

DEC 29 1982

Docket file 70-36  
PDR  
NMSS rf 070-00036  
FCUP rf release  
GHBidinger (2)  
LTyson  
ALSoong  
MHKillenger R  
WTCrow  
Region III

FCUP:GHB  
70-36  
SNM-33

Combustion Engineering, Inc.  
ATTN: Mr. H. E. Eskridge, Supervisor  
Nuclear Licensing, Safety and  
Accountability  
Route 210A  
Hematite, Missouri 63047

Gentlemen:

PRINCIPAL STAFF			
RA		OI	
D/RA		ENF	
A/RA		SP	
DPERP		PAO	
DZPROS		SLO	
DEGTP			
ML			
OL		FILE	✓

We have reviewed your application, dated February 26, 1982, for renewal of NRC License No. SNM-33. To continue our review, we need the information identified in the enclosure to this letter. This information was discussed with Mr. Eskridge and members of my staff during a site visit on December 8-9, 1982. Please provide this information by January 30, 1983.

Sincerely,

Original signed by:  
W. T. Crow

W. T. Crow, Section Leader  
Uranium Process Licensing Section  
Uranium Fuel Licensing Branch  
Division of Fuel Cycle and  
Material Safety, NMSS

Enclosure: Additional Information  
Required

H-23

JAN 3 1983

OFFICE	FCUP GHB	FCUP MS	FCUP LT	FCUP MHK	FCUP WTC		
PERSONNEL	GHBidinger:rad	ALSoong	LTyson	MHKillenger	WTCrow		
DATE	12/25/82	12/23/82	12/23/82	12/23/82	12/27/82		

Request for Supplemental Information  
License Renewal Application  
February 26, 1982

Part I LICENSE CONDITIONS

- 1.4 The forms of 4.1 w/o uranium and the source materials should be revised to exclude metal powders.
- 1.7 Describe the use of source material under this license.
- 2.5 The experience requirements of the Nuclear Criticality Specialist are acceptable. The resume of this individual (Part II) should be revised to reflect such experience.

The individual responsible for implementing the radiation safety program should have a B. S. degree in science and 2 years' work experience in a radiation protection field similar to the work he is assigned to. This section should be revised accordingly.

Please identify the responsibility of the Radiation Specialist. The resume of this individual should be added to Part II, Chapter 2.

- 2.6 The method of determining effectiveness of retraining should be specified.
- 2.7 This section should be revised to require that operating procedures for handling licensed material be reviewed and updated every 2 years.
- 2.8 This section should require that followup actions taken by the Production Superintendent be documented for items identified in the monthly inspections performed by the NLS&A Supervisor.

Regarding the ALARA Committee function, this section should be revised to include:

- a. The qualifications of the committee members (and outside consultants, if any) should be provided.
- b. The committee's responsibility for auditing the effectiveness of the training program, the administrative procedures for review of all new activities or changes in existing activities, and the responsibility for conducting periodic reviews and assessments of occupational radiation exposures (external and internal), airborne concentration of radioactive material releases to unrestricted areas, and other related abnormal events or emergencies should be provided.

- c. An annual audit report should identify:
- i. Any upward trends developing in personnel exposures (external and internal) for identifiable categories of workers or types of operations, or effluent releases. The cause of the upward trend should be investigated and discussed.
  - ii. Exposures and releases which can be lowered in accordance with the ALARA concept.
  - iii. Equipment or operating procedures which are not being properly used and maintained for exposure and effluent control.

This report should include a review of other required audits and inspections performed during the past 12 months and recommendations for any required actions necessary to assure adherence to the ALARA concept in all areas of the radiation safety program. An individual at the management level should be identified as responsible for assuring that recommendations introduced by the committee are implemented. These changes should be reflected in this section.

