

APR 20 1994

Docket No. 040-08976

License No. SMB-1527

Westinghouse Electric Corporation
ATTN: C. W. Bickerstaff
Manager, Corporate Industrial Hygiene
6 Gateway Center
Pittsburgh, PA 15222

Dear Mr. Bickerstaff:

SUBJECT: ROUTINE INSPECTION NO. 040-08976/94-001

On April 5, 1994, Mark C. Roberts of this office conducted a routine safety inspection at the former Bloomfield, New Jersey Lamp Plant of activities authorized by the above listed NRC license. The inspection was limited to a review of decommissioning activities in progress at the facility. Susan F. Shankman, Deputy Director, Division of Radiation Safety and Safeguards, accompanied Mr. Roberts on the inspection.

The findings of the inspection were discussed with Bill Rogers and Rick Grisham from your radiological contractor, Scientific Ecology Group, Inc. at the conclusion of the inspection. The results of the inspection were also discussed with B. Bowman of Westinghouse via telephone on April 6, 1994. Within the scope of this inspection, no violations were identified.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter will be placed in the Public Document Room. No reply to this letter is required.

Sincerely,

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Site Decommissioning Section
Facilities Radiological Safety
and Safeguards



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Facilities Radiological Safety
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Division of Radiation Safety
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REGION I

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Westinghouse Electric Corporation

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Enclosure:

NRC Region I Inspection Report No. 040-08976/94-001

cc:

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

State of New Jersey

bcc:

Region I Docket Room (w/concurrences)

S. Shankman, RI

DRSS:RI
Roberts/cmm

mca
4/19/94

~~DRSS:RI~~
Kinneman

4/20/94

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 040-08976/94-001

Docket Nos. 040-08976

License Nos. SMB-1527

Licensee: Westinghouse Electric Corporation
6 Gateway Center
Pittsburgh, Pennsylvania

Facility Name: Bloomfield Lamp Plant

Inspection At: Bloomfield Lamp Plant
Bloomfield, New Jersey

Inspection Conducted: April 5, 1994

Inspector: Mark C. Roberts
Mark C. Roberts
Senior Health Physicist

4-19-94
date

Approved by: John D. Kinneman
John D. Kinneman, Chief
Site Decommissioning Section

4/20/94
date

Inspection Summary: Routine, announced safety inspection conducted April 5, 1994 (Inspection No. 040-08976).

Areas Inspected: Organization and staffing; training and instructions to workers; radiological measurement instrumentation and calibration; radiation protection procedures; remediation activities; termination and release surveys; posting and labeling; radioactive waste storage and disposal; hazardous and mixed waste; closure of excavations.

Results: No violations were identified.

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DETAILS

1. Persons Contacted

*Bill Rogers, Senior Radiological Engineer and Project Manager, Scientific Ecology Group (SEG)

*Rick Grisham, Site Health and Safety Officer and Assistant Project Manager, SEG
Jerry Theriot, Instrumentation Supervisor, SEG

B. M. Bowman, Director Special Projects, Westinghouse Electric Company (via telephone on April 6, 1994)

Various members of the SEG health physics field staff

*Denotes those present at exit interview.

2. Background

The Westinghouse Electric Company's (Westinghouse) former lamp plant in Bloomfield, New Jersey was contaminated with thorium and uranium during operations conducted from the 1940's through the 1980's. The site buildings west of Arlington Avenue (Buildings 1 through 6 and the garage) were previously remediated and released for unrestricted use in 1992. The buildings east of Arlington Avenue (Buildings 7, 8, 9 and 10A) have been remediated; however, a confirmatory survey conducted by the Oak Ridge Institute for Science and Education (ORISE) on May 10-14, 1993 identified several areas with residual radioactive contamination in excess of current decommissioning criteria.

Based on the staff's review of the ORISE confirmatory survey report, Region I requested that Westinghouse provide a comprehensive remediation and survey plan for the decommissioning of the portions of the facility east of Arlington Avenue. The licensee's radiological contractor, Scientific Ecology Group (SEG), performed an assessment of this portion of the facility and prepared a remediation and survey plan. Westinghouse submitted the remediation plan for the facility to Region I, and, due to the deteriorating condition of the roof of Building 9 and 10A, also requested authorization for the concurrent demolition of portions of these buildings so that the remediation work could be accomplished in a safe manner. Region I staff reviewed the remediation and survey plan and requested additional information in a letter. In the letter, Region I authorized the concurrent demolition and survey activities to commence; however, release of building debris from the site could not commence until an adequate response to the letter was received and accepted by Region I.

