MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi
P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

August 5, 1984

NUCLEAR LICENSING & SAFETY DEPARTMENT

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
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 & 50-417
License No. NPF-13
File: 0260/L-860.0
Supplemental Information
Pertaining to the
Qualification of SRV
Seitz Solenoid Valves
AECM-84/0394

Mississippi Power & Light Company (MP&L) letter, AECM-84/0402, dated July 30, 1984, provided current information on the status of qualification testing of the Seitz solenoid valves (associated with main steam safety/relief valves). Based on discussions with your staff on August 2 and 3, 1984, MP&L is supplying the attached additional information in support of justification for interim operation, pending full qualification. This information is provided as an update and elaboration on the justification for interim operation provided in earlier submittals associated with the NUREG-0588 environmental qualification program (principally, MP&L letter AECM-81/0335, dated September 1, 1981).

Based on information provided in AECM-81/0335 and AECM-84/0402 and that provided in the attachment, MP&L considers interim operation justified in this matter until the SRV solenoid valves are fully qualified in accordance with NUREG-0588 and 10 CFR 50.49.

Sincerely,

L. F. Dale
Director, Nuclear Licensing & Safety

LFD/sad
Attachment

cc: (See Next Page)

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

Mr. Richard C. DeYoung (w/a)
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. J. P. O'Reilly (w/a)
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W., Suite 2900
Atlanta, GA 30323

SEITZ SOLENOIDS INTERIM OPERATION JUSTIFICATION ON DIKKERS SAFETY RELIEF VALVES FOR GGNS

JUSTIFICATION FOR INTERIM OPERATION

1. A successful four day DBA Test has been performed on the Seitz solenoids by Dikkers Valve Co. after thermal, mechanical and radiation aging. This testing was performed during initial qualification of the SRVs in mid-1981, however, the qualification testing did not fully consider a 40 year qualified life and a 100 day test period. Subsequently, additional testing was performed by MP&L which demonstrated successful solenoid operation through a DBA environment for 486 hrs. (20.25 days) with the existing solenoid design prior to solenoid failure. The failure of the solenoid was due to moisture intrusion into the coil through O-rings on the solenoid itself. Failure was likely induced by either radiation degradation of the seals, accident pressures, solenoid design, or a combination thereof.

   MP&L is now pursuing qualification of two new solenoid designs which are not expected to allow a similar failure mode as occurred in the previous solenoid design.

2. Besides overpressure protection, the SRVs perform two functions related to core cooling. These are to provide automatic RPV depressurization upon loss of the high pressure core spray system (HPCS) or to provide a long term alternate shutdown cooling path. The Automatic Depressurization System (ADS) function is performed through eight (8) SRV's for small and intermediate breaks (less than 0.5 $ft.^2$). These valves depressurize the system in about 15 minutes, in the event that HPCS fails to function, thus permitting the low pressure systems to flood the core. It takes up to 30 minutes (depending on break size) to reach low water level which would automatically activate ADS. Including the 15 minutes to blow down, the total time during which the solenoids must operate for this function is less

than 45 minutes. The MP&L test data to date has shown that the solenoids would operate under these conditions, and therefore, it is concluded that the ECCS function of ADS (HPCS backup) can be provided by the existing solenoids.

The second core cooling function that the SRVs provide is for a long term, alternate shutdown cooling path. In the normal RHR shutdown cooling mode, pump suction is from the recirculation piping, discharging directly through the RHR system heat exchangers to the feedwater piping back to the reactor vessel. The applicable portions of this system, including the shutdown cooling valving, have been qualified for the DBA environment. However, in the event of a loss of normal shutdown cooling, alternate shutdown cooling can be accomplished by use of the SRV's.

The alternate mode of RHR consists of drawing water from the suppression pool through the RHR heat exchanger and back to the reactor vessel through feedwater piping. The vessel water is allowed to overflow into the steam lines and discharge back to the suppression pool via the ADS SRV discharge lines (or other SRVs if available). This alternate mode of operation would normally only be necessary if the RHR shutdown cooling suction valve located inside the drywell (E12-F009) failed and if the drywell was inaccessible. It is for this off-normal mode of operation that the SRV solenoids are required to be qualified for 100 days of operation.

For the spectrum of accidents and transient events considered, the failure of the SRV solenoids prior to the 100 days required would only be of concern for small break LOCAs. For transient events, the drywell environment would not be of concern. For the large to intermediate spectrum of breaks the vessel would be depressurized through the break. If normal shutdown cooling was not available and SRVs were not operable for alternate shutdown cooling, the flow from the vessel through the break into the drywell and over the weir wall back to the suppression pool would provide a continuous loop if necessary.

For small breaks, realistic scenarios with or without operator action show no fuel failure (see NEDO-24708 plus results of TCTA small break test).

Therefore radiation levels would not prevent operator access to either replace failed solenoids or repair the RHR shutdown cooling valve. In such cases, re-pressurization could be prevented by use of the main condenser since the operator would have many hours to make either available. Should the reactor re-pressurize, core makeup would be provided by one or more of the following systems: 1) HPCS, 2) RCIC, or 3) CRD. Any of the three systems can provide adequate high pressure makeup at the SRV safety spring setpoint, if necessary.

In summary, adequate SRV solenoid qualification has been demonstrated by testing for any required short term ECCS requirements. For any long term shutdown cooling, there is only a small set of the possible spectrum of accidents and transients for which the solenoid operation for use in alternate shutdown cooling (if normal shutdown cooling is not available) would be of concern. With realistic consideration of small break LOCAs, no fuel failure would result which would prevent operator access to repair the normal shutdown cooling suction valve or SRV solenoids. For those small break LOCAs where access is not available after several weeks due to radiological concerns, many GGNS design features would allow the operator to maintain the core cooled and in a safe condition until such time as long term shutdown cooling can be provided. Therefore, in consideration of the ongoing environmental qualification on the GGNS SRV Seitz solenoids, the design of GGNS to perform its intended safety functions under the existing SRV qualification, and the many alternative methods of providing core cooling and decay heat removal at GGNS, MP&L considers GGNS to be justified for interim operation until completion of the qualification of the SRV solenoid.