U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 70-1100/82-06

Docket No. 70-1100

License No. SNM-1067 Priority 1 Category UR

Licensee: Combustion Engineering, Incorporated

P. O. Box 500

Windsor, Connecticut 06095

Facility Name: Nuclear Fuel Manufacturing and Nuclear Laboratories

Inspection At: Windsor, Connecticut

Inspection Conducted: July 26-30, 1982

Inspector: J. Roth
J. Roth, Project Inspector — 8/18/82 date

Accompanied By: R. Kratzke
NMSS Licensing Project Manager — date

Approved By: R. Keimig
R. R. Keimig, Chief, Reactor Projects Branch #2, DPRP — 8-18-82 date

Inspection Summary:

Inspection on July 26-30, 1982 (Report No. 70-1100/82-06)
Areas Inspected: Routine, unannounced inspection by a region-based inspector (39 hours) of the licensed program including: 10 CFR Part 21, organization, facility changes and modifications, internal review and audit, safety committees, review of operations, nuclear criticality safety, environmental programs, emergency drills, transportation, non-routine event reports, follow-up on a licensee event, licensee action on previously identified enforcement items, and follow-up on regional requests for information.
Results: Of the 14 areas inspected, no violations were identified in 13 areas. Two items of noncompliance and one deviation were identified in one area (violations - failure to maintain removable contamination in a clear area to less than 100 dpm/100 cm^2, paragraph 4a(3); failure to maintain hood face velocity in excess of 100 lfpm, paragraph 4a(4) and 4b(1). Deviation - Conduct of a radiation survey on a shipping container by opening a door from the contaminated area to the outside, paragraph 4a(3)).

DETAILS

1. Persons Contacted

Nuclear Manufacturing

*H. V. Lichtenberger, Vice President - Nuclear Fuel
*F. J. Pianki, General Manager, Nuclear Fuel Manufacturing
R. E. Sheeran, Supervisor, Health Physics and Safety

Nuclear Laboratories

*P. R. Rosenthal, Manager, Health Physics
J. M. Limbert, Radiological Engineer
E. C. Gordon, Senior Radiological Engineer

The inspector also interviewed other licensee employees during the inspection.

*Denotes those present at the exit interview.

2. Licensee Action on Previously Identified Enforcement Items

(Closed) Inspector Follow Item (1100/78-10-02). Training program for response organizations. The inspector verified that the licensee had incorporated training requirements for response organizations (onsite and offsite) in the Radiological Contingency Plan, Revision 2, dated May 21, 1982.

(Open) Unresolved Item (1100/79-12-01). Emergency procedures review and revision. The licensee is currently reviewing and/or revising the facility emergency procedures to incorporate the requirements of the Radiological Contingency Plan. The revisions are expected to be completed by December 31, 1982.

(Closed) Unresolved Item (1100/79-12-02). Magnitude of release determination. The licensee has incorporated an assessment of the magnitude of potential releases offsite, during an emergency, into the Radiological Contingency Plan.

(Open) Inspector Follow Item (1100/79-12-04). Alpha self-absorption corrections. The licensee has conducted a study to determine the effect of alpha self-absorption on analytical data from environmental sampling. However, this study was not available for the inspector to examine. The licensee will locate a copy of the study or redo the study and have it available for the inspector to review during the next inspection.

(Closed) Inspector Follow Item (1100/80-07-03). Installation of shelves and criticality alarm in the new Building 2 vault. The inspector verified that the licensee installed and initiated use of the new Building 2 vault

as required by the conditions specified in Amendment 32 to License No. SNM-1067, dated August 17, 1981.

(Closed) Unresolved Item (1100/81-10-01). Qualifications of the Health Physics and Safety Supervisor. The qualifications of the incumbent Health Physics and Safety Supervisor to supervise the health physics and safety functions of manufacturing facility were reviewed and approved by NRC-NMSS per Amendment 34 to License No. SNM-1067, dated February 25, 1982.

(Open) Unresolved Item (1100/81-10-02). Reevaluation of the nuclear criticality safety of the modified rod turret carts. The inspector determined through discussions with licensee representatives that the modified rod turret carts had not been reevaluated. This will be completed prior to the next inspection.

