

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
HOPE CREEK GENERATING STATION

SAFETY EVALUATION

NO. PSE-SE-2-014

TITLE: SIMPLIFICATION OF POWER ASCENSION FEEDWATER SYSTEM
RESPONSE TESTING - TEST NUMBER 21A

DATE SEP 25 1985

1.0 PURPOSE

The purpose of this Safety Evaluation is to document the results of an evaluation performed to ensure that simplification of Hope Creek's Test Number 21A, Feedwater System Response, will not adversely affect reactor safety.

2.0 SCOPE

The test specifications are related to the feedwater control system which is a subsystem of the feedwater system.

3.0 REFERENCES

1. Regulatory Guide 1.68, Revision 2, August 1978
2. Hope Creek Final Safety Analysis Report (FSAR)
Chapter 14
3. General Electric Startup Test Specification, 23A4137,
Revision 0
4. Hope Creek Generating Station Draft Technical
Specifications

4.0 DISCUSSION

Regulatory Guide 1.68 (Revision 2, August 1978), Appendix A, paragraph 4.u requires the demonstration of the operability of major plant control systems during low power testing; paragraph 5.s requires the calibration and performance verification of feedwater control systems during power ascension testing; and paragraph 5.v requires the verification of feedwater system operation in accordance with design requirements during power ascension testing. Hope Creek's Test Number 21A, Feedwater System Response, verifies that the feedwater system has been adjusted to

provide acceptable reactor water level control. Nominal level setpoint changes are used to evaluate the feedwater control system settings for all power and feedwater pump modes. Performance of this test is currently planned for heatup and Test Conditions 1 through 6. It is proposed to delete all testing at Test Condition 4 and to delete the Automatic Load Following (ALF) tests.

Deletion of ALF testing is evaluated in Safety Evaluation PSE-SE-Z-002; deletion of natural circulation testing (Test Condition 4) is evaluated in Safety Evaluation PSE-SE-Z-008. Together these two safety evaluations adequately address the changes proposed for Test Number 21A.

5.0 CONCLUSION

The subject test can be simplified by deleting ALF testing and all testing at Test Condition 4. All requirements of the test currently planned will be met, and the objectives of Regulatory Guide 1.68 (Revision 2, August 1978), Appendix A, paragraphs 4.u, 5.s, and 5.v will be satisfied. These changes do not adversely affect safety systems or the safe operation of the plant and so they do not involve an unreviewed safety question. In addition, a Technical Specifications change is not required. Therefore, Hope Creek's Power Ascension Test Number 21A, Feedwater System Response, can be simplified by deleting ALF testing and all testing at Test Condition 4.

6.0 DOCUMENTS GENERATED

None

7.0 RECOMMENDATIONS

Revision to Hope Creek's FSAR and startup test procedures shall be made to reflect the simplifications of Test Number 21A, Feedwater System Response, as discussed above.

8.0 ATTACHMENTS

None

9.0 SIGNATURES

Originator	<u>Raymond W. Johnson</u>	Date
Verifier	<u>M. F. L.</u>	9/25/85
Group Head (or SSE)	<u>M. J. Patton</u>	Date
Systems Analysis Group Head	<u>A. F. Duffy for C. W. Lindert</u>	9/25/85
Site Engineering Manager	<u>CW Chidley</u>	Date
		9/25/85

TEST NUMBER 21A - FEEDWATER SYSTEM RESPONSE
TEST SIMPLIFICATION - REDUCED NUMBER OF TESTS

OBJECTIVE:

Regulatory Guide 1.68 (Revision 2, August 1978), Appendix A, paragraphs 4.u, 5.s, and 5.v require the demonstration of operability during low power testing, the calibration and performance verification during power ascension testing and the verification of operation in accordance with design requirements during power ascension testing of the feedwater control system. Test Number 21A, Feedwater System Response, verifies that the feedwater system has been adjusted to provide acceptable reactor water level control. Nominal water level setpoint changes are used to evaluate the feedwater control system settings for all power and feedwater pump modes. Performance of this test is currently planned for heatup and Test Conditions 1-6. It is proposed to delete water level setpoint and manual feedwater flow tests at Test Condition 4 and to delete Automatic Load Following (ALF) tests.

DISCUSSION:

Acceptance criteria, level 1 and level 2, define acceptable performance of the feedwater control system to testing perturbations. Level 1 and 2 criteria require that the transient response of any level control system-related variable to any test input must be non-divergent. Testing is performed at all Test Conditions (1-6) to demonstrate compliance to these criteria. In addition, testing is performed with the Recirculation Flow Control System in both the manual and ALF modes of operation. The ALF mode testing can be deleted since the ALF mode will be disabled.

Current plant Technical Specifications do not allow continued operation at natural circulation flow. Test Condition 4 defines the region bounded by natural circulation flow near the 100% rod line. Since this is not an intended mode of operation, testing at Test Condition 4 can be deleted. The objectives of Regulatory Guide 1.68, paragraphs 4.u, 5.s, and 5.v are still satisfied with the remaining testing.