3. Organization and Staffing

Since the site is not operationally active, the Westinghouse Radiation Safety Officer for the site is based in the Westinghouse corporate office in Pittsburgh, Pennsylvania. This individual or his alternate makes periodic visits to the site to coordinate the decommissioning activities. Site support services are provided through a resident Westinghouse site manager. The site is patrolled by a contracted security service. The radiological contractor, SEG, provides health physics support for the decommissioning activities that includes, but is not limited to: health physics support for the demolition

contractor, remediation of contaminated areas, coordination of radioactive waste disposal, and final contamination surveys and sample analyses to support the release of the site for unrestricted use. The SEG project manager at the site has an assistant project manager (who is also the site health and safety officer), a radiological engineer and approximately ten health physics technicians reporting to him. The site project manager or the assistant project manager is present at the site when decommissioning work is in progress. A demolition contractor, Admiral Neumeyer, provides demolition services under direction from the Radiation Safety Officer.

No safety concerns were identified.

4. Training and Instructions to Workers

The site health and safety officer provides an overview of the radiological and industrial hazards at the site to workers and visitors prior to initial access to the controlled portions of the site. Training is documented by signing an attendance sheet. Written examinations are not administered. The inspector received the required briefing prior to initial entry to the controlled area. Workers are required to have completed a 40-hour OSHA (Occupational Health and Safety Administration) safety training course. These records were not examined.

Each morning prior to the initiation of work activities, the site health and safety officer conducts a morning safety briefing to discuss the planned actions for the day and review anticipated work hazards. Attendance at the safety briefings is recorded on a daily log that is signed by the site health and safety officer. The inspector examined the completed daily log for April 5, 1994.

No safety concerns were identified.

5. Radiological Measurement Instrumentation and Calibration

SEG provides both laboratory and field survey instrumentation for radiological measurements at the facility. Smears for removable contamination and air particulate samples are counted for alpha activity and beta activity on a SAC-4 alpha counter and a BC-4 beta counter, respectively. Standard alpha (Th-230) and beta (Tc-99) sources, traceable to NIST (National Institute for Science and Technology), are used daily to calibrate each of the counting systems. Background counts are performed daily on each counting system. Air particulate samples are counted immediately to determine if there is a significant airborne particulate hazard and counted again after sufficient time has elapsed to allow decay of the short-lived radon-222 and radon-220 decay products. The sample volumes and counting times used for typically yield minimum detectable activities (MDA's) less than $1 \times 10^{-13} \mu\text{Ci}/\text{cm}^3$. Nearly all results have been at or below this value. The results of air samples taken as of the date of the inspection have been approximately 10% of the Th-232 Derived Air Concentration (DAC) of $1 \times 10^{-12} \mu\text{Ci}/\text{cm}^3$ and less than 1% of the DAC for U-238 ($6 \times 10^{-10} \mu\text{Ci}/\text{cm}^3$).

The high-resolution gamma spectrometric analysis of soil, sludge or other solid debris samples is performed by SEG at their facility in Oak Ridge, Tennessee. Samples are sent via an overnight carrier and analyzed shortly after receipt. Results from the sample analyses are returned via facsimile with a hard-copy by follow-up mail. A typical turnaround time is two to three days from sample shipment to receipt of data. As a quality control check of the laboratory, the project manager splits approximately ten percent of the samples and submits both the original and the duplicate for analysis. The duplicate sample is not identified as a duplicate to the laboratory. The radiological engineer typically performs the data review on all gamma spectrometry sample results. He performs an informal comparison of the data from split samples to determine if the results of the two samples compare within 25% of each other. Agreement between duplicates has been generally much better than the 25% criterion.

