AUG 1 7 1981

FCUP:NK 70-1100

Combustion Engineering, Inc. ATTN: Mr. H. V. Lichtenberger, Vice President Nuclear Fuel Nuclear Power Systems - Manufacturing 1000 Prospect Hill Road Windsor, Connecticut 06095 Docket File 70-1100 PDR SHO NMSS r/f FCUP r/f **NKetzlach** LTyson WTCrow RGPage ALSoong RECunningham IE HQ (2)JRoth, R:I **JBlaylock** BBrooks ACabel1 RErickson JRobertson DWeiss

Distribution:

Gebtlemen:

We have completed the initial review of the renewal application for License No. SNM-1067, dated December 18, 1980, and find additional information is needed to complete our evaluation.

The enclosure to this letter lists our comments and questions relating to your renewal application, all of which were discussed with your staff during their visit to our office on July 22-23, 1981.

Prior to submitting it mal responses to our comments and questions, you may find it prudent to arrange a meeting to discuss a draft of your responses. Formal responses are due no later than October 1, 1981.

If there are any questions concerning this matter, please call me.

Sincerely,

Original Signed by N. Ketzlach

Norman Ketzlach Uranium Process Licensing Section Uranium Fuel Licensing Branch Division of Fuel Cycle and Material Safety

Enclosure: As stated

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COMMENTS ON COMBUSTION ENGINEERING LICENSE RENEWAL APPLICATION LICENSE NO. SNM-1067, DOCKET 70-1100

1. Pages I.1-1 and I.1-2

- a. Consolidate the authorized activities into a single section (e.g., Sections 1.2 and 1.6) or as a minimum present the activities in adjacent sections.
- b. Describe the use of 10,000 kg natural or depleted U in any form and indicate the applicable safety criteria.
- c. Correct the reference to 49 CFR. It should be Parts 170-189.
- d. Rearrange the topics in a logical order (e.g., authorized activities, locations where material is used, special authorizations, etc.). Conformance to the "Standard Format and Content for the Health and Safety Sections of the Renewal Applications for Uranium Fuel Fabrication Plants" (FP 716-4), dated October 1980 should be useful.

2. Page I.1-2

Include the possession of U_3O_8 neutron sources, if desired.

- 3. Pages I.2-1 I.2.4
 - a. Remove the "Company Background" from the license conditions section and place it in the appropriate demonstration section. Limit the description to the Nuclear Power Systems Division, but include traceability to the corporate management structure.
 - b. State the policy with regard to safety of the work place and the obligation at all times to comply with the license requirements. It should also be the policy of all organizational components to keep radiation exposures to employees and the general public to meet the ALARA requirement. Include the commitment to follow procedures.
- 4. Page I.2-5
 - Reference Figure 2.2.1 in discussing the operation of the Development Laboratories.
 - b. Confirm the Manager, Health Physics, determines whether proposed changes in operations may be approved internally or whether a license amendment is required.
 - c. Identify the responsible position for approving procedures, RWPs, and operational limits.

- d. The nuclear criticality safety criteria for the Nuclear Laboratories belong in the Nuclear Safety section of the application (Section 4.2.2). Demonstrate the control of the slab thickness by a "log."
- e. Change all criteria in this and the other license conditions sections to specify requirements (e.g., use "shall be" instead of "are").
- f. Clarify the types of "changes" requiring approval of the Manager, Health Physics.
- g. Confirm all approval documents and records of evaluations are maintained in sufficient detail to permit independent review of the analyses and that such records are maintained for at least six months after termination of the operation evaluated.

5. Page I.2-6, Section 2.2.2

- 74

- a. Include the Vice President, Nuclear Power Systems Division, in the discussion of the organization. There is no tie between the Development Laboratories and Nuclear Fuel Manufacturing at a management level below the Nuclear Power Systems Division.
- b. Demonstrate the independent and parallel lines of authority and reporting for the production and safety functions. It appears the General Manager, Fuel Fabrication, is responsible for both (see Section 2.4).
- c. Confirm the proposed changes submitted to the Health Physics and Safety Supervisor are in writing.
- d. Identify the one who determines whether the changes can be made within the framework of the license or whether an NRC amendment is required.
- e. Establish a method for determining the traceability of approved criticality control limits.

6. Pages I.2-7 and I.2-9

Include the Nuclear Safety Committee in Figures 2.2.1 and 2.2.2. Section 2.2.2 indicates the Committee reports to the Vice President, Nuclear Power Systems.

