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MC-1

SP Number 44.662.02
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LOOSE PARTS MONITORING SYSTEM FUNCTIONAL CHECK

1.0 PURPOSE

To provide detailed instructions necessary to perform a functional check of the Loose Parts Monitoring (LPM) System required by Reference 11.5.

2.0 RESPONSIBILITY

The I&C Engineer shall be responsible for insuring the proper implementation of the procedure.

PPF 1021.400-6.421

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3.0 DISCUSSION

- 3.1 The Loose Parts Monitoring (LPM) System is supplied by Technology for Energy Corporation (TEC) to detect impact noises in the reactor pressure vessel.
- 3.2 The LPM System contains four channels which monitor acoustical signals. Each channel consists of an accelerometer, charge converter, differential transducer amplifier and an impact detector.
- 3.3 Two channels monitor the feedwater vessel nozzles. The other two channels monitor two control rod drive housings.
- 3.4 Also included in the system are control module, annunciator module, audio monitor/simulator, power monitor, and tape recorder.
- 3.5 All equipment is prefixed with 1B21 and located in 1B21-PNL-252 unless otherwise noted.

4.0 PRECAUTIONS

- 4.1 Steps indicated in this procedure shall be performed in sequence.
- 4.2 The Watch Engineer shall be notified whenever a procedural step can not be completed as stated.
- 4.3 The LPM System may still receive alerts from the reactor pressure vessel. If an alert is received, allow the system to reset automatically.

5.0 PREREQUISITES

- 5.1 Obtain permission and written approval of the Watch Engineer in accordance with the station surveillance program.
- 5.2 The LPM System is in its normal operating configuration as described in Step 8.1.1 of Reference 11.4.
- 5.3 Verify that the revision number and date on this station procedure are the same as the revision number and date on the station procedure in the Control Room master file.
- 5.4 The reactor is not required to be in any special condition (Condition Ø) prior to performance of this test. However, sufficient background noise must be present.

6.0 LIMITATIONS AND ACTIONS

N/A

7.0 MATERIALS OR TEST EQUIPMENT

N/A

8.0 PROCEDURE

INITIALS

8.1 Verify that all prerequisites of Section 5.0 have been completed. _____

8.2 Initial System Verification

8.2.1 Verify the LED's on EI-502, signifying +15V, -15V, +5V, +30V available, are illuminated. _____

8.2.2 Verify the OVL LED's on VBF-148A, 148B, 149A, and 149B are indicating green. _____

8.2.3 Verify the STATUS LED's on VBD-148A, 148B, 149A and 149B are indicating green. _____

8.2.4 Verify the ALARM LED on VBA-502 is OFF. _____

8.2.5 Depress the Display Test Switch on VBI-502. Verify all segments of the Voltmeter Display LED on VBI-502 illuminate. _____

8.3 Sensor Functional Check

8.3.1 Place the Channel Select Switch on VBM-502 to channel 1 (2, 3, 4). Verify the background noise is audible. _____

8.3.2 Repeat Step 8.3.1 for channel 2, 3, and 4. _____

8.3.3 Place the Setpoint Monitor Select Switch on VBD-148A (148B, 149A, and 149B) to the "BKGD" position. Record the voltmeter reading of VBI-502 on Data Sheet 1, Appendix 12.1. _____

8.3.4 Place the Setpoint Monitor Select Switch on VBD-148A (148B, 149A, and 149B) to the "THRESHOLD" position. Record the voltmeter reading of VBI-502 on Data Sheet 1, Appendix 12.1. _____

NOTE: The magnitude of Background and Threshold voltages should be approximately equal. The Threshold voltage will be shown as a negative quantity.

