

NSIR

OCT 3 1974

Combustion Engineering, Incorporated  
ATTN: Mr. H. V. Lichtenberger  
Vice President  
Nuclear Products Manufacturing  
Windsor, Connecticut 06095

Docket No. 070-036

7408

Gentlemen:

*File*  
This refers to the inspection conducted on September 4-5, 1974, by Messrs. Ridgway and Finn of this office of activities authorized by AEC Special Nuclear Materials License No. SNM-33 and Byproduct License No. 24-16206-01 and to the discussion of our findings with Messrs. Rode, Swallow, Swaringin, Miller, Eskridge and Duel of your staff at the conclusion of the inspection.

A copy of our report of this inspection is enclosed and identifies the areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspectors.

No violations of AEC requirements were identified within the scope of this inspection.

We understand that you will take the following actions to resolve deficiencies noted in the report:

- The R-1 Reactor modification safety evaluation will be completed before processing enriched uranium.
- The criticality monitor failure will be investigated and the cause and means of preventing a failure recurrence will be completed in a timely manner.
- The pond liquid effluent proportional sampler will be repaired or replaced and flow estimates and grab samples will be taken while the sampler is out of service.

OFFICE	RO:III	RO:III	RO:III	RO:III	RO:III	RO:III
SURNAME	Ridgway/lis	Fiorelli	Finn	Fischer	Matian	Sappler
DATE	9/30/74	9/30/74	9/30/74	9/30/74	9/30/74	9/30/74

D-62

Combustion Engineering,  
Incorporated

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OCT 3 1974

In accordance with Section 2.790 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the AEC's Public Document Room. If this report contains any information that you or your contractors believe to be proprietary, it is necessary that you make a written application to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. Any such application must include a full statement of the reasons for which it is claimed that the information is proprietary, and should be prepared so the proprietary information identified in the application is contained in a separate part of the document. Unless we receive an application to withhold information or are otherwise contacted within the specified time period, the written material identified in this paragraph will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely yours,

James G. Keppler  
Regional Director

Enclosure:

RO Inspection Reports  
No. 070-035/74-03 and  
No. 74-01 (24-16206-01)

cc: Mr. J. A. Rode, Manager  
Hematite Plant, w/encl

bcc: RO Chief, FS&EB  
RO:HQ (4)  
L:D/D for Fuels & Materials  
DR Central Files  
RO Files  
PDR

OFFICE	NSIC					
SURNAME						
DATE						

U. S. ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Operations

RO Inspection Report No. 070-036/74-08  
RO Inspection Report No. 24-16206-01/74-01

Licensee: Combustion Engineering, Inc.  
Windsor, Connecticut 06095

License No. SNM-33  
Priority: 1  
Category: A(1)

Hematite Facility  
Hematite, Missouri

License No. 24-16206-01  
Priority: 3  
Category: E

Type of Licensee: Special Nuclear Material, Source and Byproduct

Type of Inspection: Fuel Facility Safety

Dates of Inspection: September 4-5, 1974

Dates of Previous Inspection: January 22-24, 1974 (Gulf Nuclear Fuels Corp)

Principal Inspector: *K. R. Ridgway*  
K. R. Ridgway

10-1-74  
(Date)

Other Accompanying Inspector: J. A. Finn

Other Accompanying Personnel: None

Reviewed By: *G. Fiorelli*  
G. Fiorelli, Chief  
Reactor Operations Branch

10/1/74  
(Date)

## SUMMARY OF FINDINGS

Enforcement Action: None.

### Licensee Action on Previously Identified Enforcement Items

Not applicable.

### Design Changes

- A. The R-1 Reactor has been lengthened ten inches. An unacceptable Nuclear Criticality Safety Analysis had been prepared. The licensee stated an acceptable analysis would be completed before enriched processing started. (Paragraph 6)
- B. The licensee has submitted a design change to DOL to install a scrubbing and filtering system for the Green Room furnaces.
- C. The licensee has designed a temporary  $UO_2$  storage area in the old Item Plant. This change has been submitted to DOL.
- D. A new 22 head fixed air sampling system in the Oxide Pellet Plant has been installed. (Paragraph 14)
- E. A temporary stack sampling system for the Oxide Pellet Plant has been installed. (Paragraph 13)

Unusual Occurrences: None.

