R3/C1-11

R111-95-A-0125

November 27, 1995

EA 95-264

ABB Combustion Engineering
ATTN: Mr. Sigvard B. Junkrans
Vice President, Fuel Operations
3300 State Road P
Hematite, MO 63047

SUBJECT: ROUTINE SAFETY INSPECTION - ABB COMBUSTION ENGINEERING, HEMATITE, MO (NRC INSPECTION REPORT NO. 070-00036/95004(DNMS))

Dear Mr. Junkrans:

This refers to the routine safety inspection conducted by Messrs. T. D. Reidinger and J. M. Jacobson of this office from October 16 through October 20, 1995, at the Hematite facility, and through November 9, 1995, at the Regional laboratory. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with you and the members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, the NRC has determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is of concern because it was identified by the NRC. The violation and the two non-cited violations identified in the subject report indicate that management may need to reemphasize to the staff the importance of following procedures and postings.

In addition, although your timely identification and corrective action for the deliberate removal of two radios from the plant restricted area resulted in the violation not being cited, management should take this opportunity to reinforce to employees that 10 CFR 70.9 requires information required by the Commission's regulations be complete and accurate in all material respects.

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Employees should also be aware that NRC regulations allow the issuance of orders and other civil sanctions to unlicensed individuals who, through their deliberate misconduct, violate NRC requirements. Deliberate misconduct, as defined in 10 CFR 70.10, prohibits an employee or a licensee contractor from engaging in deliberate misconduct that causes or, but for detection would have caused, a licensee to be in violation of any rule, regulation, regulation, or order, or any term, condition, or limitation of any license issued by the Commission. An order may be issued to an individual to prevent his or her engaging in licensed activities at all NRC licensed facilities. A violation of this regulation may also lead to criminal prosecution. The NRC expects no less than full compliance with all applicable requirements and deliberate disregard of those requirements will not be tolerated.

The results of the Region's analysis of the split samples provided to us during your final status survey for the site creek are documented in the subject report. The survey does not constitute a free release survey for that portion of your Hematite premises. The NRC will review your sampling results when they are available to determine if the area has been remediated to the levels specified in your final status survey plan.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. Your response may reference or include previous docketed correspondence, if the correspondence adequately addressed the required response. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response to this letter will be placed in the NRC Public Document Room (PDR). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction.

The response directed by this letter and the enclosed Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1990, Public Law 96-511.

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

Sincerely,

Original Signed By

Cynthia D. Pederson, Director
Division of Nuclear Materials Safety

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

Enclosure: Inspection Report
No. 070-00036/95004(DNMS)

cc w/encl: R. S. Siudek, President, ABB CE Nuclear Fuel
R. W. Sharkey, Manager, Regulatory Compliance
A. E. Scherer, Vice President, Regulatory Affairs
C. B. Brinkman, Manager, Washington Nuclear Operations
J. F. Conant, Manager, Nuclear Materials Licensing
G. Page, Manager, Assembly Operations
H. E. Eskridge, Senior Consultant, Regulatory Compliance
R. A. Kucera, Missouri Department of Natural Resources

bcc w/encl: J. Lieberman, OE
PUBLIC (IE07)

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OFFICE	RIII E	RIII	RIII	RIII E	RIII
NAME	Jacobson/ch	Reidinger	Shear for	BBurgess for	Pederson
DATE	11/17/95	11/17/95	11/20/95	11/21/95	11/27/95

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NOTICE OF VIOLATION

ABB Combustion Engineering, Inc.
Hematite, Missouri

License No. SNM-33
Docket No. 070-00036

During an NRC inspection conducted from October 16 through November 9, 1995, one violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600 (60 FR 34381; June 30, 1995), the violation is listed below:

