



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30323

Report No.: 70-824/89-06

Licensee: Babcock and Wilcox Company  
Naval Nuclear Fuel Division  
NNFD Research Laboratory  
Lynchburg, VA 24505

Docket No.: 70-824

License No.: SNM-778

Facility Name: NNFD Research Laboratory

Inspection Conducted: September 13-14, 1989

Inspector: *G. L. Troup*  
G. L. Troup, Fuel Facility Project Inspector

10/2/89  
Date Signed

Approved by: *E. J. McAlpine*  
E. J. McAlpine, Chief  
Radiation Safety Projects Section  
Nuclear Materials Safety and Safeguards Branch  
Division of Radiation Safety and Safeguards

10/6/89  
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection involved management controls, training, nuclear criticality safety, operations, maintenance, and followup on previous enforcement items.

Results:

Within the scope of the inspection, no violations or deviations were identified. One Inspector Followup Item was identified: periodic testing requirements for sump pump (paragraph 6).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. Bennett, Safety and Licensing Manager
- \*C. Boyd, Jr., Licensing and Compliance Officer
- \*S. Schilthelm, Health Physics Supervisor
- D. Spangler, Health Physicist
- C. Yates, Health Physicist
- W. Younger, Plant Engineering Supervisor

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- \*F. Alcorn, Manager, Nuclear Criticality Safety Engineering
- J. Harwell, Nuclear Criticality Safety Engineer
- \*R. Loving, Manager, Security and Safeguards
- L. Wetzel, Nuclear Criticality Safety Engineer

The inspector also interviewed several other licensee employees.

\*Attended exit interview

### 2. Follow-up on Previous Enforcement Items (88010, 92702)

(Closed) 88-10-02, Failure to Retrain an Authorized User. This item dealt with the inclusion of an individual on the Authorized User list who had not satisfactorily completed the required refresher training. The licensee's response of October 20, 1988 was reviewed with the cognizant personnel. The inspector verified that the list is now prepared from the tests (which must have a passing grade marked on it) rather than from the attendance list. The inspector had no further questions.

### 3. Management Organization and Controls (88005)

#### a. Organizational Structure

License Amendment 9 was issued on August 9, 1989 to change the facility organization and change the titles of several positions. At the time of the inspection, the licensee had implemented the new organization and titles.

Three individuals had been appointed to positions since the last inspection (License Administrator and Facility Supervisor, Health Physics Supervisor, and Industrial Safety Officer). The inspector determined that the individuals appointed met or exceeded the qualifications specified in Section 2.5 of the license application.

Amendment 9 authorized the consolidation of the License Administrator and Facility Supervisor positions into the Licensing and Compliance Officer position, which has been completed.

No violations or deviations were identified.

b. Safety Committees

The membership of the Safety Review Committee (SRC) was modified by the appointment of the Nuclear Safety Officer in April 1989. During a previous inspection, IFI 88-08-01 was identified concerning the lack of attendance by an outside member. On September 19, 1989 the Manager, Safety and Safeguards appointed the Manager, Health and Safety to the SRC, reappointed other members and, by omission, removed the outside member in question from the committee. This action closed IFI 88-08-01.

The inspector reviewed the minutes of the five SRC meetings held since the last inspection and determined that the meetings were held at the required frequency with the required quorum present. The inspector also determined that the agenda for items reviewed were in accordance with the charter.

No violations or deviations were identified.

c. Procedures

The inspector reviewed two new procedures and the revisions to seven procedures and determined that they had been reviewed and approved in accordance with the existing license requirements.

Amendment 9 revised the review and approval requirements for Area Operating Procedures (AOPs). Procedure B-GP-14, "Area Operating Procedure Requirements" was revised to incorporate the new approval requirements and scheduled for submittal to the SRC for approval at the October meeting. No revisions to AOPs will be issued until the new review and approval requirements are implemented.

No violations or deviations were identified.

4. Nuclear Criticality Safety (88015, 88020, 88025)

a. Facility Changes and Modifications

The inspector discussed authorized modifications with the cognizant managers and was advised that no changes involving licensed materials had been made since the last inspection. Consequently, no nuclear safety evaluations had been performed. One modification to the Storage Pool is discussed in paragraph 6.

