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Westinghouse

ELECTRIC CORPORATION

TESTING REACTOR

April 12, 1961

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PITTSBURGH 30, PA.

DOCKETED USAEC Division of Licensing & Regulation APR 14 1961 Docket Officer

Mr. R. L. Kirk, Deputy Director
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

DL&R: CTE
Docket 50-22

Dear Sir:

In reply to your letter of March 21, Westinghouse wishes to submit the following information in connection with the proposed review by the Advisory Committee on Reactor Safeguards of the modifications of design and method of operation of the Westinghouse Testing Reactor.

A. Design of the Control System

The control system for the Westinghouse Testing Reactor was constructed in accordance with the design described in the Final Safety Report, WCAP-369 (Rev.) and Amendment No. 9 to our License Application. The design was modified as described in report WTR-35, "Description of Changes to WTR for 60 Megawatt Operation," which was submitted to the Division of Licensing and Regulation with our letter of February 16, 1960.

A further modification of the reactor control system was made in December, 1960 in accordance with the provisions of Paragraph 3.a.(5) of Facility License No. TR-2. This change consisted of adding a switch circuit to each control rod cutback motor which permits activation of the individual motor. The circuit in no way interferes with the normal cutback mode of control rod motion, in which all control rods are driven into the core at 50 inches per minute, initiated either by manual push-button or by the previously described automatic safety circuits of the reactor. The purpose of the change is to enable the operator to pick up an inadvertently dropped control rod and return to criticality in a minimum time. Withdrawal of a control rod following single rod cutback remains subject to the

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limitations previously described in the application.

B. Testing of Control System

The control system is calibrated and tested prior to each scheduled start-up of the reactor, as follows:

1. All nuclear instrument channels are calibrated.

2. Manually initiated cutback capability is checked by driving the control rod shaft extensions and magnets down from their pre-operational positions using the manual cutback push-button.

3. Power initiated cutback and scram capability is checked using simulated signals in the power channels.

4. Control rod release signals are checked during Step 3.

5. Period initiated scram is verified by introducing a fictitious short period.

6. Manually initiated scram is checked by pushing the manual scram button.

7. Magnet currents are adjusted to give a measured control rod release time of 250 milliseconds.

8. The panel alarm unit is checked by turning the annunciator switch to the "TEST" position. This tests all of the relays which are capable of initiating cutback or scram control rod motion.

The above process is accomplished in accordance with a formal Operating Procedure.

C. Fuel Burnout Margin of Safety

Operation of the reactor is restricted to the thermal and hydraulic conditions specified by Facility License No. TR-2. A program of computer calculations for a variety of coolant flow and inlet temperature conditions is being performed to establish a table of thermal and hydraulic parameters as a function of power and control rod position. This table will be used by the operating group to doubly ensure compliance with the license restrictions.

At present, the maximum to average power distribution used in the calculations is that associated with a full charge of new fuel elements. Since new fuel is fed into the reactor at the core edge and used fuel is removed from the core center, the maximum to average power distribution should actually be lower so the results given by the calculations are corresponding conservative. The power flattening factor is presently being evaluated.

D. Fuel Melting Because of Coolant System Failure

The possibility of fuel element melting because of coolant system failure is described in the application as incredible. The various failure mechanisms which are examined in the Final Safety Report to arrive at this conclusion have been under continuous re-examination. As a result of the re-examination, we are presently incorporating an additional safety feature which will initiate a reactor scram when the pressure drop across the reactor core falls below a safe value.

Yours very truly,

E. T. Morris

E. T. Morris, Manager
Westinghouse Testing Reactor