

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 70-820/80-08

Docket No. 79-820

License No. SNM-777 Priority 1 Category UR

Licensee: United Nuclear Corporation

UNC Recovery Systems

Wood River Junction, Rhode Island 02894

Facility Name: Fuel Recovery Operation

Inspection at: Wood River Junction, Rhode Island

Inspection conducted: June 2-5, 1980

Inspectors: W. W. Kinney
W. W. Kinney, Project Inspector

6/27/80
date signed

date signed

date signed

Approved by: H. W. Crocker
H. W. Crocker, Chief, Fuel Facility
Project Section, FF&MS Branch

6/30/80
date signed

Inspection Summary:

Inspection on June 2-5, 1980 (Report No. 70-820/80-08)

Areas Inspected: Routine, unannounced inspection by a region-based inspector of: licensee action on previous inspection findings; scope of operations; organization; facility changes and modifications; training; operations; nuclear criticality safety; and internal reviews and audits. The inspection involved 28 inspector-hours onsite by one NRC region-based inspector.

Results: Of the seven areas inspected, no items of noncompliance or deviations were identified in six areas. One apparent item of noncompliance was identified in nuclear criticality safety (deficiency-Failure to have proper nuclear criticality safety limit posted in warehouse for storage of fissile material in inner containers from UNC-2600 shipping containers, Paragraph 8a).

DETAILS

1. Persons Contacted

*R. J. Gregg, Quality Assurance Manager

*K. A. Helgeson, Nuclear and Industrial Safety Manager

The inspector also interviewed the compliance manager, two production supervisors, an acting quality assurance engineer, the analytical chemist, and three operators during the course of the inspection.

*denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Infraction (70-820/79-07-01): This item of noncompliance involved licensee failure to: define a contamination control area from a clean area; require that protective clothing be worn in a contamination control area; and provide a sink and alpha survey meter or hand monitor at the exit from a contamination control area. The inspector verified that the licensee defined the contamination control area by painting a yellow line on the loading dock. Personnel were instructed on requirement to wear protective clothing in contamination control areas and to change out of them when leaving the control area. The licensee has an alpha meter at the exit from the warehouse-dock area and there is a sink close by the exit.

(Closed) Infraction (70-820/79-16-01): This item of noncompliance involved the licensee's failure to have the written procedures for packaging product address the closure of the inner containers of the shipping containers. The inspector verified that the licensee prepared an appropriate "Container Specification and Inspection Report" form for each of the shipping containers used for the packaging of radioactive material for transport. Each of these report forms list the steps required to close the inner containers of the shipping containers. Operators initial and date the forms as each step is satisfactorily completed.

(Closed) Deficiency (70-820/79-16-02): This item of noncompliance concerned the licensee's failure to have records showing that the closure of inner containers were closed properly with the use of defect-free gaskets or sealing lute. The previously mentioned "Container Specification and Inspection Report" forms have statements that the required gasket was free from defects and the gasket or sealing lute was used to close the inner containers of the shipping container. The inspector verified that the licensee maintains copies of these reports in the files concerning shipments of radioactive material.

(Closed) Deficiency (70-820/79-16-03): This item of noncompliance concerned the fact that the borosilicate glass raschig rings in I-D-24A filtrate tank did not have a boron content in the range of 11.2 to 13.8 weight percent B_2O_3 . The inspector verified that the licensee requested and received an amendment, Amendment No. 11, to their license which provided that vessels containing their original complement of rings of type E-1 glass (18.5% B_2O_3) are acceptable for use until such time as the rings require replacement for any reason.

(Closed) Infraction (70-820/79-17-01): This item of compliance concerned the amount of fissile material at a work station exceeded the posted criticality safety limit. Two packages containing a total of 572 grams of U-235 were located at a desk and the posted limit was 350 grams U-235. Material in a 4 liter bottle was also allowed. The inspector verified that the licensee required that scrap being removed from a shipping container either be placed in a 4 liter bottle or be subdivided to meet the mass limit. The licensee also took disciplinary action with the individuals involved.

3. Scope of Operations

In a letter dated April 29, 1980, to the Division of Fuel Cycle and Material Safety, the licensee declared its decision to terminate recovery of highly enriched uranium. The licensee stated they would finish the recovery efforts by about July 1980 and would then begin site decontamination efforts.

The licensee is attempting to start the processing of the waste in the lagoons to satisfy Condition No. 26 of their license. The processing of the lagoon waste will be done concurrently with the decontamination of the recovery facilities.

