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

Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station (MNS), Units 1 and 2
Docket Numbers 50-369 and 50-370
Renewed License Numbers NPF-9 and NPF-17

Subject: License Amendment Request to Technical Specification
(TS) 3.6.13, "Ice Condenser Doors"

In a letter dated March 24, 2016, Duke Energy submitted a License Amendment Request (LAR) to revise TS 3.6.13, "Ice Condenser Doors." By email dated July 12, 2016, the NRC submitted Requests for Additional Information (RAIs) related to this LAR. Enclosure 1 of this letter provides Duke Energy's response to those RAIs.

This letter contains no regulatory commitments.

Pursuant to 10 CFR 50.91, a copy of this letter has been forwarded to the appropriate North Carolina state officials.

Please direct any questions you may have in this matter to Brian Richards at (980) 875-5171.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 11, 2016.

Sincerely,

Steven D. Capps

Enclosure 1: Response to Requests for Additional Information

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U.S. Nuclear Regulatory Commission
Serial Number MNS-16-063
Page 2

xc with Attachments

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Enclosure 1

Response to Requests for Additional Information

Balance of Plants Branch (SBPB):

1. *Does a non-functional ice condenser lower inlet door (LID) position limit switch (an invalid open alarm input) render a LID inoperable?*

McGuire Response:

Surveillance Requirement (SR) 3.6.13.1 specifies use of the Inlet Door Position Monitoring System to verify that all inlet doors indicate closed. The inability to meet the SR due to an invalid open alarm input renders the affected LIDs inoperable, which in turn requires entry into Condition B of Technical Specification (TS) 3.6.13, "Ice Condenser Doors."

2. *The LAR states that a License Amendment is needed to preclude an unnecessary plant shutdown caused by an invalid "ICE COND LOWER INLET DOORS OPEN" alarm. This alarm can be the result of a single invalid LID position indication. Justify the proposed TS change providing no limit to the number of LIDs with invalid position indication.*

McGuire Response:

TS 3.6.13 has a note stating that a separate condition entry is allowed for each ice condenser door. As currently written, all LIDs are allowed to be inoperable for up to 14 days, as long as the inoperability is not due to the door being physically restrained from opening. This 14 day completion time does, however, require the ice bed temperature to be monitored every four hours.

The proposed amendment is intended to provide additional flexibility to the TS, and no changes were made to the note allowing separate condition entries for each door. For a case where a LID is inoperable solely because of an invalid open indication, the requested change would allow McGuire to remain online if any LID affected by the invalid indication is verified closed every 14 days and as long as ice bed temperature is monitored every four hours. Unlike a case where a LID is actually open, no air leakage occurs when the LID is closed, so the number of LIDs affected by an invalid open position indication is inconsequential. Also, a door with an invalid open position indication is still capable of opening as required by plant conditions. Therefore, no limit to the number of LIDs with invalid position indication is warranted.

3. *The LAR indicates that SR 3.6.13.1 requires verification that all lower inlet doors indicate closed by the Inlet Door Position Monitoring System and that this is normally performed in the CR by observance of the associated annunciator alarm status. In the event of one or more LID invalid door open alarm inputs the open/closed status verification of the remaining LIDs would be performed using the local door position display panel located in upper containment on a 12 hour frequency per TS SR 3.6.13.1, in accordance with what the Surveillance Frequency Control Program allowed for a maximum interval at that time. The local panel provides zone by zone indication of all 8 doors in a zone being shut or at least one door in a zone being open.*

a. *Would this change in SR 3.6.13.1 method verify closed position indication for all other LIDs or just all other LIDs in unaffected zones? Would the other LIDs in the affected zone(s) be remote visually verified closed on the 14 day interval?*

b. *Justify extended operation with the control room annunciator alarm locked in and LID position monitoring once each 12 hours or longer instead of continuous.*

McGuire Response:

a. Since the local door position display panel, located in upper containment, provides zone-by-zone indication, each zone that indicates closed is considered unaffected by an invalid open indication. The proposed LAR states that SR 3.6.13.1 will be met for unaffected LID indications using this local display panel.

Verification of door position for all LIDs in zones with an invalid open indication would be performed per the requested change to Condition B of TS 3.6.13. This change specifies using an alternate means of verifying door closure once every 14 days. If dose concerns prohibit normal access to inspect the LIDs, a remote video camera system may be used.

b. SR 3.6.13.1 is performed in accordance with the Surveillance Frequency Control Program. Currently, this surveillance is performed every 12 hours.

The control room annunciator alarm is an output of the Inlet Door Position Monitoring System and is for operational use. When any of the LIDs are not fully closed, the annunciator will come into alarm status, and the annunciator response includes checking the door monitor system compared to the actual door position.

As documented in Section 3.2 of the proposed LAR, monitoring the ice bed RTDs is an alternate method of checking for the presence of unwanted thermal energy ingress. In the event that an invalid open position signal causes the control room annunciator alarm to be locked in, the unit will have entered Condition B of TS 3.6.13, which requires verification that the maximum ice bed temperature is no greater than 27°F once per 4 hours.

Existing TS Condition B assumes that an ice condenser door is open or inoperable such that air leakage is occurring. In this scenario, the 4 hour verification frequency is justified based on the fact that temperature changes cannot occur rapidly in the ice bed because of the large mass of ice involved. The current TS also allows 14 days to restore an inoperable or open door to operable and closed position because maintaining the temperatures below 27°F prevents any significant loss of ice due to sublimation.

