE THE SHIRT.**
 - j. At the conclusion of the event, the gas monitor should still be attached to the last entrant to vacate the confined space.
- 6) The "**qualified entrant**" will fill out the confined space entry permit. The only entries required on the permit during the timed event are acceptable (safe entry levels) readings for oxygen, combustible gas and hydrogen sulfide.
- 7) The XTIRPA barricade and davit arm unit will be assembled and placed around the manhole. All four sides of the unit must be secured with the unit around the manhole and the entry person must be attached to the fall protection device (SRL) before the manhole safety cover is removed. Any entrant that disconnects from the SRL must be connected via a lifeline.
- 8) Remove the manhole safety cover.
- 9) Install the blower saddle vent into the manhole; attach the 90-degree fitting to the saddle. Place the blower 5-ft from the manhole and attach the blower hose to the 90-degree fitting. Turn the blower on. Verbalize – "**BLOWER ON**"
- 10) Place the manhole ladder in the manhole. Entrants will enter and exit the manhole via the portable manhole ladder. The ladder must be installed carefully and correctly and must not hit the victim.
- 11) The entry person/s will put a full body harness on the victim. After the full body harness is on the victim and properly adjusted, the entry person will attach the winch hook to the center "D" ring on the victim's harness. The arm and leg straps of the harness must be on the victim prior to lifting him with the winch. The chest strap must be attached prior to the victim's head breaking the manhole plane.

One entrant must maintain control of the victim until the victim's head breaks the plane of the manhole. The victim is the primary concern. The first entrant must begin victim aid/rescue. The task of the rescue may be completed by the second entrant. The rescue of the victim cannot be ignored!!
- 12) The victim will be raised gently out of the manhole while one entrant will assist in guiding the victim from below. The entry person **CANNOT** lift the victim.
- 13) Another team member will lift the victim using the winch.

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- 14) Two team members will carry the victim to the chair in the designated area and begin decontaminating the victim. Do not drag the victim; all body parts must be off the ground (floor of the platform) while moving the victim to the chair. Activate the shower by pulling the shower handle to its furthest position downward. The body harness will remain on the victim. The Xtirpa Davit Arm may not be dismantled and the winch hook must not be raised above the top rail of the barricade until both entrants have exited.
- 15) Teams will attach a rope with a spring link to the tool bag and lower it to the entrants. The end of the "tool rope" may be tied off to the barricade but must remain outside the confined space. The tool bag, rope and link are all to be disconnected again at the end of the event.
- 16) One entrant may begin work on the situation by closing and LOTOing the gate valves (as long as the victim is being tended to). Each entrant must LOTO the gate valves prior to performing any work on the check valve. Entrants will replace the check valve flapper and gasket, remove their LOTO and reopen the gate valves. Both entrants must assist in the check valve repair by removing or reinstalling at least one bolt.
- 17) The team member tending the fall protection system may assist with the manhole exit of the entrants.
- 18) Team members will disassemble and store all equipment behind the line in the equipment storage area. The Xtirpa unit must be fully disassembled to its original condition. The winch cable must be within the length of the weight and hook. The full body harnesses will remain on the entry persons. Time will end when all team members cross the finish line and the team captain raises his/her hands above their heads and shouts "Stop." All team members will stay in the start/finish area until released by the judges. Judges will collect the entry permit, stopwatch, harnesses, gas detector and lockout keys. Once the team has been released they will leave the competition area. The captain will be escorted to a waiting area for review of the event with the head judge.

Safety

The manhole opening will be protected with a safety cover before a team accesses the platform. It must not be removed until the Xtirpa is fully assembled and in placed over the manhole, and the entrant is completely and properly in the harness and attached to the SRL that are fully attached to the Xtirpa unit. The cover must be reinstalled on the manhole opening as soon as the entrant has been removed from the manhole and before the barricade is removed from the manhole opening. Ladder safety during usage will be required. Three points of contact will be required. Ladder rungs must be used, no sliding down the sides.

The barricade door is to remain closed and latched at all times with the exception of:
Manhole cover removal / replacement or team member entry / exit (performed while attached to SRL).

Moving the victim to the decontamination zone – Team members must close and latch the door immediately upon returning back from placing the victim in the decon chair.

