

UNITED NUCLEAR
C O R P O R A T I O N
FUELS DIVISION

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365 WINCHESTER AVENUE
NEW HAVEN 4, CONNECTICUT
777-5361

August 28, 1964

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J. S. ATOMIC ENERGY COMM.
REGULATORY
MAIL SECTION

Mr. Harold L. Price
Director of Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Sir:

The internal procedure which has been prepared for inventory of the SNM balance at the Wood River Junction plant is enclosed for your information. The procedure supplements the outline for this work which was sent to you August 18th and our discussion of the matter at your office August 24th.

We will await your comments before commencement of any portion of the inventory.

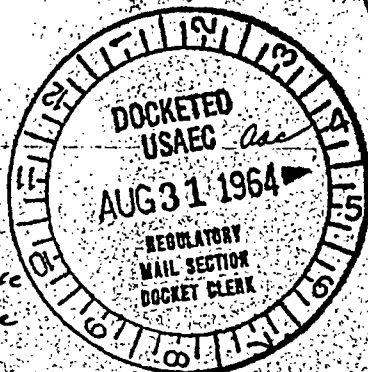
Very truly yours,

R. C. Johnson

J. A. Lindberg
Vice President

JAL:tc

enclosure



2 copies provided Compliance
1 copy provided Dr. Lake
9/1/64
JN

ACKNOWLEDGED

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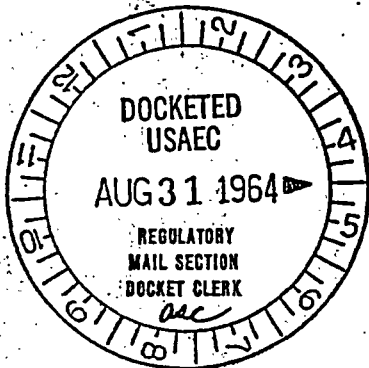
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POST-ACCIDENT
PHYSICAL INVENTORY PROCEDURE
FUELS RECOVERY PLANT

A. GENERAL

1. Objective of physical inventory of the entire plant is to establish the uranium balance of the categories of material at each of the stages in the process and to determine the uranium losses resulting from the nuclear incident.
2. The procedure will consist of sampling and analyzing all uranium bearing materials located in storage and in process equipment, except those containers in storage that have not been transferred into Process Account from storage.
3. The categories of material to be inventoried and the sequence, are as follows:
 - a. ADU contained in 4 liter bottles
 - b. Solutions in overhead storage tanks 1-D-9 & 10.
 - c. Solutions in 4 and 11 liter bottles and 55 gallon drums, excluding irradiated material which has already been sampled.
 - d. Pickle Liquor Adjustment and Storage Tanks.
 - e. Solutions in Pulse Columns, Organic Storage Tank, Filtrate and Slop Tanks.
 - f. Miscellaneous lines and equipment.



Containers that have already been sampled will not be re-sampled. The contents of these containers will be transferred to appropriate Storage Tanks after all uranium is accounted for.

4. Except as noted in paragraph 6 below, each section listed above will be handled separately before proceeding to the next. Actual values will be compared with prior estimates before proceeding to the next.
5. Only one container will be in motion at a time. Only one container will be in the sampling area at one time.
6. Incineration of burnables will be carried out while items listed in (3) above are being inventoried. This will include mops, sponges, paper, shoe covers, etc., generated during cleanup.
7. The Inventory team will consist of a Fuels Recovery Supervisor, a division Accountability Representative responsible for the inventory, and a minimum number of Chemical Operators. There will be only one inventory group in the area at any time. The Accountability Representative will verify identification of all bottles and all samples before transfer of sample to lab.
8. Any questions of nuclear safety which arise during the inventory shall be referred to the Nuclear Safety Supervisor and resolved before the affected material may be moved.

B. PROCEDURE FOR DRY ADU

1. Remove 4 liter bottle from storage rack and remove to Glove Box 1-L-16-B along a safe path. A pre-labeled sample bottle will accompany the jar.
2. Remove a 5 gram representative sample by means of a thief sampler.
3. Transfer ADU jar back to storage rack.
4. Transfer sample bottle to appropriate laboratory for analysis of total U. Obtain next jar and sample bottle.
5. This category to be inventoried completely before proceeding to C.

