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A Duke Energy Company

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November 14, 2002

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

Subject: Response to NRC Letter Dated November 13, 2002
Application to Renew the Licenses of McGuire Nuclear Station, Units 1 & 2 and Catawba Nuclear Station, Units 1 & 2

Docket Nos. 50-369, 50-370, 50-413 and 50-414

By letter dated June 13, 2001, Duke Energy Corporation (Duke) submitted an Application to Renew the Facility Operating Licenses of McGuire Nuclear Station and Catawba Nuclear Station (Application). The Application contains the technical information required by 10 CFR Part 54 and the Supplement to the Final Safety Analysis Report (FSAR) for each station as required by §54.21(d).

In a letter dated August 14, 2002, the NRC staff provided Duke a copy of the "Safety Evaluation Report with Open Items Related to the License Renewal of McGuire Nuclear Station, Units 1 and 2, Catawba Nuclear Station, Units 1 and 2." By letters dated October 2, 2002 and October 28, 2002, Duke provided its responses to the SER Open Items and revised UFSAR Supplements for each station. Comments on the SER were provided informally to the license renewal project manager.

The staff, in its letter dated October 19, 2002, provided requests for additional information on two topics and requested that Duke review an excerpt from the SER for the Waste Gas System Inspection. Duke letter dated November 5, 2002 provided responses to this staff letter.

By letter dated November 7, 2002, the staff identified a topic concerning the treatment of fuse holders within the scope of license renewal as long-lived, passive components subject to an aging management review for McGuire and Catawba. The letter indicates that the staff interim staff guidance (ISG) concerning this topic is under development and requests that Duke commit to implement, at McGuire and Catawba, the final resolution of the ISG. Duke agrees to this request and understands that the staff will transmit the final version of this ISG to Duke through the normal regulatory communication process. The following commitments will be provided in Section 18.3 of the respective station's UFSAR Supplement:

A085
A053

For McGuire, Duke commits to provide a response to the final version of the fuse holder interim staff guidance (initially provided to NEI by letter dated May 16, 2002 and when finalized by the staff) by June 12, 2021 (the end of the initial license of McGuire Unit 1).

For Catawba, Duke commits to provide a response to the final version of the fuse holder interim staff guidance (initially provided to NEI by letter dated May 16, 2002 and when finalized by the staff) by December 6, 2024 (the end of the initial license of Catawba Unit 1).

By letter dated November 13, 2002, the NRC staff provided the status of its review of the McGuire and Catawba License Renewal Application and identified open item on eight remaining issues. The Duke response to seven of these eight issues is provided in Attachment 1. In addition, Duke is providing an item that it identified that is editorial error in its October 28, 2002 letter. The remaining issue concerning the scoping of manual suppression systems in the Turbine Building will be provided on November 18, 2002.

Attachment 1 also contains several proposed revisions to the UFSAR Supplements of each station that were provided by Duke letter dated October 28, 2002. Final revisions of both UFSAR Supplements that include these committed changes will be provided to the staff on a date to be established based on discussions between Duke and the NRC license renewal project manager.

If there are any questions, please contact Bob Gill at (704) 382-3339.

Very truly yours,

M. S. Tuckman

M. S. Tuckman

Attachment:

Affidavit

M. S. Tuckman, being duly sworn, states that he is Executive Vice President, Nuclear Generation Department, Duke Energy Corporation; that he is authorized on the part of said Corporation to sign and file with the U. S. Nuclear Regulatory Commission the attached response to the Safety Evaluation with Open Items Related to the License Renewal of McGuire Nuclear Station, Units 1 & 2 and Catawba Nuclear Station, Units 1 & 2 , Docket Nos. 50-369, 50-370, 50-413 and 50-414, and that all the statements and matters set forth herein are true and correct to the best of his knowledge and belief. To the extent that these statements are not based on his personal knowledge, they are based on information provided by Duke employees and/or consultants. Such information has been reviewed in accordance with Duke Energy Corporation practice and is believed to be reliable.

M. S. Tuckman

M. S. Tuckman, Executive Vice President
Duke Energy Corporation

Subscribed and sworn to before me this 14TH day of November 2002.