Atmosphere Tester

Turn the meter on first; follow the procedures outlined in Step 5 (a-l). With one end of the hose attached to the meter place the other end of the hose into the manhole. **There will be two marks on the hose. One should be through the manhole (under the platform floor), with the other mark above the manhole rim (above the platform floor).** Once in this position the 30-second test will begin. The team member using the meter must remain with the meter and keep track of their time. Once the initial test is completed remove the hose from the manhole and from the meter. The gas meter must enter the manhole with the first entrant. It must remain in the confined space until the last entrant is removed from the manhole. **A stopwatch will be provided to each team; this is for the team to time the 30-second atmosphere test.**

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Blower Placement

The blower must be placed 5 ft from the rim of the manhole prior to entry. There will be a square drawn around the perimeter of the manhole to allow the teams to correctly locate the blower. The blower may be placed at any point, outside the square the team wishes. The blower power cord will not be plugged in, but the switch **must be turned on and left on.**

Permit

The only entries required on the permit during the event are acceptable readings for oxygen, combustible gas and hydrogen sulfide. These three entries must be made after the 30 second test and before anyone breaks the plane of the manhole. Do not wait for the readings on the gas meter. Any acceptable reading (considered safe for entry by OSHA) may be entered on the permit after the 30-second test. Readings will be written to the tenth. Example oxygen of 20 PPM will be written 20.0 PPM .Only one entrant may be listed on the permit and allowed to enter the manhole. **Gloves may be removed from the hands of the person completing the permit and only while he/she is entering information on the permit.**

Victim's Harness

It will be up to each individual team to check or adjust the victims harness for proper fit by the team during the four minute check. The full body harness on the victim should be installed to insure proper care and retrieval of the victim.

Decontamination Procedures

Place the victim in the armchair below the emergency shower. Activate the shower by pulling the handle to the furthest position downward.

Personal Hygiene

Do not place anything into your mouth, i.e., gas detector, pencils, pens, or straps. This will result in a penalty.

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Equipment Provided for Competition:

