U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 70-036/83-03(DRMSP)

Docket No. 70-036 License No. SNM-33

Licensee: Combustion Engineering, Inc.
Nuclear Power Systems
Windsor, CT 06905

Facility Name: Hematite

Inspection At: Hematite, MO

Inspection Conducted: August 16-19, 1983

Inspectors: W. B. Grant — 9/15/83 Date

B. W. Smith (PNL) — 9/15/83 Date

Approved By: L. R. Greger, Chief
Facilities Radiation Protection — 9/15/83 Date

Inspection Summary

Inspection on August 16-19, 1983 (Report No. 70-036/83-03[DRMSP])
Areas Inspected: Routine unannounced inspection of radiation protection, radioactive waste management, organization, criticality safety, audits, facility modifications, training, emergency planning, and transportation activities. The inspection involved 52 inspector-hours onsite by two NRC inspectors.
Results: No violations were identified.

DETAILS

1. Persons Contacted

*L. Duel, Engineer
*H. Eskridge, Nuclear Licensing, Safety and Accountability, Supervisor
*R. Griscom, Engineering Supervisor
G. McKay, Nuclear Industrial Safety Coordinator (Radiation Specialist)
*R. Miller, Production Control Supervisor
*A. Noack, Production Superintendent
*J. Rode, Plant Manager
K. Schelker, Lab Technician/Safety Technician
R. Stokes, Lab Technician/Safety Technician
K. Stutts, Safety Technician
*L. Swallow, Quality Assurance Manager
N. Wilpur, Safety Technician

*Denotes those present at the exit meeting

2. General

This inspection began at 8:00 a.m. on August 16, 1983 and was concluded on August 19, 1983. Normal production of uranium oxide powder and scrap recovery was observed during tours of the facility. The pellet production plant was not operating.

Renewal of License No. SNM-33 is in progress.

3. Organization

A Safety Technician was promoted to Nuclear Industrial Safety (NIS) Coordinator in June 1983, replacing J. G. Abernathy who left in March 1983. Two laboratory technicians are being cross trained as safety technicians and will go on shift when their training is complete. The technicians will alternate between the laboratory and safety duties on a monthly schedule.

4. Facility Modifications

The inspectors reviewed documentation for all changes made since March 1983 (Report No. 70-036/83-01). Safety and criticality considerations were addressed in all cases. The changes included:

a. Three modifications were made to the pellet plant area to improve safety. These were: (1) designate storage locations for mop buckets, (2) provide separate storage areas for full oxide hoppers, and (3) move a pellet boat storage table location.

b. A new scrap micronizer system, with a 12-inch blender, was added to the pellet pressing area. This system was added to provide milling and blending of clean scrap. This system duplicates the micronizer in the oxide area and will reduce the movement of material in the facility.

c. Fourteen storage spaces were moved from a location near the center walkway of the scrap recovery area to the outside edge of the room. The locations were moved to provide greater separation from furnace box carts. Six other storage spaces were added to an existing storage array of 12 spaces. This was done to ensure storage spaces for all items in the recovery area.

d. The exclusion area around the NO_x scrubber in recovery was redefined to allow for addition of a better cut-up hood in the adjacent room. A moisture separator which was previously added to keep liquids from the scrubber and an exclusion area based on surface density, was changed to one based on safe mass.

e. A second filter cut-up hood was added to the scrap recovery area. This will permit increased scrap process capability and increased ventilation.

f. A new consolidation hood was installed adjacent to the existing one. The existing hood is to be removed. The new hood was installed to provide improved air filtering and work space.

g. A 1600 liter tank was moved from the 240-3 Building to outside the 255-3 Building. This tank will be used for concentrating the liquid recovered from the retention pond. The tank was moved to centralize the pond cleanout operation. The tank will be used until the pond cleanout is completed.

h. A milling hood was moved from the pellet plant to the scrap recovery area (green room). This will decrease movement of material and personnel by placing the operation closer to material storage.

