

9 pgs

Docket No. 70-36  
License No. SNM-33  
Amendment No. 18

JAN 29 1991

Combustion Engineering, Inc.  
ATTN: Mr. J. A. Rode, Plant Manager  
Hematite Nuclear Fuel Manufacturing  
P.O. Box 107  
Hematite, MO 63047

Gentlemen:

In accordance with the amendment application dated March 16, 1990, and supplement dated September 4, 1990, and pursuant to Title 10, Code of Federal Regulations, Part 70, Materials License No. SNM-33 is hereby amended to authorize the use of Building 253. Accordingly, Condition 9 is revised to include the dates of March 16, and September 4, 1990, and Condition 38 is hereby deleted.

All other conditions of the license shall remain the same.

Revised License No. SNM-33, incorporating Amendment No. 18, and our Safety Evaluation Report are enclosed.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By:  
Charles J. Haughney, Chief  
Fuel Cycle Safety Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

Enclosures:

1. Revised License No. SNM-33
2. Safety Evaluation Report

cc w/encs:

Mr. A. E. Scherer, Vice President  
Nuclear Quality

Mr. C. R. Waterman, Vice President  
Nuclear Fuel

Mr. J. F. Conant, Manager  
Nuclear Materials Licensing

Mr. H. E. Eskridge, Manager  
Nuclear Licensing, Safety and  
Accountability

Mr. C. B. Brinkman, Manager  
Washington Nuclear Operations  
Distribution w/encl.

Docket No. 70-36	PDR	NRC File Center	NMSS R/F	SHO
IMUF R/F	IMSB R/F	VLTharpe	SSoong(2)	GBidinger
Region III	GFrance, RIII	GJackson, LFDCB	SG (2)	EKeegan

C. Robinson

OFC: IMUF: <i>LS</i>	IMUF: <i>LS</i>	IMUF: <i>LS</i>	IMSB: <i>MA</i>
NAME: SSoong: mh:	VLTharpe:	GBidinger:	CHaughney:
DATE: 1/14/91:	1/14/91:	1/27/91:	1/27/91:

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## MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1. Combustion Engineering, Inc.	3. License number	SNM-33 Amendment No. 18
2. P. O. Box 107 Hematite, Missouri 63047	4. Expiration date	December 31, 1989
	5. Docket or Reference No.	70-36
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Uranium enriched to maximum 5.0 weight percent in the U-235 isotope	A. Any, excluding metal powder	A. 8,000 kilograms contained U-235
B. Uranium, any U-235 enrichment	B. Any	B. 350 grams
C. Source material (Uranium and Thorium)	C. Any, excluding metal powder	C. 50,000 kilograms
D. Cobalt-60	D. Sealed sources	D. 40 millicuries, total
E. Americium-241	E. Solid sources	E. 200 microcuries
9. Authorized use: For use in accordance with the statements, representations, and conditions contained in Part I of the licensee's renewal application dated February 26, 1982, and supplements dated July 21, 1982; February 21, 1983; May 31, 1984; April 29, June 6, and October 11, 1988; and February 10, March 22, May 1, August 18, October 23, October 26, and November 8, 1989 (2); and January 3, January 12, March 16, and September 4, 1990, and letters dated February 29, 1984, January 20, 1986, and March 30, 1987.		
10. Authorized place of use: This licensee's existing facilities in Hematite, Missouri, as described in the referenced license renewal application.		
11. Quarterly inspections by the Supervisor, NLS&A, or his representative shall be preplanned and shall be documented. Such documentation shall be maintained for 2 years.		