Mary P. Nehus

Notary Public

My Commission Expires:

JAN 22, 2006

xc: (w/ Attachment)

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Attachment 1

Response to
NRC letter dated November 13, 2002

1. Duke identified item

Duke letter dated October 28, 2002 provided a response to Open Items 2.3-1 and 2.3-2. Duke has identified an editorial error in the table on page 2 of Attachment 2. The last row of this table should read as follows:

Fans	Pressure Boundary	Galvanized Steel	Ventilation Sheltered	None Identified Loss of Material	None Required Fluid Leak Management Program

2. Open Item 3.6.1-1, visual inspection of neutron and radiation monitoring instrument cables

The following information is provided to supplement Duke's response to Open Item 3.6.1-1 provided by letter dated October 2, 2002. The open item, as stated in the August 2002 SER with Open Items, is:

> SER OPEN ITEM 3.6.1-1
> The applicant should provide a technical justification that will demonstrate that visual inspection of high range radiation monitor and high voltage neutron monitoring instrumentation cables will be effective in detecting aging before current leakage can affect instrument loop accuracy.

In its October 2, 2002 response to Open Item 3.6.1-1, Duke provided technical information to demonstrate that the *Non-EQ Insulated Cables and Connections Aging Management Program* was effective at managing the effects of aging of all insulated cables, including high-range radiation and neutron monitoring instrumentation cables. Subsequently, the staff informed Duke that this aging management program was not adequate for managing the aging of these specific cables. Accordingly, Duke will implement a program to specifically address SER Open Item 3.6.1-1.

The name of this program is the *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits*. The scope of this program includes only non-EQ neutron flux instrumentation cables that are within the scope of license renewal. The other cables under discussion here, high-range radiation monitors/cables and the wide-range neutron flux monitors/cables, are included in the McGuire and Catawba *Environmental Qualification (EQ) Program* and already covered for license renewal by this program.

The following is a description of the *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits* using the attributes described in Appendix B of the Application:

LICENSE RENEWAL PROGRAM FOR NON-EQ NEUTRON FLUX INSTRUMENTATION CIRCUITS
Note: The License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits are

generically applicable to both McGuire Nuclear Station and Catawba Nuclear Station, except as otherwise noted.

The purpose of the *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits* is to provide reasonable assurance that the intended functions of non-EQ neutron flux instrumentation circuits will be maintained in accordance with the current licensing basis during the period of extended operation.

Scope – The scope includes the cables used in non-EQ neutron flux instrumentation circuits within the scope of 10 CFR 54.4. Non-EQ means not subject to 10 CFR 50.49 Environmental Qualification requirements.

Preventive Actions – No actions are taken as part of the *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits* to prevent aging effects or to mitigate aging degradation.

Parameters Monitored or Inspected – The parameters monitored are determined from the plant technical specifications and are specific to each instrumentation circuit, as documented in surveillance procedures.

Detection of Aging Effects – In accordance with the information provided in **Monitoring & Trending,** the *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits* provides sufficient indication of the need for corrective actions.

Monitoring & Trending – The methods for performing the *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits* are described in Section 3.3.1 of each station's technical specifications. Instrumentation circuit surveillances as required by plant technical specifications, which are performed at the normal surveillance frequency specified in the plant technical specifications, provide sufficient indication of the need for corrective actions based on acceptance criteria related to instrumentation circuit performance.

Acceptance Criteria – The acceptance criterion for each surveillance is documented in surveillance procedures.

Corrective Action & Confirmation Process – Correctives actions such as circuit trouble-shooting are implemented when acceptance criteria are not met. Further investigation through the corrective action program is performed as needed.

Administrative Controls – The *License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits* is implemented by plant procedures as required by Technical Specification 5.4.

Operating Experience – Plant specific and industry operating experience has shown that adverse circuit indications found during routine surveillances can be caused by degradation of the instrumentation circuit cable and are a possible indication of potential cable degradation.

UFSAR SUPPLEMENT REVISIONS
Table 18-1 of each station's UFSAR Supplement will be revised to insert the following item:

Topic	*Application Location*	*UFSAR / ITS Location*
License Renewal Program for Non-EQ Neutron Flux Instrumentation Circuits	NA	ITS 3.3.1

3. Open Items 3.5-1 and 3.5-3, aging effects for concrete structures and components (SCs)
Supplemental Response to Open Items 3.5-1 and 3.5-3

Summary of Open Item History to Date
Open Items 3.5-1 and 3.5-3 expressed the staff position that periodic inspections of concrete components during the period of extended operation are necessary for the staff to make a reasonable assurance finding that inscope structures and components will maintain their structural integrity and intended function(s). In both Open Items, the staff asked Duke to propose to perform periodic inspections of concrete components during the period of extended operation.

In response to these open items dated October 2, 2002, Duke specifically committed to the *Inspection Program for Civil Engineering Structures and Components* which is fully described in Section B.3.21 of the Application.

Subsequently by electronic communication, the staff requested additional information to complete its review. Duke provided this additional information in its letter dated October 28, 2002.

In its letter dated November 13, 2002, the staff stated that the aging effects for concrete SCs were not specified and that a demonstration that the effects of aging will be adequately managed were not provided.

