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P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

December 6, 1984

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
Unit 1
Docket Nos. 50-416
License No. NPF-29
File: 0272/15619
Response to Generic Letter 84-23 on
RPV Water Level Instrumentation;
O.L. Condition 2.C.(33)(e)
AECM-84/0521

On November 6, 1984, MP&L received Generic Letter 84-23 (MAEC-84/0386, dated October 26, 1984) entitled "Reactor Vessel Water Level Instrumentation in BWRs," which is a result of the NRC's review of the BWR Owners Group report SLI-8211 and NUREG-0737, Item II.F.2. As required by Generic Letter 84-23, MP&L is hereby providing our response for GGNS within 30 days of its receipt. Also, the information contained herein supplements that already provided on this subject in fulfillment of GGNS Operating License Condition 2.C.(44)(e) [License No. NPF-13] as submitted in AECM-82/368, dated August 30, 1982. The License Condition was subsequently renumbered to 2.C.(33)(e) in License NPF-29.

The NRC identifies three potential improvement categories in the subject generic letter to be reviewed by BWR licensees in order to satisfy the BWR inadequate core cooling (ICC) concerns. The three improvements involve minimizing vertical reference leg drop within drywell, using an analog trip unit system, and mitigating the consequences of a potential reference leg break and the simulteneous channel failure in a separate reference leg. Each of these concerns are discussed below for GGNS.

Reference Leg Drop in Drywell: Due to similar concerns previously identified by the NRC Instrumentation and Control Systems Branch, MP&L provided a discussion on this matter in Attachment 4 to AECM-81/341, dated September 2, 1981.

Reactor pressure vessel (RPV) water level is measured by differential pressure transmitters which measure the difference in static head between two columns of water. One column is a "cold" filled system (ambient temperature) reference leg penetrating the steam region of the RPV and the other column is a variable leg which senses the pressure of the water inside the RPV. The measured differential pressure is a function of reactor water level. GGNS (which is a BWR-6 design) incorporates four such reference leg/variable leg

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columns for the wide range and narrow range RPV water level monitoring system. Each of these reference legs have a drop of less than 7 feet inside drywell as measured from the condensing pot to the drywell penetration.

From the previous analysis performed using the worst case considerations for reference leg boiloff (small break accident with ADS operation after 1800 seconds), a maximum error of 9'6" (114 inches) could occur. This analysis conservatively assumed that the drywell temperature is maintained at the design maximum drywell temperature and the reactor is depressurized to its saturation pressure allowing the reference leg to boiloff. In addition, no subsequent operator action is taken to prevent boiloff even though specific operator actions are required by the GGNS Emergency Procedures for this condition.

Considering that the bottom of the normal operating range is around the level 4 low water level alarm setpoint which is at +32.7 inches (based on instrument zero), an error of 114 inches due to reference leg boiloff still provides a margin of approximately 85 inches (7.1 feet) prior to the actual RPV water level dropping to the top of active fuel at -167 inches.

Therefore, MP&L concludes that the existing vertical drop on the RPV reference legs are acceptable and that little benefit would be gained from further reduction of reference leg drop.

Analog Trip Unit System: The GGNS design already incorporates the use of an analog trip unit system, in lieu of a mechanical trip unit system, similar to that described in General Electric's NEDO-21617. Therefore, GGNS is in compliance with this improvement category for RPV level measurement.

Protection System Logic Concern (Michelson Concern): This concern considers the potential for a failure of RPV reference leg sensing line common to both feedwater control and any protective functions, along with the simultaneous worst case single failure of a protective system in a separate sensing line channel.

The GGNS (BWR-6) design which has four independent vessel level sensing lines has been shown to be less vulnerable to a failure of this type. Analysis of various scenarios for this concern have been conducted for both GGNS and for the BWR-6 design as part of the BWR Owners Group efforts. For GGNS this concern was evaluated and reported in AECM-81/351, dated September 10, 1981. As a result of this evaluation, it was shown that GGNS can withstand any reactor vessel level reference line break coupled with an additional worst single failure in a protective channel not dependent on the failed sensing line without compromising safety. The NRC's review of the GGNS submittal confirmed MP&L's findings which were reported in Supplement 4 to the GGNS Safety Evaluation Report (NUREG-0831). Similar analysis were conducted for the BWR Owners Group as discussed in SLI-8211. The results of this analysis also supported the positive results performed for GGNS.

Therefore, MP&L concludes that the BWR-6 RPV water level monitoring design and logic preclude this as being a safety concern on GGNS.

In conclusion, MP&L does not consider that any modifications are necessary in response to Generic Letter 84-23 for GGNS and that the issue addressed in the GGNS O.L. Condition 2.C.(33)(e) is resolved based on this response. MP&L is presently reviewing the overall RPV water level monitoring system in accordance with the Regulatory Guide 1.97 guidance, and our results will be submitted to the NRC in February, 1985 as required by O.L. Condition 2.C.(36).

Yours truly,

L. F. Dale
Director

SAB/SHH:rw

cc: Mr. J. B. Richard
Mr. R. B. McGehee
Mr. N. S. Reynolds
Mr. G. B. Taylor

Mr. Richard C. DeYoung, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. J. P. O'Reilly, Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 2900
Atlanta, Georgia 30323