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DUKE POWER

October 23, 1990

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station, Docket Nos. 50-369 and 50-370
Proposed Technical Specification Amendment to Increase the
Allowable Temperature of the McGuire Standby Nuclear Service
Water Pond

Gentlemen:

This letter contains a proposed amendment to the Technical Specifications (TS) for McGuire Nuclear Station (Facility Operating License Nos. NPF-9 and NPF-17). This amendment request seeks to change the required water temperature and monitoring elevation of the McGuire Standby Nuclear Service Water Pond (SNSWP).

Attachment No. 1 contains the justification/technical discussion, no significant hazards analysis, and environmental impact analysis. The proposed changes to the station TSs in the form of pen and ink marked pages are identified in Attachment No. 2. Attachment No. 3 provides a containment peak pressure analysis that supports the revision.

Pursuant to 10 CFR 50.91(b)(1), a copy of this amendment request has been provided to the appropriate North Carolina official.

If there are any questions, please contact P.F. Guill at (704) 373-2844.

Very truly yours,

Hal B. Tucker

Attachments

SEL539

xc: W/All Attachments

Mr. S. D. Ebnetter, Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

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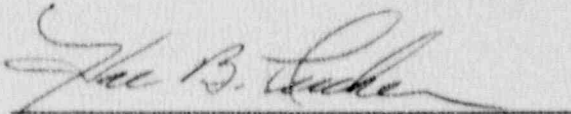
Mr. Dryne Brown, Chief
Radiation Protection Branch
Division of Facility Services
Department of Human Resources
761 Barbour Drive
Raleigh, N.C. 27603-2008

Mr. T.A. Reed, Project Manager
Office of Nuclear Reactor Regulation, USNRC
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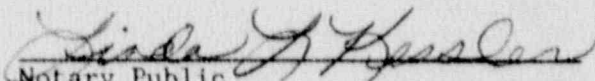
Mr. P.K. Van Doorn
NRC Senior Resident Inspector
McGuire Nuclear Station

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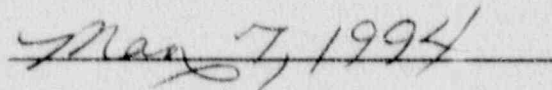
HAL B. TUCKER, being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the U.S. Nuclear Regulatory Commission this revision to the McGuire Nuclear Station Technical Specifications, License Nos. NPF-9 and NPF-17; and, that all statements and matters set forth therein are true and correct to the best of his knowledge.


Hal B. Tucker, Vice President

Subscribed and sworn to before me this twenty-third day of October 1990.


Notary Public

My Commission Expires:





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Attachment No. 1

Duke Power Company
McGuire Nuclear Station

Technical Discussion, No Significant Hazards and Environmental Analysis

Justification/Technical Discussion

The purpose of the proposed revision is to increase the required water temperature of the Standby Nuclear Service Water Pond (SNSWP), and to change the elevation at which the temperature is monitored to better ensure adequate water volume exists at the required temperature.

This amendment request for McGuire Nuclear Station will:

Revise TS 3/4.7.5 Standby Nuclear Service Water Pond, Section 3.7.5.b, to require an average water temperature of less than or equal to 82 degrees-F (instead of 78 degrees-F) at elevation 718 feet (instead of elevation 700 feet).

The Nuclear Service Water (RN) system provides normal cooling water and assured cooling water for various auxiliary and reactor building heat exchangers and coolers, and makeup for the Auxiliary Feedwater system, Component Cooling system, and Spent Fuel Cooling system during all phases of operation including anticipated transients and accident conditions. Water for the RN system is provided from Lake Norman and as a back-up, from the SNSWP. The RN system is designed so that during a seismic event in which Lake Norman would not be available as a cooling water source due to failure of Cowans Ford Dam, the SNSWP would become the ultimate heat sink. The method employed to calculate SNSWP temperatures is described in McGuire FSAR Section 9.2.2.

