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HW-25655
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9-22-52

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FROM: C. A. Rohrmann *Chas. A. Rohrmann*

U03 - SEGREGATION OF REDOX AND TBP PRODUCTION

If Redox- and TBP-derived uranium oxide is to be acceptable for further treatment by the fluorination process at K-25, product quality must be improved to yield material of lower ionic impurity content than previously permitted by the tentative specifications which have been used in the evaluation of these products. It is expected that minor revisions now being made in the Redox plant will soon result in a satisfactory product. No such early improvement is expected in the TBP product. The new specifications are so stringent that the production of satisfactory Redox material will require complete freedom from cross-contamination with TBP material in the U03 plant. Originally, segregation of TBP and Redox material through the U03 plant was proposed in order to maintain separation of these materials because of difference in U-235 isotope content. In such segregation, switching from one feed to another with the simplest clean-up of equipment between runs was considered a satisfactory means of segregation. Such segregation would be entirely inadequate in the case of the present problem of ionic impurities. Satisfactory clean-up of a common system of milling, dust collection and packaging, between runs, can not be assured. The effect of the difference in ionic impurity content between satisfactory Redox material and the expected TBP product is so great that even minor cross contamination can not be tolerated, requiring complete segregation of the two streams in the U03 plant. The elements of a proposed segregation scheme are shown on the attached sketch and are described as follows:

1. Feed Tanks

It is understood that the X-1 and X-2 feed tanks at 224-U will both be required for TBP processing. In view of this situation a new tank (X-3) is required at 224-U for handling Redox material only. With Redox processing 90-day cooled metal, a 9' x 9' excess tank is adequate for this purpose.

SPECIAL RE-REVIEW
FINAL DETERMINATION
DECLASSIFICATION CONFIRMED
BY J P Derouin DATE 5/20/81
BY AE Bailey DATE 5/27/81
RL Cragiel 4/15/99
PDA man 4-21-99

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2. Evaporator

Install the spare 100% UNH evaporator in 224-U.

3. Catch Tank

Install a new catch tank of 1000 to 2000 gallons capacity outside 224-U to receive concentrate from the 100% UNH evaporator and maintain UNH in fluid condition for feeding to segregated pots.

4. Feed System to Pots

Provide salt loop connections and pump to feed a segregated line of at least six pots. The loop should be designed so that extensions could be easily made for feeding additional pots wither in the present lines or elsewhere in the vicinity.

5. Segregation of Pots

At least six pots should be fitted to receive feed from the new concentration system. The ventilation and vapor system may remain connected to the existing facilities.

6. Product Unloading and Handling System

Product from the segregated pots will be drawn through a new cyclone separator, which will feed the (relocated) existing hammermill. The air leaving the new cyclone will go to the existing bag filter, in common with that from the existing cyclone. Thus any Redox UO_3 dust passing the cyclone (about 2% will be collected with the impure THP product. The ground Redox product will go to a separate hopped and packaging station.

Preliminary design work is being done for the purpose of defining the scope of the revision so that an estimate of cost for project proposal preparation may soon be made.

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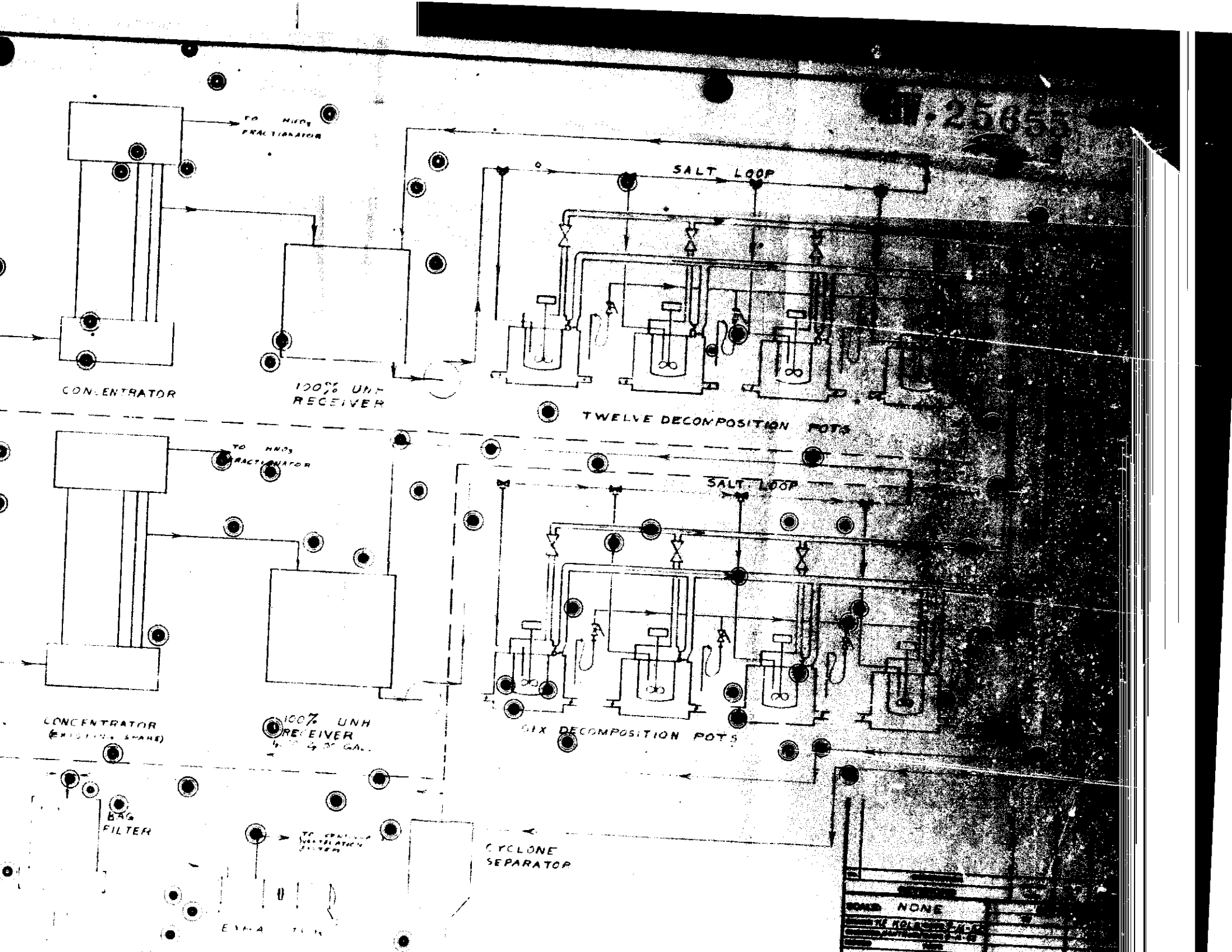
TO HNO3 FRACTIONATOR
SALT LOOP
CONCENTRATOR
100% UNH RECEIVER
TWELVE DECOMPOSITION POTS
TO HNO3 FRACTIONATOR
SALT LOOP
CONCENTRATOR
100% UNH RECEIVER
SIX DECOMPOSITION POTS
BAG FILTER
CYCLONE SEPARATOR
NONE