Duke Perspective as Background
Duke and the staff have used different processes to determine the aging effects of concrete structures and components that require management during the period of extended operation. Duke determined the aging effects that require management during the period of extended

operation by reviewing the plant-specific materials of construction and operating environments for each structure and component that is subject to an aging management review. The effects of aging on the intended functions of structures and components were also considered, as recommended by SRP-LR, Appendix A.1.

To provide reasonable assurance that the aging effects that require management for a specific material-environment combination are the only aging effects of concern for McGuire and Catawba, Duke also performed a review of industry experience and NRC generic communications relative to these structures and components. Finally, relevant McGuire and Catawba operating experience have been reviewed to provide further confidence that the set of aging effects for the specific material-environment combinations have been identified. The use of plant-specific operating experience is supported by the following statement from the Statement of Considerations for Part 54:

> The NRC believes that the history of operation over the minimum of 20-year period provides a licensee with substantial amount of information and would disclose any plant-specific concerns with regard to age-related degradation.

Taken together, the steps of this methodology provide reasonable assurance that the aging effects that require management during the period of extended operation for McGuire and Catawba structures and components have been identified. The process used by Duke to determine the effects of aging on concrete structures and components is consistent with that used in the mechanical and electrical aging management reviews. This process is also consistent with that process used in Section 3.5 of the Oconee Nuclear Station license renewal application. Furthermore, in Section 3.1 of NUREG-1723 the staff concluded that based on its review of the information provided in Sections 3.5.1 and 3.5.2 of the Oconee application, "the applicant has identified the aging effects that are associated with mechanical systems components reviewed in [Section 3.5]." This aging effects identification process provides reasonable assurance that the aging effects that require management during the period of extended operation have been identified.

NRC Perspective Leading to Additional Aging Effects

As Duke understands, the staff position is that both the operating and environmental conditions are subject to change throughout the period of extended operation and cracking, loss of material, and change of material properties could result. Therefore, Duke needs to periodically inspect these components. (SER Open Item 3.5-1, NRC letter dated August 14, 2002.) In its review to determine the effects of aging on concrete structures and components, Duke used the guidance in the Statement of Considerations that 20-years of operating experience would disclose age-related degradation and did not consider postulated changes to operating and environmental conditions that could occur during the period of extended operation.

Supplemental Information for Aging Management Review

Duke agrees that if operating and environmental conditions are postulated to change during the period of extended operation then loss of material, cracking, and change in material properties of concrete structures and components could challenge a concrete structure or component function. Therefore, under these postulated conditions, periodic inspection of these components is prudent and Duke has committed to use the *Inspection Program for Civil Engineering Structures and Components* to manage aging effects.

Accordingly, Note 4 from Tables 3.5-1 and 3.5-2 (previously provided in Duke letter dated October 28, 2002) should be revised to read as follows:

> Duke did not identify any aging effects that would result in loss of component intended function. The staff in its SER dated August 14, 2002 identified loss of material, cracking, and changes in material properties to be both plausible and applicable aging effects for all concrete components. Notwithstanding the disagreement on the aging effects that require management for the period of extended operation, Duke committed, in its response to Open Items 3.5-1 and 3.5-3 provided in a letter dated October 2, 2002, to perform periodic inspections of these concrete components to manage the aging effects of loss of material, cracking, and changes in material properties using the *Inspection Program for Civil Engineering Structures and Components.*

Supplemental Information for Section B.3.21 of the Application

The following information is provided to supplement the description of the *Inspection Program for Civil Engineering Structures and Components* contained in Section B.3.21 of the McGuire and Catawba License Renewal Application.

> Beyond these specific aging effects identified by Duke that require management during the period of extended operation, the *Inspection Program for Civil Engineering Structures and Components* is adequate to manage cracking, loss of material, and change of material properties for any of the exposed concrete components within those structures falling within the scope of license renewal.
>
> The **Parameters Monitored Or Inspected** attribute in summary description of the *Inspection Program for Civil Engineering Structures and Components* includes inspected conditions of concrete components that are examples of cracking, loss of material, and change in material properties. For example, spalling is an example of loss of material and chemical leaching is an example of change in material properties.
>
> **Operating Experience**
>
> The operating experience provided in B.3.21 demonstrates that the program is effective in identifying cracking, loss of material, and change of material properties.

Examination and assessment of the condition of a structure is performed using guidance provided in codes and standards such as:

- NRC Regulatory Guide 1.127, *Inspection of Water-Control Structures Associated with Nuclear Power Plants*
- ACI 349.3, *Evaluation of Existing Nuclear Safety-Related Concrete Structures*

Section 3.0.3.11.2 of the SER provides an evaluation of the *Inspection Program for Civil Engineering Structures and Components* that is an accurate assessment of the aging management of concrete structures and components considering the above aging effects.