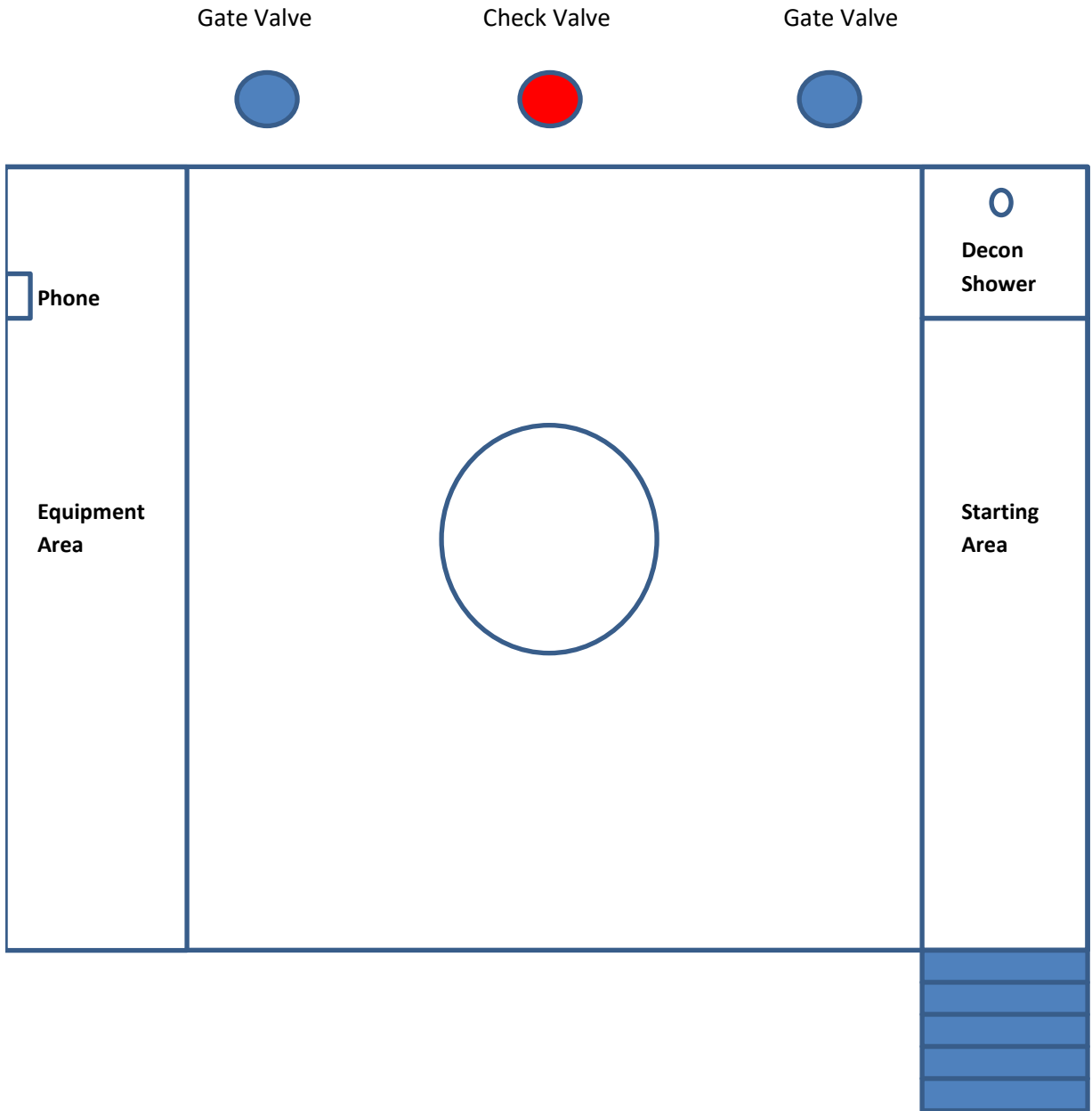
- 16ft X 16ft platform (6ft height) with a 36 inch circular opening in the center of the floor.
- Xtirpa manhole unit, Winch (Salalift II), 1 SRL (Ultra-Lok)
- Ropes for emergency retrieval of entrants (Condor 50' Lifeline Model #45J302)
- 8 foot manhole ladder (Werner Model M7108-1)
- Tool Bag (Craftsman 18" BoltOn #16896)
- Tool Bag Rope & Clip (15 Feet of 1/8" paracord - 160lb working load limit & 7/16" Spring Link – 340lb working load limit- Available at Home Depot)
- Phone to call emergency services
- One arm chair (Decontamination area)
- One clipboard
- One stopwatch
- One manhole safety cover (Safe Approach)
- Two LOTO clamshells for gate valve lockout (Model # 45MZ60 – Grainger)
- Two Gang hasps and 4 locks(2 per entrant)
- Four Lockout/Tagout Tags
- One Scott Protégé Gas Monitor With Pump
- Two ¾" combination wrenches and one flathead screwdriver.
- 2 Gate valves (Kennedy Valve C-509) and Check valve (Crispin RF 41)
- Replacement flapper and gasket
- Blower and Vent Tube Assembly

Equipment Provided by Teams

Teams will be required to supply and wear, as appropriate, the following:

1. Steel-toed shoes ANSI rating Z41-PT99
2. Hardhats meeting ANSI standard ANSI Z89.1-2003 Type I or II (bump hats are not acceptable)
3. Safety glasses/goggles ANSI rating Z87.1-2003
4. Leather gloves, mechanics gloves. Baseball, Golf gloves. **Gloves with fingertips removed or holes in the glove are not acceptable.**
5. Pencil or pen to write on confined space permits

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WEFTEC 2016 Safety Event	
Confined Space Entry Work Permit	
A. Site Information: PLEASE PRINT	
Confined Space Id. Number:	
Team name:	
Designated Entry Team Leader:	
Designated Team Attendant:	
Description of work to be performed:	
B. Protective And Emergency Equipment Needed	
Yes	No
Gloves X	
Boots X	
Harness/Davit Arm Hoist X	
Atmospheric Tester X	
Blower X	
Hard Hat/Coveralls X	
Ventilated/Purged X	
C. Atmospheric Tests	
Explosive Gases	LEL
Oxygen	%
H ₂ S (Hydrogen Sulfide)	PPM
CO (Carbon Monoxide)	PPM
(Note: if alarm sounds vent space for 15 minutes with power ventilator and retest. If alarm sounds again continue to ventilate and retest until atmosphere meets allowable limits)	
Test accomplished by:	
D. Sign Off	
Entrant Signature:	
Entrant Signature:	
Attendant's Signature:	