The licensee has scheduled the completion of all processing and decontamination work by April 1, 1981.

4. Organization

The organization for UNC Recovery Systems is shown below.

President - C. Bowers
 General Manager - C. Bowers
 Operations Manager - C. Bowers
 Production Supervisors - J. Aiello
 P. Desaulles
 Maintenance and Plant Services - R. Weber
 Quality Assurance Manager - R. Gregg
 Nuclear and Industrial Safety Manager - K. Helgeson
 Health Physics Technicians - T. Itteilag
 N. Vuono
 Nuclear Criticality Safety Consultant - J. Neumann
 Nuclear Materials Control Manager - J. L'Heureux
 Quality Assurance Engineer - J. Wakefield (part-time)
 Plant Chemist - T. Ashley
 Security Manager - R. Gigliotti
 Compliance Manager - D. Schultz
 Compliance Engineer - J. Wakefield (part-time)
 Finance and Administration Manager - J. McCusker
 Purchasing Manager - R. Smith
 Marketing Manager - S. Pennacchini

In the last few months the incumbents of four positions important to the safe operation of the facilities have left UNC Recovery Systems. The positions involved are:

- Operations Manager
- Nuclear and Industrial Safety Manager
- Plant Chemist
- Quality Assurance Engineer

The licensee has not hired other persons to fill these positions. The duties of these positions have been assumed by other members of the UNC Recovery Systems management. The duties of the Operations Manager have been assumed by the President and General Manager. The Nuclear and Industrial Safety Manager position was filled by the former Health Physics Specialist. The Health Physics Specialist position was not filled. The Plant Chemist position was filled by a former Quality Assurance Engineer. The other Quality Assurance Engineer position was made vacant by the incumbent leaving. The Quality Assurance Engineer positions were assumed by the Compliance Engineer along with his other duties.

As indicated in the previous section of this report, the licensee is attempting to initiate the processing of the lagoon waste. The licensee plans on hiring new temporary employees to perform this processing. The supervisor for this processing will be provided from the current management force.

The attrition of the management force; the initiation of the new lagoon waste continuous processing operations with new personnel; and the effects of termination of recovery operations and decommissioning of the facilities give rise to concerns about the maintenance of an adequate organization by the licensee. The licensee indicated that they have made specific arrangements to maintain an adequately staffed organization at the facility. In view of the facts that: the activities in the future will be nonroutine in nature; the activities will require careful planning and execution from a safety standpoint; and the staff is presently minimal, the licensee will have to be diligent in assuring that they do maintain an adequately staffed organization.

No items of noncompliance or deviations were identified.

5. Facility Changes and Modifications

As discussed previously, the licensee has finished the installation of the lagoon waste processing equipment and at the time of the inspection was attempting to startup the process. Also the licensee has initiated the decommissioning activities by removing equipment no longer in use in the recovery operations.

No items of noncompliance or deviations were identified.

a. Lagoon Waste Processing

The licensee initiated trial runs of the lagoon sludge filtration and drying equipment on May 19, 1980. At the time of this inspection, June 2-5, 1980, the licensee was attempting to establish the proper processing parameters for the operation of the filter. The licensee stated that they desired to have the equipment operational and operating on a three-shift-per-day five-days-per-week-basis starting June 16, 1980. They had to accomplish the following before that time.

- The licensee must hire and train at least 15 new temporary employees to complete the compliment of 18 operators required to operate the process. There would be three shifts each having six operators on a shift.
- The licensee must appoint a shift supervisor for each of the three shifts. Some training of the supervisor in the process and equipment could be required depending on the supervisor's familiarity with the process and the equipment.
- The licensee must prepare, review, and approve the procedures for operating the processes and equipment associated with the filtering, drying, and packaging of the dried sludge.

- The licensee must balance the ventilation system for the dryer and dried sludge handling equipment to assure that the air flow is from the room into the process equipment. At the time of the inspection the differential pressure across the HEPA filters in the ventilation system was about five inches of water. This differential pressure value indicates that the filters are close to the end of their useful life, and gases may not be able to pass through them at the rate necessary to maintain the pressure of the gases in the equipment negative to room air pressure.

The inspector discussed these above items and concerns with the licensee during the course of the inspection.

b. Decommissioning

The licensee has prepared a list of pieces of equipment to be decommissioned. There are approximately 170 pieces of equipment listed. Thus far the licensee has cleaned, removed, and disposed of about 30 pieces. These pieces were removed during April and May 1980. According to licensee records, 28 boxes of waste have been shipped to burial which contained these pieces of equipment along with other waste materials. These boxes had a total volume of 3,482 cubic feet. The boxes contained only 5.6 grams of U-235, according to the data listed on the Barnwell Waste Management Facility Radioactive Shipment Record Forms.

