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January 28, 1963

LOADING, OPERATING CONDITIONS, AND WATER SHUTOFF TIMES
FOR A CHARGE OF TWELVE 17-INCH N INNER FUEL TUBES OR
TWELVE 18-INCH U-2 w/o Zr ELEMENTS, PT-IP-536-A and PT-
IP-536-A, SUPPLEMENT B

Classification Control
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By Authority of CG-PR-2
Rm Oten, 3-17-94
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Verified by J E Savelly 4-15-94

HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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L. Barker

This document consists of
4 pages,

LOADING, OPERATING CONDITIONS, AND WATER SHUTOFF TIMES
FOR A CHARGE OF TWELVE 17-INCH N INNER FUEL TUBES OR TWELVE 18-INCH
U-2 w/o Zr ELEMENTS, PT-IP-536-A AND PT-IP-536-A, SUPPLEMENT B

Production test IP-536-A⁽¹⁾ authorizes the irradiation of N reactor inner fuel tubes in KER-1 and KER-2. Supplement B,⁽²⁾ PT-IP-536-A, authorizes the irradiation of N reactor inner fuel tubes prepared from a U-2 w/o Zr alloy. Both tests require that specific operating conditions and trip settings for particular loadings be approved by the managers of the Process and Reactor Development Sub-Section and the Process Technology Sub-Section prior to charging.

(1) Kratzer, W.K. Production Test IP-536-A, Irradiation of N Reactor Inner Fuel Tubes in KER Loops 1 and 2, HW-75280, October 16, 1962 (SECRET)

(2) Kratzer, W.K. Supplement B. Production Test IP-536-A, Irradiation of N Reactor Inner Fuel Tubes in KER Loops 1 and 2, HW-75383, October 24, 1962 (SECRET)

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The purpose of this document is to provide the process tube loading, high and low temperature operating limits, and water shutoff times for a charge of twelve 17.3-inch N inner fuel elements or twelve 18.5-inch U-2 w/o Zr elements in KER-1 and KER-2. The operating conditions were prepared for the 17.3-inch elements and, with the same downstream spacer column, are conservative for the slightly longer U-2 w/o Zr charge.

Process Tube Loadings

The process tube loading for a charge of twelve 17.3-inch N inner fuel elements or twelve 18.5-inch U-2 w/o Zr elements shall consist of: three 8-inch triangular perfs downstream, eighteen 8-inch spacers, one modified 8-inch triangular perf, twelve fuel elements, and one modified 8-inch triangular perf upstream. Twelve additional 8-inch spacers may be loaded upstream of the required loading at the discretion of the test author. Eight inch coupon holders approved by production test or 8-inch triangular perfs may be substituted for any of the 8-inch spacers.

Operating Limits

The high outlet temperature trip, maximum operating outlet temperature, and boiling point suppression trip are given in Figure 1 as a function of the observed tube ΔT .

For low pressure recirculation, the high outlet temperature trip shall be set at 200°C, the low pressure trip set at 500 psig, the low flow trip set at 32,000 lbs/hr, and the boiling point suppression trip set according to the Process Standards, HW-46000-K.

Water Shutoff Times

The water shutoff times given in HW-75353⁽³⁾ are valid for the loadings authorized by the document.

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(3) Kratzer, W.K. Loading, Operating Conditions, and Water Shutoff Times for a Charge of Six N Reactor Inner Fuel Tubes and for Two Charges of Dummies in KER-1 and KER-2, PT-IP-536-A, HW-25353, October 23, 1962 (SECRET)

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FIGURE 1

Trip Settings for a Charge of Twelve
N Reactor Inner Fuel Tubes or Twelve
U-2 w/o Zr Elements in KER-1 or KER-2.

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