The *Inspection Program for Civil Engineering Structures and Components* has been demonstrated to be capable of detecting and managing aging. The *Inspection Program for Civil Engineering Structures and Components* described above is equivalent to the Inspection Program for Civil Engineering Structures and Components described and evaluated in NUREG-1723, Section 3.2.6. Based on the above review, the continued implementation of the *Inspection Program for Civil Engineering Structures and Components* provides reasonable assurance that aging will be managed such that the intended functions of the structures and components will continue to be maintained consistent with the current licensing basis for the period of extended operation (i.e., 20-years from the end of the initial operating license).

4. Open Item 2.3.3.19-4, scoping of manual suppression systems in the turbine building

The response to this item is still in preparation and will be provided on November 18, 2002.

5. New Open Item 3.0.3.10.2-1, volumetric examination of small-bore Class 1 pipe welds in susceptible locations

This Supplemental Response to Open Item 3.0.3.10.2-1 supercedes the responses previously provided and is provided to clearly indicate the Duke commitment to examine small bore Class 1 piping at both McGuire and Catawba.

Small bore piping is defined as piping less than 4-inch NPS. This piping does not receive volumetric inspection in accordance with ASME Section XI, 1989 Edition, Examination Category B-J or B-F. Cracking has been identified as an aging effect requiring programmatic management for Reactor Coolant System small bore piping for the period of extended operation.

A set of susceptible small bore piping locations will be volumetrically examined on each unit. Locations to be examined will be determined based on consideration of damage mechanisms. Damage mechanisms to be considered include fatigue, stress corrosion, and flow assisted corrosion/flow wastage. Cracking due to thermal fatigue resulting from stratification of fluids and turbulent penetration flow is an aging effect that will be addressed.

The *Small Bore Piping Examination* will be an activity within the *Inservice Inspection Plan* during the period of extended operation. Small Bore Piping examinations will be performed during each inservice inspection interval during the period of extended operation. The summary description of the *Small Bore Piping Examination* provided in each station's UFSAR Supplement will be revised to read as follows:

> SMALL BORE PIPING EXAMINATION
> Small bore piping is defined as piping less than 4-inch NPS. This piping does not receive volumetric inspection in accordance with ASME Section XI, 1989 Edition, Examination Category B-J or B-F. Cracking has been identified as an aging effect requiring programmatic management for Reactor Coolant System small bore piping for the period of extended operation.
>
> A set of susceptible small bore piping locations will be volumetrically examined on each unit. Locations to be examined will be determined based on consideration of damage mechanisms. Damage mechanisms to be considered include fatigue, stress corrosion, and flow assisted corrosion/flow wastage. Cracking due to thermal fatigue resulting from stratification of fluids and turbulent penetration flow is an aging effect that will be addressed.
>
> For McGuire, *Small Bore Piping Examinations* will be performed during each inservice inspection interval during the period of extended operation following issuance of renewed operating licenses for McGuire Nuclear Station.
>
> For Catawba, *Small Bore Piping Examinations* will be performed during each inservice inspection interval during the period of extended operation following issuance of renewed operating licenses for Catawba Nuclear Station.

6. Open Item 2.3-3, aging management of structural sealant in ventilation system applications

The following response supercedes the entire response provided by Duke letter dated October 28, 2000 to correct word processing errors.

In response to Open Item 2.3-3, Duke would like to summarize its previous responses to this staff concern.

As stated in our response to RAI 2.3-4, Duke does not define materials such as ventilation area pressure boundary sealants as structures or components. The guidance provided in NUREG-1800, "Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants," states that structural sealants are "considered as subcomponents and are not explicitly called out in the scoping and screening procedures." Furthermore, the Commission in the SOC for the Final Part 54 Rule stated:

> "... the Commission has removed the words "portions of" and similar wording from the Statements of Consideration when it could be misinterpreted to mean a subcomponent piece-part demonstration."

Aging management reviews are required for structures and components – not subcomponents. Although ventilation area pressure boundary sealants are not listed as components in the LRA, Duke will assume that pressure boundary structural sealants are subject to aging management review. Pressure boundary structural sealants include, but are not limited to, sealants in the interface between a structural wall, floor or ceiling and a non-structural component such as duct, piping, electrical cables, doors, and non-structural walls.

