DATE: 7-1-77 Plant Superintendent STATION PROCEDURE COVER SHEET ID: HITT: ICATION ٨. SP 1051 Rusher 3 Rev. Title CONTROL ROD SCRAM TIME TEST Prepared By T.G. Piascik REVIEW B .. I have reviewed the above procedure and have found it to be satisfactory. TITLE SIGNATUR DEPARTMENT MEAD Derosi UNRIVIEWED SAFETY QUESTION EVALUATION DOCUMENTATION REQUIRED: C. (Significant change in procedure method or scope YES [] NO. as described in FSAR) (If yes, document in PORC/SORC meeting minutes) LINVIRONMENTAL IMPACT YES [] (Adverse environmental impact) NOD (If yes, document in PORC/SORC meeting minutes) D. PORC/SORC APPROVAL PORC/SURC Meeting Number 7.9-116 E. APPROVAL AND IMPLEMENTATION The attached procedure is hereby approved, and effective on the dates below: ive Date Plant Superintendent/Unit Superintendent Appr SF-301 Lev. 2

SCRAM TIMING BRUSH RECORDER TRACE



Rod Travel	Signals from Rod Drift Alarm
5%	Dropout of Position 46
20%	Pickup of Position 38
50%	Pickup of Position 24
90%	Pickup of Position 04
Buffer Time	Pickup of 04 of dropout of 00

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- 8.4 Depress the Chart Speed 125 mm/sec pushbutton (916).
- 8.5 Patch the Control Rod Patchboard to the desired control rods as selected by The Reactor Engineer (928).
- 8.6 Lock the plexiglass window cover and return the key to the SS (916).
- 8.7 Under the direction of the Reactor Engineer, restore the control rod pattern to the configuration prior to the surveillance testing.

9. SURVEILLANCE DATA SHEET

- 9.1 RE Form 1051-1, Control Rod Scram Time Test.
- 9.2 RE Form 1051-2, Control Rod Scram Time Test Data.
- 9.3 RE Form 1051-3, Control Rod Scram Time Test Data.
- 9.4 RE Form 1051-4, Average Scram Insertion Times for the Three Fastest Rods in a Two by Two Array.
- 9.5 RE Form 1051-5, Single Rod Scram Control Sheet.

10. FIGURES

10.1 Scram Timing Brush Recorder Trace

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- 7.14.5 Record any pertinent comments on the data sheet.
- 7.14.6 The strip chart(s) and Data Sheets will be transferred to the Office Surveillance File at the completion of the surveillance.
- 7.14.7 Calculate the average time required for 5%, 20%, 50% and 90% control rod insertions. Complete RE Form 1051-3 with the scram time for each control rod for 5%, 20%, 50% and 90% points.
- 7.14.8 Using RE Form 1051-3, record the scram insertion times for each required percent insertion and highlight each time which exceeds the tehenical specification limit. At the completion of the scram timing testing, the Reactor Engineer, or his representative, will review RE Form 1051-3. Any two by two array having two insertion times greater than the technical specification limits will be analyzed using RE Form 1051-4. If the technical specification limit is exceeded for the three fastest rods in a two by two array, management must be immediately notified.
- 7.14.9 The control rod scram time data reduction shall be accomplished immediately after the completion of the last control rod to be scrammed.
- 7.14.10 After completion of Data Reduction analysis forward completed Data Sheets to the ISI Coordinator.

8. RESTORATION

Upon completion of the Single Rod Scram Control Sheet, perform the following:

- 8.1 Remove the Single Rod Scram Test Timing Mark Module.
- 8.2 Place the Recorder Start toggle switch in the AUTO position (928).
- 8.3 Depress the Power ON pushbutton in the Recorder (916).

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7.11 Record the following information on RE Form 1051-2 for each control rod scrammed timed.

- 7.11.1 Control Rod Location
- 7.11.2 Accumulator Pressure, PSIG
- 7.11.3 Any pertinent remarks
- 7.12 Notify the Operator to open charging valve 113.
- 7.13 Repeat steps 7.4.4 through 7.12 for all control rods listed in the Reactor Engineer's Single Rod Scram Control Sheet.
- 7.14 Data Reduction
 - 7.14.1 Locate time zero on the brush paper at the point where the Channel 30 (right hand line) switches from a solid line to dashed line.
 - NOTE: Be careful of "double notches" where no space is visible between notches. Also look for channels that may not have produced a trace at all as this becomes important when assigning rod locations to the individual lines on the strip chart.
 - 7.14.2 Mark off the 5%, 20%, 50% and 90% points on the strip chart for all rods involved (refer Figure 10.1).
 - 7.14.3 Utilizing the length-to-time template, convert the 5%, 20%, 50% and 90% positions into time and record these values on the Data Sheet, RE Form 1051-2.
 - 7.14.4 Measure the buffer times and record these values on RE Form 1051-2.
 - 7.14.4.1 A short buffer (no lenthening of dashes) is indicative of failure of the internal seals.
 - 7.14.4.2 A long buffer time (greater than five (5) seconds at rated pressure scrams) is indicative of a plugging internal filter which could eventually prevent the rod from scramming.

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If the scram timing is not completed in one continous sequence, the Reactor Engineer will deviate as necessary from RE Form 1051-5 to insure that the remaining control rods are scrammed without causing unnecessary flux spikes.