7. Page I.2-8

a. Identify the person indicated as reporting to the General Manager. If it is the Health Physics and Safety Supervisor, reconcile this reporting chain with Figure 2.2.2 and Section 2.4.

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- b. Confirm the Health Physics and Safety Supervisor, Manager NLS&A, or the Licensing Consultant approves all operating and radiation safety procedures related to criticality and radiation safety.
- c. Confirm all approved operating procedures are available in the related work area, both in the Nuclear Laboratories and in the manufacturing areas.
- d. Confirm you have a document control system that assures all operating procedures are maintained current and all superseded documents are removed from circulation. Describe the document control system in a demonstration section of the application.
- e. Describe the safety-related responsibilities of the Production Manager and the Production Superintendent and specify the interaction between the two (e.g., they each appear to have production responsibilities and both of them report to the General Manager).

8. Page I.2-10

- a. Confirm the Nuclear Safety Committee reviews and approves all applications for SNM license renewals and amendments prior to submittal to che NRC.
- Confirm the Nuclear Safety Committee audits, the manufacturing operations annually, with no more than 13 months between audits and the minimum distribution of the audit reports includes the Vice President, Nuclear Power Systems and the Vice President Nuclear Fuel Manufacturing.
- c. Confirm the Committee reviews and approves all process and equipment changes not covered by Tables 4.2.5 and 4.2.6 relating to nuclear safety. Confirm a qualified person designated by the Nuclear Safety Committee performs the independent criticality safety reviews of all process and equipment changes whether they are or are not covered by Tables 4.2.5 and 4.2.6. Confirm the independent reviewer meets the minimum qualifications of the nuclear criticality specialist with the two years' experience in outside-of-reactor nuclear criticality safety being with the methods relevant to the nuclear safety analysis of the operation under review.
- d. Identify who performs the functions of an ALARA Committee.
- e. Specify the minimum frequency of Committee meetings.
- f. Specify the Committee reporting and recordkeeping requirements.

9. Page I.2-11

a. Include the approval authority for selection of members of the Nuclear Safety Committee.

 Identify the position of Supervisor, Health Physics and Safety as a key position.

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10. Page I.2-12, General

1.25

- a. Confirm the minimum qualifications for production or engineering managers, Production Superintendent, and the laboratory and quality control managers, re those stated on page VIII-12 of the existing license.
- b. Include the minimum qualifications for the foremen, the Production Superintendent, and the Production Manager.

11. Page I.2-12, Section 2.5.4

Confirm the two years' working experience for the Supervisor, Health Physics and Safety, in radiation protection shall be similar to that in the program to be managed.

12. Page I.2-13, Section 2.5.8

- Confirm the "general" qualifications for Nuclear Safety Committee membership are minimum qualifications.
- b. Confirm the minimum qualifications include a Bachelor of Science degree in engineering or one of the other sciences.

13. Page 1.2-13 and -14, Section 2.6.1

- a. Confirm the training includes ALARA practices.
- b. Confirm all personnel attend the formal training session.
- c. Confirm the training includes all the subjects listed in the October 1980 graft guide of the "Standard Format and Content."
- d. Confirm all production personnel receive additional training before changes are implemented in processes as well as in Luclear and radiation safety limits, emergency plans, or in fire protection.
- e. Distinguish between formal and informal training.
- f. Confirm the training includes an introduction to 10 CFR Parts 19 and 20.
- g. Confirm records of the training will be kept that include the date held, subject matter covered, attendees, instructor, test results, etc.
- h. Confirm all trainees shall satisfactorily complete the test bef being allowed to handle radioactive material without direct super from.

i. Specify the criticality control traiving received by the technicians.

14. Page 1.2-14, Section 2.6.2

- a. Define the "continual" retraining r ogram.
- b. Describe the annual retraining program. It could be every 2 years.
- c. Confirm the retraining program also applies to laboratory personnel and is conducted every two years.
- Specify the method used to measure the effectiveness of the retraining program.
- e. Confirm records of the retraining program, similar to those for the training program for new employees, are kept.
- f. Describe the training program for salaried personnel.
- g. Demonstrate that a "question and answer period" measures the effectiveness of a training session for salaried personnel or provide another means for measuring the effectiveness of the training program.

