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SECRET

ANL-FF-346d

DATA
[REDACTED]

This document consists of 1 pages.
Copy No. 1 of 8 copies. Series A.

14 May 1953

Program 6.1.13 Fu

To: L. K. Hurst

Special Materials Department

From: A. B. Shuck

Metallurgy Division

Re: STITCH WELDING OF URANIUM CORED-ZIRCONIUM CLAD SPECIMEN FOR EBR IRRADIATION.

We have been requested to make up one specimen, containing 12 to 13 grams of 93% enriched uranium, in the form of a plate 2.75" long by 0.280" - 0.290" wide and 0.060" thick. This specimen is to be clad with 0.0075" of bonded-on zirconium on the 2.75" x 0.290" surfaces, and with 0.050" of zirconium around the edges. We have attempted to do this by diffusion-roll bonding without success because of small heat capacity of the specimen.

The only other method which promises success is by a stitch welding process developed jointly by Noland's group and Sciaky Brothers, Inc., 4915 W.67th Street, Chicago, Illinois.

Therefore, will you please look into the possibility from an accountability and security standpoint of our making this specimen by the following sequence of operation:

<u>Operation</u>	<u>Place Done</u>
1. Fabricate and machine enriched uranium core.	ANL - 16F Area
2. Assemble into zirconium picture frame and cover plate assembly.	ANL - 16F Area
3. Helic arc weld cover plate edges to picture frame, completely enclosing core in zirconium.	ANL - 16F Area
4. Stitch (resistance) weld cover plates to picture frame, to core.	Sciaky Bros.
5. Machine cladding material to finish specimen size.	ANL - 16F Area


CLASSIFICATION CHANGED
TO: NOT CLASSIFIED
 1-14-63 H. D. Young
 Authority of: USAEC
 1-22-64 [Signature]

The above operation #4 would be done in a resistance seam welding machine between rollers, by an electric current passed through the specimen and by pressure of the rollers. There would be no exposed uranium so it would be entirely enclosed in a welded zirconium can.

We do not have the equipment to do the job at ANL and procurement of such equipment would require a very large capital investment and much delay.

ABS:jp

Distribution:

- 1. ANL-FF-346 
- 2. Schumar, J. F.
- 3. Shuck, A. B.
- 4. Hurst, L.K.

- 5. Noland, R. A.
- 6. Yaggee, F. L.
- 7. Nelson, M. C.
- 8. Reading File