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12. A written report shall be made by the NLS&A Supervisor to the Plant Manager every 6 months reviewing employee radiation exposure (internal and external) and effluent release data to determine:
  - a. if there are any upward trends developing in personnel exposure for identifiable categories of workers, types of operations, or in effluent releases;
  - b. if exposures and releases can be lowered in accordance with the ALARA commitment; and
  - c. if equipment for effluent and exposure control is being properly used, maintained, and inspected.
13. The licensee shall leak test sealed sources in accordance with the enclosed "License Condition For Leak Testing Sealed Byproduct Material Sources."
14. Release of equipment and material from the plant site or to clean areas onsite shall be in accordance with the enclosed "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated August 1987.
15. Pursuant to 10 CFR 20.302, the licensee is authorized to treat waste and scrap materials containing uranium enriched in U-235 and/or source material by incineration.
16. Within 60 days of the date of this license renewal, the licensee shall submit to the NRC a description of a proposed monitoring program to determine the quantity and environmental effects of radioactivity on spent limestone rock used as onsite fill material and to determine the environmental effects of outdoor storage of the alpha-contaminated material.
17. The licensee shall survey spent limestone rock discharge from each HF scrubber for beta contamination. Rock with beta contamination which exceeds five times the background of fresh rock shall not be used for landfill.
18. Within 60 days of the date of this license renewal, the licensee shall submit to NMSS a plan, including schedule, for the disposal of alpha-contaminated spent limestone rock.
19. The licensee shall decontaminate the two evaporation ponds such that the average residual contamination in each pond does not exceed the appropriate limit of either 250 picocuries of insoluble uranium or 100 picocuries of soluble uranium per dry gram of soil. The Tc-99 concentrations in a composite sample for each pond shall be determined.

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20. a. If the radioactivity in plant gaseous effluents exceeds 150  $\mu\text{Ci}$  per calendar quarter, the licensee shall, within 30 days, prepare and submit to the Commission a report which identifies the cause for exceeding the limit and the corrective actions to be taken by the licensee to reduce the release rates. If the parameters important to a dose assessment change, a report shall be submitted within 30 days which describes the changes in parameters and includes an estimate of the resultant change in dose commitment.
- b. In the event that the calculated dose to any member of the public in any consecutive 12-month period is about to exceed the limits specified in 40 CFR 190.10, the licensee shall take immediate steps to reduce emissions so as to comply with 40 CFR 190.10. As provided in 40 CFR 190.11, the licensee may petition the Nuclear Regulatory Commission for a variance from the requirements of 40 CFR 190.10. If a petition for a variance is anticipated the licensee shall submit the request at least 90 days prior to exceeding the limits specified in 40 CFR 190.10.
21. The licensee shall maintain and execute the response measures of his Radiological Contingency Plan submitted to the Commission by letter dated December 28, 1987. The licensee shall also maintain implementing procedures for his Radiological Contingency Plan as necessary to implement the Plan. The licensee shall make no change in his Radiological Contingency Plan that would decrease the response effectiveness of the Plan without prior Commission approval as evidenced by a license amendment. The licensee may make changes to his Radiological Contingency Plan without prior Commission approval if the changes do not decrease the response effectiveness of the Plan. The licensee shall furnish the Chief, Fuel Cycle Safety Branch, Division of Industrial and Medical Nuclear Safety, NMSS, U. S. Nuclear Regulatory Commission, Washington, DC 20555, a report containing a description of each change within 6 months after the change is made.
22. At the end of the plant life, the licensee shall decontaminate the facilities and site in accordance with the general decommissioning plan submitted in the enclosure to the letter dated January 12, 1979, so that these facilities and grounds can be released to unrestricted use. The financial commitment to assure that funds will be available for decommissioning in the letter dated March 8, 1979, is hereby incorporated as condition of the license.
23. The licensee shall continue the soil sampling program for the spent limestone fill areas, as described in the letter dated February 29, 1984, until discontinuance is authorized by the Commission.
24. The monitoring program for the spent limestone shall include:
- a. Continuous air sampling at the center of, and approximately 1 meter above, the uncovered spent limestone piles for a minimum 2-year period. The weekly samples may be composited and analyzed for uranium<sub>16</sub> activity on a quarterly basis. The lower limit of detection shall be 10  $\mu\text{Ci/ml}$ , or

<sup>1</sup> The report or petition should be submitted to the Director, Office of Nuclear Material Safety and Safeguards, with a copy to the Regional Administrator, Region III.

