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August 13, 1959

SUPPLEMENT B, PRODUCTION TEST IP-237-A, IRRADIATION OF ENRICHED SEVEN-ROD CLUSTER ELEMENTS FOR ETR TESTING

OBJECTIVE

The objective of this Supplement to PT-IP-237-A^(1,2) is to extend the maximum authorized exposure of the two enriched cluster elements in the 3674-KW front-to-back test hole from 2000 to 3000 MWD/T.

1. Kratzer, W-K., Production Test IP-237-A, Irradiation of Enriched Seven-Rod Cluster Elements for ETR Testing, HW-59335, February 23, 1959. (Secret).

2. Kratzer, W-K., Supplement A, Production Test IP-237-A, Irradiation of Enriched Seven-Rod Cluster Elements for ETR Testing, HW-59335, February 23, 1959. (Secret).

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BASIS AND JUSTIFICATION

PT-IP-237-A authorized the irradiation of two enriched cluster elements in 3674-KW to a goal of 2000 MWD/T and two enriched cluster elements in 3674-KE to a goal of 1000 MWD/T for subsequent failure testing in the ETR. It was assumed at the time the original test was written that the ETR failure testing facility would be ready by the time the two charges reached goal. When it became apparent that the failure testing facility would not be ready by the time the elements in 3674-KE were irradiated to 1000 MWD/T, their goal exposure was increased to 2000 MWD/T by Supplement A to PT-IP-237-A⁽²⁾ to keep the fuel elements in the reactor until they could be run in the ETR. It now appears that the ETR failure testing facility will be further delayed, so that a month or more waiting period between the discharge of the elements from the K reactors and their failure testing in the ETR is inevitable.

The cluster elements in 3674-KE will be discharged at an exposure of about 1700 MWD/T. In order to provide two distinctly different irradiation levels for failure testing, this Supplement to PT-IP-237-A authorizes extending the maximum exposure of the cluster elements in 3674-KW to 3000 MWD/T. It is planned to discharge the elements between 2700 and 2900 MWD/T and hold both charges until the ETR failure testing facility is ready.

TEST DETAILS

The maximum exposure of the enriched Zircaloy-2 jacketed seven-rod cluster elements in the 3674-KW front-to-rear test hole is increased from 2000 to 3000 MWD/T.

The probability of failure of the elements is not greatly increased by the increase in exposure, since the extended surface geometry should minimize the possibility of a core-associated failure and the Zircaloy-2 jackets exhibit negligible corrosion in process water. If a failure should occur, the design of the basket in which the fuel elements are contained and the arrangement of the front-to-rear test hole tubes preclude damage to the reactor.

All aspects of the original production test not specifically modified by this Supplement remain unchanged.

Reactor Fuels Unit
Process and Reactor Development Sub-Section
IRRADIATION PROCESSING DEPARTMENT

WK Kratzer:gb

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