### Other Significant Findings

#### A. Current Findings

- 1. License SNM-33 Amendment 88, dated July 19, 1974, transferred this license from Gulf Nuclear Fuels Corporation to Combustion Engineering, Incorporated (CE). Amendment 89 dated August 21, 1974, permits CE to process low enriched uranium ( $\leq 4.1\%$ ) at the Hematite Facility. The licensee was testing equipment and new air monitoring systems by processing depleted uranium and expected to start processing enriched material in about two weeks.
- 2. Operating and QC procedures are in place for startup. Several areas still need to be covered by procedures. (Paragraph 5)

3. No reliable method has been found to determine that the H/U ratio of the pellet shipping contained (UNC-2901) contents does not exceed 4.5. (Paragraph 10)
4. One of the nuclear alarm detectors was found at the alarm trip point but failed to activate the alarm. (Paragraph 16)
5. The holding pond proportional water sampler had become inoperative. (Paragraph 17)

B. Unresolved Items

1. Criticality Safety Analysis of R-1 Reactor Modification. (Paragraph 6)
2. Lack of Procedures to control equipment changes, design changes and design drawings. (Paragraph 5)
3. Method for determining the H/U ratio of shipping containers UNC-2901. (Paragraph 10)

C. Status of Previously Reported Unresolved Items: Not applicable.

Management Interview

The following individuals were present during the management interview at the conclusion of the inspection:

J. A. Rode, Manager, Hematite Plant  
R. Miller, Supervisor, Production and Materials Control  
L. Duel, Equipment Engineer  
A. Swaringen, General Foreman, Manufacturing  
H. E. Eskridge, Supervisor, NIS and NMM  
L. J. Swallow, Manager, Hematite Quality Control

The following items were discussed:

1. No items of noncompliance were identified.
2. The licensee agreed that the apparent malfunction of the nuclear monitor would be investigated to determine the cause and means of preventing recurrence. (Paragraph 16)
3. The licensee agreed that action would be taken to repair or replace the liquid effluent sampler and the grab samples would be taken during the period the sampler is out of service. (Paragraph 17)

4. The R-1 Reactor modification and the unacceptable criticality safety analysis. The licensee stated this would be resolved before processing enriched uranium. (Paragraph 6)
5. The violation by the previous owner when liquid wastes were shipped in open ended drums. The licensee stated the Paper Tiger was no longer being used and that liquid wastes would be shipped in approved shipping containers.
6. The control of old plant records. (Paragraph 9)

## REPORT DETAILS

### Part I

#### 1. Persons Contacted

In addition to those individuals attending the management interview, the following were contacted during the inspection:

G. Frankenback, QC Engineer  
R. Reed, Draftsman  
J. Fricke, NMM Clerk  
R. Bilbrey, H. P. Technician

#### 2. Plans and Scheduling

During the inspection, the oxide plant was not operating, however, some testing operations were being conducted in the pellet plant with depleted uranium. The licensee stated that operations with enriched material would begin in about two weeks. Enriched uranium has been received in preparation for startup.

#### 3. Organization

The current Hematite Plant organization is as follows:

J. A. Rode, Plant Manager

- Engineering Supervisor (Vacant)
- R. Miller, Production and Materials Control Supervisor
- A. Swaringen, General Foreman
  - Shift Foremen D. Dixon
    - G. Thomas
    - A. Noack
  - A. Day, Maintenance Supervisor
- H. Eskridge, NIS-NMM Supervisor

Mr. Rode reports to F. J. Pianki, Manager, Manufacturing (Windsor, Connecticut)

L. Swallow, Manager, Hematite Quality Control, reports to J. E. Wahler, Manager, Quality Control (Windsor, Connecticut). Mr. Swallow's responsibilities include the laboratory.

H. E. Eskridge joined the Hematite Plant on August 21, 1974, as Manager, Nuclear and Industrial Safety (NIS) and Nuclear Materials Management (NMM). His staff includes four NIS technicians. Two of the technicians were hired recently.

The licensee is in the process of staffing up to begin operations. All operators hired have had previous experience at the Hematite Plant.

4. Training

Since most of the employees hired have had previous experience at the facility, the licensee expects to give only refresher type training. No formal refresher program was available, however, the licensee stated meetings would be held with employees to review policies safety procedures and any other procedural changes made since the termination of activities early in the year.

5. Management Control Systems

Company policy and procedures are presently contained in four manuals:

- a. Operations
- b. Quality Control
- c. Nuclear and Industrial Safety
- d. Nuclear Materials Management

The licensee has reviewed and updated the material in a. and b. above and has instituted a formalized program to control procedures and procedural changes. The program includes management review and approval and control of each procedure issued or revised. Manuals c. and d. above have not yet been included in this program but the licensee plans to control all procedures in this manner.