The function supported by these structural sealants is to minimize inleakage of building pressure boundary enclosure and to maintain a differential pressure between the ventilation area and the adjacent structural areas. In some instances, the amount of assumed inleakage is quantified. In other instances, the design basis simply states that inleakage should be minimized. The structural sealants are located in benign environments and may not be susceptible to significant degradation resulting in loss of function. However, for the purpose of this review, the aging effects of concern are assumed to be cracking and shrinkage of the structural sealants.

Duke has previously proposed crediting existing technical specification surveillances that provide assurance that the design basis functions are being met. All of these surveillances, except the Control Room surveillance which is the subject of an ongoing regulatory issue, verify that the function of the ventilation area boundary, including the structural sealants, is being managed:

- The sealants for the Control Room pressure boundary enclosure are addressed by surveillance testing to demonstrate compliance with *McGuire Technical*

Specification 3.7.9 and Catawba Technical Specification 3.7.10.

- The sealants for the Auxiliary Building (VA) ventilation pressure boundary enclosure are addressed by surveillance testing to demonstrate compliance with *McGuire Technical Specification 3.7.11.4 and Catawba Technical Specification 3.7.12.4.*
- The sealants for the Fuel Building (VF) ventilation pressure boundary enclosure are addressed by surveillance testing to demonstrate compliance with *McGuire Technical Specification 3.7.12.4 and Catawba Technical Specification 3.7.13.4.*
- The sealants for the Reactor Building (annulus) (VE) ventilation pressure boundary enclosure are addressed by surveillance testing to demonstrate compliance with *McGuire and Catawba Technical Specification 3.6.10.5.*

During a meeting with the staff on September 18, 2002, the staff indicated that these surveillances do not directly manage the aging of the structural sealants. Duke agrees that the aging of the structural sealants are not directly inspected. However, the function of the sealants and the ventilation area pressure boundary, except those of the control room boundary, are being managed with reasonable assurance by the specified surveillance programs. In the event that the acceptance criteria of the surveillances are not met, the entire ventilation area pressure boundary will be inspected to determine the cause of the excess inleakage. Corrective actions are taken to repair or replace the ineffective sealant.

Nevertheless and as a practical matter in order to support the timely resolution of this open item and the completion of the license renewal review on schedule, Duke will not challenge this issue further. Duke will implement a *Ventilation Area Pressure Boundary Sealants Inspection* to manage these sealants. The following is a description of this new one-time inspection.

VENTILATION AREA PRESSURE BOUNDARY SEALANTS INSPECTION

The purpose of the *Ventilation Area Pressure Boundary Sealants Inspection* is to characterize any cracking or shrinkage of structural sealants due to exposure to the ambient conditions. Uncertainty exists as to whether exposure of pressure boundary structural sealants to the ambient conditions within the Auxiliary Building, Annulus and Fuel Handling Building could cause cracking or shrinkage and result in a loss of function of the sealants. The visual inspection will identify cracking and shrinkage of the structural sealants that would result in an inability of the sealants to maintain the differential pressure required by the current design basis. The *Ventilation Area Pressure Boundary Sealants Inspection* is a one-time inspection.

Scope – The scope of the *Ventilation Area Pressure Boundary Sealants Inspection* is the pressure boundary structural sealants installed in the ventilation pressure boundary of the Control Room, ECCS Pump Room, Annulus, and Fuel Handling areas. Pressure boundary structural sealants include, but are not limited to, sealants in the interface between a structural wall, floor or ceiling and a non-structural component such as duct, piping, electrical cables, doors, and non-structural walls.

Preventive Actions – No actions are taken as a part of this one-time inspection to prevent aging effects or to mitigate aging degradation.

Parameters Monitored or Inspected – *Ventilation Area Pressure Boundary Sealants Inspection* is a visual inspection for cracking or shrinkage of the structural sealants.

Detection of Aging Effects – In accordance with the information provided in **Monitoring & Trending**, *Ventilation Area Pressure Boundary Sealants Inspection* will detect cracking or shrinkage of the ventilation area pressure boundary structural sealants.

Monitoring & Trending – The *Ventilation Area Pressure Boundary Sealants Inspection* will visually inspect a representative sample of structural sealants at each station. Locations of inspections will be based on severity of the local ambient conditions taking into consideration temperature and radiation. The sample locations selected will provide a leading indication of the condition of all structural sealants within the scope of this activity.

No actions are taken as part of this program to trend inspection results.

For McGuire, this one-time inspection will be completed following issuance of the renewed operating licenses for McGuire Nuclear Station and by June 12, 2021 (the end of the initial license of McGuire Unit 1).

For Catawba, this one-time inspection will be completed following issuance of the renewed operating licenses for Catawba Nuclear Station and by December 6, 2024 (the end of the initial license of Catawba Unit 1).