The measurement of the amount of U-235 in the material shipped to burial is of concern to the NRC. Means of measuring the amount of residual U-235 left on equipment sent to burial are being considered by the licensee.

6. Training

The inspector reviewed the training records. Since September 1, 1979, the training given by the Manager of Nuclear and Industrial Safety has been to guard force personnel. Training has concerned radiological health including use of beta/gamma survey instruments.

The records of the monthly safety meetings held by supervisors with their operators were reviewed. The favorite subject was contamination control with this subject being the main topic in October 1979, December 1979, and April 1980. The bioassay program, airborne contamination control, respiratory protection, health physics terms, and nuclear criticality safety were other topics discussed.

No items of noncompliance or deviations were identified.

7. Review of Operations

a. Facility Examination

An inspection was performed on the 12-8 shift during the first full day of inspection. The licensee was performing uranium recovery operations. The facility was in a general satisfactory housekeeping state.

As stated previously, the licensee had removed and disposed of equipment which was no longer used in the process. The licensee had also cleaned up much of the outside areas. The licensee currently has many empty drums stored in the outside areas. The incinerator has been removed and sent to burial.

The cover which the licensee had over the lagoons failed. The licensee has sent most of the cover to burial.

No items of noncompliance or deviations were identified.

b. Standard Operating Procedures

The inspector reviewed the Standard Operating Procedures (SOP's) for five different operations. Then the inspector discussed the operations with an operator to assess the operator's knowledge of the safety requirements for the operation, especially those pointed out in the SOP for the operation. The SOP's which were reviewed and discussed are listed below.

<u>SOP No.</u>	<u>Revision</u>	<u>Effective Date</u>	<u>Subject</u>
IV-E	III	4/16/76	Decladding Operation
V-D	III	4/19/76	I-J-5 Tray Dissolver
V-H	I	11/9/79	4-X-1 Scrubber
VI-B	VI	not listed	1-D-34 Assay Tank
VI-K	New	1/11/80	Riffle Sampling Procedure

Each of the SOP's had a section specifically addressing safety requirements. Each of the SOP's was approved by the Nuclear and Industrial Safety Manager, the Operations Manager, the Quality Assurance Manager, and the General Manager.

The personnel interviewed all demonstrated good knowledge of the safety aspects involved in the operations. The operators indicated that they wore the protective clothing and respiratory protection called for in the procedures. There was one instance in which the operator indicated that he was not aware of a nuclear criticality

safety limit. In the operation of the filter for filtering dissolver solution from the tray dissolver, the operator stated that the solids on the filter could be about 1½ inches thick. The criticality safety limit given in the procedure and listed on the equipment stated that the maximum filter cake thickness allowed was 1 inch. This fact was pointed out to the operator and his supervisor.

The inspector noted an apparent inconsistency between a procedure and the equipment. According to NIS Requirement 2.6 of SOP V-H, other containers were not allowed to be within 24 inches of the sump tanks of the 4-X-1 scrubber except when draining the sump. There was a 10 liter bottle used for catching a drip from the scrubber located closer than 24 inches to a sump tank. The supervisor said this was an approved situation. The Nuclear and Industrial Safety Manager showed the inspector that this bottle was approved for use at its location by Nuclear and Industrial Safety Authorization No. 197 on November 8, 1973.

No items of noncompliance or deviations were identified.

8. Nuclear Criticality Safety

a. Evaluations

The inspector reviewed Nuclear and Industrial Safety Authorizations as shown below:

<u>Authorization No.</u>	<u>Subject</u>
RO 296	Steam Cleaning of Process Feed Tanks
RO 297	Storage of UNC 2600 Container Inner Containers in Warehouse

The authorization had final NIS approval. The nuclear safety evaluation for RO 297 approved the storage of the inner containers from the UNC-2600 shipping containers in the warehouse on the basis of the 175 gram U-235 per square foot surface criteria. The evaluation was based on the inner container containing up to 8 kilograms of U-235. On the basis of 175 grams U235 per square foot, an area of 45.7 square feet is required for the container with 8 kilograms of U-235. The evaluation stated that an area 4 by 12 feet would be assigned to each inner container. The evaluation then stated that the containers could be stored in positions 3-W-1 through 3-W-7 in accordance with the posted nuclear criticality safety posting.

