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SUPPLEMENTARY INFORMATION TO
LER 82-105/01 X-1

Mississippi Power & Light Company
Grand Gulf Nuclear Station - Unit 1
Docket No. 50-416

Technical Specification Involved: 6.9.1.12.h
Reported Under Technical Specification: 6.9.1.12.h

Event Narrative:

MP&L has reviewed the Architect-Engineer request which recommended a design change to initiate a direct turbine trip upon loss of the main circulating water pumps. According to the request, incorporation of the proposed change would satisfy a GE criterion which requires that the steam line bypass be open for at least 5 seconds following a turbine trip during a loss of condenser vacuum transient.

After a detailed review of this issue, the conclusion is that the proposed design change is not necessary. The 5 second bypass operation was not a GE criterion but rather a pressurization transient response based upon an assumption of 2 inches Hg/second vacuum decay rate, considered to be conservative at the time the FSAR was implemented.

Loss of condenser vacuum transient is categorized as an increase in reactor pressure event. There are several more severe limiting pressurization transients, such as, load reject without bypass (which resulted in maximum vessel pressure of 1234 psig and MCPR of 1.13) and turbine trip without bypass (which resulted in maximum vessel pressure of 1233 psig and MCPR of greater than 1.13) as discussed in the FSAR Chapter 15 analysis. The MSIV closure with Flux Scram transient was determined to be the most severe ASME RPV overpressurization protection event (which results in a vessel pressure of 1260 psig) as discussed in FSAR Appendix 5A.

For the loss of condenser vacuum transient, based on a FSAR assumption of 2 inches Hg/second vacuum decay rate, the steam bypass would be available for 5 seconds provided that the bypass is signaled to close at a vacuum level of 10 inches Hg less than the steam valve closure. The results (maximum vessel pressure = 1179 psig and MCPR greater than 1.13) are expected to be less severe than the limiting transient of this category.

The Architect-Engineer determined by analysis that the present GGNS logic will not allow the steam bypass valves to remain open for 5 seconds due to a higher vacuum decay rate (up to about 10 inches Hg/second). The actual bypass operation period is approximately one second. With the one second bypass operation, a new analysis for loss of condenser vacuum transient would result in the maximum vessel pressure greater than 1179 psig, but still less than the limiting 1234 psig of the load reject without bypass transient. The MCPR would also remain greater than 1.13 because the thermal transient is less severe than the analyzed limiting event. Since the proposed design change would merely improve the system behavior for a less limiting transient, it is not necessary to implement the change from the viewpoint of improving overall safety and operating margins. However, a change in the FSAR chapter 15.2.5 to reflect the as-built GGNS logic is required.

This is a final report.