

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-87/84-01 (DPRP)
Docket No. 50-87

License No. R-119

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

Facility Name: Westinghouse Nuclear Training Reactor

Inspection Conducted: May 23--25, 1984

Inspectors: *C. C. Thomas*
C. C. Thomas

June 13, 1984
Date

A. E. Sanchez-Pope
A. E. Sanchez-Pope (Trainee)

June 13, 1984
Date

Reviewed by: *J. E. Hyder*
J. E. Hyder

June 13, 1984
Date

Reviewed by: *K. R. Ridgway*
Project Manager

June 19, 1984
Date

Approved by: *K. R. Ridgway for*
Technical Support Section

June 19, 1984
Date

Inspection Summary

Inspection on May 23--25, 1984 [Report No. 50-87/84-01 (DPRP)] Areas Inspected:

Routine, unannounced inspection of records, logs, and organization; review and audit functions; requalification training; procedures; surveillance activities; experiments; fuel-handling activities; environmental protection; radiation control practices; radwaste management program; emergency planning; transportation activities; and follow-up of a licensee event report. The inspection involved 31 inspector-hours onsite by one NRC contractor inspector and one NRC contractor-inspector trainee, including 2 inspector-hours onsite during off-shifts.

Results: No items of noncompliance were identified in the areas of inspection.

Details

1. Persons Contacted

- *K. M. Rueter, WNTR Facility Manager
- *R. P. Sackschewsky, Reactor Training Coordinator
- *C. W. Emerson, Radiation Safety and Security Coordinator
- D. A. Smith, Senior Reactor Operator
- M. M. McGawn, Senior Reactor Operator

*Indicates those present at the exit interview.

2. General

This inspection, which began at 1:00 p.m. on May 23, 1984, was conducted to examine the overall program at the Westinghouse Nuclear Training Reactor. However, the inspection did not examine the security and material accountability and control activities. The facility was toured shortly after arrival, before the reactor was started up. The conditions of the facility were found to be acceptable.

As discussed in the previous routine inspection report (Report No. 50-87/81-02), the licensee had tested a new core designed to reduce the fuel possession to less than 5 kg of ^{235}U (93% enriched). This core change was incorporated in the Safety Analysis Report and the licensee renewal application, which currently is in the final review stages in the Office of Nuclear Reactor Regulation. Amendment 6 to the current licensee that reduces the licensee's possession limit to 4.95 kg of contained ^{235}U and 48 g of plutonium as plutonium-beryllium neutron sources was issued on January 18, 1982, after the licensee's holdings were reduced to that level by the shipment of excess fuel elements to the Savannah River Plant in September, 1981. The fuel shipment is discussed in Paragraph 10.

The inspection team observed a reactor prestartup check-out and startup and power operation on the evening of May 24, 1984. The startup was part of a power reactor operator training experiment. The check-out and startup were carried out in a professional manner with the duty senior reactor operator (SRO) functioning in a training role. The training activity was well done with considerable SRO/trainee interaction. The information transfer aspect of the interaction was quite good.

3. Organization, Logs, and Records

The facility organization was reviewed and verified to be consistent with the Technical Specifications and/or Safety Analysis Report. The minimum staffing requirements were verified to be present during reactor operation and fuel handling or refueling operations.

The reactor logs and records were reviewed to verify that

- a. required entries were made,
- b. significant problems or incidents were documented,
- c. the facility was being maintained properly, and
- d. records were available for inspection.

There have been several personnel changes since the last routine inspection (Report No. 50-87/81-02). K. Rueter has replaced C. Bach as the Westinghouse Nuclear Training Reactor (WNTR) Facility Manager; R. Sachschesky has replaced J. Snelson as the WNTR Reactor Coordinator; H. C. Finch has replaced R. Brandenburgh WNTR Lead Reactor Engineer; and C. W. Emerson has replaced F. Ellis as Radiation Safety and Security Coordinator (RS&SC)

All work performed in the reactor room continues to be done under the direct supervision of a WNTR staff member. There are 25 Licensed Senior Operators (SRO) on the WNTR staff.

No items of noncompliance or deviation were identified in this section of the inspection.

4. Reviews and Audits

The records and associated audit reports for the last six Reactor Safeguards Committee (RSC) meetings were reviewed, including the draft minutes of the December 7, 1983, meeting. The review was performed to verify that the licensee's review and audit program was in conformance with procedural and regulatory requirements. The audit reports reviewed were found to be timely, thorough, and technically adequate. The RSC reviews of the audits were well done and of appropriate depth.

