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

AUG 2 2 1979

REGION III

Report No. 70-036/79-06

Docket No. 70-36 License No. SNM-33

Licensee: Combustion Engineering, Inc.
Nuclear Power Systems
Windsor, CT 06095

Facility Name: Hematite

Inspection At: Hematite Facility, Hematite, Missouri

Inspection Conducted: July 16-20, 1979

Inspector: C. C. Peck C C Peck 8/15/79

Approved By: L. R. Greger, Acting Chief E/15/79
Fuel Facility Projects and
Radiation Support Section

Inspection Summary:

Inspection on July 16-20, 1979 (Report No. 70-036/79-06)
Areas Inspected: Routine, unannounced health and safety inspection, including: organization, facility changes and modifications, internal reviews and audits, procedure control, nuclear criticality safety, and operations review; radiation protection program, including internal and external exposure control and instrument calibrations; radioactive waste management, including liquid and airborne effluents and solid wastes. The inspection involved 36 inspector-hours onsite by one NRC inspector.
Results: No items of noncompliance or deviations were found in the 12 areas inspected.

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DETAILS

1. Persons Contacted

*J. A. Rode, Plant Manager
*H. E. Eskridge, Nuclear Licensing, Safety, and Accountability Supervisor
*L. J. Swallow, Quality Assurance Manager
*L. F. Deul, Engineer
*C. E. Lovell, Health Physics Technician
*R. C. Miller, Production and Materials Control Manager
*A. G. Swaringin, Production Superintendent

*Denotes those present at exit interview.

2. General

The inspection began at 8:15 a.m. on July 16, 1979. The inspector toured the principal operating areas of the plant shortly after arrival and other parts of the facility during the succeeding days of the inspection. Normal work activities were in progress and no unsafe practices or conditions were noted.

3. Previous Inspection Findings

(Closed) Commitment (70-36/78-09): Concerning the possibility of uranium being deposited in stack sample lines. Stack sample tubing from three principal exhaust stacks was recently removed and replaced. The uranium deposited in the old tubing was determined by radiochemical analysis of the acid solutions used to leach the tubing. In each of the three lines, the uranium deposit was only a small portion of the total uranium that has passed through the tube, less than 1%.

(Open) Unresolved item (70-036/78-09): Concerning the whole body counting data for one individual. Counts of the individual on two occasions in 1978 were more than the 130 microgram limit at which the licensee takes restrictive actions to prevent exposure to airborne activity. A count in April 1979 disclosed only 105 micrograms. The licensee stated that the individual will continue to use a lapel sampler while working in areas where there is a possibility of airborne activity.

4. Facility Changes and Modifications

Since the inspection of February 1979 (Report 79-02), several process changes were initiated, subjected to the formal safety and criticality review procedure, and completed. Among these changes were:

- Installation of a second filtrate boildown tank for reducing the volume of filtrates from the wet scrap recovery process before recovery of the uranium by precipitation and filtration. The second boildown tank increases the capacity of the filtrate recovery system.

- Installation of a ventilated hood for dismantling gamma-counted filters before incineration of the filter medium to recover the uranium content. The hood is limited to one filter at a time and a continuous inventory of uranium collected is to be maintained.

- Installation of a system for reducing the volume of combustible solid wastes by incineration. The installation was completed and tested using non-contaminated waste. At the time of the inspection the licensee had completed the first incineration of contaminated waste. The Office of Nuclear Material Safety and Safeguards has been asked to consider the possible need for a licensee amendment authorizing such incineration. This matter will be reviewed further during a future inspection.

- Installation of a secondary backup filter for process reactors 2 and 3 to prevent contamination of limestone in the dry scrubbers in the event of failure of the backup filters.

No items of noncompliance were identified.

5. Internal Reviews and Audits

A semiannual safety audit by auditors from Windsor was conducted in May 1979. The audit findings will be reviewed during a future inspection.

Weekly inspections of the NLS&A supervisor and monthly audits of the Quality Assurance manager were examined. These have continued at the established frequency.

No items of noncompliance were identified.

6. Criticality Safety

The licensee stated that the calibration and testing of all criticality alarms was completed. Electronic tubes in the alarms were replaced during the June '79 shutdown, an annual practice. Records indicated that the weekly functional test of the audible alarms is continuing. The inspector noted that defective light bulbs on all units, previously noted, had been replaced.

