OS2

FORM NO. SU-8.1 (REV. 6)

CP&L

SHEARON HARRIS NUCLEAR POWER PLANT

START-UP MANUAL

INSTRUCTION/PROCEDURE

SUM VOLUME VI

NO.: 1-9103-S-27

TITLE:

TURBINE OVERSPEED TRIP TEST

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE

APPROVED BY: J. M. Collins — NAME/TITLE — 7-3-86 DATE

MANAGER-OPERATIONS

8612040373 861121
PDR ADOCK 05000400
P PDR

ADVANCE CHANGE FORM

(1) Proc. No. 1-9103-5-21 Rev. 0 Change # 1

(2) Title Turbine Overspeed Trip Test

(3) Reason for the Change incorporation of walkdown, special QA, and ONS review comments

(4) Description of the Change revised pages 2,6,8,9, & 11 to reflect (3)

(5) Additional pages Attached # of Pages 5

(6) Prepared by R. Moore / PW Date 10-29-86
Name/Title

(6a) Verify Tech. Spec. Cross Reference reviewed if procedure is used to satisfy Tech. Spec. Surveillance Requirements.

R. Moore Date 10-29-86
Preparer

(7) Recommended for approval:

R. Moore / PW Date 10-29-86
1st Technical Reviewer Signature Title

J. J. Stewart / Procedure Writer Date 10-30-86
2nd Technical Reviewer Signature Title

(8) SAFETY REVIEW

Two qualified safety reviews are required prior to Final Approval. Attach Nuclear Safety Review Checklist in Accordance with AP-011.

(9) ALARA concurrence if applicable
Signature [signature] Date 11-20-86

(10) Fire Protection concurrence if applicable
Signature [signature] Date 11/20/86

(11) QA CONCURRENCE, if applicable
Signature N/A Date

(12) FINAL APPROVAL

Approved by original signed by J. L. Harness for 11/20/86 Date
Name/Title

Remarks

(Form AP-07-4-4)

List of Effective Pages

Page	Revision
1 - 12	0
2,6,8,9,11	AC 0/1

AC
0/1
RLM
10-29-86

Table of Contents

1.0 Purpose and Objective

The purpose of this procedure is to verify the on-line operation of the Turbine Mechanical Overspeed Protection Mechanism.

2.0 Prerequisites and Initial Conditions — Initials/Date

2.1 Initial Criticality and Low Power Physics testing plateau is complete per 1-9100-S-01.

_____/_____

2.2 Reactor power is less than 20%.

_____/_____

2.3 The Turbine-Generator has been at ≥ 10% Load (95 - 145 MW) for eight (8) hours or more.

_____/_____

2.4 All test personnel have been briefed on their responsibility during the test by the Power Ascension Lead Test Engineer.

_____/_____

2.5 An operator is standing by the trip lever at the Governor Pedestal, in contact with the Control Room.

_____/_____

2.6 Communications have been established.

_____/_____

2.7 A frequency counter has been installed at the Governor Pedestal to allow the operator to see the speed locally. (Spare speed pickup, terminal Box "A", TB1, points 40,41 and 42 GRND)

_____/_____

2.8 The operational status of the unit will allow the test plant prerequisites to be established and performance of the test to occur without violation of Technical Specifications or creation of conditions adverse to safe operation.

_____/_____

2.9 The Shift Foreman has granted permission to perform this test by signing in the space provided below.

_____/_____
(Shift Foreman)

3.0 Precautions

3.1 The Turbine speed should not be allowed to exceed 2010 RPM (111.6%). If the unit has not tripped when this speed is reached, the turbine is to be tripped manually.

3.2 Should bearing vibration levels increase past the alarm point of 7 mils while above 1800 rpm, this test should proceed only with the approval of the Manager-Operations.

3.3 All work and testing will be performed in accordance with the CP&L Safety Manual.

4.0 References

4.1 Drawings

N/A

4.2 Miscellaneous

4.2.1 Steam Turbines Vol I, Operation and Control, Tab 36-9, Rev. 4, Westinghouse File # 16-5005 PO NY001.

4.2.2 1-9100-S-01, Power Ascension Test Program - Power Escalation

4.2.3 CP&L Start-up Manual, Chapter 22

4.2.4 GP-006, Normal Plant Shutdown from Power Operation to Hot Standby

4.2.5 Regulatory Guide 1.68, Appendix A, 4K

4.2.6 CM-M0164, Mechanical Overspeed Trip Calibration

5.0 Test Equipment

5.1 Frequency Counter - Fluke 1900A or equivalent

CP&L ID # _____ Cal Due Date _____

6.0 Test Procedure Initials/Date

6.1 Prepare for Overspeed Test

6.1.1 Remove the Generator Load in accordance with applicable portions of GP-006 (normal plant shutdown to hot standby).

_____/_____

6.1.2 Establish communications between operator at the governor pedestal and the operator at the MCB.

_____/_____

Initials/Date

6.1.3 Note the RPM indications on the MCB DEH panel and the frequency counter used in Section 5.0. Record any difference in Section 10.1.2. AC 011 RM 10-29-86

_____/_____

6.2 Oil Pressure Test of Trip Mechanism

6.2.1 Hold speed at 1800 RPM. This portion of the test will be performed at the Governor Pedestal of the Turbine.

_____/_____

6.2.2 Move the lever marked 'Test' and 'Normal' to the 'Test' position and hold it there for the duration of this section.

