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March 11, 1985

NUCLEAR LICENSING & SAFETY DEPARTMENT

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
License No. NPF-29
File: 0260/0650
Modification to Startup Test Program
AECM-85/0076

The attached information is being submitted to support your review of proposed revisions to the Grand Gulf Nuclear Station (GGNS) startup test program. The changes proposed involve the SRV in-plant test outlined in Chapter 14 (Test No. 78) of the GGNS FSAR and described in detail in MP&L letter dated April 13, 1982 (AECM-82/150). Recent experience at the Leibstadt nuclear plant during similar SRV in-plant tests has prompted Mississippi Power & Light (MP&L) to propose a more flexible test plan to help avoid the delays due to valve weepage problems experienced at Leibstadt. Although this occurrence has no effect on the valves' ability to actuate per design, it does adversely impact the test program with respect to repeatability of the data. Since GGNS has the same SRV design (DIKKER's) as Leibstadt and MP&L's operating experience to date has confirmed the valves' tendency to weep, MP&L considers it prudent to propose modifications to the current test plan. The attached action plan discusses, in detail, three courses of action which can be taken to minimize the impact of valve weepage to the GGNS startup test program. These actions include:

- 1) reduce the total number of valve actuations by eliminating any unnecessary shakedown tests,
- 2) reduce the number of actuations on any given valve by using up to three valves for the single valve actuation (SVA) tests,
- 3) extend the test period through full power testing.

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As described in the attachment, Actions 1 and 2 are not viewed as major modifications to the original test plan as described in Chapter 14 of the FSAR. Action 3, however, represents an extension of the power level at which the test will be performed. Based on a literal interpretation of license condition 2.C(31), this change (Action 3) to Chapter 14 is considered to require prior NRC review and approval. Additional detail and justification for the proposed changes are provided in the attachment. The Plant Safety Review Committee has reviewed and concurred with the submittal of this information.

MP&L requests that the NRC review and approve these proposed modifications to the test plan. Your approval is requested by April 5, 1985 so that shutdown testing can begin immediately after the current outage. Please advise if further information is required.

Yours truly,


L. F. Dale
Director

ARR/JGC:vog
Attachment

cc: Mr. J. B. Richard (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. G. B. Taylor (w/o)

Mr. James M. Taylor, Director (w/a)
Office of Inspection & Enforcement
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ACTION 1: ELIMINATION OF UNNECESSARY SHAKEDOWN TESTS

The SRV Test Program described in AECM-82/150 which was submitted on April 13, 1982 consisted of a three phase test:

Three shakedown tests
Four single valve actuations
Four 4-valve actuations

The primary purpose of the shakedown tests are to ensure that all instrumentation is properly functioning and to optimize signal amplifier gain settings. When the test plan was originally submitted, there was little empirical basis for selecting three shakedowns except to ensure that a sufficient number would be scheduled to allow for instrument checkout. Since that time, experience at Kuo Sheng and Leibstadt nuclear plants has shown that in all likelihood only one shakedown test will need to be performed to set up the instrumentation. For this reason, MP&L intends to perform one mandatory shakedown test and make the other two optional (only to be performed if required for additional instrument checkout). Because this plan of action does not involve a change to the test methodology, acceptance criteria or planned power level (as described in Chapter 14 of the FSAR) MP&L does not view this as a major change to the test plan. This information is provided as a supplement to the April 13, 1982 correspondence.

ACTION 2: USE OF THREE VALVES FOR SVA'S

The April 13, 1982 letter indicated that the primary test valve would be V-10 (0° azimuth). Since that time V-12 (32° azimuth) has been designated as the primary valve. This reselection was based on the V-12 quencher's close proximity to the RCIC turbine exhaust and RHR A test return lines both of which have been instrumented with strain gages to evaluate the effect of SRV actuation on submerged structures. As the primary test SRV, the V-12 discharge line and quencher support have been instrumented with pressure sensors and strain gages respectively to maintain the necessary instrumentation coverage as discussed in AECM-82/150.

As described in the Kuo Sheng SRV Test Program Final Report, the SVA data base was a composite of results from three different SRV's. Backup valves were used to complete the test due to primary valve leakage after repeated actuations. MP&L intends to take the same approach in the GGNS test program should V-12 weeping become severe enough to effect data repeatability. The Grand Gulf Test Plan places a sufficient number of pool pressure sensors in the vicinity of V-10 (0° azimuth) and V-11 (16° azimuth) to allow these quenchers to serve as suitable backups, if necessary.

If Action 2 is utilized, all previously planned data could be obtained from actuations of V-10 or V-11 with the exception of discharge line pressures and quencher support strains. While this latter data would be unavailable, it is not deemed significant to the overall test objectives for two reasons. First, MP&L will perform at least one actuation of V-12 during which time the response of the aforementioned parameters will be obtained. Secondly, test data from both Kuo Sheng and Leibstadt has confirmed that the discharge line pressures and the quencher strains are consistently below predictions thereby providing additional assurance of conservative design.

