B-105
materials - uranium
from Mar 5, 1947 thru Dec 1949

10549

PA. 7

[redacted]

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By Authority of
By Alan C. Walker
Date 10-31-86

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September 22, 1948

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T. W. Hauff, Head
METALLURGY AND CONTROL DIVISION

PROPOSED FORGING - ROLLING TRIALS WITH URANIUM

BILLETS AT VULCAN

Microscopic examination of a uranium rod produced by a combination forging and rolling process at Vulcan during the recent production rolling run there (reported in Doc. No. HW-10987) showed that the grain size of the metal was comparable to alpha rolled uranium. In machining, none of the slugs turned from one end of this rod contained piping defects normally present for a distance of two to four slug lengths from the ends of rolled rods. The condition of the rod surface was good.

Since examination of this rod indicated that the forging-rolling process may effect an improvement in rod soundness with the attendant increase in rod to slug yield, it is recommended that about 50 billets be forged and rolled at Vulcan during the next run starting Sept. 27 to furnish rods for evaluation at Hanford. It is also possible that this fabricating process may effect a reduction in the billet to rod fabricating cost.

R. J. Schier

R. J. SCHIER
300 AREA PLANT ASSISTANCE GROUP
METALLURGY AND CONTROL DIVISION

RJS/so

[redacted]

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Fred M. Belmore, Office of New York Directed Operations, New York, New York

Donald G. Sturges, Operations Division, Office of Hanford Directed Operations, Richland, Washington

URANIUM ROLLING BY VULCAN CRUCIBLE STEEL COMPANY

September 21, 194[illegible]

[illegible]10521

REFER TO
SYMBOL: PPR:DGS

Enclosed for your information is report by [illegible] of General Electric Company on the production rolling run at Vulcan Crucible Steel Company during the period August [illegible] to September 2, 1948.

Since the forged rod produced during this run was shipped with the regular freight shipment, it has been impossible to obtain any significant results in time for your [illegible] contract negotiations with Vulcan. It is [illegible] you keep open the possibility of [illegible] tests at this location indicate the desirability [illegible] We will furnish you with test results on this [illegible] as they are available.

Enclosure:
1. cy 5A of HW-10987

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By Alan C. Walker DOE-RL

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MATERIALS Uranium

B-125 Materials - Uranium from Mar 5, 1947 thru [illegible] 1949 [redacted] 19 HW-10987

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By Alan C. Walker DOE-RL
Date 10-31-86

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Richland, Washington
September 13, 1948

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T. W. Hauff,
Head, Metallurgy & Control Division

URANIUM ROLLING BY VULCAN CRUCIBLE STEEL COMPANY
AUGUST 23 TO SEPTEMBER 2, 1948

This shipment, consisting of 822 Type "B" uranium billets, was rolled during the period August 23 to September 2, inclusive, at the Vulcan Crucible Steel Company in Aliquippe, Pa. This was the first attempt by Vulcan to make a production run for Hanford. The bars fabricated at this site appear to be superior to those from other sources with respect to straightness and freedom from flaws. This should result in a higher yield of sound slugs. Various mechanical difficulties were encountered; however, Vulcan considered them of minor importance.

Rolling Mill and Equipment

Document number HW-10764, covering the July 23 trial, describes the rolling mill and additional equipment located at the Vulcan Crucible plant. New rolls and guides with groove sizes similar to those used in the test run were installed in the roughing stand. A 1-7/16" round groove was provided in a separate stand for finishing to the desired 1.450" diameter.

Rolling Procedure

Billets were preheated in a gas fired billet preheat furnace which was operated at a thermocouple-indicated temperature of 900°F, without a draft. The relatively quiet atmosphere inside the furnace during the one hour heating period resulted in a smaller amount of oxidation than has been experienced at Lockport and Fort Wayne.

A sequence of operations was established to insure that billets, which were preheated to an actual temperature of 1050° to 1100°F, would not reach a temperature higher than 1150°F during passage through the rolls. A typical rolling sequence for 4-1/4" by 20" billets was as follows:

Step 1, roll 5 reductions or 9 passes.
Step 2, cool 6 minutes on rack
Step 3, roll 3 reductions or 7 passes.
Step 4, cool 6 minutes on rack.
Step 5, roll 7 reductions or 9 passes.

[redacted]

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materials - uranium 4 of 8
May 5 1947 Thru Dec. 1949