U. S. ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

REGION I

INSPECTION REPORT

CO Report No.: 71-01

Subject: United Nuclear Corporation
Research and Engineering Center

Location: Elmsford, New York

Docket No. 070-00903

License No. SNM-871

Priority I

Category A(I)

Dates of Inspection: June 8 - 10, 1971

Dates of Previous Inspection: January 20 - 21, 1971

Type of Licensee: Fuel Fabrication

Type of Inspection: Routine, unannounced

Principal Inspector: R. H. Smith R H Smith June 30, 1971 (Date)

Accompanying Inspectors: None _____ (Date)

Other Accompanying Personnel: None

Reviewed by: H. W. Crocker H W Crocker July 6, 1971 (Date)

Proprietary Information: None

SECTION I

Enforcement Action: None

Licensee Action on Previously Identified Enforcement Matters: None

Unresolved Items: None

Status of Previously Reported Unresolved Items: None Reported

Unusual Occurrences: None

Persons Contacted

The following UNC personnel were contacted during the inspection:

W. F. Roche, Vice President and Director
P. E. Clemons, Director, Health and Safety
D. Rosh, Manager, Plutonium Laboratory Operations
A. Magdics, Acting Manager, Plutonium Laboratory Operations
C. Dwy, Laboratory Supervisor
C. Gregg, Accountability Representative
R. Ard, Technical Specialist
W. Brooks, Consultant Scientist
P. Fuery, Chemist
D. Wampler, Accountability Representative

Management Interview

The following subjects were discussed with Mr. Roche and Mr. Clemons on June 10, 1971:

A. There were no items of noncompliance observed during the inspection.

B. The change in policy regarding correspondence and outlined in a memorandum of L. D. Low, Director, Division of Compliance to Regional Directors dated June 2, 1971.

SECTION II

Additional Subjects Inspected, Not Identified In Section I, Where No Deficiencies or Unresolved Items Were Found -

1. General

Work was in progress in the plutonium laboratory on a small plutonium carbide processing contract for EBR-II and no SNM was being processed at Elmsford. There is some work planned at the Elmsford laboratory involving liquid solution analysis studies and the plutonium laboratory is being prepared for FFTF fuel fabrication.

2. Organization

Mr. H. Buchanon has terminated employment with the company and Mr. D. Wampler has assumed the duties of the Accountability Representative for the Pawling site. The total number of employees at the Pawling and Elmsford sites has not changed since the previous inspection.

3. New Equipment Installations

A heat detection system is being installed in the plutonium laboratory and a sensing device will be located in each glove box, furnace enclosure and selected duct areas.

An emission spectrograph glove box has been installed in the plutonium laboratory and appeared to be in accordance with license amendment No. 25.

4. Stack Particulate Effluents

There were no gaseous effluents that resulted from SNM processing at Elmsford since the last inspection. Stack sample results were examined for the plutonium laboratory for January 1971 thru June 4, 1971.

5. Liquid Effluent Releases

The liquid waste system has not been changed since the previous inspection and sample results of releases for January 1971 thru May 12, 1971 were examined.

6. Storage of Solid Waste

There was no SNM solid waste in storage at either the Elmsford or Pawling site.

7. SNM Inventory and Shipments

a. The SNM inventory at the time of the inspection was within the license limitations.

b. Shipment records examined, January 1 to June 1, 1971.

8. In-Plant Air Sampling

The number of locations being sampled continuously has been increased at the plutonium laboratory to provide representative sampling of the work areas where new equipment is installed. Sample analysis records were examined for January 1971 through June 7, 1971.

9. Contamination Control

Survey records were examined for January 1 through June 1, 1971.

10. Personnel Exposures

a. The report required by 10 CFR 20.407(b)(II) has been submitted.

b. Exposure records were examined for December 14, 1970 through May 17, 1971.

11. Bioassay Sampling

a. Bioassay sample result records were examined for November 1, 1970 through May, 1971.

12. Nuclear Safety Controls

a. The posting, labeling and control of SNM appeared to be in accordance with the license conditions, based on the inspectors observation and interviews.

b. Instrumentation and alarm reports and records were examined for January 1 through May, 1971.

13. Emergency Evacuation Drills

a. Evacuation drill reports were examined for January 1 through May, 1971.

14. Instrumentation Calibration

a. Calibration records were examined for November 1, 1970 through June 1, 1971.

15. Environmental Monitoring

a. An environmental monitoring program had not been formalized for the Elmsford and Pawling sites at the time of the inspection.

b. Fall out and air sample records were examined for January 1971 through May, 1971.

16. Non-destructive Assay

An addition to the south side of the plutonium laboratory has been completed and the installation of equipment to perform passive neutron and gamma assays of fissile material was in progress. No date has been established for use of the facility.

17. Training Programs

The established program of a lecture series for personnel working in the plutonium laboratory will continue through calendar year 1971. The plans were reviewed for the training of emergency teams during the remainder of calendar year 1971.

