

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-87/79-03

Docket No. 50-87

License No. R-119

Licensee: Westinghouse Electric Corporation
505 Shiloh Boulevard
Zion, IL 60099

Facility Name: Westinghouse Nuclear Training Reactor

Inspection At: Zion, Illinois

Inspection Conducted: September 11, 1979

Inspector: *for L. J. Hueter*
L. J. Hueter

10/5/79

Approved By: *L. R. Greger*
L. R. Greger, Acting Chief
Fuel Facility Projects and
Radiation Support Section

10/5/79

Inspection Summary

Inspection on September 11, 1979 (Report No. 50-87/79-03)

Areas Inspected: (Routine, announced inspection of radiation protection and radwaste management program, including: qualifications; audits; training; radiation protection procedures; instruments and equipment; exposure control; posting, labeling, and control; surveys; independent measurements; notifications and reports; technical specification sampling and analysis requirements; and radioactive effluent releases. The inspection involved seven inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance or deviations were identified

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DETAILS

1. Persons Contacted

*J. Roth, WNTR Facility Manager
*F. Ellis, Radiation Safety Coordinator

*Denotes those present at the exit interview.

2. General

This inspection, which began with visual observation of facilities and equipment, posting, labeling, and controls at 9:15 a.m. on September 11, 1979, was conducted to examine the radiation protection and radwaste aspects of routine facility operations. The reactor was in operation for training purposes during the inspections. The checkoff sheets for reactor startup had been completed including checks for operability and alarm setpoints for area and criticality monitors.

No problems were noted during visual observations.

3. Organization, Qualifications, and Training

Some personnel changes have occurred since the previous radiation protection inspection (May 1978). G. Scholand has replaced T. Grady as Manager of Westinghouse Nuclear Training Center (WNTC). J. Roth still serves as Westinghouse Nuclear Training Reactor (WNTR) Facility Manager. C. Turner who replaced M. McKown as Training Systems Coordinator, vacated the position the day before this inspection; a replacement had not been selected. C. Ferguson still serves as WNTR Lead Engineer; F. Ellis remains as Radiation Safety Coordinator (RSC).

In addition to the experience and training noted in a previous inspection report,^{1/} the RCS completed a two week radiation protection course given by the School of Public Health at the University of Michigan in May 1979.

All work performed in the reactor room continues to be done under the direct supervision of an NTR staff member who provides necessary instruction in radiation protection.

No items of noncompliance or deviations were identified.

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4. Audits

The inspector reviewed records of four audits performed by the licensee's Safeguards Committee members since the last radiation protection inspection (May 1978). No major radiation protection problems were identified in these audits. Several minor discrepancies appear to have been satisfactorily resolved in a timely manner.

The reports reviewed were for audits conducted in June, August, and December of 1978, and March 1979. The audit report for June 1979 was not available.

No items of noncompliance or deviations were identified.

5. Radiation Protection Procedures

No major changes have been made in radiation protection procedures since the last radiation protection inspection (May 1978) of this area. Proper approvals had been obtained before implementation of several minor changes.

The licensee now calibrates instruments on at least two points per scale in response to recommendations in previous audit and inspection reports. ^{2/}

No items of noncompliance or deviations were identified.

6. Instruments and Equipment

The inspector reviewed area monitor locations (one of which serves as a criticality monitor), alarm setpoints, operability tests, and calibrations. No discrepancies from technical specification requirements were identified.

The licensee has low and high range beta-gamma, alpha, and neutron survey meters and laboratory counters for beta-gamma and alpha activity. Instruments were observed to be operable and in calibration (calibration stickers attached). Further, records reviewed showed that calibrations have been performed timely (quarterly). As noted in paragraph 4, instruments are now calibrated on at least two points per scale. High range gamma survey meters and Eberline PNR-4 neutron detectors are being calibrated quarterly offsite.

The sealed sources, possessed in types and quantities allowed by the license, are inventoried and surveyed for leakage quarterly.

No items of noncompliance or deviations were identified.

^{2/} Ibid.

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7. Exposure Control

The licensee's program includes the routine use of direct reading dosimeters, TLD badges, and TLD finger rings. The TLD badges contain both beta-gamma and neutron sensitive chips.

