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JUL 30 1980

Docket No. 70-36

80-02

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Manufacturing
Nuclear Power Systems
Windsor, CT 06095

Gentlemen:

This refers to the routine inspection conducted by Messrs. W. B. Grant and M. P. Phillips of this office on July 9-11, 1980, of activities at the Hematite, Missouri Facility authorized by NRC Special Nuclear Material License No. SNM-33 and to the discussion of our findings with Mr. J. Rode and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with Section 2.790 of the NRC'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 NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

7M-3

Combustion Engineering, Inc.

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JUL 30 1980

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

A. B. Davis, Chief
Fuel Facility and
Materials Safety Branch

Enclosure: IE Inspection
Report No. 70-036/80-02

cc w/encl:
Mr. J. A. Rode, Plant
Manager
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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 70-036/80-02

Docket No. 70-036

License No. SNM-33

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

Facility Name: Hematite Facility

Inspection At: Hematite Facility Site, Hematite, MO

Inspection Conducted: July 9-11, 1980

Inspectors: W. B. Grant

M. P. Phillips
M. P. Phillips

Thurmond Christman for HE

Approved By: T. H. Essig, Chief
Environmental and Special Projects
Section

7/25/80
7/29/80
7/29/80

Inspection Summary

Inspection on July 9-11, 1980 (Report No. 70-036/80-02)

Areas Inspected: Routine, announced Confirmatory Measurements - closeout inspection, including comparative results on analyses of plant radiological effluent samples and comparative check of plant environmental samples. Emergency Planning - coordination with offsite support agencies; fire prevention and protection; emergency equipment, procedures, and facilities; training for emergencies; medical arrangements; and emergency test and drills. Environmental Protection - radiological environmental monitoring; non-radiological monitoring and quality control of laboratory analyses. Licensee effluent and environmental samples were collected for independent analysis by the NRC reference laboratory. The inspection involved 34 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Personnel

*J. A. Rode, Plant Manager
*A. G. Swaringin, Production Superintendent
*L. F. Deul, Engineer
*H. Eskridge, Nuclear Licensing, Safety and Accountability Supervisor
*J. Abernathy, Health Physics Technician
C. Lovell, Foreman
K. Stutts, Health Physics Technician

Offsite Support Agency Personnel

G. Visnouske, Joachim-Plattin Townships Ambulance District
D. Hecktor, R. T., Jefferson Memorial Hospital, Festus, MO
T. Gee, R. T., Jefferson Memorial Hospital, Festus, MO
W. Buerger, Sheriff of Jefferson County, Hillsboro, MO

*Denotes those present at the exit interview.

2. Previous Inspection Findings

(Open) Outstanding Inspection Item (70-36/78-07): Quality Assurance Program. The licensee has developed a quality assurance program to ensure quality control of radiological measurements. The inspectors reviewed this document and deemed it adequate to ensure quality control of radiological measurements. Quality Assurance procedures to implement this program have not as yet been prepared. The licensee stated the individual in charge of preparing these procedures had terminated his employment with the company. The licensee stated that these implementing procedures would be completed by November, 1980. This matter remains open, pending completion of these QA procedures to implement this program. This was discussed at the exit interview.

3. Fire Prevention and Protection

Currently, the licensee's program for fire prevention and protection consists of inspections by plant and corporate personnel. Fire extinguishers and air packs are examined quarterly, and fire alarm systems are tested weekly.

The inspectors reviewed semiannual fire protection audit records for CY79. These audits were performed by American Nuclear Insurance. The audit reports identified no major items needing correction.

No items of noncompliance or deviations were identified.

4. Emergency Planning Coordination with Offsite Support Agencies

The inspectors discussed with licensee personnel coordination of emergency planning activities between the licensee and offsite agencies. Currently, the licensee has established formal Letters of Agreement (LOA) with the following agencies: Hematite Fire Protection District; Festus Fire Department; Joachim-Plattin Townships Ambulance District; Jefferson County Sheriffs' Department; and the Department of Energy, Oak Ridge, Tennessee. These Letters of Agreement are included as appendices to the licensee's emergency plan. With the exception of the LOA with the Department of Energy (dated 12/7/79), all LOA's were prepared in 1979 and need to be updated in 1980.

The inspectors visited the offsite support agencies identified under Paragraph 1. Discussions with these agencies verified that existing agreements between the licensee and the agencies remained in effect, and coordination was adequate for the agencies to maintain an effective response capability. The Joachim-Plattin Townships Ambulance District indicated to the inspectors that participation in training or drills would help to improve emergency response coordination. This was discussed at the exit interview.