15. Page I.2-14

- a. Confirm the licensee shall investigate and report any unusual events that could lead to radiation health and safety problems to the General Manager, Fuel Fabrication, or to the Vice President, Development, as appropriate. The NRC shall be notified of such occurrences.
- b. Describe the system for maintaining records relating to health and safety and their retention times. Include plant alterations or additions, abnormal and off-normal occurrences and events associated with radioactivity releases, criticality analyses, audits and inspections, instrument calibration, ALARA findings, employee training and retraining, personnel exposures, routine radiation surveys, and environmental surveys.

16. Page I.3-1, Section 3.0

Confirm operating procedures for the Health Physics and Safety group in Nuclear Fuels Manufacturing and the Health Physics group in the Nuclear Laboratories are provided and followed. Confirm any changes in or new operating procedures for the Health Physics and Safety Group are approved by the Manager, NLS&A, or the General Manager, Fuel Fabrication.

17. Page I.3-1, Section 3.1.1

Confirm each Radiation Work Permit is reviewed for its need every 30 days. and that a mechanism is established to assure that the work for which the RWP had been requested is completed in a satisfactory manner prior to restart of the related operation.

- 18. Pages I.3-1 and I.3-2, Section 3.1.2
 - a. Confirm audits and inspections are performed in accordance with a written plan.
 - b. Confirm the findings of the monthly audits in the Laboratory Operations are documented and copies submitted to operational supervision and to the Vice President, Development.
 - c. Confirm audit and inspection reports include items for correction and the actions taken on items resulting from the previous audit or a prior inspection.
 - d. Confirm a management audit of the Nuclear Laboratory operations is made annually, with no more than 13 months between audits.
 - Confirm the audit is made by one, independent of the Nuclear Laboratories, who meets the minimum qualifications of the Manager, Health Physics.
 - (2) Describe the audit and include the audit requirements.
 - (3) Confirm the management audit report is submitted to the Vice President, Nuclear Power Systems, the Vice President, Nuclear Power Systems Development, and the supervisor whose activity is being audited.
 - e. Confirm a followup inspection is made to determine that action has been taken on items identified for correction.
 - f. Confirm the Nuclear Safety Committee's fuel manufacturing area audit report is submitted to the Vice President, Nuclear Power Systems, and to operational supervision as well as to the Vice President, Nuclear Fuel.
 - g. State your ALARA commitment. Identify your ALARA Committee. Describe its operation and functions as outlined in the Draft Standard Format (Task FP 716-4, October 1980).

19. Page I.3-2, Section 3.2.1

Confirm that protective clothing shall be worn by maintenance personnel as prescribed by Health Physics personnel in the Nuclear Laboratories and by Health Physics and Safety personnel in Nuclear Fuel Manufacturing.

20. Page I.3-3, Section 3.2.2

Confirm no person who is contaminated above background levels shall leave a controlled area without Health Physics and Safety (in Nuclear Fuels Manufacturing) or Health Physics (in Nuclear Laboratories) approval.

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21. Page I.3-4, Section 3.2.3

- a. Confirm the collecting enficiency of the air filtration shall be tested in accordance with ANSI N510-1975, "Testing of Nuclear Air Cleaning System," after each filter change or provide an alternate that provides equal assurance of filter acceptability.
- b. Confirm that the minimum frequency for checking the pressure drop across the filters and the direction of air flow in the working areas shall be in accordance with the following frequencies:
 - (1) Pressure difference across the filter weekly
 - (2) Confirm the monthly audits include a check on the direction of air flow in the working area.
- c. Identify the 40 CFR 190 criteria being followed (see Amendment No.25 in current license).
- d. Identify the areas in the Nuclear Laboratories from which the discharge air is monitored.

22. Page I.3-5, Section 3.2.4

- Identify the minimum number of each type of survey instrument that is available for use.
- b. Confirm the calibration of the survey instruments shall meet the specifications described in Section 1.11 of Regulatory Guide 8.24, "Health Physics Survey During Enriched Uranium-235 Processing and Fuel Fabrication."
- c. Define "major" repair. The instrument should be recalibrated after each repair that affects the accuracy of the measurement.

