



Alternative Asbestos Control Methods (AACM) at Hanford: Worker and Training Impacts

Presenters:

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Presentation objectives

- ▶ Asbestos history & health affects
- ▶ Describe recent implementation of Alternative Asbestos Control Methods (AACM)
- ▶ EPA's role in initially agreeing to use AACM
- ▶ Hanford's use of AACM
- ▶ Training Challenges
- ▶ Current Update

Standards & Implementing Documents

- ▶ These standards and implementing documents identify the safety requirements and management and worker responsibilities:
 - 40 CFR, Environmental Protection Agency (EPA), 763.92
 - 29 CFR, Occupational Safety and Health Administration (OSHA), 1926.1101
 - 10 CFR, Energy, Part 851 - Worker Safety and Health Program

Asbestos in History

- ▶ Asbestos is a Greek word meaning “Inextinguishable”
 - The Greeks used asbestos for the wicks of the eternal flames of the vestal virgins
- ▶ First use recorded around 3000 BC, when Egyptians used it to wrap the pharaohs’ bodies
- ▶ Use included cloth for women’s clothing, table cloths, napkins, and burial shrouds.
- ▶ “Sickness of the Lungs” was observed in slaves working in asbestos mines and weaving asbestos cloth.

Asbestos in History

- ▶ Asbestos use declined during the Middle Ages, but became popular in the Industrial Revolution.
- ▶ First modern reference to toxicity and banning made by the British Labor Inspectorate, in 1898.
- ▶ Studies in 1917 in the United States showed that asbestos workers were dying unnaturally young.
- ▶ In 1928, the effect of asbestos in the lungs is identified as asbestosis.

Asbestos in History

- ▶ In the 1930s major medical journals began to publish articles that linked asbestos to cancer.
- ▶ In the 1970s, the EPA and (OSHA) began to regulate asbestos.
- ▶ Asbestos is naturally occurring and virtually everywhere in the environment. More than 40% of the land area of the U. S. contains asbestos, although great formations are rare.
- ▶ Primarily mined in Canada, Russia, and South Africa, no current mining in the U.S.

Asbestos Fiber Release

- ▶ **NON-FRIABLE:** Non-friable asbestos material is generally a bound matrix (concrete, asphalt, etc.) that will not allow asbestos fibers to become dislodged and airborne when intact.
- ▶ **FRIABLE:** The material, when dry, can be pulverized, or reduced to powder by hand pressure readily releasing fibers.
- ▶ **DAMAGED ASBESTOS** Regardless of friability, damaged asbestos will release fibers. The more damage, the greater the amount of release.

Health Effects of Asbestos Exposure

- ▶ Respiratory system is sensitive to bacteria, viruses and many airborne particles.
- ▶ If microscopic asbestos particles travel into the alveoli, asbestos related diseases can result.
- ▶ Asbestos may also become a health risk if it is ingested (cancers of the stomach, rectum, etc.).
- ▶ Asbestos skin contact may cause dermatitis, warts or corns.

Health Effects of Asbestos Exposure

Asbestos Related Diseases:

| | | | | |
|------------------------|--|------------------------------------|--------------------------------|--|
| Characteristics | Scarring of the lungs | Malignant tumor of the bronchi | Cancer of the mesothelium | Non-respiratory cancers of larynx, rectum, stomach |
| Latency Period | 15-30 years | 20-30 years | 7-10 years | Varies |
| Effect | Impairs lung elasticity and air exchange ability | Invades and obstructs air passages | Impairs breathing, fast moving | Varies |

Smoking and Asbestos Exposure

Smoking cigarettes has a synergistic effect to developing lung disease when combined with asbestos exposure:

| Classification | Non-Smoker, General Public | Smoker | Non-Smoker, Asbestos Worker | Smoker and Asbestos Worker |
|----------------|-------------------------------|-----------|--------------------------------|-------------------------------|
| Risk | 1 in 100 | 10 in 100 | 5 in 100 | 50 - 90 in 100 |

Asbestos Abatement

- ▶ **Definitions (40 CFR 61 Subpart M)**
 - ***Friable asbestos material*** means any material containing more than 1 percent asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
 - ***Category I nonfriable asbestos-containing material (ACM)*** means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products
 - ***Category II nonfriable ACM*** means any material, excluding Category I nonfriable ACM, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Asbestos Abatement

- ▶ 40 CFR 61.145 requires that:
 - notification be made prior to removal or demolition
 - asbestos containing materials be removed from a structure prior to demolition except as stipulated in 40 CFR 61.145 (c)

(These materials need not be removed if the structure is being demolished under an order of a State or local government agency issued because the structure is structurally unsound and in danger of imminent collapse.)