CONCLUSION:

The Automatic Load Following mode of operation will be disabled so not testing the Feedwater Control System in the ALF mode does not adversely affect any safety related systems or the safe operation of the plant and as such does not involve an unreviewed safety question. Plant Technical Specifications do not allow continued operation at natural circulation conditions and therefore Test Condition 4 does not affect any safety systems or the safe operation of the plant and as such does not involve an unreviewed safety question. The proposed testing satisfies the objectives of Regulatory Guide 1.68, Appendix A, paragraphs 4.u, 5.s, and 5.v, as well as the requirements of Test Number 21A. Therefore, Test Number 21A, Feedwater System Response, can be simplified by deleting the ALF testing and by deleting testing at Test Condition 4.

ATTACHMENT 2

TEST NO.	TEST NAME	OPEN VESSEL	HEAT UP	1	2	3	4	5	6	WARRANTY
(22)										
1	Chemical and Radiochemical	X	X	X		X		X	X	
2	Radiation Measurement	X	X	X		X			X	
3	Fuel Loading	X								
4	Full Core Shutdown Margin	X								
5	Control Rod Drive	X	X	X(2)	X(2)	X(2)			X(2)	
6	SRM Performance	X								
8	IRM Performance		X	X						
9	LPRM Calibration		X	X		X			X	
10	APRM Calibration		X	X	X	X		X	X	
11	Process Computer	X	X	X(3)		X		X		
12	RCIC		X	X						
13	HPCI		X			X				
14	Selected Process Temp		X			X	X(4)		X(4)	
14	Water Level Ref Leg Temp		X			X			X	
15	System Expansion	X	X	X		X			X	
16	TIP Uncertainty					X			X	
17	Core Performance			X	X	X	X	X	X	X
18	Steam Production									X
19	Core Pwr-Void Mode Response						X	X		
20	Pressure Regulator			X	X	X	X	X	X	
21	Feed Sys-Setpoint Changes		X	X	X	X	X	X	X	
21	Feed Sys-Loss FW Heating								X(5)	
21	Feedwater Pump Trip								X(6)	
21	Max FW Runout Capability								X(7)	
22	Turbine Valve Surveillance					X(8)		X(9)	X(10)	
23	MSIV Functional Test		X	X(11)	X(12)			X(13)		
23	MSIV Full Isolation								X	
24	Relief Valves		X	X(20)	X	X(20)			X(20)	
25	Turbine Trip & Load Rejection				X(15)	X(16)			X(17)	
26	Shutdown Outside CRC				X					
27	Recirculation Flow Control				X(14)			X(18)		
28	Recirc-One Pump Trip					X			X	
28	RPT Trip-Two Pumps					X(19)				
28	Recirc System Performance				X	X	X		X	
28	Recirc Pump Runback					X				
28	Recirc Sys Cavitation					X				
30	Loss of Offsite Pwr			X						
31	Pipe Vibration		X	X	X	X			X	
29	Recirc Flow Calibration					X			X	
32	RWCU		X							
33	RHR				X				X(21)	
34	Drywell & Steam Tunnel Cooling		X	X		X			X	
35	Gaseous Radwaste			X		X			X	
38	SACS Performance					X			X	
40	Confirmatory In-Plant Test				X					

- (1) Test conditions refer to plant conditions on Figure 14.2-4
- (2) Perform Test 5, timing of 4 slowest control rods, in conjunction with expected scrams
- (3) Dynamic System Test Case to be completed between test conditions 1 and 3
- (4) After recirculation pump trips (natural circulation)
- (5) Between 80 and 90 percent thermal power, and near 100 percent core flow
- (6) Max FW Runout Capability & Recirc Pump Runback must have already been completed
- (7) Reactor power between 80 and 90 percent
- (8) Reactor power between 45 and 65 percent
- (9) Reactor power between 75 and 90 percent
- (10) At maximum power that will not cause scram
- (11) Perform between test conditions 1 and 3
- (12) Reactor power between 40 and 55 percent
- (13) Reactor power between 60 and 85 percent
- (14) Between test conditions 2 and 3
- (15) Generator load rejection, within bypass valve capacity
- (16) Reactor power between 60 and 80 percent at core flow \geq 95 percent - turbine trip
- (17) Load rejection
- (18) Between test conditions 5 and 6
- (19) >50% power and >95 core flow, and performed before Turbine Trip & Load Rejection
- (20) Check SRV set points during major scram tests
- (21) Performed during cooldown from test condition 6
- (22) The test number correlates to FSAR Section 14.2.12.3.x where x is the indicated test number.

FSAR 3/7

(X) DELETED TEST POINT

HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

TEST SCHEDULE AND CONDITIONS

FIGURE 14.2.5

Amendment 10, 05/85