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# AN INNOVATIVE APPROACH TO ASBESTOS REMOVAL

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by

Edward J. Kahal

E. I. du Pont de Nemours & Co.
Savannah River Plant
Aiken, South Carolina 29808

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# AN INNOVATIVE APPROACH TO ASBESTOS REMOVAL*

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E. I. du Pont de Nemours & Co.
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## ABSTRACT

This paper reviews the Savannah River Plant program to control employee exposure to asbestos. A description of a major powerhouse renovation project will be discussed.

* The information contained in this article was developed during the course of work under Contract No. DE-AC09-76SR00001 with the U.S. Department of Energy.

SLIDE 1

This morning I will discuss the program used by the Savannah River Plant to control asbestos exposure.

The Savannah River Plant is a nuclear facility operated by DuPont for the Department of Energy. During the construction of our Plant over 30 years ago, asbestos materials were used in many Plant locations.

The most common asbestos materials used at our site include:

SLIDE 2

STEAM PIPE INSULATION

POWERHOUSE BOILER INSULATION

TRANSITE® WALLBOARDS

ROOFING MATERIALS

CEMENT PRODUCTS

In addition, we found asbestos in a number of other materials:

SLIDE 3

APRONS

GASKETS

LABORATORY HOT PADS

TALCUM POWER USED FOR GLOVES

The most common asbestos jobs at our site involve:

SLIDE 4

REPLACING OLD INSULATION

CUTTING OR DRILLING INTO TRANSITE®

We use a variety of techniques to control asbestos:

SLIDE 5

We follow a strict asbestos insulation removal procedure

We have enclosed existing asbestos steam lines with aluminum

We use asbestos free materials when available and identify asbestos insulated equipment.

I will now review each of these programs individually.

## STRICT ASBESTOS INSULATION REMOVAL PROCEDURE

Like most industries we must occasionally repair or replace asbestos insulation.

Each job is unique and requires its own special controls.

In general, we don't remove insulation which is in good condition.

But when we must remove insulation, we then follow a very strict control program which I will now review.

SLIDE 6

PERSONNEL TRAINING

Our program begins with the training of personnel. Before personnel can be authorized to perform asbestos work, they are given training. This training is conducted annually and covers.

REVIEW HEALTH HAZARDS

OSHA REGULATION

SPECIFIC JOB REQUIREMENTS

PERSONAL PROTECTIVE EQUIPMENT

AIR MONITORING

MEDICAL PROGRAM

The names of personnel authorized to work with asbestos are submitted to our local Medical Department for follow-up. The individuals are included in the Plant's Medical program. The employees who are exposed to asbestos are included in the Plant's routine Medical program which includes an x-ray and a pulmonary function test. The x-ray is read by a radiologist. If we would find an x-ray or pulmonary abnormality, the employee would be referred to an off-plant pulmonary specialist.

SLIDE 7

We initially used our Corporate videotape for our asbestos training. Later on we modified that training videotape to better suit our specific Site's program.

Employees who are authorized to work with asbestos are also given annual respirator training which includes:

SLIDE 8

VIDEOTAPE REVIEW OF THE REASONS FOR AND PROPER USE OF REPIRATORS.

HANDS ON INSTRUCTION WITH THE AID OF A TECHNICIAN IN THE PROPER METHOD OF DONNING A RESPIRATOR AND PERFORMING THE NEGATIVE PRESSURE OR POSITIVE PRESSURE QUALITATIVE FIT TEST.

SLIDE 9

QUANTITATIVE FIT TEST TO ASSURE PROPER CHOICE OF RESPIRATORS.

For a number of years we have had a quantitative fit testing program for our personnel who must wear a respirator for radioactive or toxic materials.

In the next few minutes I will review the general workpractices which we follow:

SLIDE 10

All entrances or access ways to asbestos work locations have posted warning signs and are barricaded to prevent non-asbestos workers from unwittingly entering an asbestos work location.

A current roster of personnel authorized to work in thse areas is posted along with the operating procedures at the work site.

SLIDE 11

We require disposable coveralls for most asbestos operations. Depending upon the operation we may also require a paper hood, boots and gloves taped to the coveralls.

Due to the variability of the airborne asbestos concentrations, we require, as a minimum, respiratory protection for the majority of our operations which generate asbestos fibers. As our personnel remove their protective clothing, the respirator is taken off last to avoid inhaling dust which may still be on their protective clothing.

SLIDE 12

We apply a variety of control methods at the asbestos workplace. The method we use is job dependent.

By applying a fine water mist to the insulation we have been able to keep the asbestos air levels to a minimum.

We use mechanical ventilation to control our larger jobs. The exhausted air goes through a HEPA filter.

We use a vacuum cleaner with a HEPA filter to remove loose insulation following a job.

Asbestos waste from our operations are placed in two bags, labeled as containing asbestos and sent to the Plant asbestos landfill.

SLIDE 13

We have used plastic hut enclosures during operations to protect nearby employees. This was a logical progression for us since we have successfully used this technique to control personnel exposure to radioactive dust.

SLIDE 14

In this slide, you see the scoffold being built around the distillation towers of one of our reactors prior to an asbestos removal operation.

SLIDE 15

In the next slide, you see the finished plastic hut.

SLIDE 16

During one of our powerhouse asbestos removal operations, we needed windbreakers to protect the plastic enclosures which were inside.

