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10 CFR 50.90
10 CFR 50 Appendix E

February 18, 2016
MNS-16-016

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

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

Subject: Response to Request for Additional Information Regarding the License Amendment Request (LAR) to Change the McGuire Nuclear Station (MNS) Emergency Plan to Upgrade MNS Emergency Action Levels Based on NEI 99-01, Revision 6

By letter dated May 7, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15141A047), Duke Energy requested approval of a proposed change to the Emergency Action Levels (EALs) used at McGuire Nuclear Station (MNS). Duke Energy proposes to revise their current MNS EAL scheme to one based upon Nuclear Energy Institute (NEI) document NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6 (ADAMS Accession No. ML12326A805).

The NRC staff reviewed the request and determined that additional information is needed to complete their review. A letter requesting additional information was sent on January 20, 2016 (ADAMS Accession No. ML16014A688).

Enclosure 1 of this letter provides the MNS response to the request for additional information and additional changes identified during the RAI process which were deemed necessary. Enclosure 2 provides the MNS redline version of the revised Emergency Action Level Technical Bases Document. Enclosure 3 provides the MNS final (clean) version of the Emergency Action Level Technical Bases Document.

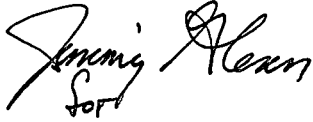
This letter makes no new regulatory commitments or changes to any existing commitments.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated North Carolina State Officials.

AX 45
NRR

If there are any questions related to this submittal contact George Murphy at (980) 875-5715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on
February 18, 2016.

A handwritten signature in black ink, appearing to read "Steven D. Capps". The signature is written in a cursive style with a large initial "S" and "D".

Steven D. Capps

Enclosures:

- Enclosure 1 - Response to Request for Additional Information
- Enclosure 2 - MNS Emergency Action Level Technical Bases Document Redline
- Enclosure 3 - MNS Emergency Action Level Technical Bases Document Final

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ENCLOSURE 1

MNS RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI)
EMERGENCY ACTION LEVEL (EAL) SCHEME CHANGE
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2
DOCKET NO'S. 50-396 AND 50-370

RAI # MNS-	SECTION/ EAL	Question	MNS Response
1	4.3	<p>Section 4.3, "Instrumentation Used for EALs," to NEI 99-01, Revision 6, states (in part): <i>"Scheme developers should ensure that specific values used as EAL setpoints are within the calibrated range of the referenced instrumentation."</i> Please confirm that all setpoints and indications used in the proposed EAL scheme are within the calibrated range(s) of the stated instrumentation and that the resolution of the instrumentation is appropriate for the setpoint/indication.</p>	<p>MNS has confirmed that all setpoints and indications used in the proposed EAL scheme are within the calibrated range(s) of the stated instrumentation and that the resolution of the instrumentation is appropriate for the setpoint/indication.</p>
2	GENERAL	<p>Section 2.5, "Technical Bases Information," states: <i>"A Plant-specific basis section that provides MNS-relevant information concerning the EAL. This is followed by a Generic basis section that provides a description of the rationale for the EAL as provided in NEI 99-01 Rev. 6." Due to the high probability that EAL decision-makers will be confused between these two sections when the information appears to be inconsistent, please justify why the rationale for two sections when it is acceptable to just have one basis section that is specific to the plant, or revise accordingly to eliminate potential confusion by user.</i></p>	<p>The MNS site specific and NEI 99-01 generic bases sections have been combined into a single bases section for each EAL. Section 2.5 "Technical Bases Information" has been revised accordingly.</p> <p>Redundant bases, where applicable, have been deleted.</p>