Asbestos Abatement

- ▶ RACM need not be removed before demolition if:
 - It is Category I nonfriable ACM that is not in poor condition and is not friable
 - It is on a facility component that is encased in concrete.....
 - It was not accessible for testing and was, therefore, not discovered until after demolition began.....
 - They are Category II nonfriable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition.

Alternative Asbestos Control Method (AACM)

- ▶ Experimental method of removing asbestos containing material (ACM)
 - Uses large amounts of water or soapy / foamy water to prevent fibers from leaving the worksite.
 - Method was developed and used to save money or rapidly meet demolition milestones in Texas, Oklahoma and Missouri
 - EPA has not approved the method for use

AACM

- ▶ Internal EPA evaluations of the method show that asbestos fibers are released off the work site.
 - 2004 - Public Justice helps defeat Fort Worth's plan to demolish the asbestos-laden Cowtown Inn by using an experimental "wet method" of asbestos removal – spraying the building with a fire hose and knocking it down with a bulldozer.

AACM

- 2005 – Public Justice sued St. Louis for using an untested “wet method” (AACM) on ~300 homes as part of preparation for an airport runway construction project. The court ruled that the method violates the Clean Air Act.
- 2007 - AACM used in test at a Fort Worth, TX apartment building. Settled-dust results obtained from testing during demolition demonstrated asbestos fiber releases

AACM

- 2008 – A Public Justice threatened suit stops the U.S. Environmental Protection Agency from illegally grinding and burning asbestos-contaminated homes damaged by Hurricane Katrina. Federal law prohibits these activities.
- 2008 – federal court ruled that the city of St. Louis violated asbestos safety standards in demolishing the buildings without removing asbestos

Hanford Use of Alternate Methods

- ▶ **May 2008 – Demolition of a power house in the 300 (Fuel Fabrication) Area. The building was pulled over with cement asbestos board (Class II ACM) still attached to the upper structure.**
 - **Permission was granted by a County Clean Air Authority for this one time activity.**

Power House Demolished in 2008



Hanford Use of Alternate Methods

- ▶ Work plan using the AACM signed 4/9/2010 by EPA, Washington State Ecology, and DOE
- ▶ 25 buildings demolished with Class II asbestos in or on them
- ▶ Some of these buildings were demolished with Class I asbestos in place
- ▶ Damaged asbestos debris remain on the ground at the demolition sites
- ▶ ~420 buildings were slated to be demolished in this manner

Video of Alternate Methods (Class II)

