

Operations Challenge Safety Event 2022

1 **Revision Notes (V2):**

2 Added Revision Notes section.

3 Added Line reference numbers.

4 Lines 102 – 109: Updated handling of tripod to align with WEF rules.

5 Lines 135 – 136: Updated attendant language to align with WEF rules.

6 Lines 153 – 154: Updated breakdown of tripod to align with WEF rules.

7 Line 230: Updated tripod equipment description to align with WEF rules.

8 Line 231: Added ropes to equipment list to align with WEF rules.

9 Line 248 – 249: Added harnesses to equipment list to align with WEF rules.

10 Line 250: Added dummy to equipment list to align with WEF rules.

11 Line 264: Updated graphic to show rope hooks.

12 **Situation:**

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

22 **Directions:**

24 **Four-minute equipment check:** The team will be allowed onto the platform to check all
25 competition equipment and supplies for four minutes prior to the actual start of the event. Part of
26 the four-minute check will include pre-adjusting harnesses including the victim's harness. The
27 victim's harness, one entrant harness, the clipboard and the gas detector can be stacked during
28 set-up. The head judge will inform the team captain when the four minutes are completed. At this
29 time all team members must immediately move to the starting area. If all equipment problems have
30 not been resolved by this time, they will be addressed with the team in starting position. A delay at
31 this point is cause for a penalty. Judges will not answer team questions during the four-minute
32 inspection time or during the event. All questions will be answered during the pre-competition
33 meeting. This is done to assure all teams receive the same instructions.

35 One team member will verbalize being the **“SAFETY SUPERVISOR”**. (This individual must
36 make the 911 call.)

38 One team member will verbalize being the **“QUALIFIED ATTENDANT”** (This individual must
39 perform the gas monitoring during the event.) and then demonstrate the powering on and initial
40 testing of the Dräger gas meter during this time, by performing and verbalizing the following steps

- 42 a. You must VERBALIZE and HOLD the right button until **the unit beeps**
43 **and the firmware version** appear on screen.
- 44 b. Once the gas meter is on Verbalize **“GAS METER ON”**.
- 45 c. Attach **Meter** to the **Pump**.
- 46 d. Attach hose to top of Pump.
- 47 e. Allow unit to finish power on self-test.
- 48 f. When screen shows a hose with arrows, use your thumb to block the end
49 of hose and verbalize **“BLOCKING PUMP”**.
- 50 g. When the arrows disappear from the hose image, release the hose and
51 verbalize **“PUMP CLEAR”**.
- 52 h. Remove hose from gas meter and neatly coil hose.

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- 53 i. Leave the meter on!
54

55 All tools required for the check valve repair may be placed / arranged in the tool bag. No other
56 equipment can be pre-assembled or disassembled prior to the start. If anything has been pre-
57 assembled or disassembled, the head judge will instruct the team to disassemble / reassemble the
58 equipment prior to starting. If there is still pre-time left, then no penalty will be assessed; however,
59 if the four-minutes have been used up, a penalty for excessive pre-check will be assessed. All
60 equipment must be placed back behind the line in the equipment storage area at the end of the
61 four-minute equipment check. The blower hose strap will begin pulled tight across the blower. The
62 ladder must hang from the hooks, not rest on.
63

64 All printed and signed names of the entrants and attendants may be made on the permit at this
65 time; names must be legible. Fill out the lockout tags. To avoid subjectivity, the judges will verify
66 legible handwriting at this time. The date on the permit and tags must be the actual date of the
67 competition!!! The format for the date will be MM/DD/YY (Ex. – 06/16/80). The power for the blower
68 will be left in the off position at this time.
69