No items of noncompliance or deviations were identified in this section of the inspection

5. Requalification Training

The inspection team reviewed procedures, logs, and training records and interviewed personnel to verify that the requalification training program was being carried out in conformance with the facility's approved plan and NRC regulations. Thirteen requalification examinations had been conducted in June 1982.

No items of noncompliance or deviations were identified.

6. Procedures

The inspector reviewed the licensee's procedures to determine if procedures were issued, reviewed, changed or updated, and approved in accordance with Technical Specifications and Safety Analysis Report requirements.

This review also verified that

- a. the procedure content was adequate to operate, refuel, and maintain the facility safely;
- b. the responsibilities were clearly defined; and
- c. the required checklists and forms were used.

The inspector determined that the required procedures were available and that the contents of the procedures were adequate.

In general, the procedures for WNTR are well established and are not subject to change. Since the last routine inspection, two new procedures have been implemented after approval by the RSC (Report 50-87/81-02). The first of these is a procedure for the annual inspection of control rods. The procedure was reviewed and found to be adequate to meet its stated objectives. The second procedure deals with the review of procedures and is designed to keep the facility procedures current and (1) to provide for the review of specific procedures on a routine basis and (2) to audit the those procedures against standards and criteria. To date, the procedures determined to be subject to periodic review and audit are operator requalification, the emergency plan, special nuclear material control and accounting, and the NTR security plan. Review of the records indicated that the reviews and audits had been done by the designated individuals at the required frequency.

No items of noncompliance or deviations were identified in this section of the inspection.

7. Surveillance Activities

The inspection team reviewed surveillance records and had discussions with appropriate operations personnel. The licensee's surveillance program was found to be adequate, well implemented, and conducted in accordance with the Technical Specifications. Procedures are available for surveillance activities that are adequate for performance of the required tests. The surveillance test records of tests performed during the past 36 months were examined in depth. All requirements were met and recorded. Required maintenance of components involved in the systems being tested also was reviewed for documentation and reverification of operational performance.

The maintenance log for the past 36 months was reviewed. All maintenance activities performed were documented in accordance with regulatory requirements and procedural commitments.

The inspection team noted that when measurements made as part of the surveillance activities were outside of prescribed limits (but not necessarily Technical Specification limits) the individual making the measurement was required to notify the Reactor Lead Engineer and the Radiation Safety and Security Coordinator. In a case identified in the

surveillance records review, the inspection team was able to follow the actions taken through review of documents other than the surveillance test reports, which do not indicate if the proper individuals had been notified or what actions had been taken. The lack of such information in the surveillance test reports was discussed with the licensee, who agreed that it would be useful to include information on the follow-up actions in the surveillance test reports and indicated that they would do so in the future.

No items of noncompliance or deviations were identified in this section of the inspection.

8. Experiments

The experiments conducted at WNTR are designed primarily for training utility power reactor personnel and, to a lesser extent, WNTR staff members. As such, the experiments are well established and rarely are revised or changed. The inspection team reviewed the licensee's procedures and concluded that they were adequate to assure that revised or new experiments would be reviewed, prepared, conducted, and documented properly. The administration established by the licensee in regard to experiments and experimental procedures appears to be sufficient to ensure compliance with Technical Specification experiment limitations.

No items of noncompliance or deviations were identified.

9. Fuel Handling Activities

The facility refueling (fuel handling) program was reviewed by the inspection team. The review included verifying approved procedures for fuel handling and their technical adequacy in the areas of radiation protection, criticality safety, technical specifications, and security plan requirements. The inspector determined by records review and discussions with personnel that fuel-handling operations and startup tests were carried out in conformance with the licensee's procedures.

No item of noncompliance or deviations were identified.

10. Transportation (Activities)

The inspector reviewed records of an irradiated fuel shipment made in 1981 to determine that conditions of the Certificate of Compliance for the 5M shipping containers and DOT regulations were followed. Eleven full, one partial, and four fuel-follower elements were shipped to the Savannah River Plant thereby reducing the high enriched uranium (>20% ^{235}U) inventory to less than 5 kg.

No items of noncompliance or deviations were identified.