Surveys of debris removed from the facility are performed with NE Technologies CM-7 gas-flow proportional detector systems. The rate-meter, detector and tank of counting gas are mounted on carts so that the devices can be moved as needed. The devices simultaneously display both the alpha and beta count rates. Separate alarm points are set for both alpha and beta radiations. The systems are calibrated and the alarm points set at the SEG office in Tennessee. The devices are calibrated to true frequency with a pulse generator and the detector is then calibrated with known alpha and beta standards that are traceable to NIST. Prior to each daily use, a calibration check is performed on each instrument. A sticker on the front of each rate-meter is initialed each day the instrument is used to signify that the daily calibration check has been performed. Instruments are not used for surveys until the daily check has been performed. The inspector observed the operation of two of these devices and confirmed that the sticker had been properly initialed indicating that the daily check had been performed. Records of the daily check of each of these instruments are maintained by the instrumentation supervisor. The inspector reviewed selected records and found them to be complete. Copies of the NIST certification of the standards were available, but were not reviewed.

Termination surveys of the floors and walls of the buildings are performed with a Ludlum Model 2350 Data Logger survey instrument equipped with a Model 43-68 100 cm² gas proportional detector. The high voltage setting on the detector allows for counting both alpha and beta radiations. The probe is operated in the continuous gas-flow mode. The instrumentation is mounted on a wheeled cart that also holds a small bottle of compressed P-10 counting gas and the flow controller. A calibration check on the proportional detectors is performed at the beginning and end of each day to ensure that the equipment has been operating properly throughout the day. The 2350 Data Logger is equipped with a microprocessor that enables the instrument to be programmed for the survey technique employed. The instrument has the capability for storing a maximum of 250 measurements. The operator takes a series of integrated measurements in a fixed pattern using a programmed count time. An automatic time delay between each measurement allows the technician sufficient time to move to the next location to take a reading. The instruments have a pause function to allow the surveyor additional time between measurements if necessary. The instruments are equipped with an audible alarm that sounds if the number of counts obtained during a measurement is greater than

the preset alarm value. The alarm set-point is typically 80% of the relevant limit. After completing the survey of an area, the collected data in the instrument is downloaded directly to a microcomputer for processing. The instrument operating procedure was recently revised to include a caution against using this instrument in low temperatures.

Personnel contamination monitoring devices, Ludlum Model 177 rate-meters equipped with Model 44-9 GM probes, are located at each authorized location for exiting contamination control areas. Calibrations of these instruments are performed at six-month intervals at the SEG Tennessee office. The inspector observed that the contamination monitor at the exit to Building 10A (SEG serial No. 00637) had been last calibrated on November 10, 1993, within the six-month calibration frequency. Other appropriate survey instrumentation, including Ludlum Model 19 Micro R meters, were observed to be available, but were not examined by the inspector.

No safety concerns were identified.

6. Radiation Protection Procedures

Prior to entry into a contaminated work area, each individual is required to read and sign a Radioactive/Hazardous Work Permit (RHWP) that describes the authorized work activity, radiological conditions, required personal protective equipment and personal survey requirements. Due to the relatively limited radiological hazard at this site, the decommissioning activities are covered by a single RHWP (BMF-007). The RHWP is updated monthly or when there is a significant change in conditions. External dosimetry is not being utilized since external radiation exposure rates are not significantly different than background. Respiratory protection is not being used since the work activities have not generated significant airborne particulate concentrations. Procedures for confined space entry and handling an injured worker are available, but were not examined. Eating, drinking, smoking and chewing are prohibited in the controlled area.

No safety concerns were identified.

7. Remediation Activities

In accordance with the remediation plan, contamination surveys have been conducted in a 10-meter radius of contaminated locations identified in the ORISE confirmatory survey. Contamination found in excess of the decommissioning criteria is removed and disposed as radioactive waste. Aggressive scarifying devices that remove the top 1/8-inch of the concrete surface were used to remediate contaminated floor areas in Buildings 7 and 8. Surveys on the third floor of Building 8 identified a contaminated drain that had been covered with concrete. The drain and the associated piping were removed and disposed as radioactive waste. Except for the basement of Building 7, remediation has been completed in Buildings 7 and 8. Remediation activities in Building 9 will commence once selected demolition of portions of the roof is completed.

No safety concerns were identified.