5. Radiation Protection

a. Air Sampling

Exposures to individuals are based on airborne concentrations determined by either fixed or lapel samplers. As discussed in Inspection Report 70-036/83-01, the licensee has evaluated lapel vs. fixed air sample data for the pellet plant workers and has concluded that fixed air sample data is more representative of workers' exposure. From April 4, 1983, until the pellet plant closed on June 7, 1983, workers did not wear lapel samplers for routine operations. Thus, their exposure was determined from fixed air sample data. The inspectors reviewed the licensee's evaluation of this matter and have no problems with it. Workers who are required to move around the plant continually, such as those in the oxide plant, will continue to wear lapel samplers for exposure evaluation. The licensee is collecting additional data from fixed samplers and lapel samplers worn by workers at the agglomeration station and will attempt to determine which sampler is most appropriate for use in that area. This matter will be reviewed during a future inspection.

Until the pellet plant closed in June 1983, air was sampled continuously at about 30 fixed operating locations. Since June 1983, about 20 fixed locations have been continuously sampled. Samples are counted daily. Examination of the data disclosed only a few sample results that exceeded the MPC for insoluble uranium (1E-10 µci/ml). The licensee investigates the cause of all sample results greater than 0.8 E-10 µci/ml. There has been no weekly exposures exceeding 40 MPC-hours, the control point for exposures to insoluble uranium dioxide. The licensee has established an action point of 32 MPC-hours, at which point work restrictions may be imposed. No problems were noted.

b. Urinalyses

Monthly samples are submitted by all operators for urinalysis by the Corporation's laboratory at Windsor, CT. The fluorometric technique is used. Monthly analyses since the inspection in March 1983 disclosed no concentrations above the action point of 25 µg/l. The highest concentration reported was 8.8 µg/l. No problems were noted.

c. In Vivo Counting

The licensee contracts the services of a mobile whole body counting unit, twice a year. Two sessions are scheduled in order to count each shift operator once annually. About 50% of the operators were counted in March 1983. No counts exceeded the licensee's 130 µg of uranium-235 action level except for one individual who has been restricted from uranium work for many years.

d. Surveys

Records of smear surveys of materials and equipment released from the plant and of plant operating areas were reviewed. No problems with the survey system or results were identified. The results of surveys where cleanup is required are reported to the responsible production foreman for cleanup. After cleanup, the area is resurveyed. No problems were identified.

No items of noncompliance or deviations were identified.

6. Radioactive Waste Management

a. Solid Wastes

Records of recent shipments of low specific activity (LSA) waste to burial sites were reviewed. Two shipments have been made since the March 1983 inspection. On March 16, 1983, 26 drums were shipped and on May 26, 1983 ten tote boxes and 22 drums of waste were shipped. Shipping papers, survey records, and certifications indicated there were no problems.

b. Liquid Wastes

Laundry waste water is the only radioactive liquid released from the facility. Measured volumes are sampled and discharged through the storm sewer to the site pond which flows to Joachim Creek. Quantities released have been less than 20 grams of uranium per month and concentrations are well within the MPC for release to an unrestricted area.

c. Airborne Releases

Ten stacks are continuously sampled when associated equipment is in operation. Stack samples are changed and analyzed weekly. Count data are combined with exhaust volumes, which are determined annually, to calculate radioactive concentrations and stack loss quantities. A review of this data showed that concentrations from each stack were less than MPC for release to unrestricted areas. The licensee investigates sample results which are greater than 50% of MPC. Concentrations generally are less than 1E-12 µci/ml.

No items of noncompliance or deviations were identified.

7. Audits

The report of the annual American Nuclear Insurers inspection dated April 20, 1983, and the weekly inspection reports by the Nuclear Licensing, Safety, and Accountability Supervisor were reviewed. No problems were noted.

Licensee management's response to the semi-annual audit of the Hematite criticality specialist, was reviewed. The auditor's concerns about the placing and wording of criticality signs were apparently satisfied.

No significant problems were noted concerning the audits and inspections.