(Closed) Violation (1100/81-10-03). Failure to provide an alpha instrument to monitor hands, shoes, and clothing for contamination at the exit to the FA-3 ventilation system mezzanine. The inspector verified that the licensee placed an alpha instrument at the exit to the FA-3 ventilation system mezzanine prior to entering the area.

(Closed) Inspector Follow Item (1100/81-10-04). Review analysis of water for uranium content in the recirculating water system at the bundle washing station. According to licensee records, no U-235 was found in the water contained in this recirculating water system.

3. Organization

The inspector determined that no significant organizational changes had occurred in the Nuclear Laboratories or in the Nuclear Fuel Manufacturing facilities since the last inspection.

No violations were identified.

4. Review of Operations

The inspector examined all areas of the plant and the nuclear laboratories to observe operations and activities in progress; to inspect the nuclear safety aspects of the facilities and to examine the general state of cleanliness, housekeeping, and adherence to fire protection rules.

a. Nuclear Fuel Manufacturing Facilities

(1) Housekeeping

The inspector noted that the fireload on the contaminated and clean sides of the FA-3 ventilation system mezzanine, on the pellet shop annex mezzanine, and, in the pellet shop annex, was excessive and was a questionable practice. Licensee representatives stated that the fireload in these areas would be reexamined and reduced as far as practicable (82-06-01).

No violations were identified.

(2) Uranium Oxide Powder Drying Belt

The inspector observed that there was a build-up of uranium oxide powder under the drying belt at the discharge end. The build-up (1 to 1½ inches) was on the funnel cone leading to the hopper. The inspector stated that the licensee should consider installing a vibrator on the discharge funnel cone to eliminate or reduce the holdup of powder, if the vibrator can be installed so that it will not shake powder off the sides of the belt. Licensee representatives stated that techniques of reducing powder holdup will be reviewed by the engineering group (82-06-02).

No violations were identified.

(3) Drum Radiation Surveys

During examination of outside areas of the facility, the inspector observed an indiviual open a door from the contaminated area on the northwest side of Building 17 to conduct a radiation survey of a Model CE-250-2 shipping container. This was identified by the inspector as a poor practice and a deviation from standard industry practice (82-06-03). At the request of the inspector, the licensee determined that the door plate outside the building, with the door closed, was contaminated to 432 dpm/100 cm^2 which was in excess of 4 times the licensee's limit of 100 dpm/100 cm^2 for clear areas of the plant. This was identified as a violation (82-06-04).

The inspector noted that procedure OS No. 1693, Revision 2, dated May 8, 1982, "Packaging UO_2 into CE-250-2" required an individual to conduct routine inspections of the package from inside the facility and also to obtain radiation readings on the package for record purposes (the package is placed outside

the building wall with the package opening extending through the wall of the building). To obtain the radiation readings on the package surface, the individual must either open the door in question and reach out to the package or walk out of the building. Licensee representatives stated that this procedure will be modified to allow the radiation readings to be taken by an individual located outside the building.

(4) Hood Ventilation

At the request of the inspector, licensee representatives took "Alnor" velometer readings on the Batch Makeup Hood and the Pellet Loading and Stacking Down-Draft tables. Air velocity at the Batch Makeup Hood with the container door open ranged from 0 to 120 linear feet per minute (lfpm). Air velocity on the downdraft tables ranged from 0 to 100 (lfpm) with an average of about 50 lfpm. The facility license states that the minimum face velocity at a ventilated hood will be 100 fpm or the hood will not be used to handle radioactive material. The Batch Makeup Hood was being used with the door open at the time of this inspection. Failure to maintain air flow in excess of 100 lfpm at the Batch Makeup Hood with the door open was identified as part of a violation (82-06-05). The licensee initiated action, prior to the inspection, to improve the air velocity on the downdraft tables (82-06-06).

(5) Postings

The inspector noted that the nuclear safety posting, for the storage of arrays of shipping containers in Building 21, had to be replaced. Licensee representatives stated that this posting on the west wall of Building 21 would be replaced.

No violations were identified.

(6) Ventilation System Sampling

During examination of the FA-3 ventilation system, the inspector noted that the particulate stack sampling device was located at about 3 feet from the floor. It was also observed that the sampling line made at least three 90 degree turns upon exiting the stack until it reached the sampling point. The inspector questioned the reliability of particulate sampling with this physical configuration. Licensee representatives stated that stack sampling techniques will be reevaluated (82-06-07).

