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Memorandum • UNITED STATES GOVERNMENT

PA-3

TO : George Bate, Chief, Production Planning and Scheduling Branch, Production Division

DATE: November 10, 1953

FROM : E. M. Kaulbach, Acting Chief, Metallurgical Development Branch Production Division

SUBJECT: REQUEST FOR URANIUM SLABS FOR NEXT ROLLING AT SUPERIOR STEEL CORP.

SYMBOL: PM:RGD

Attention: J. Siwik

In preparation for the next rolling of Savannah River plate at Superior Steel Corporation, it is requested that 50 rectangular uranium slabs be prepared to the following specifications at FMPC:

PPS-281-54 Superior Rolling

RMO-331-7

Composition of Melt

The charge used should be a blend in the proportions employed for SR slug metal. It is our understanding that this currently is approximately 4 parts derbies, 2 parts solid scrap, and 1 part briquetted chips. It is requested that records of the exact blend employed in the actual ingots be carefully maintained.

Analyses

The du Pont preferred carbon range is from 300-500 ppm. We understand from Fernald Area office that it may be difficult to bracket the carbon as closely as this. It is requested, however, that every attempt be made to hold it to at least from 200-600 ppm, the latter being the maximum spread ever accepted by du Pont for plate material. All other specifications should be identical to those employed for other SR metal.

Cropping

In order to boost the overall yield in the plate process, we request that these ingots be top cropped to remove crud but not density crop since the finish rolled strip will be cropped back to kill gage variation. We can make use of low density stock for this crop and thereby save considerably on the amount of good metal returned as solid scrap.

Casting

The ingots should be cast in rectangular molds 4"x8" in cross section. The exact weight of ingot required will have to be discussed further with Fernald since it now appears that a 680 lb. melt would yield a more efficient slab. It is our understanding that these ingots will be cast in the pilot plant since the production mold cans cannot accept rectangular molds at the present time. It now must be determined whether the pilot plant furnaces are capable of handling this slightly oversize melt. It is expected that this matter will be settled within a few days with your group and AEC-Fernald. It is felt, however, that they should

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be issued a P.O. as soon as possible so that they may be able to schedule this work.

Breakdown

The ingots as cast (shall) should be heated and broken down on the blooming mill to slabs with the following dimensions:

$8" \begin{smallmatrix} + 1/8 \\ - 0 \end{smallmatrix}$ X 1.25" no tolerance X at least 64".

Our previous experience with Fernald slabbing operations have shown that there are two serious difficulties encountered. The first is the difficulty of maintaining high enough slab temperatures during the blooming operation to insure a good structure. Micros of the last batch produced, showed a severely cold worked case while at the core there were still evidences of the dendritic as-cast structure. To eliminate this, we beta treated the slabs in the Fernald beta treating furnace. Now, however, this furnace is no longer in operation and beta treatment at Superior Steel Corporation is undesirable due to limitations on equipment and also from the standpoint of health and safety. We are therefore faced with obtaining a slab from Fernald whose structure is satisfactory in the as-rolled condition without any further heat treatment. We wonder as to the feasibility of increasing the pre-heat temperature prior to the breakdown operation.

The second difficulty has been a rather severe seaming of the edges and gouging of the surfaces of the slabs as a result of slipping with tongs and employing roll grooves for edging. The presence of these gouges has made it necessary in the past to condition slabs by surface milling at American Machine & Foundry Company. Work on the plate project would be greatly expedited if the surface quality of the slabs was improved to a point at which no machine conditioning was required.

Target Date

In preliminary conversations with Herb Paren and Russ Stanford it was indicated that Fernald would be unable to deliver these slabs before the first week in January due to prior commitments and the inability of the pilot plant to cast more than two ingots per day. We appreciate that there are problems involved in bettering this date but wish to emphasize again the urgency of the program for the development of successful Savannah River plate element prototypes. We had in mind a target date of December 12 for the Superior rolling.