70 At the end of the four-minute time all team members must immediately move to the starting area:
71

- 72 1) Team members will start behind the designated starting line (Not within the decon zone)
73 2) The team captain will start the event by yelling, "Start"
74 3) One team member, "**safety supervisor**", will immediately proceed to call 911. ***This***
75 ***team member cannot assist in any other part of the event until 911 has been called.***
76 4) The entrants will put on full body harnesses.
77 5) One team member, "**qualified attendant**", will simulate turning on the gas detector (gas
78 detector should have been left on after Four-minute check) and will then test the manhole
79 atmosphere for 30 seconds using a gas detector and provided stopwatch.
80 a. Attach hose to the top of the pump, making sure that side of the hose that
81 is shortest from tape markings is attached to pump.
82 b. **Verbalize** "**GAS METER ON**"
83 c. Use your thumb to block the end of hose and **verbalize** "**BLOCKING**
84 **PUMP**".
85 d. Release the hose and **verbalize** "**PUMP CLEAR**"
86 e. Insert the hose into the confined space, making sure that the hose is
87 inserted to a point between the two black marks. Hose cannot be tangled
88 or knotted.
89 f. Begin monitoring the space for 30 seconds.
90 g. At the end of 30 seconds, record gas readings on your form and **verbalize**
91 "**GAS READINGS GOOD**"
92 h. Remove the hose from the unit.
93 i. Remove the Meter from the Pump.
94 j. Attach gas monitor to entrant. Unit must be attached to either the entrant's
95 harness or another area outside the entrant's uniform (a clip of some form
96 will be provided to facilitate this). **THE MONITOR CANNOT BE**
97 **PLACED IN A POCKET OR INSIDE THE SHIRT.**
98
99 6) The "**qualified attendant**" will fill out the confined space entry permit. The "**qualified**
100 **attendant**" must continue to monitor the gas detector during the 30 second period. The
101 gas detector cannot be left or ignored.
102 7) The Tripod (3M DBI/ Sala 3-way combo unit) unit will be assembled and placed over the
103 manhole. The chains must be adjusted and pulled tight (adjust to the tenth link, the ninth
104 and eleventh links will be taped). The entry person must be attached to the fall protection

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- 105 device (SRL) before entry can be made. Any entrant that is connected to an SRL that
106 doesn't allow the attendant to crank you back to the manhole opening, must be
107 connected via a lifeline. Lifeline must be tied off to the railing. Entrants must remain
108 connected to their SRL while in the manhole entry. Careful consideration of open
109 manhole should be always made. This is to represent a true-life situation.
- 110 8) Remove the manhole safety cover. The entrant must be the person who removes the
111 cover and first be connected to the SRL.
- 112 9) Install the blower saddle vent into the manhole; attach the 90-degree fitting to the saddle.
113 Place the blower 5-ft from the manhole and attach the blower hose to the 90-degree
114 fitting. Turn the blower on. Verbalize – “**BLOWER ON**”
- 115 10) Place the manhole ladder in the manhole. Entrants will enter and exit the manhole via
116 the portable manhole ladder. The ladder must be installed carefully and correctly and
117 must not hit the victim.
- 118 11) The entry person/s will put a full body harness on the victim. After the full body harness is
119 on the victim and properly adjusted, the entry person will attach the winch hook to the
120 center “D” ring on the back of the victim’s harness. The entry team will have to team carry
121 the victim to the hole for rescue. The arm and leg straps of the harness must be on the
122 victim prior to lifting him with the winch. Another team member will lift the victim from the
123 space using the winch.
- 124 12) The chest strap must be attached prior to the victim’s head breaking the manhole plane.
125 One entrant must maintain control of the victim and the door of the barricade must remain
126 closed and latched until the victim’s head breaks the plane of the manhole. The victim is
127 the primary concern. The first entrant must begin victim aid/rescue. The rescue of the
128 victim cannot be ignored!! The entry person **CANNOT** lift the victim to assist the
129 winching.
- 130 13) Two team members will carry the victim to the chair in the designated area and begin
131 decontaminating the victim. Do not drag the victim; all body parts must be off the ground
132 (floor of the platform) while moving the victim to the chair. Activate the shower by pulling
133 the shower handle to its furthest position downward. The body harness will remain on the
134 victim. The tripod may not be dismantled until both entrants have exited.
- 135 14) The team member acting as the attendant must attend the manhole at all times except for
136 assisting in carrying the victim.
- 137 15) Teams will attach a rope with a spring link to the tool bag and lower it to the entrants
138 through the manhole opening (at no time may tools or the bag be hand passed through
139 the opening). The tool bag may be disconnected from the rope by the entrants to carry to
140 the check valve location. The end of the “tool rope” may be tied off to the barricade but
141 must remain outside the confined space. The tool bag, rope and link can remain together
142 at the end of the event.
- 143 16) One entrant may begin work on the situation by closing and LOTOing (both entrants must
144 LOTO using the gang hasps) the gate valves (as long as the victim is being tended to).
145 Each entrant must LOTO the gate valves prior to performing any work on the check
146 valve. Entrants will replace the check valve flapper and gasket, remove their LOTO and
147 reopen the gate valves. Both entrants must assist in the check valve repair by removing
148 or reinstalling at least one bolt. Both entrants must maintain control (“on his/her person”)
149 of their respective LOTO key. The key cannot be left lying anywhere.
- 150 17) The team member tending the fall protection system may assist with the manhole exit of
151 the entrants.
- 152 18) Team members will disassemble and store all equipment behind the line in the
153 equipment storage area. You cannot remove any equipment or pins until both entrants
154 have exited the manhole and the cover has been replaced. The tripod unit must be fully
155 disassembled to its original condition, all pins in their respective holes and all parts
156 placed back in their original storage areas. The retrieval ropes and ladder must be put
157 back on their respective hangers. Ropes should be rolled up in such fashion as to not
158 touch the floor. No items may be stacked at the end of the event. The winch cable must
159 be within the length of the weight and hook. The blower hose must be back in the blower