11. Radiation Control

The inspection team reviewed the radiation protection activities since the last health physics inspection on September 8, 1983 (Report 50-87/83-03

(DRMSP). Records were reviewed, personnel were interviewed, and observations were made to verify that radiation controls were being carried out in accordance with licensee and NRC regulations. The areas covered were

- a. posting and labeling of restricted areas and radioactive materials,
- b. control of irradiated samples,
- c. calibration of radiation detection instruments,
- d. required periodic dose and contamination surveys,
- e. exposure records of personnel,
- f. posted areas of the facility,
- g. personnel training,
- h. independent surveys, and
- i. pool water activity.

The licensee noted that the whole body and extremity exposures of the two individuals doing the annual control rod inspection during the month in which the examination was scheduled were considerably greater than the maximum annual exposures in previous years. The highest whole body exposure in 1982 was 62 mrems as compared with the maximum whole body exposure attributable to the control rod inspection, which was 134 mrem. The inspection team concluded that the additional safety resulting from the control rod inspection justified the increased exposure.

No items of noncompliance or deviations were identified.

12. Radwaste Management and Environmental Protection

The environmental monitoring program consists of TLDs changed and analyzed quarterly. Results for locations other than those directly above the reactor are basically indistinguishable from natural background.

There have been no radwaste shipments from the facility since the last health physics inspection (September 8, 1983). Two releases to the sanitary sewer system totaling 57 gal of water have been made from September 1983 to date. The total activity released was about 2 nCi.

No items of noncompliance or deviations were identified.

13. Licensee Event Report Followup

On November 10, 1981, a training class under the direct supervision of an SRO was conducting an initial fuel loading experiment. As preparation for this experiment, each trainee made several practice loadings with a dummy fuel element. The fuel handling tool has guide markings to allow the

operator or trainee to determine that the element is properly seated. During the experiment, a trainee oriented the tool so that the lever attached to the operating mechanism would hang up on the top of a control rod shroud tube. The SRO observed this but decided to let the trainee discover that a problem existed when the tool markings indicated the fuel element was not seated. Unfortunately, the trainee thought the element was seated and, without checking and before the SRO could stop him, released the element. The element dropped into its in-core position (a distance of 18 inches). The element was released and determined to be free to move. The Lead Engineer and the Reactor Coordinator were notified as required. Subsequent monitoring of the pool water and smear checks indicated there was no release of radioactivity and that the clad integrity had not been compromised. Micrometer measurements made on the lower nozzle and fuel clad area demonstrated that there was no deformation. Visual examination demonstrated that there was no apparent damage to the lower nozzle or nozzle pins. The event was reported by a telephone call to NRC Region III on November 11, 1981, and in an internal Westinghouse document WIN: 523-4209, which was dated November 11, 1981. Document WIN: 523-4209 indicates that the licensee concluded that the event was a nonreportable occurrence.

The inspection team reviewed all the documentation concerning the event, interviewed the SRO involved, and concluded that the event was a nonreportable occurrence caused by a trainee violating established procedures. The licensee indicated that the current training activities associated with the fuel loading experiment place additional emphasis on assuring that the element is in place before the tool is released.

15. Emergency Planning

The licensee has submitted a revised emergency plan. Responses to questions from NRC concerning the revised plan are being submitted with the updated license renewal application.

The licensee currently is operating under the existing emergency plan. The existing emergency plan provides for a full emergency drill with a simulated accident victim, paramedics, and hospital response every 2 years and a partial drill involving staff personnel only every other year. Letters of agreement with outside organizations are updated annually. The inspection team's review determined that the commitments made in the plan have been met.

No items of noncompliance were identified.

16. Review of Periodic and Special Reports

The inspection team reviewed the following reports for timeliness of submittal and adequacy of information submitted.

- a. Annual Report for Calendar Year 1981
- b. Annual Report for Calendar Year 1982
- c. Annual Report for Calendar Year 1983

17. Exit Interview

The inspection team met with licensee representatives (listed in Paragraph 1) at the conclusion of the inspection on May 25, 1984, and summarized the scope and findings of the inspection.

The lack of information on surveillance test reports on follow-up actions when the test results are out of prescribed limits was discussed with the licensee. The licensee agreed that such information on the surveillance test reports would be useful and indicated that they would implement the suggestion.

The inspection team complimented the licensee on the overall aspects of the facility operation and its conformance with regulatory requirements and procedural commitments.