The annual inspection of boron Raschig rings in recycle-recovery vessels had not been completed at the time of the inspection. The licensee said the inspection would be done before startup of the wet scrap recovery system.

New plastic criticality limit signs have replaced the former paper signs in the recycle-recovery and oxide facilities. A number of paper signs, which tend to become illegible and are easily torn, remain to be replaced in parts of the oxide plant and other plant areas. The licensee intends to complete the replacement in the near future.

No items of noncompliance were identified.

7. Procedure Control

The licensee is required to review and revise, if necessary, all operating procedures during each two year period beginning in March 1977.

The inspector examined nuclear and industrial safety (NIS) procedures, oxide plant operating procedures, recycle-recovery procedures, and shipping and receiving procedures. These procedures had been updated or reviewed during the last two years.

No items of noncompliance were identified.

8. Radiation Protection

a. External Exposure Control

Film badge results for the first half of 1979 showed no exposures approaching 10 CFR Part 20 limits. The highest exposure to any individual was 370 mrems beta-gamma to the whole body.

b. Internal Exposure Control

Air sample results for the period March through June were examined. Samples taken in the operating areas are counted daily. Only a small number of samples exceeded the MPC of 1E-10 uCi/ml during the period. Airborne activity routinely averages less than 10% of MPC.

Monthly urinalyses for operating and maintenance personnel for the first five months of 1979 showed no uranium concentrations approaching the action level of 50 micrograms uranium per liter.

Results of whole body counting in April 1979 were inspected. As described in Paragraph 3, the count for one individual whose WBC was above the 130 microgram action point on the two previous occasions was 105 micrograms. Other individuals averaged about 50 micrograms. Two workers whose work assignments are restricted because of exposures received several years ago, again counted above 130 micrograms.

c. Instrument Calibrations

Portable survey instrument calibration records indicated that all instruments are being calibrated quarterly, either by the licensee in accordance with an established procedure or by the manufacturer. Counting efficiencies of instruments used for counting samples are determined weekly.

No items of noncompliance were found in the radiation protection program.

9. Waste Management

a. Liquid Effluents

The licensee has countinued the practice of re-using potassium hydroxide scrubber solution after chemical treatment to remove the fluorides that accumulate. Thus, no radioactive waste solutions have been discarded to the onsite evaporation ponds since September 1978. The licensee stated that the pipeline from the wet scrap recovery process to the lagoons had been blanked.

Filtrate solution from the wet scrap process and laundry water are the only radioactive waste streams discharged to the site pond above the dam. For the first half of 1979, licensee data show an average of about 35 grams uranium per month in the filtrate and about 20 grams per month in the laundry water. Weekly samples taken from the continuous sampler at the site dam have averaged about 2E-8 uCi/ml for both alpha (uranium) and beta (principally technetium-99) analyses. These concentrations are both less than 1% of 10 CFR Part 20 limits for releases to the restricted area.

Water from sinks and showers is released to the site creek below the dam after passing through the sanitary system. This water contains a small concentration of radioactivity. It has been the practice to take a monthly sample from the sanitary system for alpha and beta analyses. The licensee has increased the sampling frequency to weekly. The more frequent samples will be more representative of the water passing through the sanitary system because the holdup in the system is about 10,000 gallons while the effluent from sinks and showers is only about 7000 gallons per week. Any unusual loss of radioactive material through the system should thus be detected by weekly sampling.

b. Airborne Effluents

Summary data indicated that concentrations for individual stacks in 1979 have been less than the 10 CFR Part 20 limits for releases to the unrestricted area without the use of dilution factors.

c. Solid Wastes

A shipment of solid radioactive waste to a licensed burial site was made in May 1979, the first shipment since May 1978. The shipment was packaged in 55-gallon drums and wooden boxes and transported as L.S.A. material (Type A quantities) in an exclusive use vehicle. Records indicated that surveys of the packages were adequate.

No items of noncompliance were identified.

10. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 20, 1979. The inspector summarized the scope and findings of the inspection. In response to certain items discussed by the inspector, the licensee:

a. Stated that the replacement of paper criticality signs with plastic signs would be completed in the near future. (Paragraph 6)

b. Confirmed their intention of taking weekly samples from the sanitary system. (Paragraph 9)