> Safety Condition S-1 of Special Nuclear Material License SNM-33 requires that licensed material be used in accordance with the statements, representations, and conditions in Chapters 1 through 8 of the application dated October 29, 1993, with supplements.
>
> Section 2.6 of Chapter 2 of the application dated October 29, 1993, requires, in part, that operations which affect licensed material be conducted in accordance with approved written procedures. These procedures provide the detailed instructions for equipment operation and material handling and the limits and controls required by the license.
>
> Health Physics (HP) Procedure 307, "Performing Smear Surveys," requires in Section V.B., "Contamination Control," that cleanup must be initiated immediately when contamination levels reach the limit of 10,000 dpm/100 cm^2. Furthermore, Section V requires that cleanup must be initiated by the beginning of the next shift when contamination levels reach the limit of 5,000 dpm/100 cm^2, and Section II requires that follow-up smears be taken after cleanup is completed.
>
> Contrary to the above, on October 10, 1995, four areas identified as exceeding contamination limits of 5,000 dpm/100 cm^2 did not have any follow-up smears taken. In addition, on October 18, 1995, two other areas that were identified as exceeding contamination limits of 10,000 dpm/100 cm^2 did not have any cleanup actions immediately initiated to reduce contamination levels.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR Part 2.201, ABB Combustion Engineering is hereby required to submit a written statement or explanation to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, with a copy to the Regional Administrator, Region III, 801 Warrenville Road, Lisle, Illinois 60532-4351, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your

response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an Order or Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. However, if you find it necessary to include such information, you should clearly indicate the specific information that you desire not to be placed in the PDR, and provide the legal basis to support your request for withholding the information from the public.

Dated at Lisle, Illinois
this 27th day of November 1995

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 070-00036/95004(DNMS)

Docket No. 070-00036 License No. SNM-33

Licensee: ABB Combustion Engineering, Inc.
3300 State Road P
Hematite, MO 63047

Facility Name: Hematite Facility

Inspection At: Hematite, MO

Inspection Conducted: October 16 - 20 Onsite, and through November 9, 1995, in NRC Region III Laboratory

Inspector: Timothy D. Reidinger 11/17/95
Timothy D. Reidinger Date
Senior Fuel Facilities Inspector

Inspector: John M. Jacobson 11/17/95
John M. Jacobson Date
Fuel Facilities Inspector

Approved By: Gary L. Shear 11/27/95
Gary L. Shear, Chief Date
Fuel Cycle Branch

Inspection Summary

Inspection from October 16 through November 9, 1995 (Report No. 070-00036/95004(DNMS))
Areas Inspected: This was an announced, routine and reactive inspection to evaluate compliance with requirements specified in NRC regulations, the license and license conditions, including a review of the following activities: Operator Training and Retraining (IP 88010), Criticality Safety (IP 88015), Operations Review (IP 88020), Transportation (IP 86740), and Radiation Protection (IP 83822). In addition, the inspectors also observed the licensee's final status survey for the site creek remediation project and split selected samples with the licensee for independent analysis by the NRC (IP 88045).
Results: A review of the safety training program indicated the licensee was adequately implementing the commitments made in its license renewal application. The licensee also performed and documented appropriate surveys for the transportation safety program. The licensee had made progress in its

radioactive waste program by segregating all of the waste which had been stored haphazardly in preparation for disposal. However, the licensee had yet to make significant progress in the actual disposal of the waste. NRC analysis of split soil samples taken during the final status survey for the site creek remediation project indicated the area has some residual uranium. However, a split sample taken at the confluence of the site creek and Joachim Creek (the boundary of the licensee's property) contained essentially no uranium above background. The licensee's results and the average concentration for the area will continue to be tracked under an open inspector follow-up item (IFI No. 070-00036/95002-02) to determine if the remediation of the area was adequate based upon the levels specified in the final status survey plan. One violation and two non-cited violations in the radiation protection area appeared to be the result of plant staff not following established licensee procedures and postings. In addition, the violation for failure to clean up areas with contamination above plant limits in a timely manner appeared to result from a lack of communication between health physics (HP) and plant operations.

Violation:

(1) Failure to provide timely clean up and resurvey areas contaminated above licensee action levels. (Section 7, Radiation Protection)

Non-Cited Violations:

(1) Entry of operators without respirators into an area posted for full face respirators. (Section 7, Radiation Protection)

(2) Removal of items from the licensee's restricted area without appropriate HP survey and approval. (Section 7, Radiation Protection)

DETAILS

1. Persons Contacted

*S. Borell, Manager, Ceramic Operations
*E. Criddle, Health Physics Supervisor
*M. Eastburn, Criticality Safety Specialist
*H. Eskridge, Senior Consultant
*K. Hayes, Industrial Safety Engineer
*R. Land, Manager, Production Support
*A. Noack, Operations Superintendent
*G. Page, Manager, Assembly Operations
*E. Saito, Health Physicist
*R. Sharkey, Manager, Regulatory Compliance

*Denotes attendance at the exit meeting held on October 20, 1995.