C. SOLUTIONS STORED IN OVERHEAD TANKS

1. 1-D-10-A, B and C Tanks

- a. Transfer the contents of 1-D-10-A Tank to 1-D-10-B Tank by way of the evaporator and pump, 1-P-23.
- b. Transfer as much as possible of the contents from the evaporator to 1-D-10-B by means of evaporator pump.
- c. Drain the remainder of solution from the evaporator, and place into a 4 liter container and transfer contents to the precipitator 1-D-20-A and/or B, C & D.
- d. With Tank 1-D-10-A and the evaporator system completely empty, proceed to inventory the Tanks.
- e. Into a 4 liter jar, drain solution from 1-D-19 precipitators and transfer to an 11 liter bottle for sampling purposes.
- f. Place 4 liter jar directly under 1-D-20-A precipitator and fill with solution from the precipitators 1-D-20.
- g. Drain additional solution from 1-D-10-B Tank and C Tank into these precipitators until Overhead Tanks are inventoried.
- h. When 4 liter jar is filled, move horizontally across the floor to the base of the platform steps.
- i. Pick up jar and pour contents into an 11 liter bottle. Pour from above the bottle or into a funnel, at least 3' distant from the bottle, and "trough" the contents into the 11 liter bottle. Repeat until 11 liter jar is filled.
- j. Agitate the 11 liter bottle using the perforated plunger or mechanical agitator.
- k. Draw out a representative sample.
- l. Weigh 11 liter bottle for gross weight.
- m. Transport and pour contents of sampled container into:
 - (1) Evaporator feed leg on platform and pump contents to 1-D-10-A by means of evaporator pump 1-P-23 or
 - (2) Three (3) inch stand pipe on suction to filtrate pump, 1-P-17, and transfer to 1-D-10-A or

(3) Into suction of OK Liquor transfer pump, 1-P-32, which has been previously drained and transfer to the 1-D-10-A.

- n. Weigh emptied container for tare weight in order to obtain net transfer.
- o. Repeat steps (f) through (n) until all solution is back into the system.
- p. Flush precipitators with a minimum amount of distilled water and drain the precipitation system completely.
- q. Sample drainings as above and proceed to next Tanks 1-D-9.

2. 1-D-9 A, B, C, D, E, & F Tanks

- a. To prepare for the inventory of these tanks, the valve which terminates line 1/2" LA6 must be removed and placed outside the west wall of the Pulse Column room or above Hoods 1-L-17 & 18. A short piece of 3/4" Tygon or suitable hose, or a 1/2" SS line will be installed from this valve to Tank 1-D-43.
- b. With all valves closed on inlet and outlet to the Overhead Tanks, drain the tank with the least amount of solution into Tank 1-D-43. (Three tanks appear to be empty from the start.)
- c. Transfer the solution from 1-D-43 to an Assay Tank 1-D-34.
- d. Agitate the tank with air and withdraw a representative sample into a previously weighed and labeled bottle.
- e. Obtain gross weight on Assay Tank. (Approximately 30 liters of solution)
- f. Transfer solution from Assay Tank to an empty 1-D-9 Tank. Properly set the valves before transferring; blank if necessary.
- g. Obtain a tare weight of the Assay Tank. Record gross, tare, net and sample number.
- h. Repeat steps (b) through (g) until the entire contents of the 1-D-9 Tanks have been inventoried.
- i. Drain 1-D-43 and 1-D-34 into a 4 liter jar. Identify the jar and contents until containers of solution are inventoried as in (D) below.
- j. Complete Overhead Tank inventory before proceeding.

D. PROCEDURE FOR DILUTE AND CONCENTRATED SOLUTIONS

- 1. 4 liter and 11 liter bottles. (Includes mop water).
 - a. Transfer one 4 liter bottle at a time into the Stainless Steel Dissolver, 1-J-4, until solution will agitate properly, approximately 45L.
 - b. Add HNO₃ from Nitric Acid Head Tank, 1-D-27, until the solution reaches 3N excess Nitric Acid.
 - c. Agitate for at least 30 minutes with air. Check acidity.
 - d. Valve in filter and transfer solution through the filter to the Assay Tank.
 - e. Agitate Assay Tank and take a representative sample into a previously weighed and labeled sample bottle.

