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2-3.6 File

October 6, 1960

Mr. J. C. Delaney
Licensing Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

SUBJECT: SNM 33 Extension: Contaminated Trash Incinerator

Gentlemen:

We are currently installing a gas fired incinerator for the purpose of concentrating uranium containing trash prior to chemical recovery. The material to be incinerated will consist of filters, rags, paper, etc. and floor mop waters. In the case of filters, rags, etc., no limitation will be imposed on U^{235} enrichment. In the case of mop water, the enrichment will be limited to a maximum of 5% U^{235}.

Description of Incinerator

An outline drawing of the incinerator is enclosed. Basically, the incinerator consists of an 18" diameter by 12-1/2" high pot supported on a 3" thick fire brick annulus. A heavy gage metal bonnet above the pot completely encloses all material in the pot and directs combustion gases to the flue. The flue is a 6 inch diameter galvanized duct. As can be seen from the drawing, the fuel combustion products cannot pass through the material in the pot and in fact no air or gas can flow through the pot with the exception of the products of combustion of the incinerated material. The off gas from the incinerated material is combined with the fuel combustion products at the top of the bonnet. Except for the fuel gas burner, the bottom of the fire brick annulus is completely open.

Criticality

In all cases the uranium content of the material in the pot will not exceed the limited safe batch for the enrichment involved as listed in Table XIII of K 1019, Fifth Revision. The pot will be cleaned after each batch.

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Hidden uranium concentrations in the incinerator are impossible since the pot forms the only bottom of the incinerator. An accumulation in the flue is unlikely since any uranium bearing particles entering the flue would have to be so light that they would carry on out the flue. This can be verified by comparing the large area of the bonnet (low gas velocity) to the restricted area of the flue (high gas velocity) and recalling that the only gases passing through the trash are combustion products of the trash itself.

Batch Preparation

Filters: The filters will be pre-cleaned by vacuuming and tapping to remove loose material. As a result the maximum uranium content in the low enrichment filters will not exceed two or three pounds. For high enrichment filters the maximum content will be approximately 100 grams. This difference is due to the size difference of low and high enrichment filters. This weight will be known since all filters are tare weighed prior to use and weighed again after pre-cleaning with the weight difference attributed to the uranium material contained. The low enrichment filters will be compressed to fit in the incinerator pot. All filters will be packaged in a polyethylene bag.

Rags, Paper, Etc.: This material is not used directly in the plant process as in the case of filters. Consequently, the uranium content is less than 1% by weight. It would therefore take a minimum of 74 pounds of this material to accumulate 350 grams of uranium. The volume of the pot is not large enough to accomodate this quantity of trash.

Trash that had been used in a manner which would result in a high uranium content will be treated the same as the filters.

Mop Water: All mop water is analyzed for uranium content. The mop water will have been concentrated by boiling down elsewhere in the plant prior to introduction into the incinerator or concentrated in the incinerator itself depending on which method is found from experience to be most efficient.

Health Physics

The filter preparation will be done in a ventilated hood elsewhere in the plant. All filters will be wrapped in polyethylene at the time of preparation. The bag will not

be removed when they are placed in the incinerator eliminating a potential dust problem. The other trash will not normally have a high uranium content and a dust problem is not expected.

The entire operation of the incinerator including the flue will be surveyed by our Health Physics Department to insure operation in accordance with AEC health requirements. Appropriate corrective action will be taken to correct any deficiencies found by this survey. The incinerator is being installed in an area included within our existing gamma alarm system.

Please let us know if you require additional information in order to approve this request for extension of license SNM 33.

Respectfully yours,

MALLINCKRODT CHEMICAL WORKS

L. J. Swallow
Nuclear Division
Hematite Plant

LJS/jrt

cc: AEC (7)

BY _____ DATE _____ SUBJECT INCINERATOR SHEET NO. _____ OF _____

CHKD. BY _____ DATE _____ JOB NO. SK 10

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