No violations were identified.

(7) Nuclear Safety Log Sheets

The inspector examined the micronizer and hammermill log sheets for the time period June 17, 1982, through July 25, 1982. The records indicated that the appropriate posted nuclear safety limit was not exceeded during the time period.

No violations were identified.

b. Nuclear Laboratories

(1) Hood Ventilation

At the request of the inspector, licensee representatives took "Alnor" velometer readings on the Warm Metallography Laboratory hood and the Chemistry Laboratory sample preparation hood. Air velocity at the face of the Warm Metallography hood ranged from 50 to 150 linear feet per minute (lfpm). The air velocity at the face of the Chemistry Laboratory hood ranged from 80 to 120 lfpm. Both hood windows were set at the maximum opening identified previously by the licensee. Failure to maintain air flow in excess of 100 lfpm was identified as part of a violation (82-06-05) previously described in paragraph 4a(4).

(2) Labeling Requirements

The inspector noted that locked container holding a 10 Ci AmBe source in Criticality Control Area 16, **located in Building 16,** was not labeled with Caution-Radioactive Material signs. The licensee stated that this container would be properly labeled. No other significant cases of inadequate labeling were identified.

No violations were identified.

5. Nuclear Criticality Safety

a. Nuclear Fuel Manufacturing

(1) Internal Review and Audit

(a) Daily Audits

Records of daily audits conducted by health physics technicians for the time period January 1, 1982, through July 25, 1982, were examined by the inspector. These audits

examined signs, logs, radiation alarms, criticality safety compliance, contamination levels, and airborne contamination levels. Items requiring correction were corrected immediately.

No violations were identified.

(b) Monthly Audits

The inspector examined documentation of monthly audits conducted by the Supervisor, Health Physics and Safety and/or a Criticality Safety Specialist during the time period January 29, 1982, through June 30, 1982. The inspector verified that appropriate corrective actions were taken or had been initiated by the licensee for the items identified in the 7 reports which required correction.

No violations were identified.

(c) Quarterly Audits

The inspector examined records of quarterly nuclear safety audits conducted by a consultant of the Nuclear Safety Committee from March 30, 1982, through June 29, 1982. The inspector verified that corrective actions were taken or initiated for the items identified in the 5 reports which required correction.

No violations were identified.

(2) Nuclear Safety Evaluations

(a) Facility Changes and Modifications

No significant facility changes or modifications were made by the licensee since the last inspection.

No violations were identified.

(b) Review of Nuclear Safety Evaluations

The inspector reviewed the records of the review and approval of process equipment or facility changes performed by the Nuclear Licensing Consultant for criticality safety or by the Supervisor, Health Physics and Safety for radiological safety. From November 18, 1982, through July 12, 1982 (Request No. 121), 30 requests for review and

approval were made by Engineering. Twenty-two of the requests were reviewed and approved. Thirteen of the requests involved nuclear and radiological safety considerations, six involved radiological safety considerations and three involved only industrial safety considerations. Conditions of approval were imposed, as needed, for criticality and radiological safety considerations. The requests involving criticality safety considerations were independently reviewed by a qualified person designated by the Nuclear Safety Committee and by the Nuclear Licensing Consultant if the original review was conducted by the Supervisor, Health Physics and Safety. The requests involving radiological safety considerations were independently reviewed by the Supervisor, Health Physics and Safety and the Nuclear Licensing Consultant. The evaluations were then countersigned by the qualified persons as required.

No violations were identified.

b. Nuclear Laboratories

(1) Monthly Audits of the Nuclear Laboratories

The inspector examined the records of 6 audits of the Nuclear Laboratories conducted by the Supervisor, Health Physics and Safety for the time period January 29, 1982, through June 30, 1982. The inspector determined that no problem areas were identified during the conduct of these monthly audits.

No violations were identified.

(2) Facility Changes and Modifications

The inspector observed that the licensee had completed installation of the Boronometer Test Facility in Building 16 and had posted the facility as Criticality Control Area 16.

The licensee completed preparation of the new SNM vault in Building 2 and transferred SNM into the vault as of January 20, 1982. The vault was properly posted with criticality control signs and the 3.7 inch slab geometry, required by Amendment No. 32, was being maintained.