2. Licensed Program

Combustion Engineering's Hematite facility produces uranium dioxide (UO_2) fuel for the commercial nuclear power industry. Low-enriched uranium hexafluoride (UF_6), limited to a maximum of 5 weight percent U-235, is received from the United States Enrichment Corporation in 2.5-ton cylinders. The solid UF_6 is vaporized, then reacted with steam and hydrogen in heated fluid-bed reactors, which converts the UF_6 into UO_2 powder. The plant pelletizes the UO_2 powder, loads the pellets into fuel rods, and loads the rods into fuel assemblies for shipment to nuclear power plants.

3. Operator Training and Retraining (IP 88010)

The inspectors reviewed selected operator training records for compliance with the requirements in Section 2.5 of the license. Section 2.5 requires the licensee to provide initial training in nuclear, occupational, and radiation safety, and emergency response. Written tests to document understanding of important concepts and biennial retraining are also required. For the random selection of new and experienced operators chosen by the inspectors, appropriate documentation of formal safety training and completed tests were on file for the initial training and biennial retraining.

The inspectors reviewed training records and interviewed personnel to verify that the required training was conducted and records were maintained.

No violations or deviations were identified.

4. Criticality Safety (IP 88015)

During tours of the plant, the inspectors observed plant areas and operator practices for adherence to approved nuclear criticality safety (NCS) postings. The inspectors did not note any discrepancies with posted nuclear safety controls.

No violations or deviations were identified.

5. Operations Review (IP 88020)

The inspectors observed operations and plant material conditions during tours of the plant facilities. The inspectors observed that the licensee had initiated a waste segregation and characterization program for the material which had accumulated in the south yard. In addition, the licensee had almost completed a decontamination room for spray washing contaminated items in the back of the pellet plant. The licensee's progress in cleaning up the waste storage area in the back of the plant and disposing of contaminated waste will continue to be tracked by the inspectors under an open inspector follow-up item (IFI No. 070-00036/95002-01).

No violations or deviations were identified.

6. Environmental Protection (IP 88045)

The inspectors were present to observe the final status survey for the licensee's site creek remediation project. The remediation effort was undertaken by the licensee this past summer after discovery that the portion of the site creek between the site dam and the railroad tracks had been contaminated with insoluble uranium-bearing sludge from upsets in the sewage treatment plant. (See Inspection Report 070-00036/95002(DRSS) for further details.) After reviewing the methodology with the NRC in a public meeting held on October 3, 1995, the licensee began the final survey to determine whether the contaminated area had been cleaned to an average of 30 picocuries per gram (pCi/g) or less on October 17, 1995.

a. Site Creek Survey

The inspectors observed the licensee remove samples from the creek bed and surrounding area according to the survey plan submitted to and reviewed by the Region. Certain of the gridded sampling points that were farthest from the creek in the northeast and southeast sections of the survey grid could not be sampled because of the density of tree roots, a hard-packed gravel road, and the railroad track bed. These samples would not have been expected to be contaminated by the treatment plant upsets because they were

significantly above the maximum water level of the creek. The licensee took additional samples from the creek bed and sides in order to conservatively bias the average uranium concentration by collecting more samples in the area which had been contaminated. This is the area which potentially could have higher uranium concentrations in the soil and sediment.

The licensee used a hand auger to remove an approximately 15-centimeter (cm) core of soil for each sampling point, and retained the top 10 cm for analysis. Samples taken along the sides of the creek which contained rock or roots had to be taken with a shovel. The inspectors had two cores removed in seven of the sampling locations in order to split the samples with the licensee as an independent check of licensee results. In addition, one sample removed from each side of the creek and one sample taken 1 meter (m) out from the confluence of the site creek and the Joachim Creek were split with the licensee.

After the samples were taken, the upper 10 cm of each sample was subsequently dried to remove the moisture, and then homogenized. The inspectors and licensee then split the 10 samples that the inspectors had requested.