The proposed amendment to increase the current SNSWP temperature of 78 degree-F to less than or equal to 82 degrees-F is requested for the following reasons. In August 1988, the monitored temperature of the SNSWP at elevation 700 feet reached as high as 74 degrees-F (see attached SNSWP Temperature Trend figure). In 1989, multi-point depth temperature surveys of the SNSWP were performed. The following data was obtained in September 1989, during the hottest period of the year:

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SNSWP Temperature Survey

<u>Elevation (feet)</u>	<u>Temperature (degrees-F)</u>
700 (intake)	69.3
703	69.6
706	71.2
709	72.3
713	73.0
716	73.2
719	73.6
722	73.9
726	74.5
729	74.7
732	74.8
736	74.8
739	74.8

The increased SNSWP temperature has been attributed to recent higher ambient temperatures and less seasonal rainfall during the high temperature months of July, August, and September as experienced over the past few years.

In addition to increasing the SNSWP TS temperature, we also propose to raise the monitoring point of the SNSWP from elevation 700 feet to 718 feet. Monitoring the temperature at elevation 700 feet does not conservatively verify availability of the required water volume since warmer water could be present at depths not monitored above elevation 700 feet. The increase to elevation 718 feet is a more conservative measurement of the SNSWP. Under warm weather conditions during which the extreme equilibrium temperature condition would occur, the SNSWP would be thermally stratified. The water closer to the surface of the pond would be warmer with colder water at lower elevations. The proposed increase to elevation 718 feet is conservative in that it provides assurance that the water being drawn into the intake is cooler than or equal to the temperature of the water at elevation 718 feet because the cooler stratified layers of water at the bottom of the SNSWP at the intake would be used before the water at higher elevations. Additionally, the maximum heat rejection to the pond occurs only four hours from the start of a LOCA. The volume of water [100 acre-feet (reference McGuire FASR Figure 9.2.2-9)] required to supply the RN system for 12 hours is available at and below the 718 feet elevation; therefore, this monitoring elevation is more conservative.

A reanalysis of the McGuire SNSWP thermal calculation using the proposed limiting temperature of 82 degrees-F at 718 feet elevation has been performed to assure that the intake water will be within the required temperature range, and that there will be a sufficient quantity of water to supply the plant for up to a 30 day period. Using the method described in McGuire FSAR Section 9.2.2, the following input was used:

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- ♦ Pond temperature is assumed to be uniformly 82 degrees-F below 718 feet elevation;
- ♦ Number of vertical stages (FT) was 46;
- ♦ Number of hours in simulation was 720;
- ♦ Number of unit volume layers was 20;
- ♦ Output check spacing was 20;
- ♦ Constant equilibrium temperature was 88 degrees-F; and ,
- ♦ The constant exchange coefficient was 150 BTU/SQ FT/DAY/DEG-F.

At the end of both 11 and 16 hours, the SNSWP intake temperature was 82 degrees-F following the start of the one unit LOCA and one unit shutdown. A maximum temperature of 94.4 degrees-F occurs at 199 hours. The final intake temperature of 92 degrees-F is reached at 555 hours where it remains until the end of the 30 day (720 hour) period.

The increase in temperature of the intake water supplied to the Containment Spray (NS) system Heat Exchangers, Component Cooling (KC) system Heat Exchangers and the Residual Heat Removal (ND) system Heat Exchangers was analyzed for impact on the containment peak pressure. The current analysis of the containment peak pressure calculation using the increased temperature resulted in a peak pressure of 12.36 psig at 7356 seconds. In the analysis, other parameters were also changed that contributed to the reduced pressure; however, these changes were not a result of the proposed SNSWP temperature increase. The primary change in decreasing the peak containment pressure was an increase in the assumed ND auxiliary spray flow rate in the analysis from 1841 gpm to 2400 gpm. See Attachment No. 3 for the analysis. For subdivision, table, reference, and figure numbers referenced in Attachment No. 3 refer to those in the current McGuire FSAR.