Records of personal dosimetry results, including vendor reports for the TLD badges and TLD rings, were reviewed for 1978 and the first half of 1979. The data submitted to the Commission for 1978 per 10 CFR 20.407(a)(2) showed that 90 people, including 19 staff members, were provided personal monitoring during the year. The highest whole body dose received was less than 500 mrem with only two people receiving greater than 100 mrem. Review of vendor reports verified this data. During the first six months of 1979, the highest whole body dose received was 89 mrem. No detectable neutron exposures were received. The reactor room is locked during reactor operation. No significant extremity exposures were detected. Finger rings are worn when handling fuel and the larger calibration sources. Form NRC-5 equivalent data are maintained by the licensee.

No items of noncompliance or deviations were identified.

8. Posting, Labeling, and Control

The information and materials required by 10 CFR 19.11 were observed to be posted.

Rooms, areas, containers, and sources were observed to be appropriately labeled and/or posted.

In addition to controls exercised at the main Training Center entrance, the door to the reactor facility is maintained locked and the door to the reactor room is interlocked to prevent entry while the reactor is operating.

No items of noncompliance or deviations were identified.

9. Air and Water Sampling and Analysis; Swipe and Direct Radiation Surveys

The inspector reviewed procedures for performing and documenting routine sampling and surveys. Surveys have been performed at required intervals.

Survey results were reviewed for the period from June 1, 1978, through August 31, 1979. Air samples only occasionally show slight activity above the minimum detectable activity (MDA) of about $1 \text{ E-}13$ uCi/ml beta and about $1 \text{ E-}14$ uCi/ml alpha.

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Reactor water samples typically show concentrations of from 1 E-9 to 1 E-7 uCi/ml of beta activity and about 1 E-10 uCi/ml (MDA) for alpha activity. On exception to this occurs shortly after the occasional 2-3 minute runs at about 5000 watts when the beta activity may go up by a factor of 10 to 100. The licensee has determined that this increased activity is due to sodium-24, which has a 15 hour half life. Two possible sources for the sodium-24 activity are considered probable. One possible source is a neutron-alpha reaction with the aluminum fuel cladding. A second possibility is a sodium exchange mechanism with the polishing resin. Periodic sampling and analysis of resin samples have shown no detectable activity above background levels. This matter is being investigated by the licensee and will be reviewed further during a future inspection.

Routine smear and direct radiation surveys have not identified any significant problems. Highest radiation levels in the reactor room are experienced when the fuel is removed from the reactor and placed in storage racks. During this time, levels in the room increase by a factor of 10-20. General levels in the reactor room are 1-17 mR/hr when fuel is in the storage racks. Radiation levels just outside the entrance door are about 0.3 mR/hr under the same conditions.

Independent measurements made with a licensee's survey meter during reactor operation showed radiation levels of about 0.01 to 0.03 mR/hr in contact with the locked entrance door to the reactor room and about 0.02 mR/hr at contact with the polishing demineralizer tank.

No items of noncompliance or deviations were identified.

10. Radwaste

There have been no liquid, solid, or gaseous radwaste shipments or releases from the facility since the last radwaste inspection (May 1978). In response to concerns raised during the previous radwaste inspection (May 1978), the licensee submitted corrected liquid effluent data in revision of previous annual reports.

The inspector discussed IE Bulletin No. 79-19 and its implication regarding potential liquid in any shipments.

No items of noncompliance or deviations were identified.

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11. Notifications and Reports

According to statements made by licensee personnel and substantiated to the extent of records reviewed, the licensee has had no over-exposures of personnel or releases requiring reporting. An annual summary exposure report for 1978 was submitted to fulfill requirements of 10 CFR 20.407.

No items of noncompliance or deviations were identified.

12. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on September 11, 1979.

The following matters were discussed:

- a. The purpose and scope of the inspection.
- b. The inspector noted that no items of noncompliance or deviations were identified and that the licensee had apparently completed appropriate action regarding the areas of concern noted at the time of the last radiation and radwaste inspection (May 1978).
- c. The inspector discussed recently issued IE Bulletin 79-19 regarding "Transportation of Low-Level Radioactive Waste for Transport and Burial."

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