7.6 Notify the Operator located on the CRD Hydraulic Modules to close Charging Valve 113 for the rod to be scrammed.

CAUTION: DO NOT REMOVE THE TOGGLE SWITCH FROM THE SCRAM TG THE NORMAL OR SELECT POSITION FOR AT LEAST FIVE (5) SECONDS.

- 7.7 Notify the SCO on duty that the rod is about to be scrammed and start a countdown from three (3) seconds
 - 7.7.1 At time approximately three (3) seconds, depress the Chart Speed 125 mm/sec pushbutton on CRP-916.
 - 7.7.2 <u>At time zero</u>, place the toggle switch for the rod to be scrammed in the SCRAM position (center position) on CRP-916.
 - 7.7.3 After five (5) seconds from time zero, depress the Chart Speed Stop pushbutton and reposition the toggle switch to its original position. (NORMAL or SELECT).

7.8 Check the strip recording to verify the entire sequence has been recorded. If not, repeat steps 7.5 and 7.7.

7.9 Record the following information on the strip chart:

7.9.1 Date

7.9.2 Time

7.9.3 Control Rod Location

7.10 Record the following information on RE Form 1051-2 at the start of testing.

7.10.1 Reactor Pressure, PSIG

7.10.2 Reactor Power, % or MWe

7.10.3 Date and Time

7.10.4 Initial of data recorder

- 7.2 Perform the following to ready the Brush Recorder located on CRP-916 for scram time testing:
 - 7.2.1 Place the Test-Auto toggle switch in the TEST position and verify the Recorder runs for ten (10) seconds (928).
 - 7.2.2 Return the toggle switch to the AUTO position.
 - 7.2.3 Insure the Chart Speed Stop pushbutton is depressed (916).
 - 7.2.4 Insure the Power ON pushbutton is depressed (916).
 - 7.2.5 Place the Recorder Start toggle switch in the MANUAL position (928).

CAUTION: DO NOT SELECT MORE THAN TWENTY (20) RODS.

- 7.3 At the Control Rod Patch board on CRP-928 patch in the rod(s) to be scrammed on the desired channels for the strip recorder.
- 7.4 Connect the Single Rod Scram Test Timing Mark Module to CRP-916 as follows:
 - 7.4.1 Obtain the key from the SS and unlock the plexiglass window cover.
 - 7.4.2 Insert the One Rod Test dual plug into the One Rod dual jack located on the recorder.
 - 7.4.3 Insert the Neutral (black) plug into the Neutral jack on the panel.
 - 7.4.4 Insert the Rod (red) plug into the jack on the panel Control Rod Markup corresponding to the rod to be scram time tested.
- 7.5 Using the Single Rod Scram Control Sheet provided by the Reactor Engineer, RE Form 1051-5, select and independently verify the rod to be scrammed on the CRP-905 pushbutton Martrix and withdraw the rod to position 48 (if not already fully withdrawn). The independent verifier will initial RE Form 1051-5 in the applicable space after the control rod is selected.

PREREQUISITES

4.1 Test Equipment:

- 4.1.1 Template relating length on Brush Recorder to time.
- 4.1.2 Single Rod Scram Test Timing Mark (Channel 30) Module.
- 4.2 The Reactor Protection System shall be operable as per IC 408A.
- 4.3 All accumulators shall be charged as per OP 302, paragraph 7.3.
- 4.4 Insure the Chart Recorder is supplied with sufficient paper to perform this test.
- 4.5 Scram timing will be performed only when the reactor is at power conditions, not to exceed 25% power.

5. INITIAL CONDITIONS

- 5.1 Obtain permission from the Shift Supervisor (SS) for authorization to commence testing. SS will initial Data Form, indicating his permission is granted.
- 5.2 Position an operator at the CRD Hydraulic Modules.

6. PRECAUTIONS

- 6.1 All procedure steps shall be coordinated with the Control Room Operator.
- 6.2 When the Individual Rod Scram and Select Switch on Panel 916 is in the SCRAM position it must remain there for at least five (5) seconds in order that the control rod is allowed to fully insert and not be caught somewhere in its travel.
- 6.3 To insure approximate full plant scram conditions during single rod scrams at normal accumulator pressures valve 113 on the CRD Hydraulic Module shall be closed to isolate the module from the charging water system.

7. PROCEDURE

7.1 Initial Data Form indicating Prerequisites and Initial Conditions are met and Precautions noted.

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1. OBJECTIVE

1.1 To verify the control rod insertion times are within the limits as set forth in the Technical Specifications.

2. ACCEPTANCE CRITERIA

2.1 Scram Insertion Times

The average scram insertion time, based on the de-energization of the scram pilot valve solenoids as time zero, of all operable control rods in the reactor power operation condition shall be no greater than:

<pre>% Inserted from Fully Withdrawn</pre>	Average Scram Insertion Times (sec.)	
5	0.375	
20	0.900	
50	2.000	
90	3.500	

2.2 The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two by two array shall be no greater than:

% Inserted from Fully Withdrawn	Average Scram Insertion Times (sec)	
5	0.398	
20	0.954	
50	2.120	
90	3.800	

2.3 The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.

3. TECHNICAL SPECIFICATION REFERENCES

3.1 Technical Specifications: 3.3.C, 4.3.C

3.2 FSAR III - 5.3

3.3 Inservice Inspection Program

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