OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: March 23, 1962

Frances K. Durkan

FROM : Frances K. Durkan
Criticality Evaluation Br.

SUBJECT: VISIT FROM THE MARTIN COMPANY TO DISCUSS AMENDMENT OF LICENSE SNM-53 (DOCKET 70-58)

Participants: The Martin Company - Bill Wachtl and Ed Scicchitano
DL&R: Dr. Charles D. Luke, Bill Layfield, Frances Durkan

Reference: LICENSE REPORT MND-2603, dtd 7/18/61

The Martin Company outlined their proposed operating procedure changes involved in the fabrication of spherical uranium dioxide sintered powder. Only two steps in the process flow will be affected.

Formerly, the two intermediate process steps were as follows:

1) A 300 gram batch of UO_2 material is transferred to the spheridizing apparatus and manufactured into spherical UO_2 powder;

2) After manufacturing, the spherical powder is washed in a 3" diameter stainless steel pipe with approximately six liters of water cycled through an inline filter and then the holdup water, removed in a centrifugal filter.

The operating procedure approved for these steps in the process flow specified that one batch of 300 grams must be completely through the manufacturing, washing and filtering steps and the whole system cleaned before another batch could be processed.

In the interest of economy and production, The Martin Company wishes to incorporate the following operational procedure change as a license amendment:

Transferral of UO_2 to spheridizing and washing apparatus (extended to include two spray wash towers, an absolute air filter, an 8 1/2" x 12" water filter, 3 1/2" x 8" water trap, 4 3/4" x 42" heat exchanger, and two pumps) in 100 gram lots of 300 gram batches. The total feed not to exceed 1400 grams between wash down of apparatus and filter change. Experience has shown an 80% yield from each 100 g lot of UO_2 introduced into the apparatus with the 20% residue

A194

distributed between the absolute air filter and the water filter, the former collecting slightly more of the residue.

The Martin Company suggested establishing the H20 filter as the determining unit. Administrative control would restrict the accumulation of U02 residue to not more than 280 grams before clean-up. This 280 g maximum corresponds to a total of 1400 grams of feed material assuming the H_2O filter accumulates the total 20% residue from each 100 g lot of feed material. Strict administrative control will be enforced as regards the absolute air filter which in reality is accumulating slightly more than half of the residue from each 100 g of U02 lot introduced into the apparatus. The middle filter of the 3-tier absolute air filter will be removed along with the water filter when the control sheets indicate a 280 gram UO_2 residue accumulation in the H20 filter. The absolute air filter which has a 500 gram accumulation capacity becomes ineffective when saturated (point at which H_2O filter record indicates a 280 gram accumulation) and must be removed for drying, hence, a double check on administrative controls is inherent. The air filter may be reused after drying until its useful life has expired (point at which its total accumulation = 500 g UO_2). The air filter accumulation will be accurately recorded by calculating the difference between feed introduced and amount of residue collected on water filter. When the control sheets indicate 500 g UO_2 accumulation, the air filter will be replaced.

The schedule proposed by Martin will insure that no more than 370 g fully enriched oxide (300 g U-235) can be accumulated with water in any piece of the equipment (limit is 500 g for air filter - see above). The following table will illustrate the operating schedule:

	Feed Addition	Product*	Accumulated Collection in Water Filter
	300 g	240 g	60
	300	240	120
	200	160	160
	200	160	200
	100	80	220
	100	80	240
	100	80	260
	100	80	280 **
Total	1400 g	1120 g	

* Remove after each feed addition.

** At this point, shut down andclean out all equipment, since another 100 g feed may go into water filter and exceed 370 UO_2 limit. Dry and weigh water filter elements and get exact weight. Get U-235 in air filter by difference. 500 g limit on air filter.