

MASTER

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or

B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.

**DUQUESNE LIGHT COMPANY
SHIPPINGPORT ATOMIC POWER STATION**

TEST RESULTS

**DLCS 1580202
T-550010**

**CONTROL ROD DRIVE MECHANISM
PRECRITICAL AND INITIAL CRITICAL TESTS**

CORE I, SEED 2

Section 2 of 3 Sections

First Issue, June 6, 1960

1 19

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

TEST RESULTS

DLCS 1580202
T-550010

CONTROL ROD DRIVE MECHANISM
PRECRITICAL AND INITIAL CRITICAL TESTS

CORE I, SEED 2

Purpose:

To determine any malfunctioning in the control rod drive mechanisms and their associated instrumentation prior to initial criticality.

Conclusions:

The control rod drive mechanisms and associated instrumentation are in satisfactory operating condition. The deficiencies that were observed during the test and subsequently corrected were; no positive indication of movement in rods 11, 82, 62, 53 and 14, as shown on the rod position indicating lights (MIP-RS) and the bottom indicator coil for rod numbered 81 was connected improperly. After the above deficiencies were corrected, the test was rerun for the rods in question and all operated satisfactorily.

Description of Test Equipment and Test Procedure:

With one rod drive MG set operating, the control rod to be checked was transferred to the appropriate spare inverter and withdrawn for two minutes. The direction of travel was observed on the rod position indicating lights, the dial position indicators and the spare bus position indicator. When the rod position indicator lights (MIP-RS) did not show an outward motion, the inverter was run in for approximately 100 seconds and the rod position indicator lights observed for an indicated outward motion. If this was the case, the rod was scrambled and the stator connections reversed. If the rod position indicators showed an outward motion, the rod was inserted about two (2) inches and then scrambled. An indication of a scram was obtained from a voltmeter connected across the output of the secondary winding of the bottom position indicator coil.

With all rods on their normal inverters each subgroup of four rods was withdrawn for about 60 seconds. All rod position indicators were observed for proper direction of travel in order to verify proper inverter operation. The subgroup was then inserted to about two (2) inches and then scrambled. Again an indication of a scram was given by a voltmeter connected across the secondary side of bottom position indicator coil of one of the four rods.

Results

DLCS 1580202 was performed on April 10 and 11, 1960. The first part of the test was a checkout of the control rod drive mechanisms for each individual rod. All the control rods and related instrumentation operated satisfactorily except rods 11, 82, 62, 53 and

TEST RESULTS DLCS 1580202

T-550010

CONTROL ROD DRIVE MECHANISM PRECRITICAL AND INITIAL CRITICAL TESTS

14. When an attempt was made to withdraw these rods, the rod position indicating lights failed to illuminate. The rod position indicating lights are the only positive indication of rod withdrawal. The failure of these lights to operate indicated the probability that the rods were not being withdrawn and that the stator power connection on the rod drive motors should be reversed. This was done for each of the rods in question and the test reperfomed. Retesting showed them to be in satisfactory operating condition (See Table I). Prior to the performance of this test, several recommendations were made by the Duquesne Light Company in order to eliminate possible damage to the rod drive mechanisms. These were:

Place a man on the head of the reactor to listen to the operation of the mechanisms. If improper operation was detected, the attempted withdrawal could be stopped immediately.

If improper operation of the control rod drive mechanism was detected, as observed in the control room, the test could be stopped.

The incorporation of these recommendations in the procedure was refused by the Atomic Energy Commission.

These safety precautions will be included in a revised test procedure prior to the next performance of this test.

The rod bottom indicator coil for rod 81 was not functioning properly. It was found that the leads from the indicating coil numbered 24 was attached to the first indicating light for rod 81, this deficiency was corrected and the rod bottom indicator coil operated satisfactorily.

All rods were transferred to their normal inverters and the second part of the test was performed by withdrawing the rods in each subgroup. Subgroups 2 and 6 were connected together and were operating at half speed. Data for subgroup 2 is identical with subgroup 6. All the control rod drive mechanisms and associated instrumentation operated satisfactorily, (Table II).

TABLE I

Inverter No.	Rod Position Indicator Lights (MIP-RS)	Rod Position Indicator (ARCP)	Rod Motion Totalizer (MCC-RS)	Spare Bus Position Indicator (MCC-RS)	Bottom Coil Voltage Indication After Each Drop	Rod Motors Found Reversed
1	OK	OK	OK	OK	OK	No. 11 and No. 14
2	OK	OK	OK	OK	OK	None
3	OK	OK	OK	OK	OK	None
4	OK	OK	OK	OK	OK	None
5	OK	OK	OK	OK	OK	No. 53
6	OK	OK	OK	OK	OK	No. 62
7	OK	OK	OK	OK	OK	None
8	OK	OK	OK	OK	Rod 81 Def	No. 82

- Notes:
1. Reversed Rod Drive Motors were corrected and retested satisfactorily.
 2. Spare Bus Indicating Lights indicated satisfactorily on both MIP and Auxiliary Rod Control Panel.
 3. Indicator coils for rod 81 were investigated and it was determined that the leads from indicating coil no. 24 were attached to the first indicating light and visa-versa.
 - 4.a Primary system pressure - 450 PSIG using coolant pumps 1A and 1D on slow speed.
 b Primary system temperature slowly increased from 156 F to 174 F.

DUQUESNE LIGHT COMPANY
POWER STATIONS DEPARTMENT
SHIPPINGPORT ATOMIC POWER STATION

CONTROL ROD DRIVE MECHANISM PRECRITICAL
AND INITIAL CRITICAL TESTS
DLCS 1580202
T-550010

TABLE II

Sub Group No.	Rod Position Indicator Lights (MIP-RS)	Rod Position Indicator (ARCP)	Rod Motion Totalizer (MCC-RS)	Bottom Coil Voltage indication after each drop
1	OK	OK	OK	OK
2	OK	OK	OK	OK
3	OK	OK	OK	OK
4	OK	OK	OK	OK
5	OK	OK	OK	OK
6	OK	OK	OK	OK
7	OK	OK	OK	OK
8	OK	OK	OK	OK

-4-

5
67

62

TEST RESULTS DLCS 1580202
T-550010

CONTROL ROD DRIVE MECHANISM PRECRITICAL AND INITIAL CRITICAL TESTS

Results Prepared By: Robert M. Fulmer

Results Reviewed By: Roger J. Lawrence

Approved (Duquesne Light Company): Charles J. [Signature] Date: 6-6-60

19 6