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RAI # MNS-	SECTION/ EAL	Question	MNS Response
3	5.1	<p>Section 5.0, "Definitions," does not include definitions for the following:</p> <ul style="list-style-type: none"> • Alert, • Notification of Unusual Event, • Site Area Emergency, • General Emergency, • Emergency Action Level, • Emergency Classification Level, • Fission Product Barrier Threshold, and • Initiating Condition. <p>Please provide justification for omitting these definitions, or revise to incorporate these definitions consistent with NEI 99-01, Revision 6.</p>	<p>The following definitions have been added to Section 5.1 consistent with NEI 99-01 Revision 6:</p> <ul style="list-style-type: none"> • <i>Alert,</i> • <i>Unusual Event,</i> • <i>Site Area Emergency,</i> • <i>General Emergency,</i> • <i>Emergency Action Level,</i> • <i>Emergency Classification Level,</i> • <i>Fission Product Barrier Threshold, and</i> • <i>Initiating Condition.</i>
4	RA1.2 RS1.2 RG1.2	<p>For the following EALs, please explain why the listed NOTES were included, or revise accordingly:</p> <ul style="list-style-type: none"> • RA1.2 – NOTE-3 • RS1.2 – NOTE-3 • RG1.2 – NOTE-3 	Deleted Note 3 from RA1.2, RS1.2 and RG1.2.
5	RA2.2	<p>For EAL RA2.2, the information in the NEI 99-01 Basis section does not contain all of the actual information from NEI 99-01, as it is germane to this particular EAL. Please explain why this information was omitted, or revise accordingly.</p>	<p>Re-instated the following text to the RA2.2 bases:</p> <p><i>"This EAL applies to irradiated fuel that is licensed for dry storage up to the point that the loaded storage cask is sealed. Once sealed, damage to a loaded cask causing loss of the CONFINEMENT BOUNDARY is classified in accordance with EAL EU1.1."</i></p>

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6	RU1.2 RA1.3	For EAL RU1.2 and RA1.3, please explain why RU1.2 uses the term "Selected Licensee Commitment (SLC)," while RA1.3 uses "Offsite Dose Calculation Manual (ODCM)." Typically both use the ODCM. Please confirm and elaborate on basis for difference, or revise accordingly.	The MNS Selected License Commitments (SLC) specify release rate limits per license commitments. The Offsite Dose Calculation Manual (ODCM) provides the methodology for performing dose assessments relative to the SLCs.
7	CU1.2 CA1.2 CS1.1 CG1.1	For EALs CU1.2, CA1.2, CS1.1 and CG1.1, please provide further detail as to why additional sumps and tanks cannot be used for these EALs, or revise accordingly.	The following sumps and tanks have been identified for inclusion in EALs CU1.2, CA1.2, CS1.1 and CG1.1: <ul style="list-style-type: none"> • NCDT - Reactor Coolant Drain Tank • PRT - Pressurizer Relief Tank • CFAE - Containment Floor and Equipment sump • ND/NS - RHR/Containment Spray Sump • RHT - Recycle Holdup Tank • WDT - Waste Drain Tank • WEFT - Waste Evaporator Feed Tank • SRST - Spent Resin Storage Tank
8	CS1.1 CS1.2	Please provide further detail as to why CS1.1 and CS1.2 from NEI 99-01, Revision 6, cannot be adequately developed. A review of the current MNS EAL scheme shows that, while limited, MNS does have NCS water level monitoring capability. Please justify the removal of these EALs from the proposed MNS EAL scheme, or revise accordingly.	Although the current NUMARC/NESP-007 Rev. 2 based EALs provide thresholds utilizing NCS narrow range water level below the bottom of the hot leg, the design and operation of the MNS water level instrumentation is such that the "site-specific level" (6" below the bottom ID of the NCS loop and top of fuel) cannot be determined at any time during Cold Shutdown or Refueling modes because the RVLIS instrumentation is not available at all times during these modes. There are no alternative means of assessing NCS water below the bottom of the NCS loop.

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10	CA2.1 SS1.1 SG1.2	For EALs CA2.1, SS1.1 and SG1.2, please explain inclusion of the table and basis language related to the Standby Shutdown Diesel Generator, or revise accordingly, as these EALs are for a loss of all sources to power essential 4160V buses 1(2) ETA and 1(2) ETB.	Deleted reference to Table C-2/S-1 AC power source tables from CA2.1, SS1.1 and SG1.2. Revised associated bases to credit the Standby Shutdown Diesel Generator only if aligned within the associated EAL timing threshold.
11	CA3.1	For EAL CA3.1, please explain why the MNS Basis has a statement related to what to do when reliable NCS temperature indication is absent. If this is an accurate statement, then please explain why this is not provided as a NOTE for the EAL, or revise accordingly.	Added new Note 9 to CA3.1 that reads: <i>"In the absence of reliable NCS temperature indication caused by the loss of decay heat removal capability, classification should be based on the NCS pressure increase criteria when in Mode 5 or based on time to boil data when in Mode 6"</i>
12	HU2.1	For EAL HU2.1, please explain in further detail the process used to determine if the seismic activity has exceeded the Operating Basis Earthquake (OBE) threshold and its classification timeliness. If the OBE threshold (vertical) is not recognized in a timely fashion from indications in, or near, the Control Room, then explain why the alternative EAL was not developed in accordance with NEI 99-01, Revision 6, or revise accordingly.	Immediate control room alarm indication of an earthquake of either 0.08 g horizontal or 0.053 g vertical or greater is annunciated through the system's network control center (NCC), following seismic trigger actuation by at least two accelerographs (vertical switch settings are 2/3 of the respective horizontal switch settings). Therefore exceeding either the horizontal or vertical OBE thresholds actuates the specified alarm. Classification is based upon receipt of this alarm. The HU2.1 bases has been revised to clarify that the OBE alarm is received based on exceeding either acceleration.