23. Page I.3-5, Section 3.2.5 and Page I.3-6, Section 3.2.8

Confirm that: (a) The room air in all areas where unclad licensed material is handled, processed, or where operations could result in worker exposure to the intake of quantities of uranium exceeding those specified in 10 CFR 20.103, shall be continuously sampled and analyzed on every shift for radioactivity: (b) Air sampling shall be accomplished using fixedlocation samplers and personnel samplers for basic evaluation of the internal exposure of workers, for supportive measurements, and for special studies; (c) The survey frequencies for the continuous air sampling will be in accordance with Table 1 of Regulatory Guide 8.24 dated October 1979, where applicable or provide the justification for an altern te survey frequency schedule: (d) During the normal operations period, if a single air sampling station indicating the airborne concentration of radioactivity for that area exceeds one MPC level as specified in Table I, Column I of 10 CFR 20, Appendix B, the licensee shall investigate the cause and take the necessary corrective action to prevent its recurrence; and (e) All corrective actions are documented.

In addition, specify the minimum flow rate used in the air sampling. The permanently mounted air sampling equipment normally used to determine concentrations in a worker's breathing zone shall be evaluated for representativeness whenever any licensed process or equipment changes are made. In addition, the location of air samplers shall be checked out at the commencement of operations in an area that has been shut down for more than six months to verify the representativeness of the air sampling.

24. Page I.3-6, Section 3.2.7

Confirm that if the most recent quarterly average of the airborne uranium concentration for any work area exceeds 25% of the respective DAC, the frequency of sampling and the type of bioassay measurements for workers in that work area shall be modified to that given in Table 3 of Regulatory Guide 8.11, "Application of Bioassay for Uranium," June 1974.

25. Page I.3-7, Section 3.2.9.1

Confirm the frequencies for surface contamination survey in all areas shall be in accordance with Annex C, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for ByProduct, Source, or Special Nuclear Material," November 1976.

26. Page 1.5-1, Section 5.1.2

Include in Section 1.0 "Standard Conditions and Special Authorizations," the activities to be authorized in the Nuclear Laboratories.

27. Page I.4-1, Section 4.1.1

Resiste the double contingency policy to conform with ANSI N16.1-1975. The policy, as stated, is less conservative.

28. Page I.4-1, Section 4.1.2

- a. Add the words "which shall be followed" to the end of the first sentence.
- b. Delete the word "necessary" from the second sentence.
- c. Confirm all procedures (not just changes) involving criticality safety controls shall be approved by the Supervisor, Health Physics and Safety, and the Manager, NLS&A, or the Nuclear Licensing Consultant.
- d. Confirm the Supervisor, Health Physics and Safety, maintains records of the review and approval of each posted safe nuclear criticality safety limic.

- 29. Page I.4-2, and I.4-3
 - The storage limits in the laboratory (as stated in Sections 2.2.1, 4.1.7, and 4.2.2) should be consistent.
 - b. Include the audit requirements of the Nuclear Safety Committee.
 - c. Confirm the Supervisor, Health Physics and Safety, maintains a record of the approvals.

30. Page I.4-4, Section 4.2.1

Remove the last sentence on the use of neutron poisons. It is not a condition.

31. Page I.4-4, Section 4.2.2

- a. Provide the criteria to be used to validate the applicability of the specified computer codes to establish the nuclear criticality safety of an operation (see Regulatory Guide 3.41, "Validation of Calculational Methods for Nuclear Criticality Safety").
- b. Provide the margins of safety to be used in applying the results of calculations in establishing safe parameters (for single units and for arrays). Consideration should be given to greater safety factors in establishing safety factors where there are larger uncertainties.
- c. Include the basic assumptions in establishing safe parameters (see examples on pages 13-14 of FP 716-4, "Standard Format and Content for the Health and Safety Sections of Renewal Applications for Uranium Fuel Fabrication Plants," dated October 1980).

32. Page I.4-5, Section 4.2.3

Place this section in the demonstration part of the application.

33. Page I.4-5, Section 4.2.4

Confirm the fraction of critical of 0.3 and 0.4 for mass and geometry limits, respectively, are based on optimum water moderation.

- 34. Page I.4-7
 - a. Confirm the maximum safe mass/unit area is based on 50 percent of the critical water-reflected infinite slab surface density assuming optimum water moderation for minimum critical surface density.
 - b. Confirm the maximum safe geometry densities for two-level arrays are based on minimum critical water-reflected slab thickness at optimum moderation and water reflection.

- c. Provide justification for the surface density for geometry controlled units: NUREG/CR-1615, "Solid Angle and Surface Density as Criticality Parameters," by J. T. Thomas, dated October 1980, indicates arrays of units that are 40 percent of bare critical sphere volume (73.7 percent of bare critical radius) could be made critical at 25 percent of the minimum water-reflected infinite slab thickness.
- 35. Page I.4-8

Provide justification that a 3/8-inch thickness of steel deck provides neutron isolation between two operating levels.

