

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 99990001/94-006  
Former License/  
Docket Nos. 29-01248-02/030-05251  
Former Licensee: Western Electric Company Inc.  
100 Central Avenue  
Kearney, New Jersey 07032  
Facility Name: AT&T Microelectronics  
Inspection At: Clark Submarine Repeater Plant  
100 Terminal Avenue  
Clark, New Jersey  
Inspection Conducted: April 26, 1994

Inspectors: Mark C. Roberts  
Mark C. Roberts  
Senior Health Physicist  
Richard S. Barkley  
Richard S. Barkley  
Senior Health Physicist

5-24-94  
date

5-24-94  
date

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

5/24/94  
date

Inspection Summary: Special, announced safety inspection conducted April 26, 1994, of remediation activities for Cs-137 contamination from prior uses under terminated License No. 29-01248-02.

Areas Inspected: Organization and staffing; training and instructions to workers; radiation protection procedures and posting of notices; remediation activities; radiological measurement instrumentation and surveys; and radioactive waste storage and disposal.

Results: No violations were identified. AT&T agreed to provide information on the sensitivity of the survey instrumentation to be used for measuring Cs-137 contamination in the drain line exiting the decommissioned laboratory.

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## DETAILS

### 1. Persons Contacted

Michael Greenstein, Technical Manager, Submarine Lightwave Repeaters, AT&T Microelectronics

\*James Hancock, Radiation Safety Officer and Project Manager, US Ecology

\*Richard Kumor, Environmental Health and Safety Engineer, Submarine Lightwave Repeaters, AT&T Microelectronics

\*John Riley, Radiation Safety Officer, AT&T Bell Laboratories

Various US Ecology field personnel

\*Denotes those present at exit interview.

### 2. Background

The Western Electric Company, a subsidiary of AT&T, was licensed to use 800 millicuries of Cs-137 in an unsealed form in the 1960's and 1970's at their facility in Clark, New Jersey. The Cs-137 was used in a chloride solution to leak test electronic subassemblies for submarine telephone cable repeaters. The licensee ceased this testing method in 1978 and decommissioned the laboratory where the Cs-137 testing was performed. The license was terminated at the request of the licensee and the NRC released the facility for unrestricted use in January 1979. The Clark facility remains an operational manufacturing plant for microelectronic components. The laboratory area where Cs-137 had been used was converted to an x-ray facility.

A survey was made in July 1992 by personnel from the AT&T Bell Laboratories' Radiation Protection Department at the request of representatives of the Environmental Health and Safety staff at the Clark Facility. The survey identified Cs-137 contamination in a drain line exiting the test laboratory and in a section of the exhaust duct in the former laboratory. AT&T has taken the initiative to remediate the Cs-137 contamination and contracted US Ecology to perform the remediation work.

A remediation and survey plan was prepared by US Ecology and submitted to the NRC by AT&T on October 18, 1993. Region I staff reviewed the plan and requested additional information in a letter dated November 22, 1993. AT&T provided a response to the NRC in a letter dated January 17, 1994. In a February 28, 1994 letter, Region I indicated that they had no objection to implementation of the remediation plan. This inspection was conducted to observe remediation work in-progress and to review the final survey methods.

### 3. Organization and Staffing

The remediation work is being conducted by a team from US Ecology consisting of the Radiation Safety Officer (RSO)/Project Manager, a health physics supervisor, a remediation supervisor and three technicians. Oversight of the contractor rests with the

Technical Manager of the Clark facility who is supported by an engineer from the Environmental Health and Safety staff. Health Physics technical support is provided by the RSO for AT&T - Bell Laboratories. This arrangement appears to provide sufficient technical support and oversight of the contractor to ensure the operations are being conducted in accordance with the remediation and survey plan.

No safety concerns were identified.

4. Training and Instructions to Workers

Key workers in the Clark facility were informed of the ongoing remediation work at the facility by the RSO from AT&T - Bell Laboratories. Workers have been requested to address questions regarding the work to him or to the Environmental Health & Safety engineer. Discussions with several of the US Ecology workers indicated that they were knowledgeable of the health physics procedures and survey instrumentation in use for this project. The US Ecology project manager as well as the AT&T - Bell Laboratories RSO have had previous experience in remediation projects and appeared capable of addressing remediation or survey problems that may be encountered.

No safety concerns were identified.

5. Radiation Protection Procedures and Posting of Notices

The radiologically controlled areas of the plant where remediation work was in progress were clearly demarcated and separated from the remainder of the plant with rope barriers, signs and step-off pads. Plastic drapes extending from the ceiling to the floor were also used in certain areas to prevent inadvertent entry. Prior to entry into the radiologically controlled work area, each individual is required to read and sign a Radioactive Work Permit (RWP) that describes the authorized work activity, radiological conditions, required personal protective equipment and personal survey requirements. Workers entering the controlled area were observed to be wearing the appropriate personnel protective equipment.