_____/_____

6.2.3 Slowly open the valve marked 'Overspeed Test' (1LO121); while watching oil pressure gauge PI-4130. AC 011 RM 10-29-86

_____/_____

6.2.4 Record the pressure from PI-4130 on Data Sheet 10.1 when the 'Reset' lever drops to the 'Trip' position for baseline data purposes.

_____/_____

NOTE: This pressure has no set value for acceptance, but is proportional to speed at the trip point, and so can be used to verify proper operations during regular operational testing. (Baseline Data) AC 011 RM 10-29-86

6.2.5 Still holding the 'Test' lever over, close the hand valve marked 'Overspeed Test' tightly.

_____/_____

6.2.6 Hold the 'Reset' lever in the 'Reset' position long enough so that it will only return to 'Normal' position, not 'Trip'.

_____/_____

Initials/Date

6.2.7 Once the 'Reset' is in the 'Normal' Position, the 'Test' lever may be released.

_____/_____

6.2.8 Defeat the electrical overspeed protection by turning the 'Overspeed Trip' keyswitch (on the trip test panel) to the 'Inhibit' position

_____/_____

6.2.9 Defeat the DEH protection by turning the 'OPC' keyswitch (on the manual DEH panel) to the 'Overspeed Test Permissive' position.

_____/_____

6.3 Press 'REF' on the turbine operator's panel, and enter a speed reference of 2015 RPM (112% speed). 'Hold' will light.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.4 Press 'ACCEL RPM/MIN' button and enter a rate of 50 (fifty) RPM/MIN.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.5 Notify the operator at the turbine to watch the digital counter carefully, and to trip the unit at 2010 RPM.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.6 Assign test personnel to watch only the digital speed indicator on the operator's panel.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.7 Press 'GO'. When the turbine trips, log the speed from both indicators on Data Sheet 10.1

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.8 Let the speed decrease to below 1700 RPM and relatch the turbine from the valve test and latch panel.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.9 Press 'REF' and enter a speed of 1700 RPM, Press 'GO'.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

Initials/Date

6.10 When turbine speed reaches 1700, press 'Transfer TV' to return to Governor Valve Control. Verify 'TV' extinguishes and 'GV' illuminates.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____

6.11 Press 'ACCEL RPM/MIN' and verify the rate is still 50 RPM/MIN.

Run #1 _____/_____ Run #2 _____/_____ Run #3 _____/_____ | AC 011 RM 10-29-86

6.12.1 If the turbine tripped itself in Step 6.7 within 1962 to 1998 RPM (1980 ± 1%), then repeat Steps 6.3 through 6.11 twice more. -

_____/_____ | AC 011 RM 10-29-86

6.12.2 If the turbine does not trip between 1962 to 1998 RPM, notify Maintenance to perform CM-M0164, Mechanical Overspeed Trip Calibration. After adjustment is completed return to step 6.0.

_____/_____ | AC 011 RM 10-29-86

6.13 On the Emergency Trip System Panel, take the Overspeed Trip keyswitch to the INSERVICE position.

_____/_____ | AC 011 RM 10-29-86

6.14 On the operator's panel on the MCB, take the OPC keyswitch to the INSERVICE position.

_____/_____ | AC 011 RM 10-29-86

6.15 Notify Shift Foreman that test is completed and the turbine is available for normal service.

_____/_____ | AC 011 RM 10-29-86

7.0 Acceptance Criteria — Initials/Date

Level I

None

Level II

7.1 The mechanical overspeed trip mechanism has successfully tripped three (3) times consecutively at speeds between 1962 and 1998 RPM (110% ± 1%). See Data Sheet 10.1

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_____/_____

Level III

None

Acceptance Criteria Approved

_____ _____
Power Ascension Lead Test Engineer — Date

8.0 Figures

N/A

9.0 Tables

N/A

10.0 Data Sheets

10.1 Turbine Overspeed Trip Test

10.1 Turbine Overspeed Trip Test — Initials/Date

Oil Pressure obtained during Step 6.2.4 _____/____
(Baseline Data)

Mechanical Trips	DEH Speed	Local Speed (Step 6.7: Acceptance Criteria 7.1)	
Run #1	_____	_____	____/____
Run #2	_____	_____	____/____
Run #3	_____	_____	____/____

If unit did not trip on first attempt (otherwise N/A, initial, and date blanks):

Oil pressure from Step 6.2.4 (second attempt) _____/____
(Baseline Data)

AC
OIL
RHM
10-29-84

_____ _____ _____
Recorded by Time Date

10.1.2 Test Comments

_____

_____

_____

_____

_____

_____

_____

_____

_____

11.0 Electrical Lineup

N/A

12.0 Valve Lineup

N/A