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13	HU3.5	Please explain why there was no EAL developed, possibly as HU3.5, for ultimate heat sink (i.e., lake level) level issues, or revise accordingly.	There is no site-specific lake level threat that is not adequately addressed through other Hazard and/or System Malfunction EALs. High lake level is adequately addressed by HU3.4. Loss of heat sink is adequately addressed by CU3.1.
14	HU4.1 HU4.2	For EALs HU4.1 and HU4.2, the areas listed in Table H-1 seem to be vague or too all-encompassing. Please explain if the listed areas are all the areas that contain equipment needed for safe operation, safe shutdown and safe cool-down, and if these areas can be fine-tuned to limit consideration for these EALs, or revise accordingly.	<p>Table H-1 Fire Areas are based on MCS-1465.00-00-0022 Design Basis Specification for the Appendix R Safe Shutdown Analysis and AP/0/A/5500/45 Plant Fire. Table H-1 Fire Areas include those structures containing functions and systems required for safe operation, shutdown and cooldown of the plant (SAFETY SYSTEMS).</p> <p>A balance must be established between defining major plant structures containing safe shutdown equipment as fire areas versus a detailed list of areas for every safety system component location. The Table H-1 list of fire areas achieves that balance in support of timely and accurate emergency classification for the end-user.</p> <p>No further refinement can be achieved.</p>

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15	HU4.3 HU4.4	For EALs HU4.3 and HU4.4, please confirm that the Independent Spent Fuel Storage Installation (ISFSI) would be an area applicable to these EALs, or revise accordingly.	The MNS ISFSI is contained wholly within the plant Protected Area. Therefore the ISFSI would be applicable to EALs HU4.3 and HU4.4 for fires within the plant Protected Area.
16	HA5.1	For EAL HA5.1, please note in the MNS Basis that this EAL is typically applicable in all operating modes, but is limited to operating modes 3 and 4 based upon a review of applicable areas of concern. However, if the plant is modified such that additional areas and/or operating modes become applicable, this EAL must be revised accordingly. Please explain what process is in place which ensures that future plant changes are considered for other than operating modes 3 and 4 under EAL HA5.1.	<p>The following note was added to the HA5.1 bases to ensure HA5.1 mode applicability remains in alignment with Table H-2 Room/Area mode applicability:</p> <p><i>NOTE: IC HA5 mode applicability has been limited to the applicable modes identified in Table H-2 Safe Operation & Shutdown Rooms/Areas. If due to plant operating procedure or plant configuration changes, the applicable plant modes specified in Table H-2 are changed, a corresponding change to Attachment 3 'Safe Operation & Shutdown Areas Tables R-2 & H-2 Bases' and to IC HA5 mode applicability is required."</i></p> <p>AD-LS-ALL-0007, Applicability Determination Process and AD-EG-ALL-1132, Preparation and Control of Design Change and Engineering Changes provide for review of changes that could affect the emergency plan and or Station Emergency Preparedness</p>

