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July 31, 1956

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Mallinckrodt Chemical Works  
Second and Mallinckrodt Streets  
St. Louis 7, Missouri

Attention: Mr. Frederick M. Belmore  
Special Assistant to the President

Gentlemen:

Enclosed is Special Nuclear Material License SNM-33, Revision No. 1.

This license authorizes you to receive and possess for use as described in your June 18, 1956 application up to one kilogram of U-235 contained in uranium enriched to about 20% in the U-235 isotope, in addition to the 7½% material previously licensed.

Before we may further review your application in regard to licensing you to receive and possess more highly enriched material we will require the following additional information:

1. After hydrolysis of the  $UF_6$ , you state that subsequent processing will be done in 0.7 pound batches. How is the hydrolyzed material separated into 0.7 pound quantities?
2. The hydrolysis hood, you state, is curbed for a depth of four inches and will have sufficient capacity to hold the entire contents of the hydrolysis system. This is not a geometrically safe system for top enrichment material. Will the hood be modified to be geometrically safe, or will batch control be used to prevent accidental criticality? If batch control, please describe how control will be exercised.
3. A four inch deep by twelve inch diameter filter is very close to a geometry which can be made critical <sup>at top enrichment</sup>. Is a batch limit

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planned, and, if so, what limit, and how will it be insured?

4. You state that moist filter cakes will be removed from the filter in batches containing 0.7 pounds. How are batches limited to this size?
5. In general, in processes where safety dependence is placed on batch size control rather than "always safe" conditions, you should provide additional information on the system of checks and balances intended to insure proper control.

*AP*  
~~On~~ <sup>As</sup> a general comment we note that there seems to be some misunderstanding of the term "always safe" and where the concept it implies may be safely invoked. Where certain supervision, bookkeeping, procedural controls or other limitations are necessary to insure safety at any point, "always safe" has no meaning, and the term "limited safe" more properly applies.

On receipt of the additional information requested we will further consider your application for highly enriched uranium.

Very truly yours,

Igall Johnson