During the inspection it was noted that several areas had not been covered by procedures, such as:

- e. Plant and Equipment Changes
- f. Safety Reviews of Changes
- g. Control of Maintenance Work
- h. Control of Design Changes
- i. Control of Design Drawings

The licensee stated that these areas would be included in the system.



6. Nuclear Criticality Safety Evaluations

One process equipment change had been made since the last inspection. The R-1 reactor vessel had been lengthened 10 inches. The calculations presented by the licensee for the criticality safety evaluation of this modification did not fulfill the requirements as stated in section 206.2.2 of the licensee application. The required double review of the evaluation by two Nuclear Criticality Safety Specialists had not been made or documented. The assumptions used were not documented. The evaluation documentation was not complete. The licensee stated that this evaluation would be completed and properly reviewed before operations with enriched uranium started.

7. Green Room

The Green Room had been used to process two dry batches of depleted oxides for development work. A temporary process off-gas system had been arranged to filter the furnace exhaust through a high efficiency filter system thereby fulfilling the license application letter dated March 27, 1974, which required filtration.

8. Shipping and Receiving

Adequate procedures for receiving and shipping radioactive materials were available. The licensee had received several cylinders of uranium hexafluoride and these were properly identified, stored within the fenced yard.

9. Records

Combustion Engineering has agreed to maintain all required records of former owners of the Hemite Facility i.e. Gulf Nuclear Fuels Corporation, Gulf United Nuclear Fuels Corporation, United Nuclear Corporation and Mallinckrodt Chemical Company.

10. Shipping Container UNC-2901

This shipping container is to be used for pellet or oxide shipments. The licensee has not resolved the problem of determining the H/U ratio of the inner container contents. <sup>1/</sup> License SNM-33 Amendment 71-30 condition 4(b)(1) requires the H/U ratio be 4.5 or less. This will be carried as an open item.

11. Inventory

The inventory of SNM was found to be within licensed limits.

1/ RO Inspection Report No. 070-036/73-01

## REPORT DETAILS

### Part II

Prepared By: J. A. Finn

*J. A. Finn*

10-1-74

(Date)

Reviewed By: W. L. Fisher

*W. L. Fisher*

10-1-74

(Date)

#### 12. Plant Status

Since turnover of the plant to Combustion Engineering, no enriched material has been processed. Depleted uranium oxide was produced for about 2 weeks early in August. Production of depleted uranium oxide pellets is in progress. It will be several weeks before any enriched uranium is processed.

All equipment was removed from the Item Plant, the Red Room, and the South Vault, and these areas were thoroughly decontaminated.

#### 13. Stack Sampling

The temporary stack sampling system at the Oxide and Pellet Plant (OPP) was completed August 30. Twenty-five stacks and vents are sampled continuously.

#### 14. In-Plant Air Sampling

Installation of a fixed station air sampling system in the Oxide and Pellet Plant was completed September 4, 1974. Sample heads were installed at 22 locations.

Fifteen new lapel air samplers were recently received.

There are no fixed air samplers in the Green Room or the laboratory. Lapel air samplers and portable samplers are available for use at those locations.

A review of air samples taken during the two week operation of the oxide plant showed no exposures to airborne radioactivity in excess of Part 20 limits.

15. In Vivo (Lung)

All operators and technicians and their immediate supervisors were counted by Helgeson Nuclear Services for lung depositions of uranium. A total of 47 counts were made on 36 employees. The formal report of the results had not been received. Review of preliminary data shows no significant changes from previous counts.

16. Nuclear Alarm System

During a tour of the plant, it was noted that the detector located in the oxide plant indicated a radiation level at the alarm trip setting (about 10 milliroentgens per hour) but the alarm was not activated. There was no special nuclear material in the vicinity. A survey meter check showed a normal background level of about 0.1 milliroentgens per hour. After several electron tubes in the detector were changed, the indicated radiation level dropped to normal background. The licensee is investigating the cause.

17. Holding Pond Sampler

Process liquid waste is not discharged to the environment. However, some contaminated liquids, such as laundry effluent, are discharged to a holding pond, which, in turn, discharges to the Joachim Creek.

The proportional water sampler at the holding pond outfall has become inoperative.

18. License No. 24-16206-01

The licensee has on hand a 10 millicurie cobalt 60 sealed source for calibration of instruments and a 13.5 millicurie californium 252 sealed source. The californium source is currently not in use. These sources were formerly held under License No. 24-12988-01 issued to General Atomic Company.

19. Plant Tour

A plant tour of the facility included observations of the status of the Item Plant, the Red Room, the South Vault, the holding pond, the wooden barn, the tile barn, and operating areas.