Field Notes - Report No. 71-01

By : R. H. Smith, Radiation Specialist, CO:I

Title: United Nuclear Corporation
Elmsford, New York
License No. SNM-871
Docket No. 070-00903

Inspection Date: June 8 - 10, 1971
Previous Inspection: January 20 - 21, 1971

Findings

1. There were no items of noncompliance observed during the inspection.

General

2. No SNM was being processed at Elmsford and only a small contract was being processed at Pawling for EBR-II.

3. H. Buchanan has terminated and the accountability representative duties for Pawling have been assigned to D. Wampler. The total number of employees is 25 at Pawling and about 125 at Elmsford.

4. Since H. Buchanan terminated this leaves only P. Clemons with technical health physics knowledge. Mr. Ard works as a technician for Clemons and primarily obtains air samples and performs surveys. Mr. Clemons is training him for other duties as time permits. Mr. Clemons stated that UNC was looking for another health physicist but this would remain low key, until processing activities were increased.

Plant Inspection - Elmsford

5. The facilities to be used in accordance with license amendment No. 27 were inspected. Chemical analysis will be performed on small samples of depleted and enriched uranium compounds, primarily uranium oxides. A limit of 20 grams of U-235 is established for the total inventory of the chemistry laboratory at one time. Liquid wastes will be handled by dumping to sewer or burial depending on analysis prior to release.

6. Unirradiated fuel rods loaded with uranium oxide pellets will also be tested in accordance with amendment No. 27. All work will be done in the Electron Beam Laboratory and the Chemistry Laboratory. Only one rod will be tested at a time that contains not more than 75 grams of U-235. Containment for the work appeared to be adequate and plans for handling all wastes appeared satisfactory.

7. Mr. Clemons stated that the required monitoring for dose rates and air sampling would be established for all work.

8. On May 19, 1971, UNC transported 55 Kg each of depleted and natural uranium to the Process Equipment Engineering Co., Summit, New Jersey to evaluate a compacting machine. The material was possessed under a New York State license and the New Jersey State Department of Environmental Protection, Trenton, New Jersey was notified prior to the work. All health physics aspects for the work was provided by UNC.

Plant Inspection - Pawling

9. A heat detection system was being installed for the laboratory. This was a requirement for the new process line consisting of six glove boxes and a sintering furnace. The licensee is installing heat sensors in each glove box and in other selected laboratory locations. The heat sensors are of two types ie., 135° F and 200° F and located according to the box use and environment.

10. All heat sensors are connected to a panel on the west wall of the Pilot Area. Each sensor location will be noted on the panel and if actuated the light comes on as well as an audible alarm. A similar slave panel is located outside the laboratory at the guard station.

11. Amendment No. 24 authorized the use of the Wet Chemistry Glove Boxes for plutonium work prior to installing a heat detection system, however, Mr. Clemons stated that no plutonium had been introduced into the new Wet Chemistry boxes or into the new processing line at the time of the inspection.

12. A new glove box has been installed for the emission spectrograph work. Mr. Fuery discussed the planned use of the box and the spectrograph equipment. The installation appears to be in accordance with license amendment No. 25.

13. The facility for performing passive neutron and gamma assays of fissile material has been completed by construction. Dr. W. Brooks was installing some of the equipment for sample counting and reviewed the intended use of the facility. Dr. Brooks stated that it was not known when the equipment installation would be completed including the testing of the equipment. A Type B door has not been installed between the facility and the laboratory but is on order. The facility appears to be in accordance with license amendments Nos. 25 and 26.

14. All areas containing SNM were properly labeled and posted with the applicable material limitations. The box inventories appeared satisfactory as posted.

The [illegible] discussed in Section 3 Amendment No. 26 and the inspector feels that the procedures and testing program should be submitted to DSH for their approval.

15. A new exhaust duct was being installed for the sintering furnace and the furnace enclosure was beipg sealed. This change became necessary since the furnace is to operate at a positive pressure as authorized by license amendment No. 25. A pressure sensing switch is installed that will close all inlet gas supply to the furnace and sound an audible alarm. This automatically actuates an emergency N_2 gas supply system.

16. The licensee is developing test procedures for the gas supply, heat detection system, furnace controls etc., and will establish a routine schedule for testing. These procedures and test records will be reviewed during the next inspection. These procedures and testing requirements.

17. Mr. Wampler was examining SNM stored in the vault and appeared to be aware of the criticality limitation rules for handling the material. He was also able to identify the quantity of SNM at various locations in the laboratory from his material inventory records.

18. There were no SNM operations being conducted in the critical facility.

Criticality Monitors

19. The instruments for nuclear criticality monitoring at both sites were observed to be functioning properly with appropriate alarm trip settings. There have not been any false alarms since the previous inspection. The new instrument had not been installed in the passive assay facility at the time of the inspection.

Emergency Drills and Alarms

20. An emergency evacuation drill was conducted at the Elmsford site on May 12, 1971 and no deficiencies were observed by the licensee during the drill. A drill is planned for the Pawling Site during June, 1971.

21. An alarm at the Pawling Site was actuated by the Laboratory Air Monitor on April 1 and 14, 1971. The first alarm was caused by a surge in power and a resistor was installed across the power input. The second alarm was during the operation of a high frequency bag sealer, however, no malfunctions were observed in the air monitor or the sealer. The personnel evacuated the laboratory in both cases.