Acceptance Criteria – The acceptance criterion for the *Ventilation Area Pressure Boundary Sealants Inspection* is no unacceptable cracking or shrinking that could result in the loss of the intended function of the structural sealant as determined by engineering evaluation.

Corrective Action & Confirmation Process – If engineering evaluation determines that continuation of the aging effects will not cause a loss of structural sealant intended function, under any current licensing basis design condition for the period of extended operation, no further action is required. If the engineering evaluation determines that continuation of the aging effects could cause a loss of structural sealant function under current licensing design conditions for the period of extended operation, then programmatic oversight will be defined by engineering. Specific corrective actions, including repair or replacement of the ventilation area pressure boundary structural sealants, will be implemented in accordance with the corrective action program.

Administrative Controls – *Ventilation Area Pressure Boundary Sealants Inspection* surveillances will be implemented by written procedure.

Operating Experience – The *Ventilation Area Pressure Boundary Sealants Inspection* is a one-time inspection activity for which there is no operating experience. However, similar visual inspections have been performed as part of the *Inspection Program for Civil Engineering Structures and Components* which has been found to be an acceptable aging management program for license renewal by the staff.

UFSAR SUPPLEMENT REVISIONS

Each station's UFSAR Supplement will be revised to include the following description of the *Ventilation Area Pressure Boundary Sealants Inspection*:

Scope – The scope of the *Ventilation Area Pressure Boundary Sealants Inspection* is the pressure boundary structural sealants installed in the ventilation pressure boundary of the Control Room, ECCS Pump Room, Annulus, and Fuel Handling areas. Pressure boundary structural sealants include, but are not limited to, sealants in the interface between a structural wall, floor or ceiling and a non-structural component such as duct, piping, electrical cables, doors, and non-structural walls.

Preventive Actions – No actions are taken as a part of this one-time inspection to prevent aging effects or to mitigate aging degradation.

Parameters Monitored or Inspected – *Ventilation Area Pressure Boundary Sealants Inspection* is a visual inspection for cracking or shrinkage of the structural sealants.

Detection of Aging Effects – In accordance with the information provided in **Monitoring & Trending**, *Ventilation Area Pressure Boundary Sealants Inspection* will detect cracking or shrinkage of the ventilation area pressure boundary structural sealants.

Monitoring & Trending – The *Ventilation Area Pressure Boundary Sealants Inspection* will visually inspect a representative sample of structural sealants at each station. Locations of inspections will be based on severity of the local ambient conditions taking into consideration temperature and radiation. The sample locations selected will provide a leading indication of the condition of all structural sealants within the scope of this activity.

No actions are taken as part of this program to trend inspection results.

For McGuire, this one-time inspection will be completed following issuance of the renewed operating licenses for McGuire Nuclear Station and by June 12, 2021 (the end of the initial license of McGuire Unit 1).

For Catawba, this one-time inspection will be completed following issuance of the renewed operating licenses for Catawba Nuclear Station and by December 6, 2024 (the end of the initial license of Catawba Unit 1).

Acceptance Criteria – The acceptance criterion for the *Ventilation Area Pressure Boundary Sealants Inspection* is no unacceptable cracking or shrinking that could result in the loss of the intended function of the structural sealant as determined by engineering evaluation.

Corrective Action & Confirmation Process – If engineering evaluation determines that continuation of the aging effects will not cause a loss of structural sealant intended function, under any current licensing basis design condition for the period of extended operation, no further action is required. If the engineering evaluation determines that continuation of the aging

effects could cause a loss of structural sealant function under current licensing design conditions for the period of extended operation, then programmatic oversight will be defined by engineering. Specific corrective actions, including repair or replacement of the ventilation area pressure boundary structural sealants, will be implemented in accordance with the corrective action program.

Administrative Controls – *Ventilation Area Pressure Boundary Sealants Inspection* surveillances will be implemented by written procedure.

7. **New Open Item 3.3.6.2.1-1, aging effects for synthetic rubber expansion joint in condenser circulating water system**

In order to resolve Open Item 3.3.6.2.1-1, Duke will implement a one-time inspection as described below:

Note: The Condenser Circulating Water Pump Expansion Joint Inspection is applicable only to Catawba Nuclear Station.

The purpose of the *Condenser Circulating Water Pump Expansion Joint Inspection* is to characterize any cracking and wear of expansion joints exposed to a raw water internal environment and the yard external environment. Uncertainty exists as to whether these environments could cause aging in synthetic rubber expansion joints such that they may lose their pressure boundary function in the period of extended operation. This activity will inspect the expansion joints internal and external surfaces to detect the presence and extent of any cracking and wear. Based on current operating experience, the *Condenser Circulating Water Pump Expansion Joint Inspection* is a one-time inspection.

