

LECTURE 5

CONFINED ENTRY HAZARDS

OBJECTIVES:

Entry into air pollution control devices or the ductwork upstream and downstream is exceptionally dangerous for agency inspectors. The objective of this lecture is to demonstrate why inspectors should not enter these devices under any circumstances.

SCOPE:

- * Problems of isolating air pollution control devices
- * Problems concerning hot, free flowing solids
- * Falls through corroded tube sheets
- * High voltage conditions
- * Inhalation and oxygen deficiency problems
- * Burns due to high gas and metal temperatures
- * Heat stress
- * Extreme noise exposure
- * Falls on slippery surfaces
- * Sudden equipment start-up

READING ASSIGNMENTS: None

VISUAL AIDS: Videotape #4

BASIC PRINCIPLES AND PROCEDURES:

- * Agency inspectors do not have the time necessary to ensure that an air pollution control system has been properly prepared for internal entry.
- * Agency inspectors do not have the necessary personal protection equipment and safety equipment to perform internal inspections.
- * All of the data and information necessary to evaluate compliance can be obtained without going inside air pollution control systems or ductwork.
- * It is inherently difficult to completely isolate air pollution control systems.

- * Adherence to confined entry permit requirements provides only limited protection.
- * Most confined entry procedures are primarily concerned with inhalation or oxygen deficiency problems. However, in the case of air pollution control sources, these represent only some of the numerous problems which can exist simultaneously.
- * A control device is not inherently safe just because it is new and has not yet been operated.
- * A control device is not inherently safe just because plant personnel are inside working.

REVIEW QUESTIONS:

1. A person from the plant's safety staff has just completed measurements of the scrubber internal gas temperature, oxygen concentration, hydrogen sulfide concentration, carbon monoxide concentration, and combustible gas concentration. All measurements indicate safe working conditions. Is it safe to enter?
 - a. Yes
 - b. No

2. There are approximately 20 people inside an electrostatic precipitator working on straightening warped collection plates. This is occurring during the early stages of a planned two week outage. Is it safe to enter to review the improvements in the alignment?
 - a. Yes
 - b. No

3. You have entered a fabric filter serving a cement kiln. The compartment's inlet and outlet dampers have been closed to isolate the compartment from the gas stream. After allowing the compartment to cool, is it safe to enter?
 - a. Yes
 - b. No

4. You are in a new electrostatic precipitator which has been installed downstream from an older unit which could not maintain compliance on a continuous basis. The boiler has been offline approximately three weeks to tie in the newer unit. A number of plant personnel are inside the new precipitator. Is it safe to enter this new unit?
 - a. Yes
 - b. No

5. Should agency inspectors enter air pollution control devices or ductwork?
 - a. Yes
(Choosing this answer automatically results in a failing grade for this self instructional course.)
 - b. No, under any circumstances

REVIEW QUESTIONS - ANSWERS:

1. A person from the plant's safety staff has just completed measurements of the scrubber internal gas temperature, oxygen concentration, hydrogen sulfide concentration, carbon monoxide concentration, and combustible gas concentration. All measurements indicate safe working conditions. Is it safe to enter?

a. Yes

Incorrect. The plant personnel often measure the conditions within several feet of the hatch. This is not representative of the pollutant and oxygen concentrations in the interior areas of the collector. Much more extensive measurement efforts are generally necessary to confirm that a device is safe for entry. Inspectors should not rely on the plant's confined entry permit system or procedures.

b. No

Correct. The problem discussed in answer "a" is only one of many reasons why internal entry is unsafe for agency inspectors.

2. There are approximately 20 people inside an electrostatic precipitator working on straightening warped collection plates. This is occurring during the early stages of a planned two week outage. Is it safe to enter to review the improvements in the alignment?

a. Yes

Incorrect. For example, the entire electrostatic precipitator could suddenly be filled with high temperature steam vented from another source in the plant. This would result in the deaths of most of the individuals inside the unit since it takes a reasonable amount of time to climb out of the small hatches usually provided.

b. No

Correct. The problem discussed in answer "a" is only one of many reasons why internal entry is unsafe for agency inspectors.

3. You have entered a fabric filter serving a cement kiln. The compartment's inlet and outlet dampers have been closed to isolate the compartment from the gas stream. After allowing the compartment cool is it safe to enter?

a. Yes

Incorrect. Most dampers leak and it is possible for fatal concentrations of carbon monoxide or fatal oxygen deficiencies to develop while inside the compartment.

b. No

Correct. The problem discussed in answer "a" is only one of many reasons why internal entry is unsafe for agency inspectors.

4. You are in a new electrostatic precipitator which has been installed downstream from an older unit which could not maintain compliance on a continuous basis. The boiler has been offline approximately three weeks to tie in the newer unit. A number of plant personnel are inside the new precipitator. Is it safe to enter this new unit?

a. Yes

Incorrect. If the personnel working on the first precipitator conducted an air load test, fatal concentrations of ozone would be generated. Due to natural stack draft, this material would be transported to the second precipitator and would immediately kill anyone inside the new unit. One of the reasons this problem can occur is that some plants have lock-out systems which address particular equipment units but do not consider the entire system.

b. No

Correct. The problem discussed in answer "a" is only one of many reasons why internal entry is unsafe for agency inspectors.

5. Should agency inspectors enter air pollution control devices or ductwork?

a. Yes

(Choosing this answer automatically results in a failing grade for this self instructional course.)

This is absolutely the incorrect answer.

b. No, under any circumstances

This is absolutely the correct answer.