- 36. Page I.4-9, Section 4.2.7
 - a. Provide the basis for nuclear criticality safety for single units and/or arrays in which neutron poisons are used.
 - b. Specify the frequency and method for inspecting the fixed poisons to determine their presence in the design locations and in the quantities required. Include the corrective action to be taken, if necessary.
- 37. Page 1.4-9, Section 4.2.8
 - a. Specify the safety margins to ensure structural integrity of equipment designed offsite that is to be used for SNM materials.
 - b. Identify the person who confirms the structural integrity and include his qualifications.
 - c. Confirm the fire protection system is also used in the laboratories.
 - d. Confirm fire hoses are not used to fight fires in the fuel assembly storage area.
- 38. Page 1.4-10
 - a. Reference the most recent "Criticality Accident Alarm System," ANSI/ANS-8.3-1979 and the corresponding Regulatory Guide 8.12, "Criticality Accident Alarm System" (January 1981).
 - Specify whether your monitoring system meets the requirements of 10 CFR 70.24, paragraph (a)(1) or (a)(2).
 - c. Describe the detector system in the laboratories. Include the method and frequency for its calibration.
- 39. Page I.6-1

Submit an emergency plan by October 9, 1981 that meets the requirements of the NRC Order dated February 11, 1981.

40. Page 1.5-3, Section 5.1.4

Identify the "environment" where liquid wastes are discharged (e.g., the Farmington River).

41. Fage II.2-1, Section 2.2

- a. Briefly describe the emergency power system for both the manufacturing and laboratory facilities. Specify the minimum frequency for testing its operability in Section 4.2.10 of the license conditions section.
- b. Descrit: the criticality alarm system in the laboratory facilities as was done for the manufacturing facility.

42. Page II.2-1, Section 2.1

Identify the principal buildings in which licensed materials are handled by the Development Department. Specify the principal licensed activities in these buildings.

43. 'age II.2-3, Section 2.7

Provide assurance the facilities are constructed and operated consistent with requirements of the applicable fire safety codes.

44. Page II.3-24

Include the resume of the Production Manager.

45. Page II.7-2

Identify and reference the arrays of under-moderated, low-enriched uranium whose ciritical surface densities are less than 50% of the infinite slab thickness for material of like moderation and density.

46. Page II.7-7

Correct the next to last column heading to the common notation for extrapolation length.

47. Page II.7-8, Section 7.1.4

Correct Figure No. to 5.27.

48. Page II.7-8, Section 7.2

Provide the validation of the method of calculations used to evaluate the nuclear criticality safety of homogeneous mixtures of fuel and water.

49. Page II.7-15, Section 7.2.3

1.00

Confirm the most conservative results of the validation of the calculational method of analysis are used in determining the limits of error in establishing the maximum K_{eff} of a system.

50. Page II.8-1, Section 8.0

Confirm Dwg. No. NFM-J-4077 is Figure B-1.

51. Page II.8-2, Section 8.1.2

Incorporate in the license conditions, Chapter 4, the criteria that provide nuclear criticality safety of the virgin powder storage area (e.g., operation of the automatic door). Confirm the presence of an ammonia cracker in a concrete block building 25 feet from Building #17.

52. Page II.8-4, Section 8.1.3

Demonstrate the safety of the Batch Make-Up Hood with different "starting distributions" in KENO to establish the maximum calculated ${\rm k}_{\rm eff}$ for the system.

53. Page II.8-12

1.clude in Chapter 4 of the license conditions section the nuclear criticality safety criteria for the safety of the powder collecting hoppers (e.g., controls for use of appropriate hoppers).

54. Page II.8-34

Include in Chapter 4 of the license conditions section the nuclea: triticality safety criteria for the safety of the pellet drying furnace

55. Page II.8-44

a. (Editorial) Line 10, Add the word "array" after "15 tier infinite."

- b. Include in Chapter 4 of the license conditions section the administrative controls to assure the absence of water in the boxes of the double shelf rod storage racks.
- 56. Page II.8-55
 - Confirm the safe fuel salvage limits are based on license conditions in Chapter 4.
 - b. Include a nuclear criticality safety evaluation for the transport of boxes of fuel rods. Include the applicable criteria in Chapter 4 of the license conditions section.

57. Page II.9-1, Section 9.1

Provide complete identification of the Environmental Impact Information (e.g., full title, document number, date of issue).