

UNITED NUCLEAR
CORPORATION

023

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777-5361

October 19, 1964

Mr. Harold L. Price
Director of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

- References:
- (1) Your letter to Mr. John Lindberg, dated 10/12/64
 - (2) Letter from Mr. Eber R. Price to Mr. John Lindberg, dated 10/12/64, SLR:GWK 70-820
 - (3) Letter from Mr. Donald A. Nussbaumer to Mr. John Lindberg, dated 10/12/64, DML:RDS 70-820

Dear Mr. Price:

References (1) and (2) deal with certain conditions which existed in our Fuels Recovery Plant, Wood River Junction, Rhode Island as possibly not being in full compliance with conditions of our AEC License No. SNM-777 and the requirements of AEC's "Standards for Protection Against Radiation" Part 20, Title 10, Code of Federal Regulations. This reply is transmitted pursuant to Section 2.201 of AEC's "Rules of Practice" Part 2, Title 10, Code of Federal Regulations. In this reply we refer to documents previously submitted and already in your hands. At this time we are not replying to Reference (3) which deals with our September 15, 1964 request for an amendment to our license; we plan to reply to that letter during the week of October 19, 1964.

The following comments are provided in the same order as the items listed in Reference (2):

Item 1 Tank 1-D-11 has been removed from the plant and equipment to perform this operation in geometrically-safe equipment is now being installed. Upon completion of the installation, a request for an amendment to our license will be made. We would desire approval for this modification by December 1, 1964.

Item 2 The system for assuring that the personnel responsible for Nuclear Safety will authorize all changes in equipment and procedures is generally described in Sections

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Mr. Harold L. Price
Director of Regulation

-2-

October 19, 1964

Item 2 (Continued)

207.1.4 and 207.2.2 of our September 15, 1964 submittal. In addition, a significant upgrading of management control has been effected by an improved system of document issuance and handling. This system provides that only those procedures authorized by the independent Process Engineering function and approved by the Nuclear Safety and Health Physics functions will be used in the plant. A system for controlled and authorized engineering changes to the process has also been instituted. Finally the independent audit function has been strengthened by the addition of the on-site Process Engineer who is responsible for Process and Nuclear Safety auditing, supported also by a bi-monthly Nuclear Safety audit under the responsibility of the Director of Licensing. These changes have already been effected.

Item 3 As referred to in Item 1, future processing of TCE solutions containing uranium will be done in geometrically-safe equipment yet to be installed. AEC approval of that operation (equipment and process) is requested by December 1, 1964.

Item 4 A systematic auditing system has now been instituted which requires that the Director of Licensing or his designated Nuclear Safety Engineer audit the Fuels Recovery Plant at least every two (2) months. This will be in addition to the continuing on-site auditing by the Process Engineer who is independent of plant operating personnel.

Item 5 }
Item 6 } The Emergency Control Plan has been revised and was part of
Item 7 } the September 15, 1964 submittal. Based on AEC comments in Reference (3), however, we will revise further that plan including emphasis on criteria for re-entry decision and distinguishing between a planned re-entry and emergency rescue operations. In particular, additional personnel monitoring equipment has been provided on-site.

Item 8 Surveys during the period April to July 1964 were performed by UNC in accordance with the approved Health Physics manual which comprised part of the license. A review of the survey data indicates that samples were in fact taken when the plant was operational and that no material in excess of that permitted in 10-CFR-20 was released to unrestricted areas during that period. To supplement the airborne discharge survey, samples in the unrestricted areas (down-wind) were taken on a weekly basis and all results were negative. Additional action will consist of a review and upgrading of the stack sampling probes. We anticipate that revision would be completed by January 1, 1965.