Survey Results and Analysis

The analysis for the NRC portion of the split samples was performed by the Region III laboratory using a gamma spectrometer. The analyst counted the U-235 activity of each sample and calculated a total uranium activity (U-234, U-235, and U-238) in picocuries (pCi) by multiplying the U-235 activity by 22. This is the ratio of total U to U-235 for uranium enriched to 5 weight percent (w/o) based on the formula for specific activity in 10 CFR Part 20, Appendix B. The change in the multiplier for low-enriched uranium (assumed to be 4-5 w/o for the licensee) is only a few percent over the range of interest compared to a counting error of 10%. The specific activity in picocuries per gram (pCi/g) was then obtained by dividing the activity by the gram weight of the sample. The results of the analysis are presented below. The standard error provided is based on the counting error only.

Results of Regional Analysis for Split Samples	
Sample Grid Location	Total Uranium Concentration (pCi/g)
A - 51	14 +/- 2
B - 1	42 +/- 4
B - 21	25 +/- 3
B - 36	19 +/- 2
B - 51	47 +/- 5
C - 8	70 +/- 7
C - 13	56 +/- 6
D - 21	12 +/- 2
E - 8	14 +/- 3

The results indicated that four of the nine samples taken from the remediated area that NRC split with the licensee were above 30 pCi/g, but significantly below levels found after discovery of the sewage sludge in the site creek. The licensee has committed to remediating the site creek area to an average uranium concentration of 30 pCi/g. In addition, one sediment sample taken one meter out from the confluence of the site creek with the Joachim creek yielded a result of 4 +/- 1 pCi/g which is essentially background.

As of the report end date, the licensee did not have results back from the contract laboratory performing the analysis for the licensee. These results will be compared to NRC's results in a future inspection report. The licensee's results and the average concentration for the area will continue to be tracked under an open inspector follow-up item (IFI No. 070-00036/95002-02) to determine if the remediation of the area was adequate based upon the levels specified in the final status survey plan.

No violations or deviations were identified.

7. Radiation Protection (IP 83822)

The inspectors reviewed selected elements of the licensee's radiation protection (RP) program for compliance with 10 CFR Part 20 requirements and the license commitments contained in Chapter 3 of the renewal application. The inspectors also observed operators and postings during plant tours for adherence to RP policy and procedures.

a. Control of Potentially Contaminated Items

The inspectors followed up on a phone call made to the Region on September 19, 1995, by the licensee regarding removal of two radios from the licensee's restricted area without appropriate HP surveys for fixed or removable contamination. The inspectors discussed the incident with the Regulatory Compliance Manager, the Health Physicist, and the operator involved who submitted a letter of resignation effective September 29, 1995. In addition, the inspectors reviewed licensee survey results for the radios after they were recovered, a licensee training attendance sheet, and licensee memoranda generated from the investigation into the incident.

The former operator stated that the first radio had been removed in early August 1995 because of a faulty speaker. The former operator cleaned the radio with alcohol and surveyed it with an alpha meter prior to placing the radio in a personal bag which she used to carry the radio offsite. The former operator exchanged the radio at a local warehouse and brought the new radio into the restricted area at the plant. Approximately 30 days later, the former operator removed the new radio in the same fashion because it too had a faulty speaker. In neither case did the former operator contact the HP department for a "Package Pass" to remove the items from the restricted area. The former operator stated that the former operator had received training on removing items from the restricted area and knew the requirement to contact HP, but didn't think removing the two radios was particularly important. The inspectors verified that the former operator had received training on May 26, 1995, concerning the requirement to obtain a survey from health physics for items to be removed from the plant.

The inspectors noted that the licensee had apparently recovered both radios. One was returned by one of the former operator's children and the other was purchased from the warehouse after identification based on the make of the radio and marks which looked liked residue from where RADIOACTIVE MATERIALS stickers had been removed. The licensee performed extensive surveys on both radios and all results were less than 10% of the allowed release criteria for fixed and removable contamination. The licensee initially placed the former operator on a 2-week suspension without pay, but then obtained a letter of resignation after learning that the former operator had lied to licensee management about the second radio. The licensee also conducted additional training sessions for all operators at the plant to reinforce the requirement for an HP survey and approval for all items and equipment leaving the restricted area of the plant.