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b. Measurement of the uranium activity on the surface of the spent limestone. Prior to conducting such a program, the licensee shall submit the sampling and analytical program to the NRC for approval.

25. Processing of  $UF_6$  in 10-ton cylinders is not authorized.
26. The 10-ton  $UF_6$  cylinders shall be equipped with valve protectors.
27. The concrete pad for storage of  $UF_6$  cylinders and the surrounding area shall be sloped or graded so that any spilled combustible fluids would not be confined to the storage area.
28. No combustibles shall be stored on the concrete pad.
29. A  $CO_2$  fire extinguisher shall be readily available near the storage pad.
30. In addition to the controls in Section I of the enclosure to the letter dated March 30, 1987,  $UF_6$  cylinders which are in transport and containing  $UF_6$  heels shall be either sealed, in-sealed overpacks, or in sealed vehicles.
31. Notwithstanding the statement in Section 4.2.3 of the application, the k-effective of a unit or an array of units shall not exceed 0.95 unless specifically authorized by the license.
32. Nuclear criticality safety evaluations performed by the licensee in accordance with Section 2.7, Part I of the application, shall be based on assumptions of optimum moderation and reflection of individual safe units and of arrays.
33. Nuclear criticality safety evaluations involving k-effective calculations performed by a Nuclear Criticality Specialist shall be independently reviewed and approved by an individual having, as a minimum, the qualifications of a Nuclear Criticality Specialist.
34. For uranium enriched to more than 4.1 w/o U-235, the licensee shall limit the agglomeration/granulation process, each agglomerated powder storage location, and the pellet pressing operation to safe mass units as specified in Table 4.2.4, Part I of the application.
35. Deleted.

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36. Deleted.

37. Deleted.

38. Deleted.

39. At all times, the licensee shall limit moderating material (solutions and powders), except poreformer and lubricant, to not more than two 5-gallon pails on each of the second and third floors of Building 254.



FOR THE NUCLEAR REGULATORY COMMISSION

Date:

1/28/91

By:

Charles J. Haughney

Division of Industrial and  
Medical Nuclear Safety, NMSS  
Washington, DC 20555

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

JAN 29 1991

DOCKET NO: 70-36

LICENSEE: Combustion Engineering, Inc. (CE)  
Hematite, Missouri

SUBJECT: SAFETY EVALUATION REPORT, AMENDMENT APPLICATION DATED  
MARCH 16, 1990, AND SUPPLEMENT DATED SEPTEMBER 4, 1990,  
RE AUTHORIZATION TO USE BUILDING 253

BACKGROUND

During the period of 1988 and 1989, CE built several buildings including Buildings 253, 254, and 256 to be used for its new pellet production operations. On November 24, 1989, the NRC issued Amendment No. 15 to Materials License No. SNM-33 authorizing the use of enriched uranium in Buildings 254 and 256 for pellet production. At that time, because the soil below Building 253 was found to be contaminated with radioactive material, Amendment No. 15 was issued with License Condition 38 prohibiting the use of Building 253 and maintaining Building 250 as an authorized place of use. By application dated March 16, 1990, and supplement dated September 4, 1990, CE requested an amendment to remove Condition 38 and authorize the use of Building 253.

DISCUSSION

The dimensions of Building 253 are 77 feet wide, 133 feet long, and 17 feet high. It has a concrete slab floor, concrete block walls, and a metal supported roof. Building 253 is to be used for liquid waste solidification, utilities, storage of chemical and maintenance items, offices, a change room, and storage of UO<sub>2</sub> powder. Ventilated air from the building is passed through absolute filters prior to release to the atmosphere.