8.3.5 Repeat Steps 8.3.3 and 8.3.4 for VBD-148B, 149A, and 149B. _____

8.4 Simulator Functional Check

8.4.1 Place the Simulator Enable/Disable Switch on VBM-502 to the "ENABLE" position. _____

8.4.2 Depress the Simulator Impact Switch on VBM-502 to the "IMPACT" position momentarily. Verify the following:

- a) The status LED's on VBD-148A, 148B, 149A, and 149B are illuminated red. _____
- b) The first alert display on VBC-502 displays the first alert channel. Record the channel number on Data Sheet 1, Appendix 12.1. _____
- c) The alarm LED on VBA-502 is illuminated. _____
- d) The Control Room Annunciator Alarms. _____
- e) VBR-502 is in a forward/record mode. _____

8.4.3 After approximately one minute stop VBR-502 by depressing the "STOP" button. _____

8.4.4 Rewind VBR-502 to the point where the footage counter reads "0000". Play the section just recorded. _____

8.4.5 Place the "METER" selector switch of VBR-502 to the "REP" position for each of the four channels, one channel at a time. Verify the following:

- a) VBR-502 did record the signals from VBM-502 on each of the four channels. _____
- b) The signals as seen on the monitor meter of VBR-502 are approximately ± 5 db on each of the four channels. _____

8.4.6 Depress the system reset switch on VBC-502 while simultaneously placing the Simulator Enable/Disable Switch on VBM-502 to the "DISABLE" position. _____

9.0 ACCEPTANCE CRITERIA

9.1 The sensors are functioning properly as demonstrated in Section 8.3.

9.2 The LPM System is functioning properly as demonstrated in Section 8.4.

10.0 FINAL CONDITIONS

10.1 Submit all test results in accordance with the station surveillance program.

10.2 Upon completion of this procedure, the system is ready for operation. Leave the Loose Parts Monitoring System in a normal operating configuration - powered with no alarms - or as directed by the Watch Engineer.

11.0 REFERENCES

11.1 Shoreham FSAR 14.1.8.4

11.2 TEC Assembly Drawings 111600.02-7.81-15A thru 31A.

11.3 TEC Operations and Maintenance Manual #30063-01 T037.410.01

11.4 SP 23.662.01, Loose Parts Monitoring System

11.5 Technical Specification, Section 3/4.3.7.12

12.0 APPENDICES

12.1 Data Sheet 1, SPF 44.662.02-1

12.2 Equipment Numbers and Channel Designation

DATA SHEET 1

Procedure Step

8.3.3	Background Voltage of VBD-148A	_____ V
	Background Voltage of VBD-148B	_____ V
	Background Voltage of VBD-149A	_____ V
	Background Voltage of VBD-149B	_____ V
8.3.4	Threshold Voltage of VBD-148A	_____ V
	Threshold Voltage of VBD-148B	_____ V
	Threshold Voltage of VBD-149A	_____ V
	Threshold Voltage of VBD-149B	_____ V
8.4.2	B) First Alert Channel _____	

EQUIPMENT NUMBERS AND CHANNEL DESIGNATION

NOTE: All equipment numbers are prefixed by 1B21.

Model #	CHANNEL #			
	1	2	3	4
Endevco 2273AM1 Sensor	VBE-148A	VBE-148B	VBE-149A	VBE-149B
TEC-500 Charge Converter	VBT-148A	VBT-148B	VBT-149A	VBT-149B
TEC-932 Differential Transducer Amplifier	VBF-148A	VBF-148B	VBF-149A	VBF-149B
TEC-1432 Impact Detector	VBD-148A	VBD-148B	VBD-149A	VBD-149B
TEC-1433C Control Module	VBC-502			
TEC-133C Annunciator Module	VBA-502			
TEC-1439 Audio Monitor/Simulator	VBM-502			
TEC-913 Power Supply Monitor	EI-502			
TEC-142 Alert Setpoint Monitor	VBI-502			
TEC-146 Tape Rec. Interface	VBS-502			
Racal Tape Recorder	VBR-502			
TEC-141 AC Power Distrib. Junc. Box	E/S-252			