TAKE TIME FOR SAFETY

"Sewer Entry"

Trainer Outline

1. **This safety session will teach employees to:**
   - Identify and understand the hazards associated with sewer entry.
   - Develop policy and work practices to reduce identified risks and exposures.

   Sewer entry differs in three vital respects from other permit required entries; first, there rarely exists any way to completely isolate the space to be entered; second, because isolation is not complete, the atmosphere may suddenly and unpredictably become lethal from causes beyond the control of the entrant, and third, experienced sewer workers are especially knowledgeable in entry and work in their permit spaces because of their frequent entries.

2. **Adherence to procedure:**
   - The employer shall designate entrants who are trained in entry procedures.
   - Designate employees who demonstrate that they follow these entry procedures exactly as prescribed.

3. **Potential hazards:**
   - Engulfment: Can be caused by a liquid or a flowable solid like sand or grain, which could immerse and bury a person.
   - Toxic gases: Equal to or more than 10 ppm of hydrogen sulfide or carbine monoxide. If the presence of other toxic contaminants is suspected, specific monitoring programs should be developed.
   - Explosive/flammable gases: Greater than 10% of the lower flammable limit (LEL).
   - Oxygen: A concentration of oxygen in the atmosphere of the space should not be less than19.5% and no greater than 23.5%.

   Before and during each entry the atmospheric conditions must be determined to be in acceptable entry parameters to ensure employee safety.

4. **A confined space may be entered without a permit or attendant if:**
   - The space can be maintained in a safe condition for entry by mechanical ventilation.
   - Pumps and lines which may reasonably cause contaminants to flow into the space shall be disconnected and locked out, or effectively isolated by other means to prevent air contamination or engulfment.
   - The surrounding area shall be surveyed to avoid hazards such as drifting vapors from the tanks, piping, or sewers.

5. **Testing:**
   - The atmosphere within the space should be tested to determine whether dangerous air contamination and/or oxygen deficiency exists.
   - Gas monitors and explosion meters are examples of monitoring equipment.
   - A written record of the pre-entry test results should be kept at the work site for the duration of the job.
   - Monitoring air quality should be continued during entry.

   Entry cannot be made until it has been verified that the atmospheric conditions are safe.

6. Entry procedures:

- Verify that all PPE is being used.
- Continuous monitoring of the atmosphere in the immediate vicinity of the workers.
- Entrants shall immediately leave the space when the gas monitor alarm is activated.
- Provide continuous mechanical ventilation during entry.
- Monitor the weather conditions for rainfall or water run-off during entry.
- A written copy of operating and rescue procedures shall be at the work site.

7. Discussion Points:

Ask employees to discuss what hazards may be encountered when working in a sewer and what can be done to address the hazards.

8. Conclusion:

Entry into a sewer can be safely made after acceptable atmospheric conditions are verified. Anytime those conditions change the employee must exit the space immediately and not re-enter until the conditions have improved.

9. Test Your Knowledge

Have your employees take the Sewer Entry quiz. By testing their knowledge, you can judge their ability to understand how to reduce losses by following safe entry procedures and whether they need to review this important topic again.

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Quiz

SEWER ENTRY QUIZ

1. What is the minimum oxygen level for safe entry?
a) 24.3%
b) 15.5%
c) 19.5%

2. An outside attendant is not required in a non-permit required space.
a) True b) False

3. A written record of the monitor's reading is not necessary.
a) True b) False

4. Which of the following is a hazard?
a) Engulfment
b) Toxic gases
c) Explosive/flammable gases
d) All the above.

5. Rain fall and water run-off does not affect underground sewers.
a) True b) False

6. All pumps and lines which could cause contaminates to flow into the space should be:
a) Disconnected
b) Locked out
c) isolated
d) All the above

7. Employees must receive training before entering a sewer.
a) True b) False

8. Hazardous conditions that should be monitored during entry are:
a) Oxygen deficiency
b) Lower flammable limits
c) Hydrogen sulfide
d) All the above

9. Monitoring can stop after acceptable conditions are verified.
a) True b) False

10. A copy of the operating and rescue procedures must be at the work site.
a) True b) False

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Quiz Answers

ANSWERS TO SEWER ENTRY QUIZ

1. c. 19.5%

2. a. True

3. b. False

4. d. All the above

5. b. False

6. d. All the above

7. a. True

8. d. All the above

9. b. False

10. a. True

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Handout

Always Follow Sewer Entry Procedure

Adherence to procedure:

- The employer shall designate entrants who are trained in entry procedures.
- Designate employees who demonstrate these entry procedures exactly as prescribed.

Potential Hazards:

- Engulfment: Can be caused by liquid or a flowable solid like sand or grain, which could immerse and bury a person.
- Toxic gases: Equal to or more than 10 ppm of hydrogen sulfide or carbine monoxide. If the presence of other toxic contaminants is suspected, specific monitoring programs should be developed.
- Explosive/flammable gases: Equal to or greater than 10% of the lower flammable limit (LEL).
- Oxygen: A concentration of oxygen in the atmosphere of the space should not be less than 19.5% and no greater than 23.5%.

A confined space may be without a permit or attendant if:

- The space can be maintained in a safe condition for entry by mechanical ventilation.
- The surrounding area shall be surveyed to avoid hazards such as drifting vapors from the tanks, piping, or sewers.
- Pumps and lines which may reasonably cause contaminants to flow into the space shall be disconnected and locked out, or effectively isolated by other means to prevent air contamination or engulfment.

Testing:

- The atmosphere within the space should be tested to determine whether dangerous air contamination and/or oxygen deficiency exists.
- Gas monitors and explosion meters are examples of monitoring equipment.
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