Training Workers about DOE's 851 Rule: Understanding the Big Picture on Health and Safety Management, DOE Trainers' Exchange, 5-7-12 Presented by Bruce Lippy

OBJECTIVES

At the end of this session, you will be able to:

1. Describe the 6 topics covered in the course
2. Explain the strategy of giving the course a broader health and safety management structure
3. Describe the main components of an excellent health and safety management system
4. Suggest ways to improve and deliver the materials

Our major challenge was creating regulatory training that wasn't boring.

Another major goal was to help the student to see the similarities among health and safety management systems.

Another goal was to design for group learning.

Scott Klekar, HAMTC
Training Coordinator, Hanford

The curriculum uses statements from champions to reinforce points and there are statements from DOE workers about their experiences with 851.

James Hardy, Nuclear Chemical Operator, Hanford

The major goal in PowerPoint design was to follow the Assertion-Evidence approach.

- Approach created by Dr. Michael Alley of Penn State and colleagues
- They contend that the defaults of PowerPoint are not based on research in communication or cognitive psychology.
- The attempt is to ground slide structure in communication research

- Alley has results showing students do better with this approach

This course was developed for National PETE, Partnership for Environmental Technology Education. The Lippy Group team that developed the course:

- Bruce Lippy, Ph.D., CIH, CSP
- Mike Cooper, CIH, CSP, MPH
- Bernie Mizula, MS, CIH
- Tom Ouimet, MPH, MBA, CIH, CSP
- Martha Lippy, M.Ed.

The curriculum contains:

- 6 PowerPoints
- Student manual
- Instructor manual
- 21 high definition video clips on module topics featuring Dr. Bill McArthur, Head of DOE's 851 program
- Layne Davis, Executive Director VPPPA
- Larry Liberatore, former Head of OSHA's VPP for public sector
- Resource disc

The six modules are:

1. Introduction
2. Access to Information
3. Reporting Events and Hazards
4. Risk Identification and Assessment
5. Worker Exposure Assessment
6. Communications

Module 1-Introduction

The course starts with an introduction to how far we've come by looking at historical events like the Hawk's Nest tunnel in WV killed 476 workers in 1927.

Photo courtesy Suburban Emergency Management Project

The worst industrial tragedy in this country took place during the Great Depression in West Virginia. Thousands of men traveled from across the country to build a tunnel through Gauley Mountain to divert water from the New River to a hydroelectric plant to supply power to a industries operated by Union Carbide as well as others.

It turned out that the rock they blasted, drilled, and hauled was almost pure silica, a deadly dust that causes silicosis in the lungs. The company and engineering firm in charge were aware of the situation and wore

respirators when inspecting the project, but ordered work to proceed full speed ahead without any protection provided to workers to prevent inhaling the dust. Silicosis is usually a disease that develops over a long period of exposure. In this case, the exposures were so intense that they caused an acute form of silicosis that killed or made workers ill in a matter of months.

The course tries to put the scope of problems in context: Since passage of OSH Act:
There have been 341,000 workplace fatalities and 68 criminal prosecutions. The total jail time received has been 42 months. More jail time has been spent for harassing burros on federal land.

The course materials try to put a human face on occupational fatalities

December 21, 2003 New York Times:

As the autopsy confirmed, death did not come right away for Patrick M. Walters. On June 14, 2002, while working on a sewer pipe in Cincinnati in a trench 10 feet deep, he was buried alive under a rush of collapsing muck and mud. A husky plumber's apprentice, barely 22 years old, Mr. Walters clawed for the surface. Thousands of pounds of dirt pressed on his chest, squeezing and squeezing until he could not breathe.

The 851 Rule applies to contractors. How are they defined?

Anyone under contract with DOE, including subcontractors at *any* tier
any affiliated entity such as a parent organization

The key aspects of 851 are handled early like conditions for refusing work. What are they?

1. A reasonable belief that the task poses an imminent risk of death or serious physical harm; and
2. A reasonable belief that there is insufficient time to seek effective redress through normal hazard reporting and abatement procedures

Put that in English in your group

Employees should participate in daily worksite inspections according to the DOE 851 Implementation Guide (DOE G440.1-8 12-27-06)

For worksite inspections to be effective, employees should:
Source: DOE 851 Implementation Guide (DOE G 440.1-8 12-27-06)

- ❑ Be trained in hazard recognition, analysis and control
- ❑ Have access to worker protection professionals
- ❑ Have access to reference sources
- ❑ Be able to suggest abatement methods
- ❑ Be able to track corrective actions

Group exercise: At your DOE site, how many of these can you check

American National Standards Institute has a standard called, "Occupational Health and Safety Management Systems." The standard designation is ANSI/AIHA Z10-2005.