Calculations were also performed to determine the impact of the increased SNSWP temperature on the McGuire HVAC systems, essential heat exchangers, and all safety related motors with heat exchangers. Equipment limitations dictate that intake water temperature must be maintained below 95 degrees-F. The calculated maximum intake temperature of 94.4 degrees-F is therefore acceptable.

No Significant Hazards Analysis

10 CFR 50.91 requires that the following analysis be provided concerning whether the proposed amendment request involves a significant hazards consideration as defined in 10 CFR 50.92. Standard for determination that an amendment request does not involve a significant hazards consideration are if operation of the facility in accordance with the proposed amendment would not:

- 1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or,

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- 2) Create the possibility of a new or different kind of accident from any previously evaluated; or,
- 3) Involve a significant reduction in a margin of safety.

Operation of McGuire Nuclear Station in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated. The SNSWP does not play a role in the initiation of any accident sequence; therefore, the probability of an accident previously evaluated does not increase as a result of increasing the temperature and monitoring point of the SNSWP. The consequences of an accident previously evaluated do not increase as a result of the changes. During a LOCA, concurrent with a seismic event that would make Lake Norman unavailable as a cooling water source, the SNSWP would become the ultimate heat sink. The 4 degree temperature increase in the KN system water was analyzed for its impact on the containment peak pressure. Based on this analysis previously described, the resulting containment peak pressure is 12.36 at 7356 seconds. Therefore, this proposed revision is in accordance with the current containment peak pressure analysis, and the consequences of previously evaluated accidents have not increased. Monitoring the temperature at elevation 718 feet in the SNSWP provides additional assurance that the required amount of water is available at the required temperature due to thermal stratification as previously discussed.

Operation of McGuire Nuclear Station in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated. As stated above, the SNSWP does not have an operational role in which it can initiate an accident. The proposed change does not involve any design or hardware changes with the exception of installing a new temperature monitor at the 718 feet elevation of the SNSWP. The SNSWP will continue to fulfill its required function as designed. Therefore, the proposed change would not create the possibility of a new or different kind of accident.

Operation of McGuire Nuclear Station in accordance with the proposed amendment would not involve a significant reduction in a margin of safety. The proposed changes were reviewed for impact on all of the systems serviced by the RN system. SNSWP cooling water at 82 degrees-F will provide the required cooling water at an acceptable intake temperature for the required 30 day period. The current containment peak pressure calculation using the proposed temperature of 82 degrees-F resulted in a decrease in the peak pressure, as stated previously. Calculations were performed for other equipment (i.e. heat exchangers, electrical motors with heat exchangers, HVAC components) which determined that the 4 degree increase in intake temperature (from 78 degrees-F to 82 degrees-F) is acceptable and well within the design specifications for the equipment. The increase to elevation 718 feet at which the SNSWP temperature is a more conservative measurement of the SNSWP.

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Under warm weather conditions during which the extreme equilibrium temperature condition would occur, the SNSWP would be thermally stratified. The proposal to monitor temperature at elevation 718 feet is conservative in that it provides assurance that the water being drawn into the intake at elevation 700 feet is cooler than or equal to the temperature of the water at elevation 718 feet. The maximum heat rejection to the pond occurs four hours from the start of a LOCA. The volume of water (100 acre-feet) required to supply the RN system for 12 hours following a LOCA is available at and below the 718 feet elevation; therefore, this monitoring elevation is conservative and, there is no reduction in a margin of safety.