No violations or deviations were identified.

b. Audits

The inspector reviewed the Facility Supervisor Nuclear Criticality Safety Weekly inspections conducted April 2 - August 28, 1989, and the Nuclear Safety Officer's quarterly audits for the 1st and 2nd Quarters, 1989. One deficiency in the maintenance of material unit logs was identified; additional training was provided to Authorized Users in the proper method of completing the logs.

The inspector also reviewed the Safety Audit Subcommittee (SAS) reports for the August 1988, November 1988 and March 1989. The frequency of the audits and membership of the SAS were determined to be in accordance with Section 2.8.3 of the license application.

No violations or deviations were identified.

c. Criticality Monitoring Systems

The inspector reviewed the weekly functional tests for the criticality monitoring systems, which were performed on a rotating schedule so that all monitors were checked monthly, and the August 1989 semi-annual calibrations.

The inspector verified that the new neutron monitors installed for the Hot Cells (paragraph 5) had been incorporated in the functional check procedure (RL-TP-400) and were in the calibration program.

During tours of plant areas the inspector observed that individual monitors were operable and that none were in a failed or alarmed condition.

No violations or deviations were identified.

d. Analytical Methods

The inspector discussed the codes and methods used to perform nuclear criticality safety evaluations with the cognizant supervisor. No new analytical methods had been added since the last inspection.

No violations or deviations were identified.

5. Hot Cell Operations

- a. On January 31, 1998, the licensee suspended all operations involving special nuclear material (SNM) in three Hot Cells. This suspension was the result of an analysis of the criticality monitoring system response to the design basis accident in Regulatory Guide 3.4 in the cells, which indicated that high dose rates from neutrons would be present outside of the Hot Cells but would not be detected by the gamma monitoring system.

- b. The licensee installed temporary neutron detectors on the outside of Cell 3 in March 1989 to permit resumption of SNM operations. Hot Cell 1 was left in operation based on more extensive shielding on that cell. A further evaluation of Cell 1 revealed that the shielding present in the viewing windows was not as effective as previously assumed, and high neutron dose rates could be present outside Cell 1 under the design basis accident. SNM operations in Cell 1 were suspended on July 19. The neutron monitors previously installed on the other cells were moved to cover one of the viewing windows in Cell 1.
  - c. An evaluation of Cell 1 was performed by the licensee to assess the ability of the installed monitors to detect a criticality accident at various locations in the cell. The evaluation determined that a criticality occurring in the most shielded position would be detected by the monitors. The inspector reviewed the evaluation report and determined that it had been performed using qualified methods and had been independently reviewed, as required.
  - d. Based on the results of the evaluation, and the results of an evaluation performed by another laboratory, the Manager, Nuclear Criticality Safety Engineering informed the Licensing and Compliance Officer by memorandum dated September 14, 1989 that Cell 1 could be returned the service. Cells 3 and 4 remain shutdown pending the procurement and installation of additional neutron detectors.
6. Cask Handling Area (CHA) Pool (92701)
- a. On October 13, 1988, a leak in the overflow gutters and drain piping in the CHA pool resulted in the spillage of approximately 515 gallons of water onto the soil beneath the cask handling area. The evaluation of the leak and description of the corrective actions were contained in the licensee's report of November 11, 1988.
  - b. The corrective actions included the installation of a steel overflow sump with a drain pump in the pool. In the event of high pool level, the overflow would go into the sump and be pumped to the holding tank. The report stated that routine testing of the pump would be established.
  - c. The inspector observed that the sump and pump had been installed in the pool, and by discussion with cognizant personnel, that the pump and float controllers had been tested after installation. However, the "routine testing of the pump" had not been established. Licensee management representatives stated that a periodic test for the pump and controllers would be developed. This will be reviewed during subsequent inspections [IFI 89-06-01]. The pool level alarms, which alarm at a pool level below the sump overflow level, are functionally tested weekly.

## 7. Exit Interview

The inspection scope and findings were summarized on September 14, 1989, with those persons indicated in paragraph 1. Management representatives acknowledged the new Inspector Followup Item on the testing of the CHA pool sump pump and the closing of the violation on training (88-10-02). The licensee did not identify any materials provided to the inspector as proprietary.