- 3.1.1 Please describe the approval process for a Special Evaluation Traveler (SET, or Radiation Work Permit).
- 3.2.1 This section should be revised to explicitly require that protective clothing be worn in the contamination areas; that all personnel wash and monitor their hands and other exposed areas of their bodies, and monitor their personal clothing with the alpha monitor when exiting contamination areas; and should not allow an individual whose skin or personal clothing is found to be contaminated above background radiation level to exit a contaminated area without approval of the radiation safety staff.
- 3.2.2 This section should specify the maximum allowable pressure differential before HEPA filters in exhaust systems will be replaced. The pressure differential across the HEPA filter should be checked on a monthly basis.

- 3.2.3 This section should confirm that the radiation detection survey instruments will be calibrated on a routine basis at least every 6 months and after each repair that would affect the accuracy.
- 3.2.4.2 This section should specify the minimum frequency of surface surveys and clean up action levels for all areas in the facility and should meet the limits stated in Tables 1 and 2 of Regulatory Guide 8.24.
- 3.2.4.4 This section should contain the following additional specifications. Deviation from the indicated ones should be justified.
- i. Confirm that the room air in all areas where unclad licensed material is processed and where operations could result in worker exposure to the intake of quantities of radioactive material exceeding those specified in 10 CFR 20.103, shall be regularly sampled and analyzed for airborne concentration of radioactivity. The survey frequency for the continuous air sampling of workers' breathing zone shall be in accordance with Table 1 of Regulatory Guide 8.24 dated October 1979, where applicable.
  - ii. If a single air sampling reading for workers' breathing zone indicates the airborne concentration of radioactivity for that area exceeds  $MPC_{air}$  specified in Table 1, Column 1 of 10 CFR 20, Appendix B, an investigation of the cause shall be made and documented.
  - iii. If fixed air sampling equipment is used to determine concentration in a worker's breathing zone, the fixed air sampling head shall be reexamined for its representativeness whenever any licensed process or equipment changes are made.
  - iv. The airborne concentration of radioactivity of the room air and breathing zone shall be assessed at once after each specified sampling frequency to quickly identify any unexpected concentration level of radioactive material in each area.
- 3.2.4.5 Please specify the frequency for reading the personnel dosimeter and the action level(s) of personnel exposure above which an action will be taken to prevent the total occupational dose from exceeding the standard specified in 10 CFR 20.101. Include the action to be taken.
- 4.1.2 Criticality reviews and approvals should be required for final design as well as installation or modification of process equipment.

- 4.2.3 For validated computer calculations, the allowable  $K_{eff} + 2$  sigma + bias may not exceed 0.95. The limit for  $K_{eff}$  should be revised accordingly. The paragraph on "basic assumptions used in establishing safe parameters" should be revised to provide "criteria used in establishing safe parameters...." Items a, b, and c should be rewritten to provide the criteria. Item a should require "evaluation of the possibility..." and prevention of accumulation by design modification, administrative controls, etc. Item b should provide criteria for excluding moderator materials. Item c should provide criteria for establishing the "maximum credible" mist density.
- 4.2.5 The last sentence on I.4-7 limits non-co-planar slabs to 12-inch vertical separation and 6-inch horizontal spacing. Should these be expressed as maximum and minimum separations, respectively? The precise spacing may not be possible in a production plant.
- 4.2.6 Criteria for spacing "moderation controlled SIUs" are provided for the solid angle method. However, no criteria are provided which will be used to establish such a unit. Criteria for moderation controlled units must be provided or such units must be established by license amendment.
- 4.2.8 In this section, a commitment is made to consider the effects of evaporation and precipitation on concentration controlled units. The section should provide criteria for evaluating and/or limiting such effects. Are all units, except the Raschig ring poisoned units, limited by mass control? This section should be rewritten to clarify the intent of the criteria. The Raschig ring standard reference should be N16.4-1979.
- 5.1.2 and 5.1.3 The lower limits of detection (LLD) for analysis for airborne concentration of radioactivity in the facility, and liquid and airborne effluents release to unrestricted areas from the facility should not be more than 10% of the concentration limits listed in Table I and Table II, respectively, of Appendix B to 10 CFR Part 20. LLD is defined in Regulatory Guide 4.16, dated March 1978.
- 5.1.4 For any waste, including the contaminated equipment retained onsite, describe the frequency of radiation surveys and the inspection of the stored waste package.