Finally, MP&L has assessed the impact of this action on the desired test results and concludes that the pool pressures generated by actuations of V-10, V-11, or V-12 (under the same initial conditions) are only sensitive to the difference in the free air volume in the tailpipes and not the azimuthal orientations. Because the difference in the air volumes between the three valves is only 2.8%, the effects on the pool pressures have been shown to be very small.

While this action involves the potential use of less instrumented quenchers, a minimum of one V-12 actuation will provide line pressure and quencher strain data. For this reason, MP&L believes that this approach is consistent with the original test objectives. This information is provided as a supplement to the original April 1982 correspondence.

ACTION 3: EXTENSION OF TEST TO FULL POWER

Table 14.2-3 of the Grand Gulf FSAR indicates that Test Number 78 "SRV In-Plant Test" will be performed in Test Condition 3 (up to 75% reactor power). Test Condition 3 was specified because this is the earliest possible time to perform the 4-valve MVA (Multiple Valve Actuation) without undue risk of a reactor scram or large thermal transient. In view of the difficulties anticipated in completing the tests during TC3 and the need to minimize unnecessary plant shutdowns, MP&L requests the latitude to conduct the SRV tests between Test Condition 3 and Test Condition 6 (up to 100% reactor power). This schedule flexibility would have the advantage of utilizing planned and unplanned shutdowns between Test Conditions 3 and 6 in order to re-establish the prerequisite valve conditions (including any required reworking of the valve seats, if necessary). A proposed markup of FSAR Table 14.2-3 is shown on page 4 of the attachment.

MP&L has reviewed the technical consequences of this action and has concluded that any adverse effects are minimal because there is only an approximately 5% difference in RPV pressures between 75% and 100% power conditions. This slight pressure increase results in a very small increase in the SRV induced hydrodynamic loads. In addition, to gain confidence with regard to the conservatism of the predicted Grand Gulf SRV loads, MP&L intends to conduct at least one shakedown test and one SVA test during Test Condition 3 applying all Level I and Level II Acceptance Criteria. In view of the fact that the additional 3 SVA's and 4 MVA's are planned to establish the statistical basis for the 95-95 confidence level and that similar testing at Kuo Sheng and Leibstadt resulted in satisfactory resolution without any structural modifications, MP&L believes that this approach provides schedule flexibility without compromising the test objectives, methodology or criteria described in the April 13, 1982 letter. This plan of action will enhance the repeatability of test data while minimizing potential impact to the test program.

Based on a literal interpretation of license condition 2.C.(31), this action is considered to require specific NRC concurrence since it is a change to the power level stated in Chapter 14 of the FSAR.

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FSAR

TABLE 14.2-3 (Cont.)

STARTUP TEST PROGRAM

STI NO.	TEST NAME	COLD TEST OR OPEN RPV	HEAT UP	TEST CONDITIONS						WARRANTY
				1	2	3	4	5	6	
30	Recirc. System: Trip One Pump					X ¹³			X ¹³	59
	Trip Two Pumps					X ¹³			X	59
	System Performance				X	X	X	X	X	59
	Runback					X				
	Non-Cavit. Verif.				X	X				
31	Loss of T-G Offsite Power				X ¹³ , SP					59
33	Drywell Piping Vibration	X			X	X		X	X	55
34	RPV Internals Vibration	X			X	X		X	X	55
35	Recirc. System Flow Calibration					X			X	59
36	Isolated Reactor Stability	X ¹⁵								
70	Reactor Water Cleanup System	X				X				
71	Residual Heat Removal System	X		X					X	59
72	Drywell Atmosphere Cooling	X			X				X	
74	Offgas System	X		X		X			X	
75	Cooling Water Systems	X		X		X			X	
76	ESF EQ. Area Cooling				X ¹⁶				X ¹⁷	
77	MSIV Leakage Control				X ¹⁸					
78	In-Plant SRV Testing					X		X	X	59
79	Penetration Cooling		X						X	

Proposed
Change

- See Figure 14.2-4 for Test Conditions region map.
- Perform Test 5, timing of 4 slowest control rods in conjunction with these scrams.
- Between Test Conditions 1 and 3.
- Between Test Conditions 2 and 3.
- Between Test Conditions 5 and 6.
- Before 100% Load Rejection.
- Future maximum power test point.
- Determine maximum power without scram.
- Perform at 100% Core Flow, 50% $\pm 2.5\%$ Power.
- Deleted.
- 70-80% Power.
- 80-90% Power.
- Do STI 33 in conjunction with this test.
- Demonstrate Recirculation System Runback Feature.
- <2 percent power @ 600 psig and 900 psig.
- In conjunction with STI 14.
- In conjunction with STI 71.

- L = Local Flow Control Mode
M = Master Manual Flow Control Mode
X = Local or Master Manual Flow Control Mode
A = Automatic Flow Control Mode
SP = Scram Possibility
SE = Scram Expected
SD = Scram Definite
BP = Bypass Valve Response
* = Do either Stop Valve or Control Valve Trip

- In conjunction with STI 28 or any time a reactor isolation and depressurization are convenient.
- 60 to 80 percent power, ≥ 95 percent core flow.