- f. Obtain gross weight and transfer solution to the 1-D-9 storage tanks.
 - g. Obtain tare and net weights.
 - h. Repeat (a) through (g) until 4 liter jars of solution have been inventoried (not to include irradiated materials which have been previously sampled).
 - i. For 11 liter bottles, transfer first to 4 liter jars in manner to insure nuclear safety and proceed with the inventory as in (a) through (g) above.
 - j. Attempt to match solutions to obtain a high concentration of approximately 30 grams per liter.
 - k. 4 liter bottles will be rinsed and the rinsings consolidated into another 4 liter jar and processed through the SS Dissolver. 11 liter bottles will be rinsed in the same manner.
 - l. Empty 4 liter bottles will be stored upside down on available storage shelves, and empty 11 liter bottles will be placed in a horizontal position under the platform to the Reactor Loading Hood.
 - m. Complete bottle solution inventory.
2. 55 Gallon Drum of Solution, Excluding Pickle Liquor (which has not been transferred to process).
- a. Transport drums of uranium solution to the Pickle Liquor Room.
 - b. Agitate contents with air for 15 minutes in two locations of the drum.
 - c. Obtain representative sample in bottle properly weighed and labeled.
 - d. Weigh drum on scale before returning drum to original storage spot.

E. PICKLE LIQUOR ADJUSTMENT TANK 1-D-12 & STORAGE TANK 1-D-41

- 1. Drain adjustment Tank into a tared 55 gallon lined drum.
- 2. Drain contents of Storage Tank into tared 55 gallon lined drums. Sample initial material withdrawn from bottom of tank to insure concentration < 5 grams/l. before filling any drum.
- 3. Agitate contents of drums by air for 15 minutes in two locations in the drum.
- 4. Obtain representative sample.
- 5. Weigh drums for gross weight in order to obtain net contents.
- 6. Label sample with proper drum identification.
- 7. Transport drums to outside storage and store with New Haven Pickle Liquor.

F. PULSE COLUMNS, ORGANIC STORAGE TANK, FILTRATE & SLOP TANK

1. Pulse Columns

- a. Drain each column and phases separated as necessary by utilizing separatory funnels into 4 liter jars. There should be sufficient supply of empty jars at this time.
- b. Take jars of aqueous phase from Extractor and Scrub Columns. Transfer to 11 liter bottles and sample. Store in always-safe dollies on S. wall of tower.
- c. Solution below 5 grams per liter store in drums for later reprocess as Pickle Liquor through the Adjustment Tank, 350 gram limit per drum.
- d. Solutions more concentrated than 5 grams per liter (Strip Column), handle through the Stainless Steel Dissolver and Assay Tank as above.
- e. Organic Phase to be held in 11 liter bottles and sampled. Treat as in (2) below.

2. Organic Storage Tank 1-D-5

- a. The contents of 1-D-5 will be drained into 4 liter jars and transfer to 11 liter bottles.
- b. Agitate 11 liter bottles and obtain a representative sample.
- c. Transfer organic after sampling into the carbonate scrub column and allow organic to flow back into Storage Tank 1-D-5.
- d. Organic from Pulse Columns may be disposed as in (c) above.

3. Filtrate & Slop Tanks

- a. Recycle each tank containing solution for one hour.
- b. Obtain representative sample.
- c. Measure quantity of solution. (sight glass)

G. MISCELLANEOUS

1. Incinerator Ash

- a. Ash from incineration which has been generated during the inventory, will be placed in 11 liter jars.
- b. Take a representative sample from each jar.
- c. Obtain net weight of material and return jars to storage shelves.

2. Pump Bodies and Discharge Lines

- a. Pumps such as Feed Metering Pumps, Organic Feed Pump and Transfer Pumps are to be drained of solution that has not been inventoried. Solution to be drained in a 4 liter jar.
- b. Lines containing solutions that have not been inventoried will be drained into a 4 liter bottle. (Extractor Feed line, Scrub Recycle line and Adjustment Pickle Liquor transfer lines are examples).

- c. Consolidate solutions from 4 liter jars into 11 liter bottles.
- d. Agitate, sample, weigh to obtain a net weight.
- e. According to concentration, transfer the solution to the appropriate feed tank.

3. T.C.E.

- a. Sample T.C.E. bottles.
- b. Obtain net weight.
- c. Hold T.C.E. in Storage.

4. Drain SS Dissolver completely by removing the flange. Sample solution in 4 liter jar.

5. Drain Assay Tank and sample solution as for Dissolver.