8. Termination and Release Surveys

Prior to making the final termination survey measurements, a permanent one-meter by one-meter grid pattern was established on the floor and on the walls to a height of two meters above the floor in the remediated areas. Technicians then make a series of four measurements in each grid square utilizing the Ludlum Model 2350 survey meter and Model 43-68 gas proportional probe. The probe is held nearly at contact with the surface being monitored. A smear measurement is also taken in each of the grid squares. The measurements are performed in an established pattern for coordination with the software used to manipulate the down-loaded data.

A computer program, written by Ludlum and modified by SEG for their specific use, is used to download the data from the survey instruments to a microcomputer. Each sample point is stored in the data file by sample number, detector number, count time, counts measured, cpm/probe area, and dpm/probe area. The operating parameters for the survey instrument are also stored in the data file. Hard copies of the data are kept for each survey area. The inspector reviewed one of the survey packages for an area on the third floor of Building 8 and did not find any results that exceeded the decommissioning criteria.

Due to the relatively poor structural condition of portions of the roof of Buildings 9 and 10A, Westinghouse is demolishing some of the interior roof and walls to enable the survey and remediation work to be accomplished safely. Sections of the concrete inner roof have been removed intact and all surfaces surveyed to measure contamination levels. Each section of roof is uniquely identified and a log kept of the survey results. Other types of debris are surveyed and segregated by material type and contamination level. Metal items that are surveyed and indicate contamination levels less than the criteria for release for unrestricted use are sprayed with green paint as an indication that the material meets the criteria for unrestricted release. Clean metal is expected to be recycled as scrap. Contaminated spots on metal items are encircled with fluorescent orange spray paint. The contaminated areas are to be removed by cutting out the contaminated portion and disposing as radioactive waste. The inspector examined the two piles of metal debris and did not find any indication that material had been placed in the incorrect pile. Contaminated rubble and soil is stored in large metal boxes or in piles inside the building pending further disposition. The boxes and piles are clearly marked as containing radiological contaminated material.

No safety concerns were identified.

9. Posting and Labeling

Entry to contaminated or potentially contaminated areas is indicated by appropriate ropes and signs instructing that an RHWP must be signed prior to entry. An NRC Form-3 was observed to be posted at the entrance to the offices in Building 2 and in a closed bulletin board in the conference room in Building 2. The note required to be posted in accordance with 10 CFR 19.11 (b) had been posted next to the NRC Form-3, but had fallen to the bottom of the bulletin board. SEG personnel immediately reattached the note and also replaced a similar note adjacent to the NRC Form-3 at the entrance to Building 2.

No safety concerns were identified.

10. Radioactive Waste Storage and Disposal

Low level radioactive waste from the site is staged in several different locations on the site. Waste generated from the remediation in Buildings 7 and 8 is currently being stored in bags in the buildings. Contaminated rubble from the remediation in Buildings 9 and 10A is stored outside in large metal boxes or stored in piles inside the buildings. The decision on how to package and ship the material for disposal has not yet been determined. Westinghouse or SEG has not yet shipped any of the waste for disposal.

No safety concerns were identified.

11. Hazardous and Mixed Waste

Since mercury was also used at this facility in the production of lamps, analysis for mercury vapor is performed during cutting and excavation activities. Mixed waste (a mixture of hazardous wastes regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA) and radioactive wastes regulated under the Atomic Energy Act) may possibly be generated during the remediation of Building 9 due to the previous use of both thorium and mercury in this building. SEG is aware of the potential for generating mixed waste or hazardous waste and performs appropriate monitoring. No mixed waste has been generated during the current remediation activities at the site. A urinalysis for mercury is conducted on each worker before he begins employment to establish a baseline for the individual and is repeated upon the termination of employment.

No safety concerns were identified.

12. Closure of Excavations

There are several open excavations in Building 7 and 9 due to the removal of contaminated pipes. The inspector asked if any of the excavations would be filled, due to safety concerns, prior to an NRC confirmatory survey. The project manager stated that certain excavations that posed a potential safety hazard for personnel may need to be filled. The inspector requested that Region I be notified if any excavation is to be filled prior to the confirmatory survey so that plans could be made for taking archived samples from the area.

No safety concerns were identified.

13. Exit Interview

The results of the inspection were discussed with the licensee representatives identified in Section 1.