



Steven D. Capps
Vice President
McGuire Nuclear Station

Duke Energy
MG01VP | 12700 Hagers Ferry Road
Huntersville, NC 27078

o: 980.875.4805

f: 980.875.4809

Steven.Capps@duke-energy.com

Serial No. MNS-16-023

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10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Duke Energy Carolinas, LLC (Duke Energy)

McGuire Nuclear Station (MNS), Units 1 and 2
Docket Numbers 50-369 and 50-370,
Renewed Facility Operating License NPF-9 and NPF-17

Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
Renewed Facility Operating License NPF-35 and NPF-52

Response to Request for Supplemental Information Needed for Acceptance of
Requested Licensing Action Regarding License Amendment Request for Control
Room Chilled Water System Technical Specifications

REFERENCES:

1. Letter from Steven D. Capps (Duke Energy) to NRC (Serial: MNS-16-002), dated January 7, 2016 (ADAMS Accession Number ML16029A077), *Proposed Technical Specifications (TS) Amendment TS 3.7.10, "Control Room Area Chilled Water System" (MNS), and TS 3.7.11, "Control Room Area Chilled Water System" (CNS)*
2. NRC letter from G. Edward Miller to Steven D. Capps (Duke Energy), dated March 1, 2016 (ADAMS Accession Number ML16055A333), *McGuire Nuclear Station, Units 1 and 2 and Catawba Nuclear Station, Units 1 and 2 - Supplemental Information Needed For Acceptance of Requested Licensing Action RE: License Amendment Request for Control Room Chilled Water System Technical Specifications (TAC Nos. MF7224, MF7225, MF7226, and MF7227)*

ADD /
NRR

By letter dated January 7, 2016 (Reference 1), Duke Energy submitted a License Amendment Request (LAR) for Technical Specifications (TS) TS 3.7.10, "*Control Room Area Chilled Water System*" (MNS), and TS 3.7.11, "*Control Room Area Chilled Water System*" (CNS).

The NRC staff reviewed the LAR and determined that supplemental information is needed regarding the acceptability of the proposed LAR in terms of regulatory requirements and the protection of public health and safety and the environment. By letter dated March 1, 2016 (Reference 2), the supplemental information was requested. The supplemental information requires submission by March 17, 2016. The Duke Energy responses to the supplemental information are provided in the Enclosure to this letter.

The conclusions of the original Significant Hazards Consideration and Environmental Considerations contained in the January 7, 2016, LAR (Reference 1) are unaffected as a result of this supplemental response.

Pursuant to 10 CFR 50.91, a copy of this LAR supplement is being provided to the appropriate States of North and South Carolina officials.

There are no regulatory commitments contained in this letter or its enclosure.

If you have any questions or need additional information on this matter, please contact Lee A. Hentz at (980) 875-4187.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 16, 2016.

Sincerely,

A handwritten signature in black ink, appearing to read "SD Capps", written in a cursive style.

Steven D. Capps

Enclosure: Response to Supplemental Information

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cc: (with enclosure)

Catherine Haney
Regional Administrator
U.S. Nuclear Regulatory Commission - Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, GA 30303-1257

G.A. Hutto III (Catawba)
Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Catawba Nuclear Station

J. Zeiler
Senior Resident Inspector (McGuire)
U.S. Nuclear Regulatory Commission
McGuire Nuclear Station

G.E. Miller
NRC Project Manager (McGuire)
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 8-G9A
111555 Rockville Pike
Rockville, MD 20852-2738

J.A. Whited
Project Manager (Catawba)
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 8 B1A
11555 Rockville Pike
Rockville, MD 20852-2738

S.E. Jenkins Manager
Radioactive & infectious Waste Management
Division of Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201

W.L. Cox, III
Section Chief, Division of Environmental Health
Radiation Protection Section
North Carolina Department of Environment and Natural Resources
1645 Mail Service Center
Raleigh, NC 27699

Response to Request for Supplemental Information Needed for Acceptance of Requested
Licensing Action Regarding License Amendment Request for Control Room Chilled Water
System Technical Specifications

By letter dated January 7, 2016 (Agencywide Documents Access and Management System Accession No. ML 16029A077), Duke Energy Carolinas, LLC (Duke Energy or the licensee), submitted a license amendment request for McGuire Nuclear Station, Units 1 and 2 (MNS 1 and 2) and Catawba Nuclear Station, Units 1 and 2 (CNS 1 and 2). The proposed amendment would modify the Control Room Area Chilled Water System Technical Specifications to allow a finite time to address a loss of both trains provided Control Room temperature remains below 90°F. The NRC staff has reviewed your application and concluded that the information delineated below is necessary to enable the staff to make an independent assessment regarding the acceptability of the proposed amendment in terms of regulatory requirements and the protection of public health and safety and the environment.

For MNS and CNS

NRC Question 1

With both trains of the Control Room Area Chilled Water System inoperable, the effects of heat stress due to the rising temperature, under some circumstances, may impede the operators' ability to take actions required to safely operate the nuclear power unit. From a human factors perspective, please describe any effects that the proposed change may have on the control room operators. In this description, include a justification that any impacted persons will still be able to successfully perform their job role.

Duke Energy Response to Question 1

This question was further clarified during the March 1, 2016, conference call between the NRC Staff and Duke Energy: "What would be the impact on the Control Room Operators if the Control Room remained at or near 90°F for the duration of the proposed Condition B Completion Time of 24 hours."