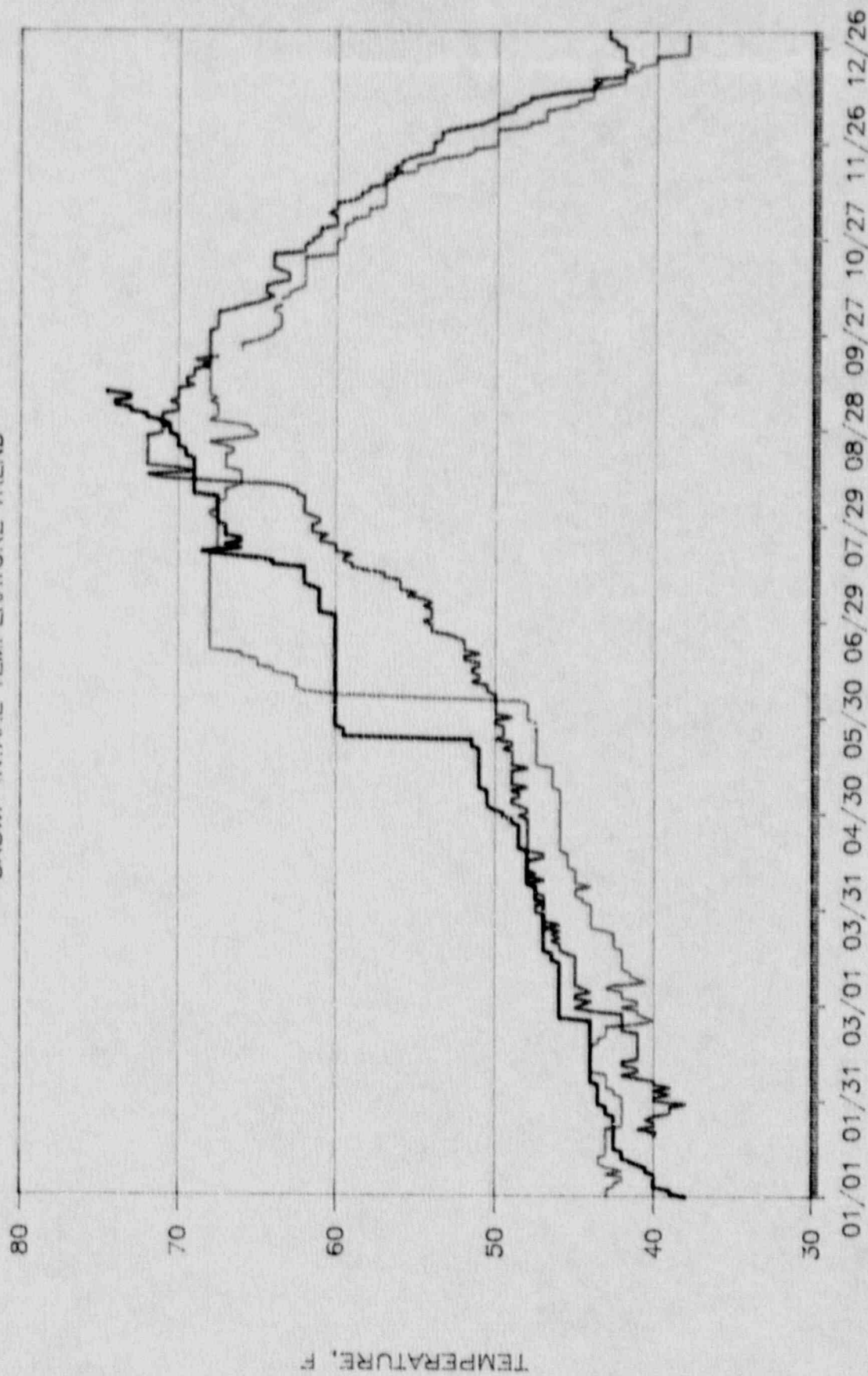
As discussed above, we have determined the proposed amendment request does not involve a significant hazards consideration as defined by 10 CFR 50.92.

Environmental Impact Analysis

The proposed TS amendment has been reviewed against the criteria of 10 CFR 51.22 for environmental considerations. The proposed amendment does not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor increase individual or cumulative occupational radiation exposures. Additionally, the amount of heat that is calculated to be transferred to the SNSWP has not changed. Therefore, the proposed TS amendment meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

McGUIRE NUCLEAR STATION

SWSWP INTAKE TEMPERATURE TREND



9-10-90