Stack Effluent

22. Pawling stack effluent records were reviewed for January 1971 through June 4, 1971. The samples are obtained continuously and changed and counted on a weekly basis. The maximum concentration observed in the records was 4.25×10^{-15} uCi/ml alpha activity. Mr. Clemons stated that some beta counting would also be done on future samples. The stack air sample is obtained in a representative method of the stack discharge.

Liquid Effluent Releases

23. On April 9, 1971 a total of 1900 gallons of liquid waste was released to the sanitary sewer from the Elmsford site. A gross alpha count of the waste showed the concentration to be 2.4×10^{-8} uCi/ml. Mr. Clemons stated that if SNM was used that the samples would also be counted for beta. This was the first liquid waste released during 1971.

24. From January 1971 through May 12 a total of 80 gallons of liquid waste was released to the lake from the Pawling site. The concentration of the waste releases ranged from 6.3×10^{-10} to 1.9×10^{-9} uCi/ml based on gross alpha counting. Mr. Clemons stated that samples would also be counted for beta in the future. See Exhibit "A" for calendar year 1970 information.

Solid Waste

25. There was no solid waste stored at either site. A shipment of waste was made on May 4, 1971 from the Pawling site by ATCOR. Waste is transported to the NFS site at West Valley, New York for burial.

Shipments

26. Records of material shipments were reviewed for January 1971 through June 3, 1971. The records were adequate and shipments appeared to be performed properly.

Material Inventory

27. The SNM inventory at Pawling was Pu ~16 kgs and U-235 ~19 kgs. The inventory at Elmsford was 39.9 grams of Pu and 270 grams of U-235.

In-Plant Air Sampling

28. There have been five additional air sampling locations/are to cover the new processing line and chemistry boxes that have been installed. facilities in the Fuel Lab

29. The air is sampled through the fixed monitoring system at a flow rate of one cfm and the filter paper used is a 1.125 inch diameter Gelman fibre glass type E. Samples are counted for alpha activity for two minutes after approximately a 17 hour decay.

Contamination Surveys

30. Records were reviewed of daily and weekly routine and special contamination smears for January 1971 through June 7, 1971. The maximum smear result observed in the plutonium laboratory was 207 dpm on a glove and the glove was changed.

31. The maximum smear result observed for the Elmsford Facility was 400 dpm/100 cm^2 on a floor smear and the floor was cleaned.

32. Cleaning is performed at both sites when positive contamination smear results are obtained from equipment or floors.

33. The contamination records for the work performed at the Process Equipment Engineering Co., Summit, New Jersey showed a result of 10 dpm/100 cm^2 alpha activity at the completion of the work.

Personnel Exposures

34. Personnel exposure records for calendar year 1970 showed a maximum personnel whole body exposure of 990 mrem with a plant average of about 75 mrem.

35. The records for January 1971 through May 17, 1971 showed a maximum whole body exposure of 160 mrem with an average of 15 mrem.

36. Film badge dosimeters are exchanged on a two week frequency and serviced by the Nucleonic Corporation of America, Brooklyn, New York.

37. Mr. Clemons stated that he had submitted a calendar year 1970 exposure report as required by 10 CFR 20.407(b)(II).

Bioassay Samples

38. The records of quarterly bioassay sample results were examined from November 1, 1970 through May, 1971 and the maximum result of Pu-239 analysis was 0.12 ± 0.06 dpm/850 ml. Mr. Clemons stated that bioassay samples would be obtained from selected employees at the Elmsford site if work is done with unclad SNM.

39. The plutonium resample level of one dpm/sample was discussed with Mr. Clemons and he agreed to use a resample level of 0.4 dpm/sample.

Survey Instrumentation

40. The inventory of survey instruments at both sites was satisfactory for the work in progress. The calibration records were reviewed and the present system is a card with each instrument and a file letter for criticality instrument calibrations. Mr. Clemons stated that he was consolidating the calibration records into a book with a record for each instrument. This will also show the disposition for instruments ie., location,returned for repair, on loan, etc.

Environmental Monitoring Program

41. Records were reviewed of fall out samples that are located around the plutonium laboratory at the critical facility, waste storage and the lake outlet. The samples collected on March 18, 1971 showed a maximum gross alpha of 34.7 cpm.

42. Air samples from the location of the fall out collectors for the period January 28 to February 4, 1971 showed a maximum alpha activity of 7.16×10^{-14} uCi/ml with an average of about 1×10^{-15} uCi/ml.

43. Mr. Clemons has scoped and proposed an environmental monitoring program for both sites, however, it had not received management approval at the time of the inspection. Mr. Clemons stated that some environmental samples would also be counted for beta activity for collection of data.

Training Programs

44. Mr. Clemons stated that the program of lecture series at Pawling would continue for 1971 and that he would replace Mr. Buchanan as a lecturer on the Radiation ~~service~~ series.

45. Training of the emergency teams in first aid will be conducted in 1971 in an attempt to qualify all types. Mr. Clemons also routinely conducts meetings with the fire and radiation monitoring team members.

R. H. Smith
Radiation Specialist

June 30, 1971
Date