

GEORGIA TECH RESEARCH REACTOR

Chapter
9

Instrumentation
& Surveillance

Control Rod Drop Time

Procedure 7202
Approved 7-17-81
Latest Rev. 4-25-84
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I. GENERAL REQUIREMENT

A. Frequency

Monthly

B. Technical Specification or other reference

See 3.2c., and 4.2c.

II. PREREQUISITES

A. Reactor shutdown. Core is cold and xenon free.

B. A licensed reactor operator to perform the rod withdrawals.

C. Containment Integrity exists (see Tech. Spec. definition 1.26).

III. PROCEDURAL INSTRUCTIONS

A. Reset all control interlocks.

B. Drive the Regulating Rod from IN to OUT and record the following times (in seconds) or positions (in inches) on the data card in the Control Room files.

1. DOWN limit switch position.

2. Time to drive to the UP limit.

3. UP limit switch position.

4. Time to drive to the DOWN limit.

C. Set up initial conditions for the Universal Counter as described on pages 3 and 4 of this procedure.

D. Prior to measurement of the shim blade drop times, perform the following steps to evaluate the reactor shutdown margin. Note: These steps should be omitted if the core is not cold and xenon free.

1. - Raise the regulating rod to the full OUT position.

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2. Raise shim blade No. 3 to the full OUT position.
3. Raise either shim blade 1, 2 or 4 until 0.015 k/k reactivity has been added (refer to the blade worth calibration curves.)
4. Verify that the reactor is subcritical. Log this verification in the console logbook.
- E. Shim Blade Drop Time. Drive a selected blade from DOWN limit to UP limit (determine Aux. Switch setting). Reset counter and press MANUAL SCRAM Switch. Record values for the following positions and times.
 1. DOWN limit switch position.
 2. Auxiliary DOWN limit switch position.
 3. UP limit switch position.
 4. Drive time to UP limit.
 5. Two drop times in milliseconds, as determined by the Universal Counter.
- F. Repeat E 1-5 for the remaining shim blades.

IV. ACCEPTANCE CRITERIA

A. Regulating Rod

1. Limit switch positions.

DOWN limit between 0.0 and 0.2 inch.

UP limit between 11.8 and 12.0 inch.
2. Drive time

Between 45.5 and 48.5 seconds.

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B. Shim Blades

1. Limit switch position

UP limit between 54 and 57 degrees.

2. Drive time

Between 30 and 345 seconds

3. Drop time

Between 430 and 500 milliseconds and time is not
 ± 20 msec different from previous months time.

C. Advise Reactor Supervisor if any acceptance criteria
are not met

V. UNIVERSAL COUNTER - PREPARATION

These steps outline the set-up required for the Universal Counter instrument necessary to perform the measurements specified on the previous pages.

A. Initial Set-Up

1. Remove LCRM input signal to the Universal Counter at rear of chassis.
2. Select "TI A to B" function.
3. "Fast/Norm/Hold" switch to Hold.
4. "Time Base/Multiplier" switch to 1 millisecond.
5. "Time Base" toggle to X1.
6. Channel A "Attenuation" to X1.
7. Channel A "AC-DC" to DC.
8. Channel A "Slope" to minus.
9. "SEP-COM" to SEParate.
10. Channel B "Attenuation" to X1.
11. Channel B "AC-DC" to DC.
12. Channel B "Slope" to positive.
13. Channel B "Level" to 0.

B. Regulating Rod

The Universal Counter is not used for any regulating rod measurements.

C. Shim Safety Rods

1. When the auxiliary limit switch position is being determined, first trigger the counter ON by moving the Channel A "Level" control from -0.5 to +0.5 then back to -0.5. Drive the blade up until the switch resets and the counter stops. Then change the Channel A slope to positive. Again, turn the

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level control to start the counter. Drive the blade down until the switch actuates and the counter stops. Read the blade position.

2. Drive the blade to the up limit position.
 3. Reset the counter and firmly press the SCRAM button. The counter will display the drop time in milliseconds.
 4. Drive the blade from the down limit to the up limit and determine the drive time.
 5. Repeat step 3 above to determine the second drop time.
- D. Return to Normal Operating Mode.
1. "Fast/Norm/Hold" switch to Norm.
 2. Function switch on STOP.
 3. "Time Base/Multiplier" to 1 second.
 4. Connect LCRM signal lead to counter.