HP Procedure 309, "Survey of Items for Unconditional Release," requires in Section II.B. that all items released to individuals must be accompanied by a "Package Pass" with an HP approval and appropriate management approval. Furthermore, Section III requires that contamination checks be made and records kept on all items leaving the plant. The failure of a licensee operator to obtain a "Package Pass" with approval by HP and appropriate management before removing two radios from the restricted area of the site, and the failure to record contamination checks of the radios, is a violation. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII of the NRC Enforcement Policy.

b. Adherence to Postings

During a tour of the Erbia Plant on October 19, 1995, the inspectors observed two operators in the mezzanine area without respirators. The inspectors observed that the mezzanine had been roped off by HP and posted as an Airborne Radioactivity Area. The posting read: "Airborne Radioactivity Area - High Contamination - Full Face Respirator Required." The inspectors inquired why the operators were in the posted area without full face respirators. The responsible HP technician indicated that earlier in the shift, he had cleared the area for entry without a respirator while he was present, but had not removed the posting when he left because work on equipment containing UO_2 powder was planned for the next shift.

The operators apparently thought that they could reenter the area without respirators based on the earlier entry. The inspectors indicated that adherence to plant postings under all conditions is extremely important, and if conditions no longer warrant a particular posting, then the area should be cleared by HP or nuclear safety, and the posting removed. The licensee agreed that the operators should not have assumed they could ignore postings based on their knowledge of conditions. Training emphasizing the importance of strict adherence to posted requirements was provided to all operators at the beginning of each shift on the following day. This failure constituted a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

c. Routine Surveys and Decontamination

Safety Condition S-1 requires that licensed material be used in accordance with the statements, representations, and conditions in Chapters 1 through 8 of the renewal application. Chapter 3, Section 3.2.6.2, requires, in part, that material on processing equipment or fixed on surfaces shall be limited as required to control airborne radioactivity and external radiation exposures.

In addition, clean up action shall be started no later than the beginning of the next work shift when removable surface contamination exceeds the action level limits specified.

Health Physics (HP) Procedure 307, "Performing Smear Surveys," Section V.B. "Contamination Control" required that cleanup must be initiated by the beginning of the next shift when contamination levels reach the 5,000 dpm/100 cm^2 [5,000 disintegrations per minute per 100 square centimeters] limit. Furthermore, this procedure required that cleanup must be initiated immediately when contamination levels reach the limit of 10,000 dpm/100 cm^2.

A review of selected survey records for various plant areas revealed that on October 10, 1995, contamination area surveys identified four areas with readings ranging from 5,609 to 9,176 dpm/100 cm^2. The inspectors could not determine whether clean up actions for reducing contamination levels had been initiated by the beginning of the next shift. Follow-up surveys, conducted after cleanup of the contaminated areas, were not conducted or documented. In addition, no documentation that cleanup was initiated immediately or at the beginning of the next shift when contamination levels exceeded the 10,000 dpm/100 cm^2 limit was available.

On October 18, 1995, contamination survey results identified two areas with readings of 10,327 dpm/100 cm^2 and 11,996 dpm/100 cm^2. On the afternoon of October 19, 1995, the inspectors toured the areas and spoke with the responsible supervisors and determined that immediate clean up actions for reducing contamination levels in these areas had not been initiated, nor had cleanup begun at the start of the shift following the survey by the HP technician. The licensee indicated that there was a lack of communication between the HP and operations staffs regarding the identification and timely cleanup of contaminated areas, and that this had been a recurring problem. The failure to initiate clean up actions to reduce contamination levels either immediately or by the beginning of the next shift is a violation (Violation 070-00036/95004-01).

One violation and two non-cited violations were identified.

8. Transportation (IP 86740)

The inspectors reviewed the licensee's transportation survey program which was the responsibility of the HP department. The inspectors noted that the licensee had written procedures for receiving and shipping packages containing radioactive materials and performing surveys for exposure rates and removable contamination. A review of survey records for the period including January to October 1995 for packages shipped and received documented that removable contamination on cylinders and

overpacks was below the limits of 49 CFR 173.443. Dose rates for cylinders, overpacks, and vehicles were below the limits in the Department of Transportation regulations as well.

No violations or deviations were identified.

9. Exit Meeting

The inspectors met with the individuals denoted in Section 1 of this report at the conclusion of the onsite inspection on October 20, 1995. The inspectors summarized the scope and findings of the inspection and indicated that the split samples from the site creek would be analyzed by the Region III laboratory.

The licensee did not identify any of the information discussed at the exit meeting as proprietary.