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

REGION III

Report No. 50-87/80-05

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, IL

Inspection Conducted: June 27, 1980

Inspector: L. J. Hueter L. J. Hueter 7-18-80

Approved By: W. L. Fisher, Chief W. L. Fisher for 7/18/80
Fuel Facility Projects and
Radiation Support Section

Inspection Summary

Inspection on June 27, 1980 (Report No. 50-87/80-05)
Areas Inspected: Routine, unannounced 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; notifications and reports; and IE Bulletin 79-19. The inspection involved seven inspector-hours onsite by one NRC inspector.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

*J. Roth, WNTR Facility Manager
*F. Ellis, Radiation Safety Coordinator
C. Bach, Training Systems 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 9:00 a.m. on June 27, 1980, was conducted to examine the radiation protection and radwaste aspects of routine facility operations. The reactor was in operation for training purposes during the inspection. 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

G. Scholand remains as Manager of Westinghouse Nuclear Training Center (WNTC). J. Roth still serves as Westinghouse Nuclear Training Reactor (WNTR) Facility Manager and reports to Mr. Scholand. In February 1980, C. Bach filled the position of Training Systems Coordinator left vacant just before the previous radiation protection inspection (9/79). Mr. Bach reports to Mr. Roth. C. Ferguson still serves as WNTR Lead Engineer; he reports to Mr. Bach. F. Ellis Jr. remains as Radiation Safety Coordinator (RSC) and also serves as Emergency Coordinator. In these capacities he reports to Mr. Scholand. Mr. Ellis serves jointly with Mr. Bach as Security Officer and in this capacity they report to Mr. Roth.

Mr. Bach has a B. A. Degree in mathematics and credit towards a Masters Degree in Mechanical Engineering. He has eleven years previous experience with Westinghouse in thermal hydralics while with the Advanced Reactor Division at Waltz Mill, Pennsylvania. He came to the training center in November and December 1979 for Senior Operator Training (SRO) and received his SRO license on January 18, 1980.

As noted in a previous inspection report (87/79-03), Mr. Ellis 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.

4. Audits and IE Bulletin 79-19

The inspector reviewed records of the audit of low-level radioactive waste transfer, packaging, and transport activities conducted September 17, 1979, by Mr. A. Sabo, Director, NES Licensing Safeguards and Safety (Westinghouse Nuclear Center, Monroeville, Pennsylvania). The audit was titled "Transfer, Packaging, and Transport of Low-Level Radioactive Waste Audit Checklist for License No. R-119, Docket 50-87." The audit included Items 1-6 of IE Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial." The audit noted that several requirements of the bulletin had not been met by the licensee; most have since been completed. The outstanding item (training) for IE Bulletin 79-19 is scheduled for completion during the summer of 1980. The licensee generates minimal radwaste. Any waste generated has been very low level. No waste shipments have been made for at least the past two and one half years and none are pending. The following current findings were made by the inspector:

a. The licensee maintains current copies of DOT and NRC regulations.

b. The licensee maintains a current set of the licenses placed on the three waste burial firms by the agreement states of Nevada, South Carolina, and Washington.

c. The licensee has designated in writing the Site Radiation Safety Coordinator to be responsible for the safe transfer, packaging, and transport of low-level radioactive material.

d. Items 3.5.6 of the NTR Operations Manual was modified to ensure that low-level radioactive wastes are properly packaged for transport and burial by the addition of the following paragraph:

"The packaging of low-level radioactive waste for transport and burial will adhere to the Westinghouse Electric Corporation "Radioactive Shipment Check List." The check lists are filed in the NTR file cabinet drawer No. 3 under 'I.E. Bulletin 79-19.' The packaging and shipping of these wastes will also be coordinated with the Westinghouse Office of the Director, NES Licensing, Safeguards and Safety."

The three page Radioactive Shipment Check List contains management approved instructions, precautions, and requirements. Any waste "processing" is to be done by the Radiation Safety Coordinator with no delegation of this responsibility being planned by the licensee.

e. Reactor operator trainees are instructed to minimize the generation of waste (disposable gloves, etc.). The routine training program will be used to provide training for reactor operators in the DOT and NRC regulatory requirements, the waste burial license requirements, and the management approved procedures. This training is to be initiated in July 1980.