No items of noncompliance or deviations were identified.

5. Facilities, Equipment, and Supplies

During the inspection, the inspectors conducted an inventory of the plant's first aid room, control room, fire fighting equipment, emergency control center, meteorological monitoring equipment, tile barn, (Emergency Operations Facility) and various emergency equipment stations. All emergency equipment examined was found to be operational. Radiological monitoring instruments were found to be operational and in current calibration.

No items of noncompliance or deviations were identified.

6. Emergency Medical Arrangements

The inspectors discussed arrangements for emergency medical care with licensee personnel. The licensee has established a formal understanding with Barnes Hospital, St. Louis, for handling contaminated patients. Detailed procedures were developed and incorporated into the licensee emergency plan. The licensee also has a formal agreement with N. P. Knowlton Jr., M. D. to handle emergency radiation injuries at Barnes Hospital. In cases involving life threatening situations, an informal agreement exists between the licensee and the Jefferson Memorial Hospital, Festus, Missouri.

The inspectors discussed the Jefferson Memorial Hospital's emergency plan with Messrs. D. Hecktor, R. T. and T. Gee, R. T. The inspectors determined from these discussions that adequate emergency medical arrangements exist between the licensee and the hospital.

7. Training for Emergencies

The inspectors discussed the licensee's program for training of plant and offsite agency personnel in emergency response. Currently, the licensee conducts training in first aid and fire fighting for selective plant personnel. Monthly training records for December showed 15 plant personnel received first aid training and 21 plant personnel received fire training. Plant foremen receive formal training courses in criticality safety and controls. Additionally, all employees receive training in criticality safety, fundamentals of health physics, and familiarization of emergency alarms and actions required.

The licensee's emergency response training of offsite support agencies included orientation sessions and a plant tour for the local Hematite fire fighting personnel during 1979.

The inspectors reviewed monthly safety meeting and training records for the period June 1979 to May 1980. These records indicated that the licensee conducted the required emergency plan training.

No items of noncompliance or deviations were identified.

8. Emergency Drills

The inspectors discussed tests and drills relating to emergency planning with licensee personnel. The licensee tests selected nuclear and non-nuclear alarm functions on a weekly basis. Evacuation drills relating to nuclear and non-nuclear alarms are conducted at least semiannually and at least one of the drills involves participation by offsite agencies. The inspectors reviewed emergency drill critiques and other records for the period June 1979 to March 1980 (drills conducted during July 1979, October 1979, and March 1980). Review of these records and discussion with the licensee indicated that required drills were conducted.

No items of noncompliance or deviations were identified.

9. Emergency Plan and Procedures

The licensee has established an emergency plan and implementing procedures. The emergency plan was submitted to the NRC staff for review, and was approved and incorporated into the license with Amendment No. 5 issued on November 9, 1979. The call list was updated in February 1980. Implementing procedures were reviewed and found to meet the minimum requirements for coping with radiation emergencies as specified in the approved emergency plan.

No items of noncompliance or deviations were identified.

10. Licensee Internal Audits

The inspectors examined licensee review and audit activities for CY79 in the area of emergency planning. Audit reports from both plant and corporate management were reviewed.

No items of noncompliance or deviations were identified.

11. Radiological Environmental Monitoring

The inspectors discussed the radiological environmental monitoring program with licensee representatives and examined the monitoring stations. Soil and vegetation monitoring data for CY79 were examined. Offsite air monitoring data and liquid effluent monitoring data for the period July 1979 through June 1980 were also examined. Results for the environmental monitoring program were found to be complete and revealed no anomalous results or trends.

Initial results for the soil and vegetation monitoring for the first quarter of 1980 were erroneously analyzed by the contractor laboratory (Controls for Environmental Pollution) for fluoride concentrations rather than for gross alpha and gross beta radioactivity. Recently reported contractor data contained errors which were discovered by the licensee during this inspection. The licensee immediately initiated action to have the samples re-analyzed for gross alpha and gross beta radioactivity.

License Condition No. 20 requires the licensee to take a quarterly off-site air sample at two locations and to record unusual plant conditions, wind velocity, and wind direction at the time of sampling. The licensee maintains continuous air sampling with a weekly collection at the two locations specified, and also maintains continuous meteorological monitoring of wind speed and direction at the site. The inspectors noted that the manner in which the licensee was conducting the offsite air monitoring program was not in strict compliance with the above referenced license condition. The program currently in use, however, provides data which, in the judgement of the inspectors, is at least equivalent to the data which would have resulted from the program described in License Condition No. 20. This was discussed at the exit interview.