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160 and the strap must be pulled tight. The full body harnesses will remain on the entry
161 persons. Time will end when all team members cross back into the starting area (Not
162 within the decon zone) and the team captain raises his/her hands above their heads and
163 shouts "Stop." All team members will stay in the start/finish area until released by the
164 judges. Judges will collect the entry permit, stopwatch, harnesses, gas detector and
165 lockout keys. Once the team has been released, they will leave the competition area. The
166 captain will be escorted to a waiting area for review of the event with the head judge.

167

168 **Safety**

169 The manhole opening will be protected with a safety cover before a team accesses the platform.
170 It must not be removed until the tripod is fully assembled and in place over the manhole, and the
171 entrant is completely and properly in the harness and attached to the SRL that is fully attached to
172 the tripod unit. The cover must be reinstalled on the manhole opening as soon as the last entrant
173 exited the manhole and before the barricade is removed from the manhole opening. Ladder
174 safety during usage will be required. **Three points of contact will be required. Ladder rungs**
175 **must be used, no sliding down the sides. Ladder rungs may not be skipped.**

176

177 **Team members may not run!!! No member should have both feet off the ground at the**
178 **same time.**

179

180 **Atmosphere Tester**

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

190

191 **Blower Placement**

192 The blower must be placed 5 feet from the rim of the manhole prior to entry. The blower power
193 cord will not be plugged in, but the switch **must be turned on and left on.** The blower saddle
194 must remain in the hole until the both entrants have completely vacated the space.

195

196 **3M Tripod Unit**

197 The 3M Tripod Unit must be set-up with the legs extended so that the pins are placed in the 6th
198 hole up. All 3 Devices must be attached to the tripod before entry is made by any entrant. All pins
199 must be reinstalled in their proper location at the end of the event and the legs of the tripod put
200 back to the 1st hole location. The tripod feet must not leave the floor once placed over the
201 manhole until the last entrant has exited the manhole.

202

203

204 **Permit**

205 All lines of permit must be filled out. The entries required on the permit during the timed event will
206 be entries under section C, these must be made after the 30 second test and before anyone
207 breaks the plane of the manhole. All other entries may be filled out during the 4-minute check. Do
208 not wait for the readings on the gas meter. Any acceptable reading (considered safe for entry by
209 OSHA) may be entered on the permit after the 30-second test. Readings will be written to the
210 tenth. Example oxygen of 20 PPM will be written 20.0 PPM. **Both of the entrants must be**
211 **listed on the permit to be allowed to enter the manhole. Gloves may be removed from the**
212 **hands of the person completing the permit and only while he/she is entering information**
213 **on the permit.** Confined space ID number will be Team number.

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214

215 **Victim's Harness**

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

219

220 **Decontamination Procedures**

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

223

224 **Personal Hygiene**

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

227

228 **Equipment Provided for Competition:**

- 229 • 16ft X 16ft platform (6ft height) with a 36-inch circular opening in the center of the floor.
- 230 • Tripod (3M DBI/ Sala 3-way combo unit)
- 231 • Rope for emergency retrieval of entrants (Condor 50' Lifeline Model #45J302)
- 232 • 8-foot manhole ladder (Werner Model M7108-1)
- 233 • Tool Bag (Craftsman 18" BoltOn #16896)
- 234 • Tool Bag Rope & Clip (15 Feet of 1/8" paracord - 160lb working load limit & 7/16" Spring
- 235 Link – 340lb working load limit- Available at Home Depot)
- 236 • Phone to call emergency services
- 237 • One armchair (Decontamination area)
- 238 • One clipboard
- 239 • One stopwatch
- 240 • One manhole safety cover (Safe Approach)
- 241 • Two LOTO clamshells for gate valve lockout (Model # 45MZ60 – Grainger)
- 242 • Two Gang hasps and 4 locks (2 per entrant)
- 243 • Four Lockout/Tagout Tags
- 244 • One Gas Monitor with Pump (Drager X-am 2500)
- 245 • Two 3/4" combination wrenches and one flathead screwdriver.
- 246 • 2 Gate valves (Kennedy Valve C-509) and Check valve (Crispin RF 41)
- 247 • Replacement flapper and gasket
- 248 • Exofit 3 D-Ring, USABB part number for the small is 65113, medium, 65114, large is
- 249 65115
- 250 • Rescue Randy
- 251 • Blower and Vent Tube Assembly