The posting for position 3-W-1 through 3-W-7 was for material in approved shipping containers. The inner container of the UNC-2600 shipping container is not an approved shipping container, and the posting should not have been considered adequate solely on this basis.

Beyond this, the posted limit for the UNC-2600 shipping container was 10 kilograms of U-235. In this instance, the amount of fissile material which could be in the 4 x 12 foot area would be: 48 square feet multiplied by 175 gram U-235 for square foot, or 8.4 kilograms. Obviously, the posted nuclear criticality safety limit of 10 kilograms was not appropriate for the evaluated and approved limit of 8.0 kilograms contained in an inner container of the UNC-2600 shipping container and stored in an area of 48 square feet. This is an item of noncompliance.

b. Observations During Inspection of the Facility

As discussed previously, the licensee had inner containers of the UNC-2600 shipping containers holding scrap fuel elements stored in the warehouse. These containers were held on wooden 2 by 4's, which were to maintain the spacing of the containers from other containers. As was discussed previously, the posting for the storage areas of the warehouse did not properly address the storage of these containers. There were four containers stored. The containers held between 3,008 and 3,590 grams of U-235.

The inspector also noted that nuclear safety postings were in place except there was no posting on the canner for sealing cans of product. This lack of a nuclear criticality safety limit posting for the canner was previously mentioned in Inspection No. 70-820/79-04.

No items of noncompliance or deviations were identified.

c. Criticality Alarms

The inspector observed the alarm settings of the criticality monitors. The alarms were set from 15 to 20 mR/hr.

According to the licensee's records, the criticality monitors are calibrated at 10, 25, and 40 mR/hr. The calibrations were done quarterly during August and November 1979 and February and May 1980. The records also showed replacement and repair of monitors.

No items of noncompliance or deviations were identified.

d. Raschig Ring Filled Vessels

The inspector examined the records of the monthly raschig ring level checks for the period September 1979 through May 1980. The rings in the thirteen vessels checked were about the control levels.

The analytical results for the July 17, 1979, samples taken from the vessels were reported in September. The boron content of the rings sampled were all above the 3 weight percent license limit. The sample from the 1-D-24A filtrate tank was evidently a "new" ring, since it had a B_2O_3 content of 12.05 weight percent.

The licensee removed tank 1-D-41 from service in May 1980. The raschig rings were sent to burial.

No items of noncompliance or deviations were identified.

9. Internal Reviews and Audits

The inspector reviewed the records of the license required weekly audits performed by Nuclear and Industrial Safety during the period from August 2, 1979, through May 30, 1980. Until October 31, 1979, the nuclear criticality safety consultant documented his weekly audit of the facility from a nuclear criticality safety viewpoint. After that time, there were no reports of these audits. The Manager of Nuclear and Industrial Safety performed the weekly audits during the entire period. Two audits disclosed items requiring corrective actions.

The monthly and quarterly reviews and appraisals of the weekly inspections were also prepared by the Manager of Nuclear Safety. The monthly and quarterly reviews for 1980 were reviewed by the inspector.

The last annual audit was performed by one technical specialist from UNC Naval Products during December 1979. This auditor recommended that all nuclear criticality safety and health physics evaluations require dual review notwithstanding the provision of item 2.4 of section 206 of the approved license application. On April 18, 1980, the licensee rejected the recommendation on the basis that unilateral evaluations were made only when the proposed changes or modifications were within previously approved internal standards or NRC licensed standards.

The auditor pointed out that four recommendations from the 1978 annual audit had not been satisfied. In their reply the licensee provided the status of their actions regarding these recommendations.

No items of noncompliance or deviations were identified.

10. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on June 5, 1980. The inspector presented the scope and findings of the inspection. The inspector spoke to these individuals on June 18, 1980, by telephone and discussed the item of noncompliance with them at that time. (Paragraph 8.a.)

During the exit interview, the inspector expressed his concerns about the impending startup of continuous operations of the lagoon waste process scheduled for June 16, 1980. The licensee assured the inspector (prior to continuous operations) that: procedures would be prepared; supervisors would be appointed; newly hired personnel would be trained; and the air filtration and ventilation system for the dryer and dried sludge handling equipment would be providing proper airflow into the process equipment. (Paragraph 5.a.)

The inspector noted that operators appeared to be well versed in the safety aspects of the operations reviewed with them by the inspector. However, one operator was not aware of the nuclear criticality limit of 1 inch on the filter used with the tray dissolved operation. (Paragraph 7.b.)