No items of noncompliance or deviations were identified.

12. Nonradiological Effluent and Environmental Monitoring

The licensee's nonradiological environmental program consists of analysis of air and vegetation samples for total fluoride concentrations. This program covers both effluent and environmental sampling and analysis.

The inspectors reviewed monitoring data from January 1979 through June 16, 1980, and examined the UF₆ conversion building stack sampler. On four occasions, weekly air samples were not collected. The foremen's log for these periods was checked to verify that the plant stacks were shutdown. Examination of program results revealed no anomalous results or trends and no discrepancies from required monitoring as specified in License Conditions Nos. 16, 17, and 18. The semiannual fluoride reports for 1979 were reviewed by the inspectors and found as specified in License Condition No. 19.

No items of noncompliance or deviations were identified.

13. Quality Control of Laboratory Analysis

The licensee's program procedures for assuring quality in analyses performed pursuant to effluent and environmental requirements were examined by the inspectors and discussed with licensee personnel.

Nonradiological environmental and effluent samples are analyzed onsite by the licensee. The inspectors reviewed procedures and records relating to operation and calibration of instrumentation used to measure total fluoride concentrations. All laboratory instruments examined appeared to be properly calibrated. The inspectors determined the licensee quality control program for both effluent and nonradiological environmental samples was adequate.

Currently, radiological environmental samples are collected by the licensee and analyzed by a contractor laboratory, Controls for Environmental Pollution. The licensee collects and analyzes building stack air particulate samples for gross alpha activity. The inspectors reviewed procedures and records relating to operation and calibration of instrumentation used to measure gross alpha activity. All counting equipment examined appeared to be properly calibrated.

No items of noncompliance or deviations were identified.

14. Confirmatory Measurements

During the inspection, effluent and environmental samples (splits and duplicates) were collected as follows: (1) environmental liquid samples from Joachim Creek; (2) site dam; (3) north monitoring well; (4) environmental soil and vegetation samples from station No. 13; (5) liquid waste effluent sample from the laundry waste holding tank; and (6) an air particulate effluent sample. These samples were obtained for independent analysis by the NRC Reference Laboratory. During a future inspection, the results of the NRC laboratory analysis will be compared with those of the licensee under the Confirmatory Measurements inspection program conducted by the NRC Office of Inspection and Enforcement.

15. Results of Comparative Analyses of Effluents

Results of followup comparative analyses performed on effluent samples collected at the plant on July 18, 1979 are shown in Table I. The criteria for comparing these measurements are given in Attachment 1. Of the four sample comparisons, the licensee's results yielded two agreements and two possible agreements. The inspectors discussed comparative results with the licensee.

The licensee and the inspectors agreed that in the future, liquid samples collected for comparative gross beta analysis will be compared on counting equipment calibrated using an NBS-traceable Cs-137 reference source. The inspectors stated this calibration need only be conducted for samples collected pursuant to the confirmatory measurements program.

No items of noncompliance or deviations were identified.

16. Results of Analyses of Environmental Samples

The results of followup comparative analyses performed on environmental vegetation, soil, and liquid samples collected at the plant on July 18, 1979, are shown in Table 2. The inspectors discussed the results with the licensee with emphasis on apparent disagreements.

Although the NRC has not established formal criteria for comparative analyses of environmental samples, it is noted in Table 2 that the licensee is in disagreement with the NRC Reference Laboratory for the soil and vegetation samples. Water samples from the Joachim Creek yielded such low concentrations that a statistical comparison of these results would not be meaningful. In general, uranium activity levels detected in the plant monitoring wells were well below MPC values listed in 10 CFR 20.

No items of noncompliance or deviations were identified.

17. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 11, 1980. The inspectors summarized the scope and findings of the inspection. The licensee made the following remarks in response to certain of the items discussed by the inspectors:

- a. Agreed to complete final typing of the Quality Assurance Plan and develop and implement QA procedures by the end of November 1980. (Paragraph 2)
- b. Agreed to improve emergency response coordination with the Joachim-Plattin Townships Ambulance District. (Paragraph 4)

- c. Stated that they would look into possible amendment of License Condition No. 20 at some future date. (Paragraph 11)

Attachments:

1. Table I, Confirmatory
Measurements Program
2. Table 2, Environmental Samples
Results
3. Attachment 1, Criteria for
Comparing Analytical Measurements