The highest exposure rate measured in the general work area was a reading of 40  $\mu\text{R}/\text{hour}$  directly above a floor drain clean-out. Respiratory protection is not being used since the work activities have not generated significant airborne particulate concentrations (less than 10 percent of the Derived Air Concentration of  $6 \times 10^{-8}$  microcuries/cm<sup>3</sup>).

During the inspection, the inspectors did not observe the posting of an NRC Form 3 in the general radiological work area. The regulations in 10 CFR 19 require licensees to post this form in a conspicuous location so that individuals engaged in licensed activities may observe the form. Since there is no active NRC license for the facility, the regulations in 10 CFR 19 do not specifically apply. The AT&T representatives and the inspectors agreed that an NRC Form 3 should be posted so that workers would be aware

of the mechanism for contacting the NRC if desired. The inspectors provided a copy of NRC Form 3 and the AT&T representatives agreed to promptly post the form.

No safety concerns were identified.

#### 6. Remediation Activities

The inspectors reviewed the remediation work area which was separated from the rest of the facility by a plastic tent to limit the spread of contamination. The inspectors noted that a section of the drain line was removed due to contamination found in excess of the decommissioning criteria. US Ecology discarded the line as radioactive waste. Soil samples taken in the area under the drain line indicated residual Cs-137 at concentrations less than 15 pCi/gram. A small amount of soil was removed and discarded as radioactive waste. Concrete with contamination levels in excess of the decommissioning criteria has been removed and disposed as radioactive waste. Aggressive scarifying devices that remove the top portion of the concrete surface will be used to remediate any contaminated floor areas. A 30-foot section of the abandoned ventilation duct in the area is to be removed and cleaned if possible or disposed as radioactive waste. AT&T plans to remediate sections of the main drain line from the laboratory to the street via either high pressure water flushing and/or brushing of the main and/or branch lines. The lines will be temporarily plugged and the water used in the flushing operation collected, filtered and analyzed. AT&T expects that the water can be released following the filtration.

No safety concerns were identified.

#### 7. Radiological Measurement Instrumentation and Surveys

US Ecology provides both laboratory and field survey instrumentation for the remediation project at the facility. Smears for removable contamination are counted by US Ecology in a temporary trailer set-up adjacent to the plant. Gamma radiation surveys are conducted using a NaI detector and ratemeter. Surface contamination measurements are performed with a "pancake" GM detector and rate-meter. A review of this instrumentation and selected survey results indicates that the equipment has sufficient sensitivity to measure contamination levels below 5,000 dpm/100 cm<sup>2</sup>. Gamma spectrometry analysis is performed both by AT&T Bell Laboratories and an outside contractor. Gamma spectrometry results have identified only Cs-137 as a contaminant.

Prior to making the final termination survey measurements, a one-meter by one-meter grid pattern was established on the floor and walls of the laboratory area. Technicians were observed using appropriate monitoring techniques while making surveys of each grid area. Smear measurements are also taken in each of the grid squares to evaluate removable contamination.

The inspectors discussed the methodology and criteria that AT&T would utilize for the evaluation of contamination inside the drain line. US Ecology planned to inspect the drain line using a video camera mounted on a small motorized cart. A radiological survey was to be conducted simultaneously using a Ludlum Model 44-62 NaI detector (1.3 cm. x 2.5 cm. crystal) and scaler/rate-meter to measure residual contamination levels in the lines. AT&T indicated that residual contamination levels would have to be below 5  $\mu$ R/hour for release of the drain line. The inspectors noted to AT&T and US Ecology the need to also check the contamination levels of portions of the branch lines to the main drain line.

The inspectors indicated that the criteria of 5  $\mu$ R/hour is not a contamination criteria, but is an exposure rate criteria, and further indicated that AT&T should apply appropriate residual contamination criteria (5,000 dpm/100 cm<sup>2</sup>) to determine if the drain line has been properly remediated. The inspectors reviewed the calibration detector for the detector probe and concluded that the instrument had been properly calibrated for exposure rate. However, the calibration data was not sufficient to determine a calibration factor to convert the measured exposure rate to contamination levels for the specific geometry of the drain pipe. Additional information concerning the sensitivity of the detector in the specific geometry of the drain line is needed to determine an appropriate calibration factor. AT&T agreed to evaluate the sensitivity of the detector to Cs-137 contamination given the geometry posed by the drain line and provide this information to the NRC. The resolution of this matter will be evaluated via future communication with AT&T.

No additional safety concerns were identified.

#### 8. Radioactive Waste Storage and Disposal

Low level radioactive waste from the remediation operations at the site is staged near the US Ecology trailer. The total volume of waste to be generated by this remediation project is estimated to be about 115 ft<sup>3</sup> consisting of contaminated soil and concrete, portions of the contaminated drain line, protective clothing and cleaning material. The waste will be placed in strong, tight containers (standard 7.5 ft<sup>3</sup> metal drums and/or 100 ft<sup>3</sup> B-25 containers) and shipped for volume reduction prior to disposal at a licensed low-level waste burial site.

No safety concerns were identified.

#### 9. Exit Interview

The results of the inspection were discussed with the AT&T and US Ecology representatives identified in Section 1.