Duke Energy has in place an Administrative Procedure, "Heat and Cold Stress," based on an industry standard, that evaluates activities which expose workers to adverse environmental conditions and provides means and methods to avoid heat stress related health incidents. Control Room activities can be considered "Light work: sitting or standing with moderate arm or trunk movement, monitoring equipment, minimal walking." Per the Procedure's "Stay Time Chart," there are no stay time limits for light work up to a wet bulb globe temperature (WBGT) of 90°F. Stay time is defined as the recommended amount of time that a worker is expected to safely work in a moderate to high heat environment.

Control Room temperature is measured as a dry bulb temperature, meaning the impacts from humidity are not accounted for as they are with WBGT. Low humidity impacts dry bulb temperatures positively, thus the WBGT will equate to a lower temperature than the measured

dry bulb. Conversely, very high humidity (90-100%) impacts dry bulb temperatures negatively, thus the WBGT will equate to a higher temperature than the measured dry bulb.

During a loss of cooling event in the Control Room, there would not be an appreciable increase in humidity as temperature rises since most of the Control Room heat load is in the form of sensible heat. Latent heat, which drives humidity, accounts for only a fraction of the total room heat load. Thus, high humidity levels in the Control Room are not a concern for MNS or CNS. This means that the currently measured dry bulb temperature would be comparable to the WBGT, and there are no mandated stay time restrictions as long as the Control Room temperature remains 90°F or less.

From a human factors perspective, based on the above considerations, the proposed change will have no adverse impact on Control Room Operators. The effects of rising temperature in the Control Room should not impede the Operators' ability to take actions required to safely operate the nuclear power unit.

Duke Energy also has readily available instruments that easily measure WBGT. These are available close to the Control Room and do not require any specific qualifications. Their set-up and use are described in the "Heat and Cold Stress" procedure. As such, an exact determination of Control Room WBGT can easily be determined.

In addition, Operator shifts are limited to 12 hours. Supplemental staffing can be provided to allow Operators to periodically rotate during shifts if the need arises.

NRC Question 2

The submittal indicates that the current licensed design temperature of the Control Room equipment is 90°F or less, verified every 12 hours. This value was determined assuming that at least one train of the Control Room Area Chilled Water System was available for active removal of heat. When in the proposed Condition B, the ability to remove heat from the Control Room would be significantly reduced. Although it appears that the increased frequency of verification of Control Room temperature (i.e., every 4 hours) is meant to account for this, the submittal does not address why it is adequate. Please provide a quantitative justification for the 4 hour surveillance interval and how the 90°F limit remains valid given potentially increased Control Room heat-up rates.

Duke Energy Response to Question 2

The four hour monitoring frequency of Control Room temperature when in the proposed Condition B was predominately based on remaining consistent with NRC approved TSTF-477 Rev.3 and draft TSTF-553. As the Control Room is continuously occupied, any temperature changes would be immediately recognized by the Operators.

MNS and CNS have in place "Abnormal Procedures" (AP) to take mitigating actions when Control Room temperature reaches 80°F and take actions to shutdown the affected Units if temperature rises above 90°F.

The MNS AP is entered by Operators on symptoms such as: Control Room temperature increasing, chill water supply temperature increasing (alarms at 55°F), or Control Room supply air temperature increasing (alarms at 75°F). Once the AP is entered, MNS Control Room temperature is monitored continuously.

The CNS AP is entered by Operators on symptoms such as: Control Room temperature increasing, Control Room Air Handling Unit (AHU) low flow alarm, Control Room Chiller "off" alarm or "critical trouble" alarm. If the CNS Control Room reaches 80°F, temperature is monitored continuously until one train of Control Room Area Chilled Water System (CRACWS) is restored.

In summary, MNS and CNS enter the applicable AP for "Control Room High Temperature" prior to any significant increase in Control Room temperature or early symptoms of CRACWS equipment malfunctions. Once the APs are entered, Control Room temperature is continuously monitored with specific actions to be taken at 80°F and 90°F. These AP actions satisfy the intent of proposed Action B.1 and the associated Completion Time of four hours.

As stated in Section 3.6 of the LAR, the most likely application of proposed Condition B and the associated Required Actions is when both CRACWS trains are inoperable but one train is functional with the ability to cool the Control Room. In this case, the Control Room temperature would remain constant at a normal value, and the 90°F limit is not challenged.

For CNS

NRC Question 3

The submittal indicates that the current licensed design temperature of the Control Room equipment is 90°F or less. The submittal also indicates that, while the temperature control band for MNS is 75°F to 90°F, the band for CNS is 72°F to 85°F. Please clarify the apparent discrepancy between the CNS licensing basis and system design.

Duke Energy Response to Question 3

The current licensed design temperature for the CNS Control Room is 90°F. This is the Technical Specification (TS) limit as defined in CNS TS 3.7.11. This represents the temperature at which CNS will take action to shut down both Units. The 90°F limit does not represent the maximum temperature at which equipment in the Control Room will operate, nor does it represent the temperature at which CNS operates the Control Room. The CRACWS "design set point" (temperature at which the Control Room is maintained) is 74°F. In a large system, however, there is always a range of temperatures over which a system will operate. The submittal addresses this potential range by using the values stated in the Technical Specification Bases for CNS TS 3.7.11 which is 72°F - 85°F.

Although the operating range of 72°F- 85°F is the administrative limit, 90°F remains the TS limit as defined in CNS TS 3.7.11. It should be noted that CNS maintains the Control Room at 74°F. Actions will be taken anytime the Control Room temperature reaches 80°F or above. This provides margin to the LCO limit of 90°F.