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Memorandum

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TO : Lyall E. Johnson, Acting Director
Division of Materials Licensing

DATE: SEP 29 1964

FROM : Leo Dubinski, Assistant Director for Materials LD
Division of Compliance

9/30/64

SUBJECT: REPORT ON VISIT TO UNITED NUCLEAR CORPORATION'S SCRAP RECOVERY FACILITY, WOOD RIVER JUNCTION, TO OBSERVE INVENTORY ACTIVITIES

CO:RBC

Attached for your information is a report of a visit to United Nuclear's Scrap Reprocessing Facility made on September 22, 1964, to observe the licensee's activities in inventorying special nuclear material in the plant. Region I is continuing the review of these activities and the information attached will be included in their report concerning these activities.

Attachment:
Cpy memo to Dubinski fm Chitwood,
dtd 9/28/64, w/atts

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

C-46

SEP 28 1964

Leo Dubinski, Assistant Director
for Materials
Division of Compliance
Richard B. Chitwood, Inspection Specialist
(Criticality)
Division of Compliance
REPORT ON VISIT TO UNITED NUCLEAR CORPORATION'S SCRAP RECOVERY FACILITY, WOOD RIVER JUNCTION, TO OBSERVE INVENTORY ACTIVITIES

On September 22, 1964, I visited the subject licensee to observe inventory activities being conducted at the facility by licensee representatives under the procedures submitted to the Commission on September 14, 1964. In reference to these procedures, Dr. Marvin Mann indicated by letter to United Nuclear Corporation on September 17, 1964, that the Commission had no objection to the licensee conducting his inventory in accordance with the latest procedures they submitted.

When I arrived at the plant about 8:45 a.m. Tuesday, the inventory activities had not been resumed from the previous day. Work did not begin until about 9:30 a.m. because of the late arrival of the accountability representative on the inventory team. This individual did not realize that the presence of all members of the team was required for work to be performed. The inventory team is comprised of the following individuals with the corresponding responsibilities.

William R. Pearson, Process Supervisor
Stan Skowronek, Nuclear Safety Supervisor
Marshall Cutler, Accountability Representative
John Murphy, Process Operator

Work on the inventory began on Monday and on that day all of the nominally dry ADU was sampled, labeled and stored. In addition, the inventory team had performed the operations described in section C.1.a through C.1.d of the procedure. This consisted of transferring the contents of 1-D-10-A storage tank to 1-D-10-B by way of the evaporator. During this operation a condition was encountered which resulted in writing the first alternate procedure. While draining the evaporator, organic was found with the aqueous solution. Since the procedure formerly written did not anticipate this contingency, it was necessary for the licensee to provide an alternate procedure permitting the use of a separatory funnel to separate the organic material from the aqueous before the aqueous solution was added to the 1-D-20-A precipitate vessel according to the original procedure. A copy of this alternate procedure is attached as Appendix A.

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Inventory Activities Observed Tuesday

The inventory team listed above began work at about 9:30 a.m. They started with procedural step C.1.e, which initiated the draining operation for the 1-D-19 precipitators. The 1-D-19-B and C precipitator discharges were found plugged with ADU which had settled to the bottom of the vessels and hardened. Even though a 1 normal solution of HNO_3 had been added to the vessels 1-D-19-B and C the previous day, the ADU was found to have remained intact. About 1 1/2 hours were required to break through the ADU plug in 1-D-19-C using a rigid steel rod inserted from the top of the precipitator vessel to churn and impact the ADU cake. In addition, a steel wire was inserted through the drain line and ball valve in an effort to break through the ADU cake from the bottom. This approach was finally successful. After the ADU plug was broken, the material was collected in 1-gallon containers. The remaining ADU in the 1-gallon container was dissolved by the addition of 1 normal HNO_3. The material from the 1-gallon bottle was transferred to a 5-inch diameter 11-liter bottle as described in procedural step A-11. This material was weighed, sampled and poured into the evaporator. The precipitator 1-D-19-B was the second vessel to be unplugged after about 2 hours of churning and prodding in the same fashion as described for unplugging 1-D-19-C. Because of the delay encountered in removing the plug from 1-D-19-B, the supervisor, Mr. Pearson, wrote an alternate procedure requesting approval to bypass procedural step C.1.e and to proceed with step C.1.f which authorizes draining of the 1-D-20-A precipitator. In this procedure, he requested permission to use two operators not on the inventory team to proceed with the 1-D-19-B unplugging operations. This procedure was approved by the Nuclear Safety Supervisor. The activities associated with the 1-D-20-A were discontinued almost before they got under way when the plug was removed from the 1-D-19-B precipitator. The contents of the 1-D-19-B precipitator were then removed, inventoried and transferred to the evaporator in the same fashion as was the material in the 1-D-19-C vessel. This second alternate procedure is attached as Appendix B. When the 1-D-19-C clean out and material inventory for this system was completed step C.1.f of the procedure was started.