Scope – The scope of the *Condenser Circulating Water Pump Expansion Joint Inspection* is the expansion joints at the discharge of the condenser circulating water pumps that fall within the scope of license renewal. There are four of these expansion joints on each unit at Catawba.

Preventive Actions – No actions are taken as part of this inspection to prevent aging effects or to mitigate aging degradation.

Parameters Monitored or Inspected – The parameters inspected by the *Condenser Circulating Water Expansion Pump Joint Inspection* are signs of cracking and wear from exposure to the internal and external environments.

Detection of Aging Effects – The *Condenser Circulating Water Pump Expansion Joint Inspection* is a one-time visual inspection that will detect the presence and extent of degradation on the internal and external surfaces of the expansion joints.

Monitoring & Trending – The *Condenser Circulating Water Pump Expansion Joint Inspection* will visually inspect the internal and external surfaces of the license renewal expansion joints for specific signs of cracking, checking, crazing, cuts, tears, blistering, ply separation, flattened arch, abnormal bulges, scale, flakes, and soft spots.

For Catawba, this new inspection will be completed following issuance of renewed operating licenses for Catawba Nuclear Station and by December 6, 2024 (the end of the initial license of Catawba Unit 1).

No actions are taken as part of this activity to trend inspection results.

Should industry data or other evaluation indicate that the above inspections can be modified or eliminated, Duke will provide plant-specific justification to demonstrate the basis for the modification or elimination.

Acceptance Criteria – The acceptance criteria for the *Condenser Circulating Water Pump Expansion Joint Inspection* is any signs of cracking and wear will be evaluated.

Corrective Action & Confirmation Process – If engineering evaluation determines that continuation of the aging effects will not cause a loss of component intended function(s) under any current licensing basis design conditions for the period of extended operation, then the aging management review is complete and no further action is required. If engineering evaluation determines that additional information is required to more fully characterize any or all of the aging effects, then additional inspections will be completed or other actions taken in order to obtain the additional information. If further engineering evaluation determines that continuation of the aging effect could cause a loss of component intended function(s) under current licensing basis design conditions for the period of extended operation, then programmatic oversight will be defined. Specific corrective actions will be implemented in accordance with the corrective action program.

Administrative Controls – The *Condenser Circulating Water Pump Expansion Joint Inspection* will be implemented in accordance with controlled plant procedures.

Operating Experience – The *Condenser Circulating Water Pump Expansion Joint Inspection* is a one-time inspection activity for which there is no operating experience. During the course of other maintenance activities, the expansion joints have been inspected. The expansion joints were found in good condition and no specific follow-up was deemed necessary. This one-time inspection will validate these results.

Conclusion

Based on the above review, implementation of the *Condenser Circulating Water Pump Expansion Joint Inspection* will adequately verify that no need exists to manage the aging effects on the components or will otherwise take appropriate corrective actions so that the components will continue to perform their intended function(s) for the period of extended operation.

Catawba UFSAR Supplement Revision

The Catawba UFSAR Supplement, Section 18.2.20 will be revised to include the following summary:

Scope – The scope of the *Condenser Circulating Water Pump Expansion Joint Inspection* is the expansion joints at the discharge of the condenser circulating water pumps that fall within the scope of license renewal. There are four of these expansion joints on each unit at Catawba.

Preventive Actions – No actions are taken as part of this inspection to prevent aging effects or to mitigate aging degradation.

Parameters Monitored or Inspected – The parameters inspected by the *Condenser Circulating Water Expansion Pump Joint Inspection* are signs of cracking and wear from exposure to the internal and external environments.

Detection of Aging Effects – The *Condenser Circulating Water Pump Expansion Joint Inspection* is a one-time visual inspection that will detect the presence and extent of degradation on the internal and external surfaces of the expansion joints.

Monitoring & Trending – The *Condenser Circulating Water Pump Expansion Joint Inspection* will visually inspect the internal and external surfaces of the license renewal expansion joints for specific signs of cracking, checking, crazing, cuts, tears, blistering, ply separation, flattened arch, abnormal bulges, scale, flakes, and soft spots.

For Catawba, this new inspection will be completed following issuance of renewed operating licenses for Catawba Nuclear Station and by December 6, 2024 (the end of the initial license of Catawba Unit 1).

No actions are taken as part of this activity to trend inspection results.

Should industry data or other evaluation indicate that the above inspections can be modified or eliminated, Duke will provide plant-specific justification to demonstrate the basis for the modification or elimination.

Acceptance Criteria – The acceptance criteria for the *Condenser Circulating Water Pump*

Expansion Joint Inspection is any signs of cracking and wear will be evaluated.

