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

REGION III

Report No. 70-036/81-01

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

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

Facility Name: Hematite

Inspection At: Hematite, MO

Inspection Conducted: January 26-29, 1981

Inspector: C. C. Peck C C Peck 2/25/81

Approved By: L. R. Greger, Acting Chief L R Greger 2/25/81
Facilities Radiation
Protection Section

Inspection Summary

Inspection on January 26-29, 1981 (Report No. 70-036/81-01)
Areas Inspected: Routine, unannounced health and safety inspection, including: organization, training, audits, criticality safety, radiation protection, radioactive waste management, operations review and transportation activities. The inspection involved 23 hours on site by one NRC inspector.
Results: No items of noncompliance were identified.

## DETAILS

1. Persons Contacted

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

*Denotes those present at the exit interview.

2. General

The inspection began at 1:00 p.m. on January 26, 1981, and was concluded on January 29. All operating areas of the plant were included in the inspection.

3. Organization

Ms. Brenda Pigg has replaced Mr. Allen Savage as Quality Control Laboratory Supervisor. There have been no other changes in management or supervision since the previous inspection (August 1980).

4. Training

New operators are given 18 hours formal training in process operations and related radiological and industrial safety aspects. The training is conducted by appropriate members of the production, engineering, and safety staffs. A written test is administered following the training. Tests taken by operators hired in the last year were examined by the inspector.

Other new employees are provided with eight hours orientation by the safety supervisor and a health and safety technician. Nuclear and industrial safety, radiation protection, waste handling, and regulatory requirements are among the subjects covered. The inspector examined records of recent orientation sessions.

No items of noncompliance were identified.

5. Audits

Annual and semiannual audits of nuclear and radiation safety are required by the license. These are conducted by representatives from the company's Windsor plant. The inspector reviewed the documentation

of audits completed in November 1980 and verified that actions have been taken or are planned in response to the audits.

Weekly internal inspections by the Nuclear Licensing, Safety, and Accountability Supervisor, and monthly criticality audits by the Quality Assurance Manager continue. Records of these audits were reviewed.

No items of noncompliance were identified.

6. Criticality Safety

The nuclear alarm system consists of gamma sensitive instruments, audible alarms, and a remote indicator panel. Detectors are located to respond to elevated radiation levels in all areas where an incident is feasible. Although the license requires monthly testing of the system, tests continue to be conducted weekly.

An evacuation drill, initiated by the criticality alarm system, was conducted in October 1980. Personnel evacuated to the tile barn, located outside the perimeter fence, where emergency equipment is located. The licensee reported that the drill disclosed no significant procedural problems.

Boron Raschig rings in three large diameter vessels are required by the license to be inspected annually. The test includes visual examination of the rings, determination of boron content by chemical analysis, and measurement of the level of the rings in the tanks. Records indicating satisfactory completion of the 1980 tests were examined.

No items of noncompliance were identified.

7. Radiation Protection

. External Exposure Control

Film badges, exchanged monthly, are required for employees. Examination of records disclosed that the highest total body dose to any individual in 1980 was 220 mrems. The highest individual skin dose was 820 mrems.

. Internal Exposure Control

Monthly urinalyses are required for all production and maintenance workers. Other employees submit semiannual samples. An independent laboratory analyzes the samples by a fluorometric method which has a detection limit of 5 ug/l uranium. Results for the period since the previous inspection in August 1980 were examined (Report No. 70-036/80-04). While a few results slightly exceeded the detection limit, all were well below the resample limit of 50 ug/l.

In vivo counting of production and maintenance people is conducted twice a year by a mobile counting service. Counts above 130 ug uranium-235 are cause for work restriction. The second series of counts for 1980 was conducted in October. With the exception of one individual who is permanently restricted from work in areas with exposure potential, all counts were less than 130 ug. The highest individual count was 101 ug, and the average for the group was about 33 ug. Typical 95% confidence intervals for the counts range from 30 to 50 ug.

Lapel sample data are the principal means of controlling internal exposure. Each production operator wears a sampler about 40% of his work time with preference for jobs with higher potential exposure. Daily exposures are calculated for each worker based on his lapel sample or the sample of a worker in the same area. Results of daily samples from fixed samplers in the oxide plant, pellet plant, and recycle-recovery areas are available for supplementary information. Examination of data for the last two quarters of 1980 disclosed no exposures exceeding 40 MPC-hours in any week. The highest individual exposure in any week was about 24 MPC-hours. The average weekly exposure for all individuals was about 5 MPC-hours.

. Notifications and Reports

The licensee submitted the exposure reports required by 10 CFR 20.408 to the NRC for two individuals who terminated their employment in 1980. Reports are being prepared for two individuals who were recently terminated.

No items of noncompliance were identified.

8. Radioactive Waste Management

. Airborne Effluents

Effluents from stacks in the oxide building, pellet plant, and recycle-recovery area are continuously sampled. Samples are counted weekly and the uranium content calculated based on the enrichment of the uranium being processed. Effluent concentrations are calculated for each stack from the established discharge volume of the stack.

Stack effluent data for 1980 were examined. No uranium concentrations exceeding MPC for release to an unrestricted area were noted.

The licensee said that the sample line for the oxide scrubber stack frequently plugs with dust from the scrubber. Means of correcting the condition were discussed. Relocation of the sample probe from the top of the stack to a lower position appears feasible. This would shorten the line and permit easier replacement if the problem persists.

Liquid Effluents

Laundry water and liquids from the wet recovery process are released to a site pond. Water from the pond is continuously sampled as it flows over a dam to the site creek. Radioactivity concentrations are a very small fraction of that permitted by 10 CFR Part 20 for release to an unrestricted area.

Measurement data for 1980 indicate that the uranium loss from the wet recovery process was significantly lower than in any previous year, primarily because of increased efforts to recover uranium from filtrate solutions. Effluent from the plant laundry is now the principal source of radioactivity released to the pond. This source also was reduced in 1980 by installation of a filter press in the discharge pipeline.

The only other radioactive liquid released is from the sanitary system to the site creek. The system is sampled weekly for gross alpha and beta analyses. In 1980, samples averaged about 200 pCi/l alpha and 130 pCi/l beta, both of which are less than 1% of MPC for release to an unrestricted area.

No items of noncompliance were identified.

9. Transportation Activities

Uranium hexafluoride cylinders require testing and certification every five years in accordance with ANSI N14.1-1971 and document ORO-651. Twenty-three licensee-owned model 30B cylinders were tested and certified on site in late 1980. The licensee engaged certified quality assurance inspectors for the program. Test documentation indicated that all cylinders met visual inspection requirements, and satisfied ultrasonic thickness, hydrostatic, and pneumatic leak tests.

Quality assurance documents for new model 30B cylinders recently acquired were examined. Vendor certificates stated that each cylinder complied with applicable ASME codes, and that required weld inspections, radiographs, hydrostatic tests, and pressure tests of valves and plugs had been made.

No items of noncompliance were identified.

10. Operating Procedures

Procedures require biennial review and revision in accordance with the licensee's approved license application. Completion of such a review is due at the end of March 1981. The inspector examined completed oxide and pellet plant procedures, which comprise the major portion of the procedures. These had been revised and approved by appropriate supervision and management. The licensee stated that other procedures were in the revision process.

No items of noncompliance were identified.

11. Exit Interview

The inspector met with licensee representatives identified in Paragraph 1 at the conclusion of the inspection. The scope of the inspection was described and discussed.

The licensee representatives indicated that actions would be taken to correct sampling problems for the oxide plant scrubber stack. (Paragraph 8)