Section 3.2 of the standard, *Employee Participation* recommends: **"Ensure effective participation by employees at all levels, *including those working closest to the hazard."***

Z-10 specifically uses the hierarchy of controls. Group Exercise: Decide on the level of controls that have been applied.

#	Description	Control level
1	**Placing cones around broken floor tiles**	
2	**Using water-based hand cleaner rather than cleaning up with turpentine**	
3	**Placing of damping material in metal bins to reduce noise of metal parts dropping from the line**	
4	**Training workers how to safely operate a punch press**	
5	**Wearing a full-face respirator**	
6	**Building a sound-proof booth for operators at cinder block plant**	
7	**Picking up radioactively-contaminated waste with robot**	

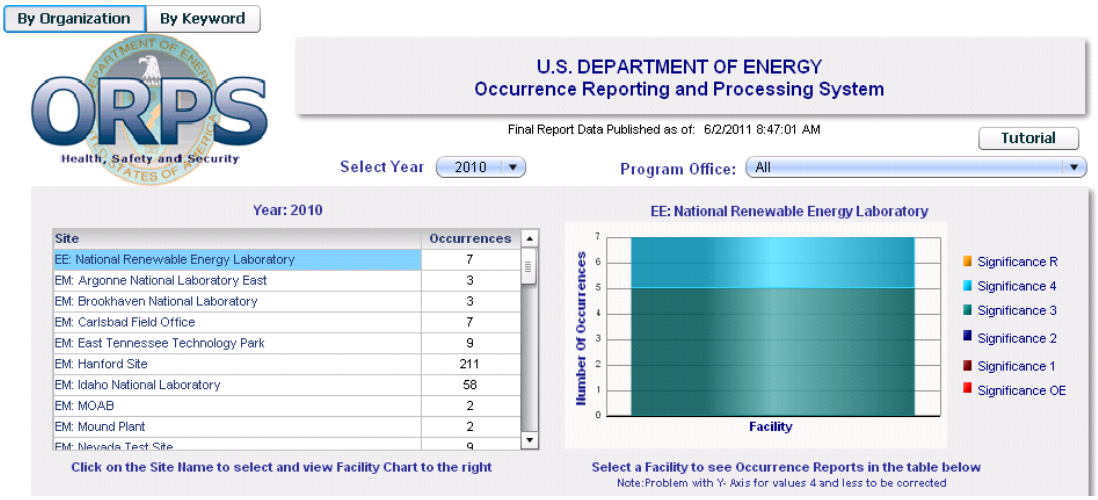
Part 851 is based on DOE's Voluntary Protection Program. DOE VPP has lots of creative ideas.
http://www.hss.doe.gov/HealthSafety/wsha/vpp/tools/tools.html

1. Hanford's Union Safety Representatives
2. Savannah River's SAFE-T Construction Safety Program
3. Idaho's Safety Observations Achieve Results (SOAR)
4. Idaho's Passports

5. WIPP's "The Porcelain Press"

Module 2-Access to Information

Occurrence Reporting and Processing System (ORPS) reports are available to the public.



http://www.hss.doe.gov/csa/analysis/orps/finalorps/orps.html

This is from the ORPS final occurrence report website. The reports can be filtered by site, year and program office (energy efficiency and renewable energy, environmental management, fossil energy, etc.).

Group Exercise:
Use the ORPS database to find information on an incident at a DOE site.
Answer the following questions:

1. What was the incident?
2. What were the adverse effects?
3. What were the causes?
4. What corrective actions were taken?
5. Any corrective actions that should have been taken but weren't?
6. Could a similar incident occur at another site?

Module 3-Reporting Events and Hazards

Activity: (if internet is available) Working with a successful near-miss reporting system developed by the International Association of Fire Fighters

1. Go to the web site www.firefighternearmiss.com.
2. Go to search reports, and enter a topic closely related to your work (falls, struck-by, cuts, etc.).

