

DOCKET No. 70-90

*File by*

**ENGELHARD INDUSTRIES, INC.**

August 27, 1958

EXECUTIVE OFFICES

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NEWARK, N. J.  
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United States Atomic Energy Commission  
Division of Licensing and Regulation  
Licensing Branch  
Washington, D. C.

*H. J. ...  
...  
...*



Attention: Mr. J. C. Delaney, Chief, Materials Section

Gentlemen:

In reply to your letter of August 12, 1958, Docket 70-90, L&R:CPM, in which you request additional information on procedures to avoid accidental criticality, we wish to submit the following data and procedures for your consideration.

The limited weight of three kilograms of uranium metal or alloy in a five inch diameter cylindrical geometry is considered safe from critical accidents upon applying the data from LA-2063, Table IX, which states for any reflector class the safe mass limit of highly enriched uranium (b)(4)

(b)(4) of U at a ratio of H<sub>2</sub>O of 0.01. From Table III, LA-2063 for homogeneous solutions of uranium (b)(4)

Ex 4

(b)(4) Additional safety factors accrue when using lower enrichments in the five inch diameter cylinder.

Ex 4

Procedural methods employed in the dissolving operation to prevent double batching or exceeding the proposed three kilogram limit include:

- (a) The dissolvers shall not be charged with more than three kilograms of uranium metal or alloy. The dissolver volume prevents the use of sufficient acid to dissolve more than three kilograms of metal at one time.
- (b) The dissolvers must be inspected before charging metal to assure they are empty. This inspection must be performed by the supervisor in charge of operations and noted on the log sheet.
- (c) The metal must be weighed under the direct supervision of the supervisor and the weight checked by both operator and supervisor.
- (d) The supervisor must oversee the actual charging of the dissolver and note this on the log sheet.
- (e) The dissolver is closed and sealed and no further metal can be added until the present charge has been dissolved and removed.

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- (f) The dissolver is emptied after the prescribed period of dissolving. The supervisor must then inspect the dissolver vessel to be sure all metal has been dissolved. If any metal remains additional acid is added and the dissolving cycle is repeated. The dissolver is again inspected by the supervisor. He must certify that the dissolver is empty before a new charge can be added.

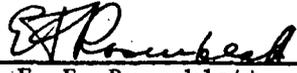
As three kilograms is the maximum metal charge used at anytime we feel that this procedure and weight limit will never result in a critical incident.

The reference quoted above is:

LA-2063 (Confidential), Nuclear Safety Guide  
Los Alamos Scientific Laboratory.

Very truly yours,

ENGELHARD INDUSTRIES, INC.

By:   
E. F. Rosenblatt  
Senior Vice President and  
Director of Research

EN/ar

cc L.C. Burman  
P. Napoli  
B. Nurmi