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February 14, 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: 0260/15320
Groundwater Level at Grand Gulf
AECM-85/0035

Grand Gulf Nuclear Station (GGNS) Units 1 and 2 have a Construction Monitoring and Dewatering System located around the power block and the Standby Service Water Basins. The purpose of this system is to monitor and dewater the perched aquifer which underlies the power block. Unusually heavy rainfall during the period of January through July 1983 caused the water level in this aquifer to rise and, in the case of dewatering well 8 (DW-8) slightly exceed the design basis groundwater elevation for GGNS of 109.0 feet Mean Sea Level (MSL). This incident was initially described in the Mississippi Power & Light (MP&L) letter to the NRC dated March 9, 1984 (AECM-84/0020). Subsequently a teleconference was held on November 15, 1984 between MP&L and the NRC staff to discuss questions resulting from the NRC staff's review of AECM-84/0020. The purpose of this letter is to address the concerns expressed in the November 15, 1984 teleconference (Attachment 1). Additionally, this letter provides the results of a December 1983 study performed to determine the cause for exceeding the design groundwater level (Attachment 2).

The abnormally heavy rainfall experienced during the period January - July 1983, affected some site areas much greater than others. In particular well DW-8, located on the Southeast corner of Unit 1 directly behind the Radwaste Building, was the only well that exceeded 109.00 ft. MSL. There is a very low probability of a similar rainfall event occurring during the life of the plant (1 in 200 year event). The use of Unit 1 construction dewatering wells will continue as a precautionary measure until construction and backfilling is completed for Unit 2. After these Unit 2 activities are completed, monitoring of the perched aquifer and mapping of the site area will be performed to determine the expected normal groundwater conditions for the operating life of the plant. Therefore, MP&L feels that it is unnecessary to change the design basin groundwater level from 109.0 ft. MSL.

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If you have any questions, please contact this office.

Yours truly,

L. F. Dale
Director

MLC/JGC:rw
Attachment

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

Mr. Richard C. DeYoung, Director (w/a)
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Mr. J. Nelson Grace, Regional Administrator (w/a)
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Outlined below are MP&L responses to the NRC staff questions asked during the November 15, 1984 teleconference.

Question 1

Does a groundwater level above 109.0 ft. MSL impact the safe operation of GGNS?

MP&L Response

A review of design calculations was performed to determine sensitivity of GGNS Unit 1 buildings to a maximum groundwater elevation of 114'-6". In reanalyzing the Unit 1 buildings, the following elements were considered:

a. The effect of a higher hydrostatic pressure on the overall building's stability, as well as on the structural adequacy of the various building components.

b. The effects of a higher groundwater table on the leak tightness integrity of the buildings.

The results of the reanalysis of the Unit 1 buildings, assuming a maximum groundwater elevation of 114'-6", indicated that (1) the structural integrity of the Unit 1 buildings will not be impaired and (2) the presence of the existing waterstops above elevation 109.0 ft. will preserve the leak tightness integrity. Therefore MP&L concludes that the safety of the plant was not affected when DW-8 exceeded 109.0 ft. MSL by 1.21 ft.

Question 2

Would operation of the Unit 1 Dewatering Wells maintain the water level below 109.0 ft. MSL?

MP&L Response

Based on past history of dewatering well operation, MP&L believes that the water level would be maintained at a level below 109.0 ft. MSL for all rainfall events up to a Probable Maximum Flood (Reference AECM-81/0343, dated September 3, 1981).

Extremely heavy rainfalls were experienced during the January - July 1983 time period in which the perched aquifer exceeded 109.0 ft. MSL. These rainfalls were equivalent to a 1 in 200 year event (see Attachment 2). In addition to these heavy rains the Unit 1 construction dewatering wells were not operating. Since only one well showed elevations above 109.0 ft. MSL and by only 1.21 ft., it is highly unlikely if all the wells were operating that groundwater elevations would exceed 109.0 ft. MSL.

Question 3

Is there a connection between the perched aquifer and groundwater or is recharge to the perched aquifer limited to the percolation of rain water?

MP&L Response

The maximum regional groundwater level recorded in the power block area is 84.0 ft. MSL. During normal Mississippi River elevation, the regional groundwater table ranges from 60 to 80 ft. MSL, normally sloping towards the river. However, a temporary reversal of groundwater elevations occurs during flood stages of the river with a maximum elevation of 103 ft. MSL during the local Probable Maximum Flood. Perched groundwater levels recorded in the power block areas are generally below 100 ft. MSL with the highest measured being 113.0 ft. MSL at the ultimate heat sink. Since the regional groundwater level is normally below the perched groundwater level, the recharge of the perched aquifer is limited to percolation of rain water.

Question 4

What actions will be taken to avoid a similar incident in the future?

MP&L Response

The construction dewatering system was installed to remove seepage of groundwater into the excavation and inflow of precipitation during construction. Upon completion of construction on Unit 1, the dewatering wells (DW-6, DW-7, DW-8) and SSW Basin well (DW-5) were deactivated. As a precautionary measure against a similar incident in the future, the Unit 1 Wells (DW-6, DW-7, and DW-8) and SSW Basin well (DW-5) were restarted in November, 1983 and will continue until Unit 2 construction and backfilling activities are completed. Monitoring of the perched aquifer will continue for approximately one year following the completion of Unit 2. A groundwater contour map of the site area indicating expected normal groundwater conditions during the operating life of the plant will be developed per FSAR Section 2.4.13.2.5.