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17	HS6.1	For EAL HS6.1, please explain why the operating mode specificity to the key safety functions listed in the EAL was not incorporated, or revise accordingly.	<p>Revised HS6.1 mode applicability from ALL to Modes 1 – 6.</p> <p>Revised HS6.1 based upon an assessment of applicable modes for each of the listed safety function as follows:</p> <p><i>“An event has resulted in plant control being transferred from the Control Room to the Auxiliary Shutdown Panels or Standby Shutdown Facility (SSF)</i></p> <p>AND</p> <p><i>Control of any of the following key safety functions is not reestablished within 15 min. (Note 1):</i></p> <ul style="list-style-type: none"> ● <i>Reactivity (Modes 1, 2 and 3 only)</i> ● <i>Core Cooling</i> ● <i>NCS heat removal”</i>
18	SU3.1 SA3.1	For EALs SU3.1 and SA3.1, please correct the typographical errors related to specifying the wrong tables to be referenced.	Corrected typographical errors related to specifying the wrong tables to be referenced.
19	EU1.1	<p>Under Category E – Independent Spent Fuel Storage Installation (ISFSI) guidance, the statement: <i>“Formal offsite planning is not required because the postulated worst-case accident involving an ISFSI has insignificant consequences to the public health and safety,”</i> is not applicable to this proposed EAL scheme. Please provide further justification for this statement or revise accordingly to remove.</p> <p>In addition, please incorporate guidance related to the fact that EALs HU1 and HA1 are also considered for events that occur at the ISFSI, or explain basis for not including.</p>	<p>Deleted the following cited statement from the Category E introduction</p> <p><i>“Formal offsite planning is not required because the postulated worst-case accident involving an ISFSI has insignificant consequences to the public health and safety.”</i></p> <p>Revised the ISFSI category introduction to read:</p> <p><i>“The MNS ISFSI is contained wholly within the plant Protected Area. Therefore a security event related to the ISFSI would be applicable to EALs HU1.1, HA1.1 and HS1.1.”</i></p>

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20	FPB Bases	Under the Fission Product Barrier (FPB) Matrix, the cited NEI 99-01 Basis sections for several of the FPB criteria are not from the NRC-endorsed NEI 99-01, Revision 6. Please either revise to what has actually been endorsed, or (depending on the response to RAI-03), unify the basis sections into one.	As per response to RAI-2, the MNS site specific and NEI 99-01 Revision 6 bases have been unified.
21	FC Potential Loss 2 RCS Potential Loss 1	For Fuel Clad Barrier Potential Loss 2 and Reactor Coolant System Potential Loss 1, please provide further justification as to why the Heat Sink Red language was added to the Plant-Specific Basis section, as no documentation was provided to justify its inclusion, and it appears to provide a caveat to declaration, or revise accordingly.	<p>The plant-specific bases was added to support interpretation of the words "...and heat sink is required" added to the FPB potential loss thresholds related to Heat Sink CSFST red path. This is consistent with the generic bases which states:</p> <p><i>"In accordance with EOPs, there may be unusual accident conditions during which operators intentionally reduce the heat removal capability of the steam generators; during these conditions, classification using threshold is not warranted"</i></p> <p>The added bases also supports the condition where, due to a large break LOCA with RCS pressure less than SG pressure, heat sink is not required even though heat sink red path conditions exist.</p> <p>In both instances the determination is quickly made that heat sink is not required upon entry into FR-H.1 Response to Loss of Secondary Heat Sink.</p>

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Attachment A
Summary of EAL Changes NOT Associated with RAI Responses

The table below summarizes changes that have been introduced to the EAL submittal documentation for reasons other than the responses to the NRC RAIs.

EAL #	Tech Basis Change?	Description
SA9.1	Yes	MNS Reference #7 NEI source IC corrected to read SA9 vs. CA6.
HU1.1	Yes	Split EAL HU1.1 into three separate EALs: HU1.1, HU1.2 and HU1.3 to better support the offsite notification process.
HA1.1	Yes	Split EAL HA1.1 into two separate EALs: HA1.1 and HA1.2 to better support the offsite notification process.
SU8.1	Yes	Added new Note 10 consistent with response to Catawba Nuclear Station RAI #20 related to re-enforcement of the VX-CARF actuation time delay bases discussion.
CMT Potential Loss D.3	Yes	Added new Note 10 consistent with response to Catawba Nuclear Station RAI #20 related to re-enforcement of the VX-CARF actuation time delay bases discussion.
SU4.1	Yes	Revised SU4.1 and related bases to accurately reflect Technical Specification 3.4.16 NCS activity limits: NCS activity > any of the following Technical Specification 3.4.16 limits: <ul style="list-style-type: none"> - Dose Equivalent I-131 > 1.0 $\mu\text{Ci/gm}$ for > 48 hrs. - Dose Equivalent I-131 > 60 $\mu\text{Ci/gm}$ - Dose Equivalent Xe-133 > 280 $\mu\text{Ci/gm}$