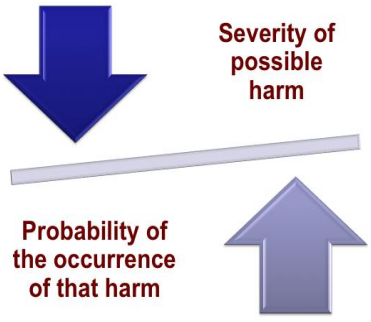
3. From the list of reports choose a report to discuss with your group and print the report out.
4. Review and discuss completed report with your group. Discuss how the report may be used to prevent the incident from happening again.
5. Each group member will next look at a blank report. Is there anything you would want added/removed for your line of work? If so what are they?
6. Group members will be asked what they learned from the National Fire Fighters Near-Miss reporting system and from near-miss reporting in general.

Example Report: Exploding ammo hits firefighters (10-308)

First arriving units to a fully-involved structure fire (a double-wide with add-ons), were met with the unmistakable sounds of ammunition being cooked off in the structure about fifty feet from their engine. Based on these conditions, the crews decided upon a defensive operation. They used the truck mounted deck gun to quickly cool the corner of the structure where the ammunition was located. Incident command was established and a safety perimeter was declared. After just a few minutes on scene, one of the pump operators felt that he had been struck on the back by a projectile. A quick check, noted no visible injury and he quickly returned to pump operations. However, damage was noted to the outer shell of his bunker coat.
A post incident review and an inspection of the pump operator's gear revealed a projectile had penetrated his coat's outer shell, skimmed across the vapor barrier, and exited the outer shell a few inches lateral of the first penetration**. Lessons?**

Module 4-Risk Identification and Assessment

Risk is a function of



This is the way safety and health professionals think about risk, that it is the product of the severity of the possible harm and the probability of the occurrence of that harm. Most people think more about consequence or severity, without considering risk as the product of severity *and* probability. A great example is the risk of a $1 million insurance loss with a frequency of once every thousand years is $1,000/year. An event that would cost $1,000 in losses, but occurs every year has the same risk: $1,000/year. Which would you insure against? (Donald Lorenzo, Process Safety Institute, 1998).

This is the most basic risk matrix.

Probability	Low	Low to Medium	Medium to High	High
High	A	M	U	U
Med to High	A	M	U	U
Low to Med	A	A	M	U
Low	A	A	M	M

Severity

A = acceptable
M = marginal
U = Unacceptable

Group Activity: Apply the matrix to this operation

The courses teaches other hazard assessment tools besides JHAs. How many have done a What-if Analysis. Let's do a simple What-if Analysis together. Think about the things that could go wrong with setting up the National Christmas tree and jot three down: Use this form to record your brain storming. Note the rules on the slide.

What-If?	Result	Controls - in place or needed

Rules for each group:

1. Start *each* question with "What if…?"
2. Everyone in the group should pitch an idea
3. Do not criticize the question, just work it
4. Identify 1 or 2 of the greatest risks not covered
5. Be prepared to report these to the larger group

Module 5-Worker Exposure Assessment

10 CFR 851 requires that contractors comply with the ACGIH TLVs when they are more protective than the OSHA PELs.

Group Exercise with NIOSH Pocket Guide

For this example we will assume conditions of normal temperature and pressure and use 24.45 as the molar volume of air. We want to convert the results from mg/m^3 to ppm. Working as a group, use your Pocket Guide to fill in the blanks.

The lab reported results of **1.2 mg/m^3 benzene**

- Molecular weight of benzene: _____
- Benzene TLV-TWA: _____

Convert the results to ppm and determine if the exposure was above the TLV-TWA.

Is the amount greater than the TLV-TWA? Yes ☐ No ☐

ANSWER:

Molecular weight of benzene: 78.11
Benzene TLV-TWA: 0.5 ppm

$$\text{ppm} = \frac{(mg/m^3 \times 24.45)}{MW}$$

$$\text{ppm} = \frac{(1.2 \times 24.45)}{78.11}$$

$$\text{ppm} = \frac{29.34}{78.11}$$

ppm = 0.38

Which is less than the 0.5 ppm, the ACGIH TLV-TWA for benzene

Module 6-Communications

Workers have the right to "express concerns related to worker safety and health."
851.20(b)(7)

Employers must promptly resolve issues resulting from an employee-raised Stop Work
10 CFR 851.20

Safety inspectors investigating incident

In Final Report on West Pharmaceutical Explosion, CSB Finds Inadequate Controls for Dust Hazards, Calls on North Carolina to Strengthen Fire Code on Combustible Dust.