McGuire Selected Licensee Commitment (SLC) 16.6.3, "Inlet Door Position Monitoring System," requires this position indication system to be functional. As long as the ice bed temperature indication is functional and ice bed temperatures are verified no greater than 27°F every four hours, the SLC allows the Inlet Door Position Monitoring System to be out of service for 14 days.

The proposed change to TS 3.6.13 involves a scenario where an invalid open position indication exists for a LID. In this scenario, no air leakage into the ice condenser exists because the open indication is spurious, and the spurious nature of the indication is re-verified every 14 days. Since validating ice bed temperatures are within range every four hours is acceptable when some amount of air leakage exists and/or when the Inlet Door Position Monitoring System is out of service, continuously monitoring the local door position display panel is not warranted.

4. The proposed TS change does not have a completion time for continued operation with one or more LIDs with non-functional position limit switch (an invalid open alarm input). Would TS LCO 3.0.4 permit mode change to a mode of applicability without restoring proper LID position indication function?

McGuire Response:

TS LCO 3.0.4.b provides the option of performing a risk assessment in order to determine the acceptability of entering a mode or other specified condition when an LCO is not met. Exceptions to TS LCO 3.0.4.b are stated in individual specifications, and TS 3.6.13 does not contain any such prohibition.

Therefore, as long as the risk assessment is acceptable and appropriate risk management actions are established, TS LCO 3.0.4 could be used to permit changing modes while a LID position indication input is not functioning properly.

PRA Operations and Human Factors Branch (APHB):

Attachment 1 of the March 24, 2016 license amendment request (LAR) contains a marked up revision of REQUIRED ACTION B.1 which requires operators to "Verify maximum ice bed temperature is $\leq 27^{\circ}\text{F}$ " once per 4 hours.

This revision adds a new NOTE (emphasis added): "Required Action B.2.1 applies only when one or more ice condenser lower inlet doors are inoperable due to having an invalid open alarm."

REQUIRED ACTION B.2.1 goes on to state "Verify affected lower inlet door is closed" once per 14 days OR conduct REQUIRED ACTION B.2.2.

The NOTE does not clearly indicate when, or how to determine that the alarm is truly invalid (as opposed to being suspected invalid). REQUIRED ACTION B.2.1 provides one means for verifying that a suspected invalid alarm is truly invalid (by verifying that the door is truly closed), however, under some conditions it directs operators away from REQUIRED ACTION B.2.1 without directing them to an alternate method for verification.

This strategy has the potential for causing complacency in operators similar to what was observed in the Three Mile Island accident (see NUREG/CR-1270 for more information). Operators knew of a long-standing leak that caused temperature indications on the pressurizer PORV exhaust pipe to be elevated during normal conditions. As a result, operators learned to expect faulted indication and subsequently altered their mental model of the system. During the accident operators ignored, or otherwise misinterpreted, valid temperature indications from the system. As a result, it took operators 138 minutes to come to the conclusion that the PORV was open. If the operators did not have the expectation that temperatures in the PORV exhaust pipe are normally high (and should therefore be ignored), they may have observed the increase in the PORV exhaust pipe temperature and come to the conclusion the PORV was stuck open much sooner and may have prevented the accident.

Please clarify the logic of this TS or revise the TS to ensure that it does not promote operator complacency.

Clarify how it is possible for operators to make the determination that the signal is invalid without performing REQUIRED ACTION B.2.1.

Describe how procedures and/or training will be used to ensure that operators do not systematically ignore what they may perceive as a chronically faulted alarm.

McGuire Response:

The proposed revision to TS 3.6.13 Condition B adds a new Required Action, which provides the flexibility to allow continued operation with an inoperable LID. New Required Action B.2.1 verifies once every 14 days that a LID affected by an invalid open position indication is closed.

The note preceding the new proposed Required Action specifies that Required Action B.2.1 is only applicable in the case that a LID is inoperable due to the presence of an invalid open alarm. In other words, this note is not intended to define how station personnel determine that a

position indication alarm is invalid. Rather, the note prevents the station from using the revised TS to continue operation except in cases where an invalid open position indication exists.

If TS 3.6.13 Condition B, as revised by the proposed amendment, is entered as a result of an open LID position indication, the required actions in levels B.1 and B.2 must be taken. Monitoring of ice bed temperatures, as specified by Required Action B.1, would begin. Additionally, until operators know that the LID open alarm is invalid, they would have to assume that the door actually is open, which requires restoring the door to operable status and closed position within 14 days per Required Action B.2.2. This is in accordance with how operators are trained to follow Technical Specifications.

The most likely method of proving that the open position indication is faulty involves using alternate methods to verify that the affected LIDs are closed. Once verified, either physically (if radiation is not excessive) or by remote camera, the first performance of Required Action B.2.1 will have been completed. In order to continue operation, ice bed temperatures would have to be monitored every four hours, and the affected LIDs would have to continue to be verified closed every 14 days.

Although the control room annunciator for ice condenser door position will remain lit while any LID has an open signal (valid or invalid), the local door position display panel in upper containment can provide a more refined understanding of which doors are affected. This display panel will be used to perform the normal 12 hour surveillance for the LIDs unaffected by the invalid position indication. If other zones are found with open position indications, TS 3.6.13 Condition B would be entered for the newly affected LIDs, and the appropriate required actions would be taken. By entering the TS and taking the actions specified, the control room operators maintain awareness of plant performance.