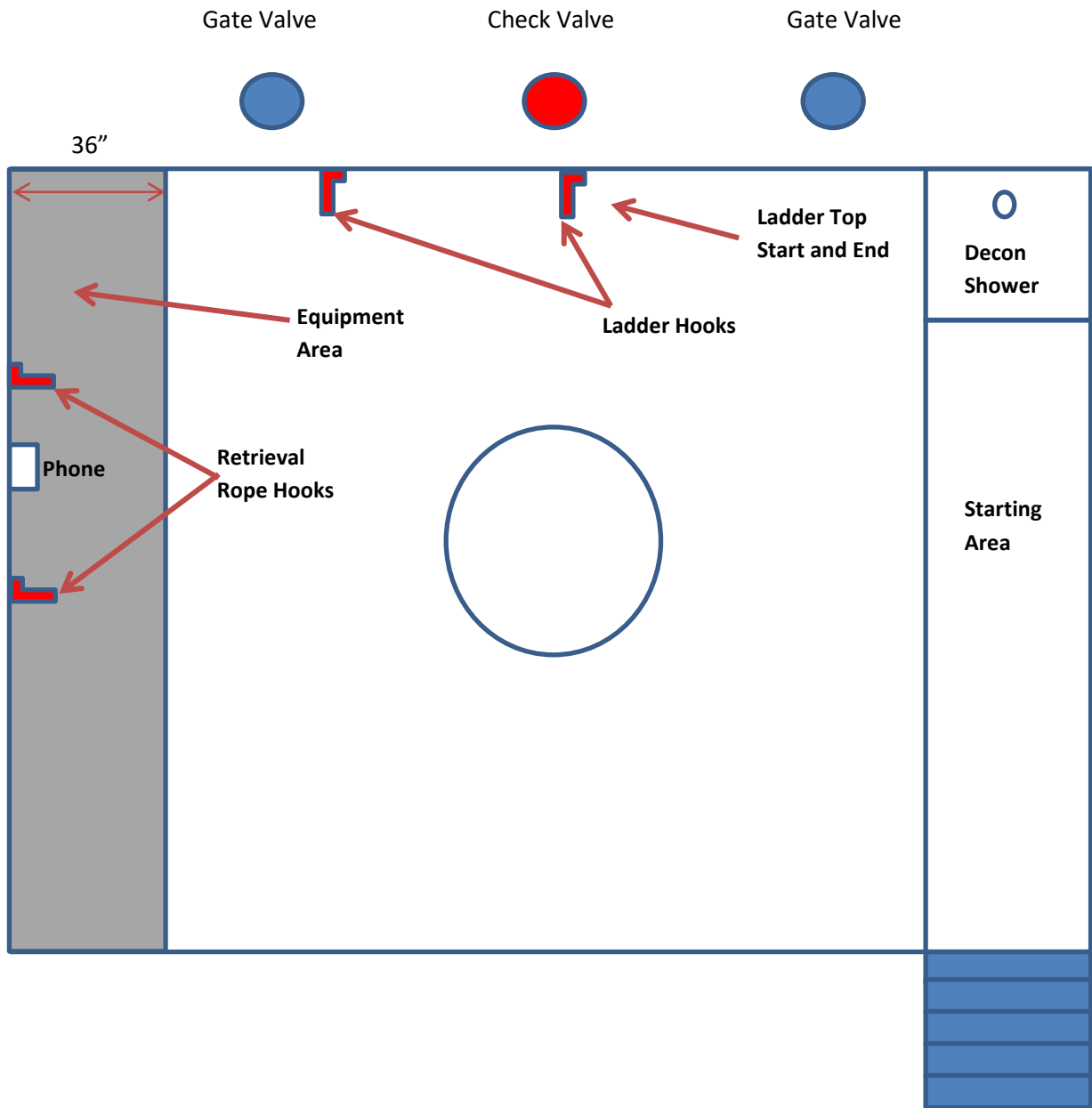
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253 **Equipment Provided by Teams**

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

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

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| | | | |
|---|-----|----|--|
| Texas Water 2022 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 | | | |
| Boots | | | |
| Harness/Davit Arm Hoist | | | |
| Atmospheric Tester | | | |
| Blower | | | |
| Hard Hat/Coveralls | | | |
| Ventilated/Purged | | | |
| C. Atmospheric Tests | | | |
| Explosive Gases | LEL | | |
| Oxygen | % | | |
| H2S (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: | | | |