Radiation Safety

The existing radiation protection program as described in the license will be applicable and extended to cover the activities in Building 253. The staff has determined that CE's current program is adequate to protect the health and safety of the workers and public.

Criticality Safety

Although Amendment No. 15 restricted Building 253 as an authorized place of use, the applications for Amendment No. 15 had requested license revisions relating to Building 253 that involved nuclear criticality safety. This nuclear criticality safety review evaluates the current application and that information within the applications for Amendment No. 15 relevant to Building 253.

In general, the following activities will be performed in Building 253. Scrap  $UO_2$  will be transferred in geometrically safe pails into Building 253. The scrap recycle in the pails will be loaded into recycle hoppers. The recycle hoppers will be stored in the bulk recycle storage room of Building 253.

The licensee has proposed moderation control as the main criterion for nuclear criticality safety in Building 253. The moisture content of the material transferred to the recycle hoppers will be limited to a maximum of one weight percent moisture (water). In Part I of the license, the licensee has provided a commitment to control the moisture content within the recycle hoppers.

Prior to transfer of the recycle hoppers from Building 253, two independent moisture measurements will be made. Samples will be withdrawn and measured for moisture content with instruments that are calibrated semiannually. Conductivity and change in mass determinations are utilized to measure the percent moisture. One sample will be withdrawn from the pails prior to loading the recycle hopper. Another sample will be withdrawn from the recycle hopper following loading and non-pneumatic blending within the recycle hopper.

The recycle hoppers will be mechanically sealed with a flange cover to ensure dryness during transfer of material from Building 253. A hood arrangement will prevent the ingress of extraneous moderating material when the flange cover is removed while loading the recycle hoppers.

The staff has performed a nuclear criticality safety analysis of the operations proposed for Building 253. The analysis was conducted to examine the possible limitations on storage configuration. The analysis included the modelling of an infinite planar array of filled recycle hoppers containing  $UO_2$  with five weight percent U-235 and one weight percent water. This conservative model represents the most reactive condition and is highly subcritical when an internal moderation control of one weight percent moisture is maintained. Thus, nuclear criticality safety is based upon moderation control. Therefore, the staff concludes that adherence to the limits and controls established in the license is sufficient to ensure subcriticality.

### Environmental Protection

On May 17, 1989, the NRC staff prepared an Environmental Assessment to support License Amendment 15 which authorized the use of enriched uranium for pellet productions. The Assessment included the use of Buildings 253, 254 and 256. Based on this Assessment, a Finding of No Significant Impact was made pursuant to 10 CFR Part 51. The Finding was published in the Federal Register on May 24, 1989.

### License Condition 38

Because the soil beneath Building 253 was found to be contaminated with radioactive material, Amendment 15 was issued with Condition 38 prohibiting the use of Building 253 and maintaining Building 250 as an authorized place of use. By letter dated July 2, 1990, NRC permitted CE to backfill the contaminated areas



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below Building 253 and proceed with building construction. This was done with the understanding that at the end of plant life, further decontamination may be necessary. During a telephone conversation on December 7, 1990, between Messrs. H. E. Eskridge of CE and Sean Soong of NRC, Mr. Eskridge indicated that all controlled areas within Building 250 are now a part of Building 253. Accordingly, Condition 38 should be removed.

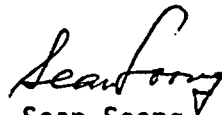
#### CONCLUSION/RECOMMENDATION

The staff concludes that the proposed activities will have no adverse effect on the public health and safety or the environment. Approval of the amendment application is recommended.

The Region III Principal Inspector has no objection to this proposed action.



Charles Robinson  
Uranium Fuel Section  
Fuel Cycle Safety Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS



Sean Soong  
Uranium Fuel Section  
Fuel Cycle Safety Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

Approved by:

George H. Bidinger, Section Leader

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NAME:SSoong:mh:	CRobinson:	VLTharpe:	GHBidinger:
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