Areas of the Building 2 high bay area are currently being modified to increase the number of controlled ventilation zones for use under the facility byproduct material license No. 06-00217-06.

No violations were identified.

6. Safety Committees

The inspector examined the minutes of the annual Nuclear Safety Committee meeting and audit of the Nuclear Fuel Manufacturing facilities which was held on December 16, 1981. The meeting minutes were dated March 3, 1982, and covered only the nuclear safety aspects of the facility. Discussion of the radiological protection and ALARA aspects of the facility was to be issued at a later date. Through discussions with licensee representatives, the inspector verified that an evaluation of these aspects of the facility had been conducted, but the report was not issued as of the date of this inspection. This was discussed at the exit interview. The licensee committed to completing and issuing this report by August 31, 1982 (82-06-08).

No violations were identified.

7. Nonroutine Events

The inspector verified through discussions with licensee representatives that no nonroutine events, within the scope of this inspection, occurred at this facilitiy since the last inspection with the exception of the transportation incident described in paragraph 10.

No violations were identified.

8. Evacuation Drills

The inspector verified that an evacuation drill was conducted at the Building 2 facility on May 14, 1982, subsequent to initiation of use of the Building 2 SNM vault. The drill was critiqued as required and corrective actions were taken, where required.

No violations were identified.

9. 10 CFR Part 21 Procedures

The inspector verified that the licensee had posted the proper notices, as required by 10 CFR 21.6, and that procedures required by 10 CFR 21.21 had been written. The procedure: API-17, "Reporting of Safety Hazards Applicable to Requirements of 10 CFR Part 21", Revision 2, dated January 23,1979, is contained in the "Power Systems Group Administrative Manual" as an Administrative Policy Instruction and is available for any employee to use as required. This procedure also contains a copy of a "Substantial Safety Hazard Report" form which is to be used to report the item to applicable management.

No violations were identified.

10. Transportation Activities

On June 18, 1982, the licensee released a waste shipment for transport to the Barnwell, South Carolina burial site. The shipment arrived at the burial site on June 19, 1982, and was to be buried on June 21, 1982. On June 21, the transport vehicle was opened and the bottom panel of one container (Box 0052) was found to be broken open. Apparently, this container broke open during transport to the burial site. Details of this incident and enforcement actions taken by the NRC and the State of South Carolina are described in NRC Inspection Report No. 70-1100/82-07.

11. Contaminated Storage Area

The inspector examined the "contaminated storage area" which was located in a wooded area of the licensee's site approximately 900 feet northwest of Building 2. This area had been initially discovered during an aerial radiation survey and was subsequently reported to Region I on June 13, 1980.

The licensee is currently developing techniques and procedures to determine the background radiation level which will be applicable to this site. The licensee has also mapped out the area into 30 foot x 30 foot squares (grid) in preparation for conducting an internal closeout survey.

During examination of the area, the inspector conducted a cursory radiation survey using a Ludlum Model 12S Micro R Meter. Radiation levels at about 2-3 feet above the surface averaged about 7 $\pm$ 3 micro R per hour. Radiation readings at the surface of the area averaged about 9 $\pm$ 6 micro R per hour. These radiation readings included background radiation.

No violations were identified.

12. Liquid Effluent Release Stream

During this inspection, the inspector followed the Industrial Stream from the point of effluent release from the site waste treatment facility downstream. This was done to determine if there were any ponds associated with the stream in which uranium build-up could occur. Approximately 100 to 150 yards downstream, a stagnant pond was encountered. As a result, the inspector requested licensee representatives to sample and analyze the water and sediment in this pond and any others which may be located along the stream, prior to stream entry into the Farmington River. Licensee representatives stated that they were not aware that this pond was there and that it and any others found would be sampled and analyzed for uranium as requested (82-06-09).

13. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) prior to the conclusion of the inspection on July 30, 1982. The inspector summarized the scope and findings of the inspection. Remarks made by licensee representatives have been incorporated into the applicable paragraphs of the report details. As previously stated in paragraph 6, the licensee commmitted to complete and issue the Nuclear Safety Committee report concerning evaluations of the radiological protection aspects of the manufacturing facility for the year 1980 by August 31, 1982.