Miller, Diane M.

From:

Sent: Sunday, November 06, 2005 8:52 PM

To: ., NIOSH Docket Office

Cc: Shahra (Senator Bill Nelson) Anderson; I

Subject: Re: Pinellas Plant Site Profile

Please find attached information on "Building 200" which contains comments on the CDC/NIOSH "Pinellas Plant Site Profile."

GEND-LMSC employee on Pinellas Plant site
CME employee on Pinellas Plant site

Pinellas Plant Site Profile

Building 200

November 3, 2005

Scope

This document is a recollection of a former GEND/ LMSC employee that was in the position to know about some of the equipment and processes used in Building 200 at the Pinellas Plant. It is the author's intent not to disclose any classified material or processes herein. Further, the intention of this document is to provide the CDC/NIOSH and ex-employees of the site with additional information not shown in the ORAU Team Dose Reconstruction Project for NIOSH titled "Pinellas Plant - Site Description."

About the Author (employee)

The author was employed at this location between . His job in engineering required visits to building 200 over a span of 31 years, sometimes daily. He was involved in the design and drawings of test equipment, and of particular concern, equipment used in the testing, both destructive and non-destructive, of neutron generators. As such, he was familiar with the testing procedures as well as the environment.

NIOSH's Existing Description of Building 200

The following is the current (November 3, 2005) description in document ORAT-T-TKBS-0029-2, revision 00), dated 08/05/2005, section 2.2 (Site Activities and Processes, Building 200):

> Building 200 was built in stages between 1959 and 1978; it covers approximately 1,505 square meters (16,200 square feet). The building was used for destructive testing of neutron generators and other components manufactured at Pinellas (Author unknown 1988a, Bldg. 200 survey). Destructive testing included shock, vibration, and explosive tests.
>
> The modernization task force completed a radiological survey of building 200 in 1988 to identify the general level of radiological contamination and perform an initial decontamination cost estimate. The June 1988 survey showed less than 5 percent of Building 200 contaminated with tritium. The maximum contamination level was 1xlo4 disintegrations per minute per 100 square centimeter smear inside a testing chamber, and the average contamination was less than 220 disintegrations per minute per 100 square centimeters (Author unknown 1988a, Bldg. 200 survey). The final characterization report in 1997 found that radioactive waste and tritium was present inside the building but did not identify specific contamination levels or types of radioactive waste; the report found that all quantities were less than reportable amounts required by 40 C.F.R. pt. 355 or 40 C.F.R. pt. 302.4 (Author unknown 1996a,p.3).
>
> During operation the building exhaust system maintained negative pressure on three testing chambers (boom boxes) and a single radiological waste drum. The ventilation system passed through high-efficiency particulate air (HEPA) filters before being exhausted from the building roof (MMSC 1995, p. 5-4). The stack exhausted 36.8 cubic meters per minute (2,300 cubic feet per minute). It stands 17.7 meters (58 feet) tall and is 30.5 centimeters (12 inches) in diameter.

Further, the following is under 2.3 (Site Products), subsection 2.3.1 (Equipment), paragraph "Building 200:

> Building 200 was used to test the operability of the neutron generators under extreme conditions. These quality assurance tests included destructive testing of the units inside test chambers known as boom boxes. The ventilation system for Building 200 passed through HEPA filters before exhausting out the building roof.

Comments on NIOSH's Existing Description of Building 200

This author does not dispute statements in the document ORAT-T-TKBS-0029-2, revision 00) as I have no evidence to the contrary. Likewise, I do not confirm the reports correctness. I do feel that the report omits information, which is contamination from radioactive material that did not pass to the filtering system and/or stack.

I do pose likely sources for radioactive contamination in this document, resulting from testing operations, collection, and disposal of waste neutron generators, instrumentation cables, foam insulation, plastic containers, and plywood baffles.

This document is by no means complete in that it describes all of the process used in building 200 for the functional testing of neutron generators or in the testing of any other components generating radioactive materials or waste.

Functional Testing of Neutron Generators

Certain quantities of neutron generators were functionally tested. This involved destruction of the units by explosive detonation, resulting in fragments of the units as well as other materials. The units were typically pack in urethane foam which also fragmented, adding to the radioactive waste. Note that this was rigid foam that that ranged from chunks down to sand gain sized particulate. Styrofoam was also used as a spacer to located the generators in relation to the measurement instrumentation. There was also instrumentation cables and connectors which became part of the waste.

For "Boom Boxes," a special treated (fireproofed?) plywood barrier was installed inside the chamber doors to deflect some of the detonation. They were rotated 90-degrees after each generator test, allowing for four tests. Particles of the generator would imbed in these boards. It is not known how these boards were disposed of.