In draining the contents of 1-D-20-A a black crud was noted in the UNH solution. In order to remove this impurity from the solution it was necessary to initiate a third alternate procedure which was reviewed and approved by the Nuclear Safety Supervisor (see Appendix C). This procedure authorized exchanging the 1-gallon plastic bottle called for by the procedure with a filter flask (approximately 4-inch

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long neck, 2-inch diameter with an inverted conical body of approximately 30 degrees), on top of which would be placed a cylindrical pan having a filter frit in the pan base. This filter pan had dimensions of approximately 9-inches diameter by 4 inches high. Although not stated in the alternate procedure, the operator did not allow the solution depth in the filter pan to exceed 1/2-inch at any time. The inventory was terminated at 3:00 p.m. when it was recognized that a plastic conical funnel of approximately 45 degrees and about 10 inches in diameter at the lip was being used to receive material poured directly from the 11-liter bottle after the inventory step without procedural approval and when it was learned that the Nuclear Safety Supervisor had left the plant premises.

Here again it appears that not all members of the inventory team recognized that their presence was required in connection with the inventory activity. At the end of the day shift the 55-gallon drum containers outside of the building were lashed together and tied down in preparation for the high winds accompanying the hurricane Gladys. In addition, steps were being taken to secure all containers within the plant to prevent uncontrolled movement of material in the event that windows and doors were blown out and open.

Other Observations and Information

Titanium Contamination

T. Gallopy, a chemist recently employed by United Nuclear has been assigned the immediate task of determining the source and nature of the titanium contamination in the plant production material. According to Richard Holthaus there is considerable puzzlement over the large variation in titanium contamination values reported. These range from 6 to 500 parts per million in a given sample.

Leaks At End Plates of Overhead Storage Tanks

I observed all of the overhead storage tanks and noted that the end plates and flanges on these vessels are about 1/4-inch thick. They are secured by approximately eight bolts. I noted that about four heavy duty "C" clamps were affixed to one end of the 1-D-10-C and D

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tanks to supplement the bolts used to secure the face plates and to prevent leaks. According to Pearson, these vessels were to have met a 90 psig test prior to acceptance by United Nuclear. However, according to him, United Nuclear agreed to an acceptance pressure of 40 psig since the higher performance value could not be realized.

Attachments:
Appendices A-C

cc: R. W. Kirkman, CO:I

APPENDIX A

SPEED MESSAGE

TO S. Skarovek FROM N. R. Pearson

SUBJECT Addendo to Inventory Procedure

DATE 9/21 1964

Please add the following procedure to section C-1 of the Inventory Procedure. The purpose is to separate organic materials from aqueous uranium solutions at 1-D-20.

1. Set up 2 liter separated funnel under 1-H-2 oven.
2. Move 1 gallon bottle from the Evaporator or 1-D-22 to the separating funnel. Keep this bottle 2 feet minimum from other uranium bearing materials.
3. Collect aqueous phase as specified in existing procedure.
4. Collect organic phase in 1 gallon bottle(s) for further inventory.

Approved S. Skarovek 9/21/64

SIGNED N. R. Pearson

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APPENDIX B

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SPEED MESSAGE

TO S Skowronek FROM W R Pearson

SUBJECT Deviation From Inventory Procedure

DATE 9/22 1964

I request permission to temporarily omit step C.I.e. 1-D-19B precipitator is plugged with solid ADH and will not drain. This precipitator will be unplugged by 2 operators not on the Inventory Team. As soon as it is unplugged these operators will be reassigned again. The precipitator 1-D-19B will then be drained and inventoried by the Inventory Team.

Change approved — S Skowronek 9/22/64

SIGNED W R Pearson

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APPENDIX C

SPEED MESSAGE

TO S. Skaronek FROM W R Pearson

SUBJECT

DATE 9/22 1964

I request that we be allowed to use a 4 liter filter flask to drain the 1-D-90A precipitator. The reason is to enable a filtration of the liquor to remove "black Tails". Draining from 1-D-90A will be controlled to prevent overfilling the filter flask

OK. S Skaronek 9/22/64

SIGNED W R Pearson

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