No items of noncompliance or deviations were identified.

5. Radiation Protection Procedures

Except as noted in the previous paragraph, no major changes have been made in radiation protection procedures. Proper approvals appear to have been obtained before implementation of any procedural changes.

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 had an adequate supply of operable and calibrated survey meters as well as laboratory counters for beta-gamma and alpha activity. Calibrations are conducted quarterly and cover at least two points per scale. Neutron survey meters and high range gamma survey meters continue to be calibrated offsite.

Sealed source inventory and leak tests continue to be performed quarterly. All sources have been accounted for; no evidence of leakage has been noted.

No items of noncompliance or deviations were identified.

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 were reviewed for 1979 and the first five months of 1980. The data submitted to the Commission for 1979 per 10 CFR 20.407(a)(2) showed that 221 people (more than double the number from the previous year) were provided personal monitoring during the year. Twenty-five of the 221 were staff members; the remainder were essentially all student trainees. The highest whole body dose received was less than 250 mrems with only three people receiving greater than 100 mrems. Review of vendor reports verified these data. During the first five months of

1980, the highest whole body dose received was 69 mrems. No detectable neutron doses were received. The reactor room door is locked during reactor operation and is interlocked such that the reactor would trip should the door be unlocked. Finger rings are worn to evaluate extremity doses when handling fuel and the larger calibration sources.

Extremity doses have been less than a factor of two higher than whole body doses. Form NRC-5 equivalent data are maintained by the licensee.

The licensee provided separate TLD badges to two Westinghouse employees in 1979 and to two other Westinghouse employees thus far in 1980 for work performed at power reactors. Separate records are maintained of this dose. The highest dose received during a quarter by any of these individuals at the power reactors was 1153 mrem. None received a combined dose greater than 1250 mrem per calendar quarter, including dose received at both the WNTR facility and the power reactor facility. Form NRC-4's are maintained for these individuals.

No items of noncompliance or deviation were identified.

8. Posting, Labeling, and Control

The information and material required by 10 CFR 19.11 were observed to be posted. No room or area posting discrepancies were noted.

In addition to controls exercised at the main entrance to the Training Center, 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

Survey results were reviewed for the first five months of 1980. One monthly air sample showed activity slightly above the minimum detectable activity (MDA) of about 1E-13 uCi/ml beta and about 1E-14 uCi/ml alpha. Monthly reactor water samples during this period showed concentrations from about 2E-9 to 1E-8 uCi/ml of beta activity and about 1E-10 uCi/ml (MDA) for alpha activity. No new information has been learned regarding the low levels of short-lived sodium-24 activity observed in reactor water shortly after certain 2-3 minute runs at about 5000 watts, as noted in a previous inspection report (305/79-03).

Routine area 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 giving rise to general levels in the reactor room of 1-20 mR/hr. Radiation Levels on contact with the fuel assemblies may be as

high as 1-2 R/hr depending upon reactor operating history. Whole body and extemity dose received substantiate good control over handling of the fuel. Area smear surveys results are typically below the MDA. An error by a factor of about 10 was observed in the licenee's MDA's for smear survey data in January 1980. However, contamination levels were not significant in January 1980; this matter was discussed in the exit interview.

Independent measurements made with a licensee's Eberline Model E-530 GM type survey meter during reactor operation showed radiation levels of about 0.02 to 0.05 mR/hr in contact with the locked entrance door to the reactor room and about 0.02 mR/hr at contact with the polishing deminalizer tank.

No items of noncompliance or deviations were identified.

10. Radwaste

There have been no liquid, solid, or gaseous radwaste shipments from the facility since the last radwaste inspection (September 1979). The licensee did make a planned release to the sanitary sewer system. This release consisted of 25 gallons of water from the laboratory waste hold-up tank with a total activity of less than .01 microcuries.

No items of noncompliance or deviations were identified.

11. Notifications and Reports

According to statements made by licensee personnel and substantiated to the extent of records reviewed, the licensee had had no overexposures of personnel or releases requiring reporting.

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.

c. The matter of calculational errors (smear survey MDA) not being detected by the licensee and the potential consequences of such errors were discussed. The licensee agreed to plot certain routine data to assist in trend determinations and error identification. (Paragraph 9)