Destructive Equipment used

There were several types of equipment used to functional test neutron generators. This depended on the end use of the generator.

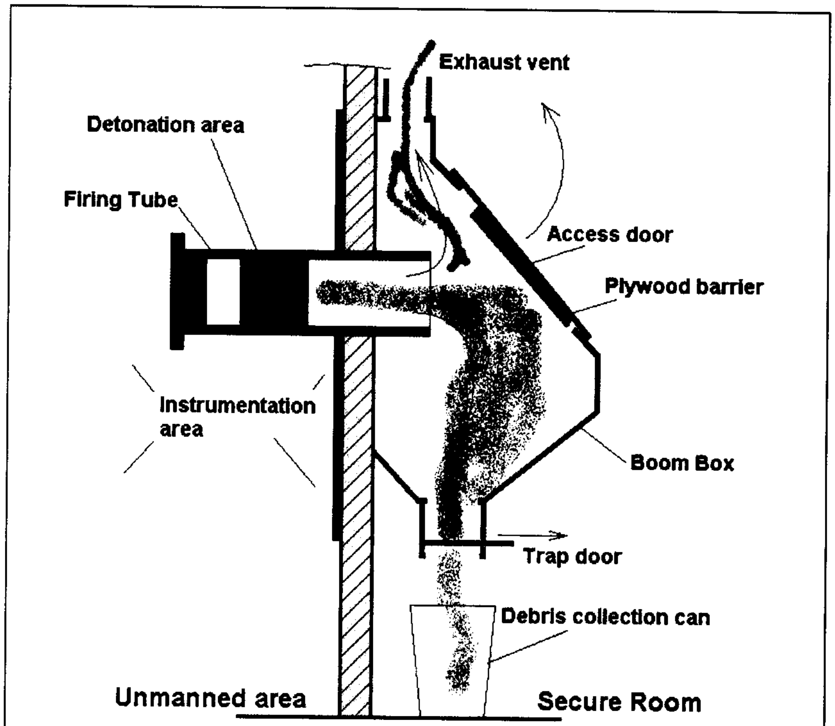
1. <u>Firing Tubes with Boom Box containers</u>. This equipment was mounted on and through a wall. The neutron generator was wired and assembled in a urethane foam fixture and inserted in a "firing tube." The tube was closed and the area where the firing tubes were located was cleared then the generator detonated. On the far side of the wall (in the secured room), a steel "Boom Box" was mounted. This contained the detonation. The top of the boom box was connected to a duct system. The bottom was a funnel shape that had a sliding trap door in it. After the detonation, a plastic bag was placed in a standard office trash can placed under the boom box. The firing tube was opened and a rammer inserted to push any debris out of the tube into the boom box. The boom box's trap door was opened, and the main access door opened as well. Any surviving debris was brushed down using a standard dustpan brush. The bag was tied and stored in case any further examination was needed. I have no recollection of the test technicians using any protective wear, neither gloves, or dust masks, certainly not respirators.

2. Spin Testing in an enclosed fixture. This equipment basically looked like a big top loading washing machine. It was located inside the secured room. The neutron generator was wired and assembled in a hard plastic material fixture and inserted in a heavy aluminum fixture. The very heavy lid on the top of the equipment was closed, people left the secured room, and the neutron generator was detonated. After the test, the equipment was opened, the fixture removed, and the debris contents (generator and plastic fixture pieces) manually pried out on a work bench and placed in a plastic bag. There was no direct vent for this equipment other than the room's ventilation.

Design of the "Boom Boxes"

The boom boxes were constructed of steel, about 1/8 to 1/4 inch thick. They were of welded construction. The hinged doors swung up to access the area to be cleaned (neutron generator debris). On the back side of the door, the plywood panel was mounted in a simple frame. The door was flat sheet metal with about a 1/8 inch gasket cemented to the inside to make contact with the boom box face. It was by no means an air-tight fit. The door were not latched down, but held in place by elastic cords.

On top of each chamber there was an exhaust duct about 4X8 inches that joined together then went up to the exhaust system. The sliding door on the bottom was of a guillotine design.



Firing Tubes and "Boom Box" configuration
(no scale)

There were two complete testing systems, each having instrumentation, firing tubes, and boom boxes. Each system had two firing tubes (large and small), and on the back side of the wall a boom box was located. The boom box had two compartments (chambers), two access doors, and two sliding trap doors, all of which was aligned behind each firing tube. The boom box was actually one large welded unit and had a permanent steel barrier between each compartment.

Final Comments

Various type of environmental testing equipment was used to test products, including neutron generators. I do not know if any of the neutron tubes fractured during vibration or shock testing. The report should indicate that either there were no reports of tube breakage or that no information is available on possible tube breakage.