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December 16, 1964

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UNITED NUCLEAR CORPORATION, FUELS RECOVERY FACILITY, WOOD RIVER JUNCTION, RHODE ISLAND, LICENSE NO. SNM-777

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Attached is the inspection report for the December 14, 1964 visit to the Fuels Recovery Facility at Wood River Junction, Rhode Island. Operations were resumed at 2:30 p.m. on December 14, 1964, for the first time since July 24, 1964. Previously prepared plans and procedures for the start up were being carefully followed and management controls were judged to be adequate.

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U. S. ATOMIC ENERGY COMMISSION
Region I
Division of Compliance

TITLE: UNITED NUCLEAR CORPORATION
Fuels Recovery Facility
Wood River Junction, Rhode Island
License No.: SNM-777

DATE: 16 DEC 1964

Date of Visit: December 14, 1964

BY: Willie G. Browne, Inspection Specialist (Criticality)

SUMMARY

The Fuels Recovery Plant at Wood River Junction, Rhode Island actually resumed operations at 2:30 p.m. on Monday, December 12, 1964. The required four signature approvals on "rework route cards" and "rework material notices" for the routine additions of ammonium diuranate (ADU) filtrates to the 1-D-24 tank, were delivered to the plant about 11:00 a.m. on December 12, 1964. This allowed the plant to proceed with the ADU precipitations.

The document listing all United Nuclear's commitments on plant start up and the corresponding actions taken concerning these commitments, has been completed in rough draft form and will be issued on Wednesday, December 16, 1964. All items in the document that should have been completed before start up, have been done.

Modifications to the extraction column system have been made which allow the use of AMSCO as a product stream scrub in place of the Trichloroethane (TCE) formerly used. TCE will not be used in the Fuels Recovery Plant process again.

DETAILS

I. Scope of Visit

Start up operations for the Fuels Recovery Plant had been delayed because some of the procedures had not been approved for handling the "out of process equipment" ADU filtrates. It was estimated that these approvals and other details of the operating plan would be completed by December 14, 1964, so an inspection was scheduled for that date, to observe the start up operations.

Persons Contacted:

Stan Skowronek, Go-No-Go Committee Representative at the Plant Site

R. A. Holthaus, Plant Superintendent

Dale Chapman, Supervisor

Clifford Smith, Supervisor

William Pearson, Supervisor

Elmer Barton, Health Physicist

Russell Smith, Process Engineer

II. Results of Visit

A. Status

The plant was physically ready to start at 8:00 a.m. on Monday, December 14, 1964, but the approved "rework route cards" and "rework material notices" had not been delivered to the plant site. Mr. Stan Skowronek brought the approved forms with him from New Haven at 11:00 a.m. on December 14, 1964. With all necessary approvals on site, the plant could start operations and the first work done was to start up the evaporator and concentrate OK liquor from the 1-D-10C tank. Two samples were then taken as controls on the titanium contamination problem.

At 2:30 p.m. ADU precipitations were finally started in the 1-D-19 precipitators and the plant actually resumed operations for the first time since July 24, 1964. After all of the concentrated OK liquor in the 1-D-10B tank has

been converted to ADU precipitate, the contents of the 1-D-16 tank will probably be processed through to ADU precipitate. After the 1-D-10B tank is empty, the 1-D-10A tank contents can be sent to the evaporator, concentrated and then stored in the 1-D-10B tank. When the 1-D-10A tank is empty, it will be cleaned and flushed to remove any traces of titanium contamination left in the 1-D-10A storage tank.

The extraction columns will be started the latter part of the week and should be running on 12/21/64. Feed from the 1-D-9 tanks will be processed through the columns, the evaporator, and the precipitators. Samples will be taken for titanium determinations.

B. Observations

At the time of the inspection the following items were observed:

(1) The extraction column system has been modified so that product solution from the 1-C-8 column now enters the top of the 1-C-10 column instead of entering the bottom of the column. The 1-C-10 column (formerly the TCE column) now contains AMSCO solvent (lighter than water) for scrubbing out the trace quantities of organic in the product stream. This change eliminates the use of the TCE in the process at the Fuels Recovery Plant.

(2) The document that Stan Skowronek is preparing, which lists the commitments that the United Nuclear Corporation has made concerning the Fuels Recovery Plant start up (both to the AEC and within UNC), has been completed in rough draft form. The document is about 35 pages long and will be issued on December 16, 1964. Items 1 through 61 of the commitments and items 1 through 33 of the internal suggestions were reviewed by the AEC inspector. All commitments listed in the document, which are applicable to the plant start up, were either completed, or are being handled in a satisfactory manner.

(3) Four approved "remark route cards" were delivered to the Plant by Stan Skowronek about 11:00 a.m. on December 14, 1964. The four cards are concerned with the following activities:

(a) The return of raffinate samples to the extraction column.
(b) The return of organic samples to the extraction column.
(c) The addition of filtrates from the ADU precipitation to the 1-D-24B tank.
(d) The processing of impure ADU to UO_2.

(4) After concentrating the OK liquor from the 1-D-10C tank (experimental program material), two samples were taken. One sample will be precipitated in the laboratory and converted to UO_2. The other sample will be stored as a reference sample, while the experimental program material is being converted to UO_2 in the process equipment. These samples will be used as a basis for determining the amount of titanium picked up by the uranium while it goes through the process equipment to final product form.

(5) An analysis of waste water in the 1-D-14A tank on 11/19/64, indicated the presence of beta-gamma activity, but it is possible that the analysis was in error. During the past week, half of the waste water in the 1-D-14A tank was transferred to the 1-D-14B tank. Both tanks were then filled with well water, lime was added to a pH of 10. The tank was agitated, allowed to settle overnight, and then the supernate was sampled. No beta-gamma activity was detected in the supernate from either tank, so the contents of each tank was discharged to the lagoon. To be sure that no beta-gamma activity is actually present in the lagoon water, the lagoon water will be sampled and an analysis will be made by an independent laboratory, before the lagoon water is discharged to the river.

(6) Two truck loads of HERVA shipping containers, from Westinghouse at Cheswick, Pennsylvania arrived at the Fuels Recovery Plant on 12/14/64. One truck load contained forty-two 55 gallon drums and it arrived at 9:00 a.m. The second truck load of 43 drums arrived at 9:45 a.m. These shipments were stored as received and in compliance with the Fuels Recovery Plant license.

The Plant Superintendent was then informed that an additional five shipments totalling almost 400 drums, were on their way to the Fuels Recovery Plant at Wood River Junction. A survey of the storage area available revealed that there was no room for storing all of these drums in the manner stipulated by the license. Mr. Holthaus contacted the Nuclear Safety Manager, at New Haven, Connecticut, Frank Cronin, and informed him of the problem. Mr. Cronin agreed to call the Division of Materials Licensing to see if a 12' distance between shipments could be used rather than the orthographic projection method stipulated in 501.n. of the license.

Since the NERVA shipping container is really a 55 gallon drum that acts like a bird cage and has a 5" pipe in the center that contains the NERVA product, Mr. Cronin felt that the use of a 12' spacing between shipments should be reasonable. The orthographic projection rule was to apply to solutions, but is unduly restrictive for the dry uranium carbide solids in the NERVA shipping containers.

Mr. Boltheus realized that he had the alternative of sending the shipments back to the customer, if storage arrangements would not accommodate the shipment.