

Quarterly Status Report for
Quarter Ending December 31, 1983

"Degraded Core Accident
Hydrogen Control Program"

Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417

Mississippi Power & Light Company

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Quarterly Status Report - December 31, 1983

"Degraded Core Accident Hydrogen Control Program"

1.0 Introduction

This quarterly status report is submitted to comply with a requirement in Supplement Number 4 to NUREG-0831, Safety Evaluation Report related to the Operation of Grand Gulf Nuclear Station Units 1 and 2. This requirement specifies that Mississippi Power & Light (MP&L) should provide quarterly reports outlining the status of the on-going research program to address degraded core hydrogen control requirements. This report covers the last calendar quarter of 1983 ending December 31, 1983.

This report includes brief summaries of the submittals made by MP&L during this quarter along with summaries of meetings between the NRC staff and MP&L. MP&L is participating in the Hydrogen Control Owners Group (HCOG) which is conducting generic research and completing generic analyses to resolve the degraded core hydrogen control issue. Since the work completed by HCOG complements the MP&L program to resolve this issue, this report also includes summaries of meetings between the HCOG and the NRC. The summaries of these meetings included in this report do not reflect a formal HCOG position with respect to any issue and represent only the MP&L interpretation of the meetings.

2.0 Summary of MP&L Submittals

AECM-83/0671, October 17, 1983

MP&L letter number AECM-83/0671, dated October 17, 1983, provided the following information to clarify questions related to equipment survivability and particularly to resolve concerns of the NRC's staff on calculation of temperatures in the drywell using the CLASIX-3 computer code:

- (1) Discussion of scaling of convective heat fluxes in response to specific staff questions,
- (2) Revisions to the containment and drywell equipment lists with explanatory discussion,
- (3) Additional CLASIX-3 analyses and MARCH analyses which predict degraded core conditions more accurately and indicate that there is limited potential for a flammable mixture to exist in the drywell, and
- (4) Discussion of the drywell thermal environment for a degraded core accident.

AECM-83/0659, October 25, 1983

MP&L letter number AECM-83/0659 dated October 25, 1983, provided additional clarification as to the estimated effect of sprays on containment thermal environment during hydrogen combustion. This submittal supplemented information provided to the NRC in AECM-83/0479 dated August 23, 1983. Resolution of the actual spray effectiveness issue will come through testing at the 1/4 scale HCOG facility.

3.0 Summary of Meetings

MP&L and NRC Meeting on October 26, 1983

MP&L met with the NRC on October 26, 1983, to discuss the October 17, 1983, submittal (AECM-83/0671), and the 1/4 scale hydrogen combustion program.

Topics of discussion of AECM-83/0671 included the approach in selecting equipment required to survive a hydrogen burn, methodology adopted to evaluate equipment survivability, and drywell temperature concerns.

The staff also discussed the preliminary comments from the containment systems branch (CSB) on the 1/4 scale test program. These comments resulted from the CSB review of the HCOG August 12, 1983, submittal (HGN-012).

3.1 Planned Future Meetings with NRC

MP&L anticipates meeting with the NRC under the auspices of HCOG to discuss the planned 1/4th scale test. This discussion would cover test objectives and facility design.

4.0 Test Program Status

The summaries and status of the HCOG test programs as stated here do not reflect the HCOG position with respect to any test program and represent only a MP&L interpretation of these programs.

4.1 1/20th Scale Test Program Status

An advance copy of the following volumes were sent to Mr. C. Tinkler of the NRC staff providing the results of the "Hydrogen Combustion Testing In A One-Twentieth-Scale Model of a BWR6/Mark III Containment"

- (1) Volume I: "Facility Description and Results Summary"
- (2) Volume II: "Test Data and Supplementary Information"

4.1.1 Planned Activities in the 1st Quarter of 1984

Report on the 1/20th scale test will be issued.

4.2 1/4th Scale Test Program Status

Preparation of the test site has been completed. The foundation design has been completed and constructed.

Detailed drawings are completed, materials have been ordered and construction of assemblies have begun for the test facility.

4.2.1 Planned Activities for the 1st Quarter of 1984

Beginning of field erection is planned for mid-January, 1984.

Continue construction of test facility.

Continue instrumentation design and equipment procurement.

4.3 Ignition Effectiveness Test in Rich Hydrogen-Air-Steam Mixture

Test to measure the ignition effectiveness of the GM AC 7G Glow Plug in rich hydrogen-air-steam mixtures have been conducted using a 17 liter quasi-spherical vessel at AECL's Whiteshell Nuclear Research Center. The preliminary copy of the report has been sent to Mr. C. Tinkler of the NRC staff.

The Supplementary Tests investigating the ignition limits associated with steam condensation continued through the fourth quarter.

4.3.1 Planned Activities in the 1st Quarter of 1984

Report on the ignition effectiveness tests in rich hydrogen-air-steam mixtures will be issued.

The Supplemental Tests will be completed and an addendum report will be issued.