TABLE I

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM

FACILITY: COMB ENG

FOR THE 3 QUARTER OF 1979

| SAMPLE | ISOTOPE | -----NRC----- | | ---LICENSEE--- | | ---NRC:LICENSEE--- | | |
|------------|----------|---------------|---------|----------------|---------|--------------------|---------|---|
| | | RESULT | ERROR | RESULT | ERROR | RATIO | RES | T |
| P FILTER | ALPHA | 3.4E-05 | 8.0E-07 | 4.6E-05 | 0.0 | 1.4E+00 | 4.2E+01 | P |
| L WASTE(1) | ALPHA | 6.2E-06 | 3.0E-07 | 4.1E-06 | 1.2E-07 | 6.6E-01 | 2.1E+01 | P |
| | (2)ALPHA | 7.8E-08 | 3.0E-09 | 7.7E-08 | 7.0E-09 | 9.9E-01 | 2.6E+01 | A |
| | (2)BETA | 8.1E-08 | 9.0E-09 | 6.9E-08 | 4.0E-09 | 8.5E-01 | 9.0E+00 | A |

TEST RESULTS:

A=AGREEMENT

D=DISAGREEMENT

P=POSSIBLE AGREEMENT

N=NO COMPARISON

L Waste (1) = Laundry Effluent

L Waste (2) = Site Pond

Liquid Waste Samples results are in $\mu\text{Ci/ml}$

Particulate filter results are in $\mu\text{Ci/filter}$.

TABLE 2

ENVIRONMENTAL SAMPLES, COMBUSTION ENGINEERING, HEMATITE, MO

| <u>Sample</u> | <u>Analysis</u> | NRC | | LICENSEE | |
|----------------------------------|-----------------|-----------------------------|--------------|-----------------------------|----------------------------------|
| | | <u>Result</u> ^{1/} | <u>Error</u> | <u>Result</u> ^{1/} | <u>Percent MPC</u> ^{2/} |
| Soil-Plant Location #13 | Alpha | 14.0 | ±2.0 | 1.1 | 0.93 ^{3/} |
| | Beta | 28.0 | ±6.0 | 1.3 | 0.06 ^{3/} |
| Vegetation-Plant Location #13 | Alpha | 0.10 | ±0.06 | 1.1 | |
| | Beta | 15.0 | ±1.0 | 13.0 | |
| Joachim Creek Upstream | Alpha | 1.5 | ±0.2 | <2 | 0.005 |
| | Beta | 8 | ±6 | 7 | 0.04 |
| Joachim Creek Downstream | Alpha | 1.8 | ±0.3 | <2 | 0.006 |
| | Beta | 32. | ±7 | 12 | 0.16 |
| North Monitoring Well | Alpha | 6 | ±1 | 23 | 0.02 |
| | Beta | 1,200 | ±60 | 452 | 6.0 |

^{1/} Water samples are reported in pCi/liter and soil and vegetation samples are in pCi/gram. All samples collected on July 18, 1979.

^{2/} Based on 10 CFR 20, Appendix B, Table II, MPC values for U-234 and Th-234 for alpha and beta activity, respectively.

^{3/} Values shown apply to soil and vegetation in combination and are based on derived MPC values.

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures to maintain statistical consistency with the number of significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance. The acceptance category reported will be the narrowest into which the ratio fits for the resolution being used.

| <u>RESOLUTION</u> | <u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u> | | |
|-------------------|---------------------------------------------------|-------------------------------|-------------------------------|
| | <u>Agreement</u> | <u>Possible Agreement "A"</u> | <u>Possible Agreeable "B"</u> |
| <3 | No Comparison | No Comparison | No Comparison |
| >3 and <4 | 0.4 - 2.5 | 0.3 - 3.0 | No Comparison |
| >4 and <8 | 0.5 - 2.0 | 0.4 - 2.5 | 0.3 - 3.0 |
| >8 and <16 | 0.6 - 1.67 | 0.5 - 2.0 | 0.4 - 2.5 |
| >16 and <51 | 0.75 - 1.33 | 0.6 - 1.67 | 0.5 - 2.0 |
| >51 and <200 | 0.80 - 1.25 | 0.75 - 1.33 | 0.6 - 1.67 |
| >200 | 0.85 - 1.18 | 0.80 - 1.25 | 0.75 - 1.33 |

"A" criteria are applied to the following analyses:

Gamma spectrometry, where principal gamma energy used for identification is greater than 250 keV.

Tritium analyses of liquid samples.

"B" criteria are applied to the following analyses:

Gamma spectrometry, where principal gamma energy used for identification is less than 250 keV.

Sr-89 and Sr-90 determinations.

Gross beta, where samples are counted on the same date using the same reference nuclide.