

NATIONAL LEAD COMPANY
OF OHIO

34-1-309F
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November 1, 1960

SUBJECT: TRIP REPORT TO STAUFFER-TEMESCAL COMPANY, RICHMOND, CALIFORNIA,
OCTOBER 19, 1960.
TO: J. A. Sulgiew, M.D.
FROM: J. F. Wing

CENTRAL FILES

OBJECTIVE OF TRIP

The objective of the trip was to discuss the health and safety aspects of a proposed off-site test involving electron beam melting of solid uranium metal at the Stauffer-Temescal Company, Richmond, California. The technical aspects of the test were discussed at the same meeting by A. D. Cavett, Metallurgical Department, who is submitting a separate trip report.

CONCLUSIONS AND RECOMMENDATIONS

Somewhat similar work with uranium has been done by the Stauffer-Temescal Company in the same furnace on two previous occasions - for North American Aviation Company and for Hanford. For metal purity and health and safety reasons the operating personnel have developed a good set of basic rules for operating and decontaminating the equipment. However, since NLO will be responsible for the health and safety aspects of the test, it is recommended, as has been the practice in similar situations in the past, that a representative of the Health and Safety Division be present during the test to insure adequate compliance with the personnel protection and equipment decontamination requirements. This will also permit NLO to acquire operational exposure data which would be of value for design criteria should this process or a modification thereof be installed locally.

PERSONS VISITED

Stauffer-Temescal Company:
Dr. D. F. Mastick, Vice-President and General Manager
P. T. Persons, Assistant General Manager
Dr. J. K. Y. Hum, Chief Metallurgist
G. W. Bower, Sales Manager
Jack Merrill, Furnace Operator

National Lead Company of Ohio:
A. D. Cavett, Metallurgical Department
J. F. Wing, Industrial Hygiene and Radiation Department

DESCRIPTION OF TRIP

A meeting was held at the Stauffer-Temescal Company, Richmond, California, on October 19, 1960 between the above listed persons

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to discuss the technical and health and safety aspects of the proposed test. Following the discussion the NLO representatives, Dr. Guss and Dr. Merrill visited the furnace facility.

The furnace heat is produced by bombarding the work with a stream of electrons traveling at extreme velocities through a very high vacuum. Melting stock can be in any form: pellets, rods, sponge, scrap, or even fine powders. The molten metal drips into an ingot mold at the furnace bottom. The ingot mold is shallow and open on the bottom. As the material solidifies, it is extracted from the mold by an ingot puller at a rate selected to maintain a constant level in the molten pool. After a sufficient length of ingot is cast, it is allowed to cool prior to removal through the furnace. The whole melting cycle can be directly viewed and controlled by the furnace operator. Very close control of melt additions and ingot retractions can, thus, be achieved. The equipment is reportedly capable of producing a very pure product and will melt uranium metal quite easily.

The furnace and associated equipment is located in a separate building which also contains a small office and a shower-change area. Only activities associated with the furnace operation are carried out in this building. The furnace operating procedure and the decontamination procedure used by the Stauffer-Temescal personnel was discussed in detail and appears to be sufficiently complete. However, since NLO will be responsible for the health and safety aspects of the proposed test, it is recommended that a representative of the Health and Safety Division be present during the test. This appeared desirable on the behalf of the Stauffer-Temescal personnel and would certainly insure that adequate protective measures were taken and that the decontamination of the facility would be complete with respect to NLO's responsibility.

One concern with the operation of the furnace hinges on the power level used. A large voltage potential is used to produce the electron beam. The 20,000-volt level marks the beginning of the more penetrating X-radiation. The furnace operator stated that past studies using film badges in various positions around the furnace have shown no significant radiation levels escaping from the enclosure. He did not recall at what power level the furnace was operating when this study was made. Below the 20-KV level there should be no radiation exposure problem due to the relatively thick furnace walls; however, since the furnace is capable of operating above this level, particular attention should be paid to the external radiation level during the test. The exact power level that would be used in the proposed test had not been decided; however, indications were that it will very probably equal or

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exceed the 20 CF level. This aspect did not appear to be of particular concern to the Stauffer-Temescal personnel due to their successful history of past operations.

The entire test melting is expected to require approximately two weeks with the decontamination time requiring approximately one day. In all, approximately 720 pounds of normal uranium metal will be melted in a series of approximately 18 melts.

MISCELLANEOUS

The personnel at the Stauffer-Temescal Company were very cooperative and appeared eager to do the test work.

COMMITMENTS

None.

J. F. Wing
J. F. Wing

JFW:mjs

cc: J. H. Noyes - 3
J. A. Quigley, M.D. - 1x
R. H. Starkey
A. D. Cavett
H. M. Eikenberry
C. E. Polson
H. Davis

Central File ✓