Video Removed

Video of Class I Mechanical Removal

Video Removed

Reactor Rod Racks

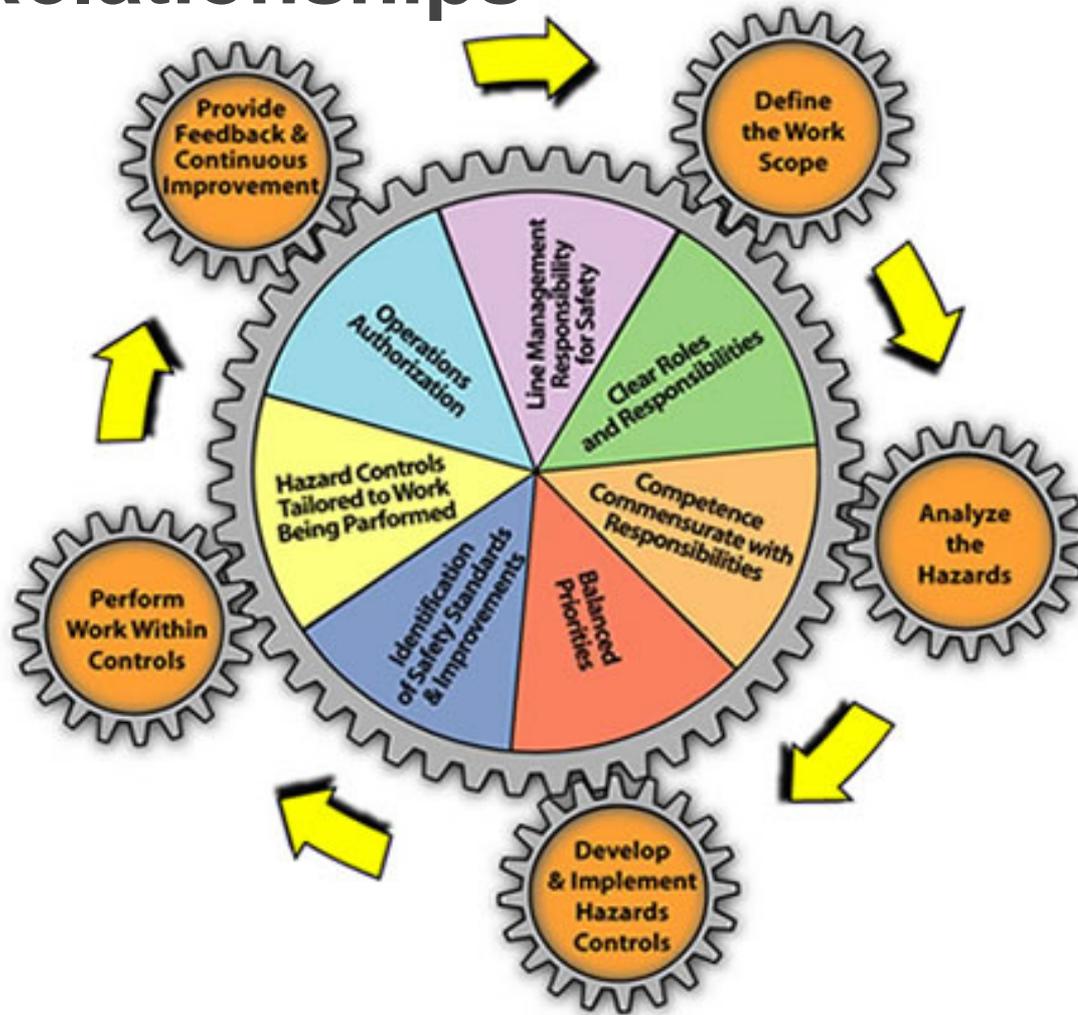
Class I Mechanical Removal/Demolition

- ▶ **Class I (Thermal Systems Insulation) was left in place in power houses during demolition**
 - May 2011 notification to DOE stated that an estimated 780 cubic feet of TSI would be left in place in one power house during demolition
 - Rationale was that a “safety professional” had determined that insulated areas were unsafe to enter.

Power House Demolition



ISMS Relationships



Training Issues Associated with AACM

- ▶ **Worker Trainers (and other asbestos trainers) were continuously in classroom discussions concerning the AACM.**
 - Students in the classes would typically spend 30 minutes to an hour vigorously discussing why we teach one thing and the contractors are doing something else.
 - The credibility of the instructors and the contractors were both brought into question in the discussions

Training Issues Associated with AACM

- ▶ **Student frequently asked questions:**
 - What buildings were involved and when were the activities performed?
 - If I worked around these activities, is my health in danger?
 - If I participated in these activities as a worker, can my asbestos certification(s) be revoked?
 - Why was asbestos containing material left around the demolition sites?

Training Issues Associated with AACM

- ▶ **Student frequently asked questions:**
 - Why is my company using the AACM if the regulations say they can't?
 - Why was my management not informed (and why wasn't I told) about the demolition method and the risks?
 - Why were multiple worker concerns and stop works disregarded?

Training Issues Associated with AACM

- ▶ **Student frequently asked questions:**
 - Why was the AACM demolition method expanded to include Class I asbestos containing materials?
 - If water was used to keep asbestos fibers from getting airborne, why was there no water management at the worksites?

Revocation of AACM Authorization

- ▶ **March 1, 2012 – EPA and WA State Department of Ecology revoke authorization previously granted to use the AACM.**
- ▶ **Contractors, DOE and Labor are working on a corrective action plan for cleaning up the asbestos debris that was left at the demolition sites and removal of damaged ACM in various other areas of the site.**

Wrap Up and Review

Questions?