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LOADING AND OPERATING CONDITIONS FOR A CHARGE OF ELEVEN OR FOURTEEN 23-INCH NAE-1 ELEMENTS IN KER-3 AND KER-4 UNDER PT-IP-477

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LOADING AND OPERATING CONDITIONS FOR A CHARGE OF ELEVEN OR FOURTEEN
23-INCH MAE-1 ELEMENTS IN KER-3 AND KER-4 UNDER PT-IP-477-A

by

W. K. Kratzer

IRRADIATION PROCESSING DEPARTMENT

March 22, 1962

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By Authority of W A Smyth

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HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON

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LOADING AND OPERATING CONDITIONS FOR A CHARGE OF ELEVEN OR FOURTEEN
23-INCH NAE-1 ELEMENTS IN KER-3 AND KER-4 UNDER PT-IP-477-A

Production Test IP-477-A⁽¹⁾ authorized the irradiation of NAE-1⁽²⁾ elements in KER-3 and KER-4 and specified certain limitations on the operating conditions for the elements. The test required that specific operating conditions and trip settings for particular loadings would be approved by the Managers of the Process and Reactor Development Sub-Section and the Process Technology Sub-Section prior to charging.

The purpose of this document is to provide the process tube loading and operating limits for a charge of eleven or fourteen 23-inch NAE-1 elements in KER-3 and KER-4.

The process tube loading for a charge of eleven elements and a fifteen-foot downstream thermocouple train in either KER-3 or KER-4 is given in Table 1. The loading for a charge of eleven elements without a thermocouple train in either KER-3 or KER-4 is given in Table 2. The loading for a charge of fourteen elements in either KER-3 or KER-4 is given in Table 3. For any of the loadings in either loop, the maximum authorized outlet temperature is 290 C, the high outlet temperature trip should be set at 305 C, and the boiling point suppression trip should be set at 25 C. These conditions are valid for process tube ΔT 's up to 77 C at 80,000 lbs/hr flow. Water shutoff times will be supplied by the test author as required.

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- (1) Kratzer, W. K., Production Test IP-477-A, Irradiation of N Reactor Fuel Elements in KER Loops 3 and 4, HW-72269, January 9, 1962 (SECRET)
- (2) Kusler, L. E. and W. K. Kratzer, Method for Designating Experimental Coextruded Zircaloy-2 Jacketed Fuel Elements, HW-67225, Oct. 26, 1960 (CONF-UNDOCUMENTED)

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TABLE 1

PROCESS TUBE LOADING FOR A CHARGE OF ELEVEN 23-INCH NAE-1 ELEMENTS
AND A FIFTEEN FOOT DOWNSTREAM THERMOCOUPLE TRAIN IN KER-3 OR KER-4

<u>Position from the Downstream End</u>	<u>Number of Pieces</u>	<u>Description</u>
1	--	15-foot thermocouple train
2-12	11	23-inch NAE-1 elements
13-17	5	16-inch tubular perfs

TABLE 2

PROCESS TUBE LOADING FOR A CHARGE OF ELEVEN 23-INCH
NAE-1 ELEMENTS IN KER-3 OR KER-4

<u>Position from the Downstream End</u>	<u>Number of Pieces</u>	<u>Description</u>
1-10	10	16-inch tubular perfs
11-21	11	23-inch NAE-1 elements
22-27	6	16-inch tubular perfs

TABLE 3

PROCESS TUBE LOADING FOR A CHARGE OF FOURTEEN 23-INCH
NAE-1 ELEMENTS IN KER-3 OR KER-4

<u>Position from the Downstream End</u>	<u>Number of Pieces</u>	<u>Description</u>
1-8	8	16-inch tubular perfs
9-22	14	23-inch NAE-1 elements
23-26	4	16-inch tubular perfs

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