8. Criticality Safety

Criticality safety is primarily based on engineering design of safe volume or mass. Procedural constraints include: (1) limiting the number of items at a work station, (2) specifying the minimum separation of items at a work station, and (3) restrictions on movement and storage of items. The inspectors reviewed records and procedures, and observed the process areas for criticality safety. No problems were identified.

The annual calibration of criticality monitors scheduled for August had not been completed at the time of the inspection. The results of the calibration will be reviewed during a future inspection.

The licensee reported that a false nuclear alarm occurred in the pellet plant on June 13, 1983. One person did not evacuate when the alarm occurred and was discovered by the re-entry team. The employee claimed he did not hear the alarm. The alarm horns were tested for proper operation and four alarms were removed, adjusted, and reinstalled. Sub-

sequent tests of the alarms during drills conducted on June 14 and 15 found no problem areas. No reason for the alarm on June 13 was identified. The pellet plant had not operated since June 7, 1983.

Criticality limit signs were compared with the criticality sign log. No problems were noted. The semi-annual audit of February 1983 recommended an improvement in wording for one of the signs and the addition of a sign in one of the storage areas. Both items were completed.

9. Training/Retraining

New employees receive at least five hours training in radiation and industrial safety, followed by a quiz. According to the licensee there have been no employees hired since 1981.

Retraining is accomplished through monthly safety meetings. Radiation safety, criticality safety, and respiratory protection are specific subjects reviewed at least annually. Meeting records indicate two of these subjects have not been reviewed in 1983. This was discussed at the exit meeting and will be reviewed during a future inspection.

No items of noncompliance or deviations were identified.

10. Emergency Planning

a. Drills

Emergency evacuation drills are conducted at least twice a year. Drills are initiated by activation of the criticality alarms. Personnel assemble in the tile barn, a short distance outside the restricted area fence, where emergency supplies and equipment are kept.

Drills were conducted at least twice in 1982 and 1983. Records indicate that evacuations, personnel accountability (except as noted in Section 8), and re-entries were accomplished expeditiously.

b. Emergency Equipment

Emergency supplies in the tile barn are inventoried weekly. The inventory includes radiation instruments, film badges, dosimeters, protective clothing, respirators, SCBA equipment, and first aid supplies. In addition, SCBA equipment and first aid supplies are available at two locations in the plant.

c. Agreements with Emergency Support Organizations

The licensee has letters of agreement dated January 1983 with the physician who normally provides medical assistance to plant personnel and with Barnes Hospital in St. Louis, which is equipped to handle emergency radiation injuries. Agreements with the Jefferson County Sheriff's Department and the Hematite Fire Department were verbally renewed in 1983.

d. Fire Protection

Fire extinguishers are available in all operating and storage areas of the plant. Tags indicated that the extinguishers are visually inspected monthly for seal integrity. The extinguishers are weighed quarterly. The inspectors observed that the quantities of combustible materials in operating areas are small.

Semi-annual fire protection inspections by American Nuclear Insurers continue.

e. Emergency Training

Fire extinguishers and SCBA usage are annual subjects in safety meetings. Many employees have received training in fire fighting from the St. Louis Fire Department.

Safety technicians, foremen, and some operators are trained in first aid.

No items of noncompliance or deviations were identified.

11. Transportation Activities

Radioactive materials received consist primarily of uranium hexafluoride cylinders from government enrichment facilities and scrap materials for recovery from the Company's Windsor plant. Shipments consist primarily of uranium oxide powder and pellets to Windsor.

The inspectors examined records of shipments made in 1982 and 1983 to date for compliance with packaging, contamination control, labeling, and placarding requirements. No discrepancies were found.

No items of noncompliance or deviation were identified.

12. Exit Meeting

The inspectors met with licensee representatives denoted in Section 1 at the conclusion of the inspection. The inspectors summarized the scope and findings of the inspection. In response to certain items discussed by the inspector, the licensee:

a. Stated the evaluation of fixed location samplers and lapel samplers for employee exposure determination in the agglomeration area would be completed.

b. Stated that employee retraining in criticality safety and respiratory protection would be completed by the end of the year.