SLIDE 17

This is an example of an air lock used in one of our powerhouse operations.

ALUMINUM ENCLOSURE OF EXISTING ASBESTOS INSULATED EQUIPMENT

Our Power Department has enclosed a majority of the Plant's steam lines with an aluminum jacket. This represents over 20 miles. We have used aluminum enclosures for insulated process equipment.

SLIDE 18

With this enclosure we can BETTER CONTAIN THE ASBESTOS, IMPROVE THE MAINTENANCE AND ENHANCE THE GENERAL APPEARANCE

SLIDES 19 and 19A

In the next two slides, you can see the enclosure of asbestos insulated process equipment.

ASBESTOS FREE MATERIALS USED WHEN AVAILABLE

We have found asbestos free materials for a number of our applicatons:

## SLIDE 20

| ASBESTOS APPLICATION | SUBSITITUE |
|---|---|
| APRONS | FIBERGLASS/SILICA FABRIC |
| GLOVES | KEVLAR® |
| LABORATORY HOT PADS | CERAMIC FIBER BOARD |
| PIPE INSULATION | FIBERGLASS, MINERAL WOOL |
| TALCUM POWDER | ASBESTOS FREE TALCUM POWDER |
| TRANSITE® WALLBOARDS | CHEM-FIL® |

## ASBESTOS IDENTIFICATION

## SLIDE 21

We have strategically placed identification tape to alert our personnel to asbestos and non-asbestos insulation. As you can see, there is an arrow pointing in the direction of the insulation.

We want to prevent personnel from breaking into asbestos insulation without proper controls.

## ASBESTOS SURVEILLANCE PROGRAM

Today our asbestos surveillance program consists of AIR MONITORING AND VISUAL AUDITS.

SLIDE 22

Air monitoring is performed by trained technicans and is directed by one of the Plant industrial hygienists. We use the Du Pont P2500 Constant Flow Pump set at 2 lpm and calibrated with the Kurz® Mass Flowmeter. The air sample is collected on an OPEN FACE 0.8μm MCE filter.

In addition to monitoring the job, the technicians all conduct visual audits to assure that the workpractices are being followed properly and the personal protective equipment properly worn.

SLIDE 23

Our samples are analyzed by the Plant industrial hygiene laboratory. We use phase contrast microscopy. One of the advantages of analyzing the samples on Plant is a fast sample turn around.

We, therefore, can give supervision guidance as a lengthy job progresses.

In 1978, we faced a challenge which I will now describe.

SLIDE 24

In this slide, you see the largest coal powerhouse in the DuPont Company. It is over 5 stories high. It supplies 1/2 of the Plant's average power consumption. During normal operating conditions we have 75 personnel in this facility.

In 1978, we overhauled one of our boilers.

SLIDE 25

Our challenge was to remove 1500 $ft^2$ of asbestos insulation from the sides of the boiler without interrupting Plant power needs or overexposing powerhouse personnel to asbestos.

For this job we hired a contractor. It was agreed that he would follow our Site's asbestos control program.

This operation involved over 16 insulators over a period of 20 days. Their procedure included:

SLIDE 26

PERSONNEL TRAINING

PLASTIC ENCLOSURE UNDER NEGATIVE PRESSURE

- 4 AIR EXHAUSTERS EACH CONNECTED TO A HEPA FILTER
- 500 CFM/EXHAUSTER

SEPARATE CHANGE STATIONS

SLIDE 27

AIRLOCK

WET TECHNIQUE

ROSTER OF AUTHORIZED PERSONNEL ALONG WITH JOB PLAN POSTED AT THE WORK SITE

BARRICADES AND WARNING SIGNS

SLIDE 28

TARPAULIN OVER FLOOR GRATINGS TO PREVENT DUST FROM AN UPPER LEVEL GOING TO A LOWER LEVEL.

PERSONAL PROTECTIVE EQUIPMENT

- SUPPLIED AIR SUITS (INSULATORS)
- HALF MASK RESPIRATOR WITH TYPE "H" CARTRIDGES USED BY THE LABORERS WHO ENTERED THE WORK ZONE TO COLLECT THE BAGGED WASTE
- DISPOSABLE COVERALLS AND HOODS
- BOOTS AND GLOVES TAPED TO THE COVERALLS

SLIDE 29

LOOSE ASBESTOS WASTE CLEANED WITH HEPA FILTERED VACUUM CLEANER

BULK ASBESTOS WASTE WAS DOUBLE BAGGED AND DISPOSED AT THE SITE ASBESTOS LANDFILL

Air monitoring was done to evaluate the effectiveness of our controls. This involved both PERSONNEL and CONTROL samples.

Before we examine the monitoring results, note that in 1978 the Asbestos Permissible Exposure Limits were:

SLIDE 30

| | |
|---|---|
| 2 F/cc | 8 hr TWA |
| 10 F/cc | CEILING |

SLIDE 31

Sixteen CEILING personnel samples were collected during worst case conditions. The samples ranged from ND to 1.5 F/cc.

SLIDE 32

Thirty short term CONTROL samples were collected at several locations outside the enclosure. These samples were all non-detected.

During this operation, we were able to videotape some of the work. At this time, I will show you a 3 minute excerpt from the videotape.

VIDEOTAPE

SLIDE 33

In conclusion, this job was completed with no overexposure to Plant or contractor personnel with no interruption to the powerhouse operation.