



# MISSISSIPPI POWER & LIGHT COMPANY

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June 6, 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  
SRV In-Plant Test Plan,  
Justification For Conclusion of  
Testing  
AECM-85/0179

By letter dated April 11, 1985, the NRC staff approved changes to the Grand Gulf Nuclear Station (GGNS) Safety/Relief Valve (SRV) in-plant test plan. These changes had been proposed by Mississippi Power & Light (MP&L) in letter dated March 11, 1985 (AECM-85/0076). The revised test plan consisted of one shakedown test, four single valve actuations (SVA) and four multiple valve actuations (MVA). A series of SRV tests were subsequently conducted April 23 through April 25, 1985. These tests included one shakedown test, three SVAs each of which was followed by a consecutive valve actuation and one MVA. Portions of this testing were witnessed by representatives of your staff and of NRC Region II. Following the single MVA test, the SRV test program was temporarily suspended to allow the reduction and review of limited portions of test data. Leakage through the tested valves, as anticipated and discussed in the above referenced MP&L letter, also necessitated a temporary suspension of valve testing at that time.

Based on a review of the real time data collected during the above tests, (summary attached), MP&L concludes that the test objectives have been met and that there is sufficient data to confirm the adequacy and conservatism of the analytical models used in the GGNS containment design. MP&L considers that additional tests would only confirm the above conclusion. Furthermore, additional testing represents added duty on the safety/relief valves and other components which would otherwise be avoided if additional testing is not conducted.

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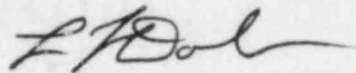
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Therefore, MP&L requests NRC review of the attached information and concurrence that the scope of SRV testing conducted thus far is sufficient and no additional testing is required. The Plant Safety Review Committee has reviewed this information and concurs with the conclusions reached. It should be noted that this information is not intended as a comprehensive summary and evaluation of test results. A summary test report of the SRV In-Plant Test Program will be provided to comply with Operating License Condition 2.C(34).

Currently, the plant is in the final phase of the start-up test program (Test Condition 6). In order to avoid delays in the completion of this test condition, your review and concurrence is respectfully requested by June 24, 1985. MP&L realizes this is a rapid turnaround request; however, supporting vendor data was only recently available. Please contact this office, if you require further information or if we can assist your review in any way. In accordance with 10 CFR 170, an application fee \$150.00 is enclosed.

Yours truly,



L. F. Dale  
Director

MLC/JGC:vog  
Attachments

cc: Mr. J. B. Richard (w/a)  
Mr. O. D. Kingsley, Jr. (w/a)  
Mr. R. B. McGehee (w/a)  
Mr. N. S. Reynolds (w/a)  
Mr. G. B. Taylor (w/o)  
Mr. R. C. Butcher (w/a)

Mr. James M. Taylor, Director (w/a)  
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Region II  
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GGNS SRV In-Plant Test Program:  
Justification For Conclusion of Testing

1. INTRODUCTION

For Grand Gulf Nuclear Station (GGNS) the Safety/Relief Valve (SRV) in-plant test plan is described in detail by MP&L letter dated April 13, 1982 (AECM-82/150). The test program was modified in the MP&L letter dated March 11, 1985 (AECM-85/0076). The test program consists of a shakedown test, four single valve actuations and four multiple valve (4-valves) actuations.

2. TEST OBJECTIVE

The primary objective of the SRV in-plant test plan is to provide sufficient information to confirm the adequacy and conservatism of the analytical models used in the Grand Gulf containment design with respect to loadings from SRV actuations. The test matrix was established to provide measurement of Grand Gulf unique pool pressure time histories, structural loads, and acceleration responses during various SRV actuations. Multiple tests were planned in each matrix test to establish the statistical basis for the 95-95% confidence level.

3. TESTS PERFORMED

On April 23 through April 25, 1985, a series of SRV tests were conducted at GGNS. These tests included one shakedown test, three single valve first actuations (SVA) each of which was followed by a consecutive valve actuation (CVA), and one multiple valve actuation (MVA) test. The optional CVA tests were performed to provide information to confirm the adequacy of the Grand Gulf design for which the most limiting SRV loading is the CVA. The test program was temporarily suspended following the single MVA test to allow limited reduction of selected portions of recorded data and because test valves were exhibiting seat weepage, as anticipated and described in MP&L letter AECM-85/0076.

4. TEST RESULTS AND DISCUSSION

A total of 138 pressure sensors, strain gauges, and accelerometers were installed at GGNS. During the actual testing approximately 25% of the sensors were recorded simultaneously on both the data acquisition system and on oscillographs. The oscillograph data provided real time measurements used to determine the acceptability of test results and is the basis for information and conclusions provided here.

The real time pressure data was collected from sensors located on the basemat and drywell wall. For each test, real time sensors were located within a radius of 2r of the quencher in order to read peak bubble pressure for that test. To eliminate acoustic response and provide results comparable to the analytical cut-off frequency used in the original plant design, a 100Hz low pass filter was used.

Statistical evaluations were performed to obtain pressures (95-95% confidence level) utilizing recorded data for SVA and CVA. The SVA measured pressures of +5.3/-3.6 psid compared favorably to the expected values of +7.7/-4.4 psid. The CVA measured pressures were +10.7/-7.1 psid, which are well within the Grand Gulf design values of +18.2/-7.7 psid (adjusted for the 75% power level test conditions). The MVA results are very similar to the SVA results. Pressures recorded during the MVA were less than or equal to those recorded during the various GGNS SVAs and to those observed during similar MVA testing at the Kuosheng Nuclear Plant. Overall, the MVA test results were indicative of the expected response and similar to four valves actuated independently with very little interaction of hydrodynamic loads.

SRV discharge leg (SRVDL) and quencher internal pressures were recorded during the shakedown test and the MVA test. The peak SRVDL internal pressure was a high frequency spike with a magnitude of 480 psi, which is less than design value of 550 psi. The recorded peak quencher hub pressure of 250 psi during the shakedown and MVA tests is also less than the design value of 550 psi.

The measured strain data shows small strains in the quencher supports and little induced strain in any of the submerged structures, base mat liner, and containment liner (approximately less than half the predicted values). This is consistent with the Kuosheng Nuclear Plant test results which showed that structural strains were much smaller than predicted.

The measured mean structural accelerations for all tests range from 6% to 70% of the expected value which is consistent with the Kuosheng test results where measured responses were very small compared to predicted.

## 5. CONCLUSIONS

Based on review of the real time data, sufficient test data is available from these tests to demonstrate that Grand Gulf SRV hydrodynamic loads, structural loadings, and acceleration responses are well within the Grand Gulf design values. The measured pressures closely match the GESSAR methodology. The available data shows good repeatability for SVAs and CVAs and similarity as expected between SVAs and MVAs. Any additional tests would be confirmatory. Based on the above information, MP&L has concluded that all test objectives have been met and additional testing to complete the test matrix is not necessary.