- 5.2 The Environmental Monitoring Table should be replaced by Table 3.3 and Figure 3.8 in the Environmental Assessment prepared by the NRC Division of Fuel Cycle and Material Safety, dated November 1982. This change will serve to establish collection and analysis frequencies and to identify sampling locations.
- 8.0 This section should be updated to reference the approved Radiological Contingency Plan.

## Part II SAFETY DEMONSTRATION

- 2.3 Because the accumulation of hydrogen in the Oxide Building is a possibility, the need for a hydrogen detection system should be evaluated. Automatic operation of the exhaust blower should be considered in the event of an alarm as well as process shutdown.
- 2.4.1 We are unable to determine the disposition of all liquid wastes in this section or in referenced Chapter II.8.0. The disposition of all process liquids should be described.
- 2.4.2 The detection limit for radioactivity for the spent limestone should be specified. Plans for disposal of contaminated limestone should be described.
- 5.1 The percent of personnel in annual dose range table for 1981 is incorrect.
- 5.2 Please provide an analysis of occupational exposures (external and internal) and quarterly average airborne concentration of radioactivity at each work area in the facility, covering at least the past 2 years of plant operations, for each type of operation performed (such as  $UF_6$  conversion process) in an appendix to this section.

The analysis should identify the sources and locations where most exposures occurred, as related to job categories and work activities. Any trends in exposures or airborne concentration of radioactivity that can be identified should be discussed. Abnormal occurrences should be reviewed and categorized, considering such aspects as frequency, operation being performed, and the magnitude of the resulting exposure. The analysis of internal exposures should consider air sampling data as well as bioassay data (including in vivo lung counting). The analysis should conclude with a description of any steps or measures planned or taken to reduce employee exposure and airborne level, and the effectiveness of these measures.

Please provide specific example(s) regarding what changes have been made to equipment and procedures to improve containment and to reduce airborne exposure in the facility. Point out the results of these improvements.

- 7.4 Effects of Interunit Moderation, is provided in an apparent attempt to show that interspersal moderation (mist) has no effect on array reactivity. We attempted to confirm your calculations using Keno and 27GROUPNDF4 cross-sections in scale. Our K-effective values were significantly lower but also showed an increase in reactivity due to interspersed moderator. It appears that the use of two group cross-section sets are not appropriate for this evaluation. You should provide validation of your calculations for arrays of cylinders with and without interunit moderation. Alternately, we recommend use of KENO for this type of calculation using low density materials between fissile units.
- 7.5 It appears that slabs will be limited so that the major face of any slab will be parallel to the floor. This requirement should be reflected as a license condition in Part I.
- 7.6 The derivation for safe arrays ended with a  $k_e$  value of 0.935. This derivation failed to consider the sigma value<sup>e</sup> of 0.007 or the 1% bias. The consideration of 2-sigma (0.014) + bias (.01) yields a  $k_e$  in excess of the established limit in Part I. This section should be revised to demonstrate proper treatment of uncertainty and bias in keno calculations. Figure II.7-3 makes reference to Table 9-4. The correct reference should be provided.
- 7.7 This section apparently is designed to show that stacked arrays satisfy surface density criteria. Without the Keno results, we are unable to reach the same or any other conclusion. The section should be expanded to support the conclusion. The limit of five units in a vertical column should be in Part I as a proposed license condition.
- 8.1.1 Storage of  $UF_6$  cylinders should be evaluated for breakage of valves during onsite transport or storage onsite. If the consequences are unacceptable, valve covers should be used and a proposed license condition in Part I should require use of valve covers.
- 8.1.2 This section should demonstrate safety of the steam chamber in the event that a  $UF_6$  release occurs in the chamber.
- 8.1.6 Reference to Section II.9.2 does not appear to be appropriate. Please provide the correct reference.
- 8.2.1 Reference to Appendix A is made in this section. Please provide Appendix A.
- 8.7.4 and  
8.7.6 ANSI Standard N16.4-1971 has been replaced by N16.4-1979. (See comment on 4.2.8, Part I)