Mr. Harold L. Price
Director of Regulation

-3-

October 19, 1964

- Item 9 A report showing the results of airborne radioactivity surveys and concentrations of radioactivity in the liquid waste effluent will be submitted under separate cover on or before November 1, 1964. The results had been accumulated previously but the report had not been completed. The revised Health Physics manual submitted as a portion of our September 15, 1964 request for license amendment includes a statement of a proposed future survey program. A description of that program will also be incorporated in the report which we will submit on or before November 1, 1964.
- Item 10 Procedures have been established and personnel instructed regarding testing and calibration of the nuclear alarm and calibration of survey meters. A gamma source will be obtained for testing of the alarm system and a calibration source will be made available for calibration of the meters and the alarm. We will be in compliance by week of October 19, 1964 and expect to have our own calibration source, which will be licensed if required, by January 1, 1965.
- Item 11 Disposal of contaminated waste solutions by methods other than those outlined in Section 300, Paragraph 303.4.1 will not be permitted. All plant personnel have been informed of this requirement. For liquids (including TCE) that cannot be processed through the waste disposal system, equipment will be installed and the license amended by December 1, 1964.
- Item 12 The roof contamination resulting from the July 20, 1964 spill was cleaned up that day as regards gross-contamination and recovery of uranium values. The plan to fix the remainder by applying a new section of roof was postponed by the inclement weather preceding the July 24, 1964, accident. Corrective action has now been completed and full compliance has been achieved.
- Item 13 Standard signs have been ordered and posting will be completed by November 1, 1964.
- Item 14 This item has been corrected as of September 2, 1964 as noted in Reference (2).

Mr: Harold L. Price
Director of Regulation

-4-

October 19, 1964

In addition to the matters commented on above, you requested our response to several other matters connected with operational safety.

- A. (i) (ii) (iii) Special personnel training and improved management controls have been instituted to insure adequate control over the identification and movement of special nuclear material in the plant. All containers of special nuclear materials have been tagged with permanent tags and new labels have been designed and procured for identification of the contents. In Item 2 of this letter we briefly described the new management system which assures that operators follow approved procedures and which provides for auditing by an independent Process Engineering function.
- B. (i) (ii) (iii) The Health Physics Manual and the Emergency Control Plan have been revised and submitted (September 15, 1964) as part of the requested amendment of our license. Specifically, radiation survey instruments capable of evaluating radiation levels up to 500R per hour have been procured. Additional personnel monitoring equipment and self-contained breathing apparatus have been obtained and are now available for use in an emergency situation. Effective means for the determination of neutron doses or the presence of neutrons are being investigated; a decision as to the optimum method for neutron detection will be made on or before January 1, 1965.
- C. Counting equipment required to provide prompt results of analyses of smears, airborne samples and liquid effluent samples has been purchased and installed.
- D.&E. The two (2) items mentioned were promptly corrected. The personnel training program and the instituting of a new procedure control and audit system will prevent future recurrence.

Very truly yours,



W. L. Allison
Acting General Manager

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Supplemental
entry



Aerial Photo - Wood River Jet.
Fuels Recovery Plant

ATTACHMENT I

United Nuclear Corporation
Scrap Plant Facilities
Wood River Junction
Rhode Island

Docket No. 70-820

General Information Manual

1. Section 207.2.2, page 7 of 10 - In the third paragraph of this Section, you indicated that the words ". . . before introducing enriched uranium and . . ." would be deleted.
2. Section 207.3, page 10 of 10 - What will be the maximum quantity of special nuclear material on hand at any one time.
3. Section 800, page 3 of 4 - More detailed description of the emergency power system. Does the emergency generator start up automatically or must it be started manually. If the generator does not start automatically, please confirm that the plant will be evacuated until power is restored to the monitor alarm system. Also, please describe the procedures and frequency for testing the emergency power system.
4. Section 1004 - An evaluation of the probability and effects of the release of radiation or radioactive materials as a result of accidents such as fire, explosion or nuclear incident.

Health Physics Manual

5. Section VIII, page 3 of 3 - (a) In this license application you have requested authorization to process source material as well as special nuclear material. Since this would include thorium, as well as uranium, the MPC's for air and water specified in subsection B and C of this page should be determined in accordance with the appropriate notes in Appendix B, for mixtures of radionuclides. (b) In subsection E on this page you specify that personnel exposure to external radiation will be limited to 3 rem per quarter. This exposure is permissible when the conditions specified in Sections 20.101 and 20.102 of 10 CFR 20 are met.
6. Section IX, page 1 of 2 - (a) In subsections A and B of this page, you state that scheduling of routine sampling is given in the Appendix. In the Appendix you state that the initial frequency for air and smear sampling in non-process areas will be monthly in some places and weekly in others. Further, you state that air and smear sampling in all process areas (stations) will be obtained once per week when operations are

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137
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performed. Please describe in more detail your procedures for evaluating exposure of individuals to concentrations of radioactivity in process and non-process areas including the type of air samples that will be taken - breathing zone or general air, and procedures for controlling personnel exposure in the event that air concentrations are above the applicable MPC. (b) Method and frequency of calibrating air samplers. (c) In subsection c of this page, you state that the radioactivity of the liquid waste effluent is measured at the lagoon discharge on a continuous basis. Please describe in more detail the equipment for sampling and its reliability.

- 7. Section IX, page 2 of 2 - More detailed description of your procedures for determining the concentrations of airborne radioactivity released from the exhaust stacks including type equipment, frequency and location of such surveys.
- 8. Section XI, page 1 of 2 - It is stated that full face air line masks and "Dust Foe" respirators may be used under certain conditions; please note that no allowance shall be made for the use of respiratory protective equipment except as specifically authorized pursuant to Section 20.103(c), 10 CFR 20. This does not mean that such protective equipment may not be used to reduce further below the allowable concentrations specified in Appendix B, 10 CFR 20.

9. Section XIII, page 1 of 1 - What is the fire resistance rating of the absolute filters to be used in the hoods and glove boxes. *Not fire resistant - Based on recovery of aluminum from filters.*

10. It was noted on Drawing Y101 that a septic tank and leaching bed were to be installed. Will there be any radioactive materials discharged to this tank or leaching.

11. More detailed description of the liquid waste disposal lagoon including the following: (a) Is the polyethylene liner one solid sheet or is it several over-lapping sheets. If there is over-lapping, how are the sheets joined; (b) At what frequency is the polyethylene liner inspected for voids; and (c) Hydrological and geological description of the land where the lagoon is situated and your evaluation of the possibility of radioactive material reaching subterranean waters.

sample and water ... annually]

Emergency Control Plan

12. Page 10 - Emergency equipment storage location. Type of survey instruments and air sampling equipment. Frequency of calibrating such equipment.

13. Page 15 - More detailed description of post nuclear incident procedures including the following: (a) Method of accounting for all personnel; and (b) Procedures for collecting and monitoring indium foils on personnel film badges.

100ft. stack exits
Northy Oak Ridge
Don't operate in assembly no detector

14. The term "limited safe . . ." is used throughout the license application. Please define what is meant by this terminology.
15. The safe volume, $k = 0.71$, applies to 4.8 liter containers only. This has an allowable solid angle of 1.9 steradians.
16. Please confirm that special nuclear material not held under this license will be isolated from material under this license in accordance with Section III-A of the renewal application guide; or no distinction shall be made between this licensed material and other special nuclear material (not isolated), and the material shall be received, possessed, stored, and shipped as provided for in this license.
17. *Pattern
on Oak Ridge
design* In order to assure nuclear safety of the entrainment separator (Section 304.2.1) under accident conditions which could cause them to be flooded, it would appear necessary that the entire entrainment separator be of safe geometry or be filled with Raschig rings or other suitable fixed neutron poisons.
18. The nuclear safety analysis of the evaporator should include the expansion joint in case of failure of the tube bundle.
19. A nuclear safety analysis should be submitted of all lines and vessels employed to collect steam condensate from the heat exchanger of the evaporator which will demonstrate that they will be safe from accidental criticality in case of a possible tube bundle failure.
20. Since uranium salts may form within the condenser from entrained uranium in the off gas and because of possible flooding of the evaporator, we request a nuclear safety analysis of the condenser (1-E-1); related piping and the vessel shown at position F-1.5 on Figure A-903. Also, it appears possible from Figure A-903 to accidentally valve-off all venting to evaporator 1-E-2 creating a hazardous condition during operation of the evaporator.
21. It appears that Section 304.2.1(b) should be corrected referring to nominal reflection, not minimal. Also, your reference to 1 1/2" of steel applies to metal systems and, therefore, should be corrected to read 1" steel corresponding to solutions.
22. A nuclear safety analysis of all overflow bottles used in the facility, e.g., from Filtrate tanks, 1-D-24, and OK Liquor tanks, 1-D-10.

23. A nuclear safety analysis which takes into account all pumps used to transfer solutions containing or potentially containing special nuclear material.
24. In Section 304.10, it is stated that 10 kg uranium is "limited safe" at $H/U \leq 4$. From Figure 1, TID-7016, Rev. 1, 10 kg uranium (93% U-235) is safe at an H/U not exceeding 2.
25. Further information relating to the responsibilities of the plant superintendent regarding nuclear safety, including the method of training and issuing instructions to operators and conduct of internal inspection audits to assure that approved procedures are followed. Administrative channels of communication with Supervisor, Nuclear Safety/Health Physics, who evidently will be located off-site.