Corrective Action & Confirmation Process – If engineering evaluation determines that continuation of the aging effects will not cause a loss of component intended function(s) under any current licensing basis design conditions for the period of extended operation, then the aging management review is complete and no further action is required. If engineering evaluation determines that additional information is required to more fully characterize any or all of the aging effects, then additional inspections will be completed or other actions taken in order to obtain the additional information. If further engineering evaluation determines that continuation of the aging effect could cause a loss of component intended function(s) under current licensing basis design conditions for the period of extended operation, then programmatic oversight will be defined. Specific corrective actions will be implemented in accordance with the corrective action program.

Administrative Controls – The *Condenser Circulating Water Pump Expansion Joint Inspection* will be implemented in accordance with controlled plant procedures.

8. Steam generator divider plates and pressurizer surge and spray nozzle thermal sleeves
This response supercedes the response provided by Duke letter dated October 28, 2002

NRC Inspection Report 50-369/02-06, 50-370/02-06, 50-413/02-06 and 50-414/02-06 (at page 2 of the report) dated September 9, 2002 identified that the Inservice Inspection Plan does not include two Reactor Coolant System components even though the Inservice Inspection Plan was credited to manage the aging of these components within the Application. The components are the pressurizer surge and spray nozzle thermal sleeves and the steam generator divider plates.

Immediately following this inspection, Duke re-reviewed the license renewal basis for components and determined that the inspection findings were correct. The Inservice Inspection Plan does not apply to these components and both the in-house engineering specification tables and the Application tables incorrectly listed the Inservice Inspection Plan as one of the set of applicable aging management programs for these components. Since the actual aging management reviews did not take credit for the Inservice Inspection Plan for managing aging of these components, Duke has determined that this is an editorial error in the Application. The following description serves to clarify the actual aging management review basis for these components and, more importantly, reports that the August 14, 2002 Safety Evaluation Report (SER) with Open Items will require no revision to correct this editorial mistake.

The license renewal function of concern for the thermal sleeves within the pressurizer surge and spray nozzles is to protect the pressure boundary of the nozzles themselves. The pressure boundary of the pressurizer surge and spray nozzles could be impacted (1) by cracking of the nickel-based alloy weld connecting the thermal sleeves to the nozzles or (2) by severe loss of

material or cracking of the austenitic stainless steel thermal sleeves themselves. The first reason for including these thermal sleeves within the Aging Management Review results in Table 3.1-1 of the Application was to assure that these welds were considered within the Alloy 600 Aging Management Review. Section 3.1.2.2.2 of the SER provides an evaluation of the Alloy 600 Aging Management Review that is an accurate assessment of the aging management of the nickel-based alloy welds connecting the thermal sleeves to the pressurizer surge and spray nozzles. The second reason for inclusion was to identify that the Chemistry Control Program will manage cracking and loss of material of the thermal sleeves themselves. Section 3.0.3.2 of the SER provides an evaluation of the Chemistry Control Program that is an accurate assessment of the aging management of the thermal sleeves and their connecting welds. Finally, the Thermal Fatigue Management Program described in Section 4.3 of the SER will manage the pressure boundary function of the nozzles by managing any aging associated with thermal fatigue-induced cracking of the welds or thermal sleeves. Therefore, the pressurizer surge and spray nozzle thermal sleeves are within the scope of license renewal and all applicable aging effects are managed by the programs that are described and evaluated in the SER.

A similar rational to the thermal sleeves exists for including the steam generator divider plate (called primary divider plate in Application Table 3.1-1 and in the SER) within the Aging Management Review results. The license renewal function of concern for the divider plate is the pressure boundary of the steam generator shell itself. The divider plate is welded to the steam generator shell using nickel-based alloy welds. The pressure boundary of the steam generator could be impacted (1) by cracking of the nickel-based alloy weld connecting the divider plate to the shell or (2) by cracking of the nickel-based alloy divider plate itself. The primary divider plate is located in the lower head of each steam generator and separates the hot leg primary fluid from the cold leg primary fluid. Reactor coolant is located on both sides of the divider plate. Cracking of the divider plate and connecting welds is address by the Chemistry Control Program and by the Alloy 600 Aging Management Review. The Chemistry Control Program also manages loss of material for the divider plate. Section 3.0.3.2 of the SER provides an evaluation of the Chemistry Control Program that is an accurate assessment of the aging management of the primary divider plate and connecting welds. Likewise, Section 3.1.2.2.2 of the SER provides an evaluation of the Alloy 600 Aging Management Review that is an accurate assessment of the aging management of these items. Therefore, the primary divider plate is within the scope of license renewal and the applicable aging effects are managed by programs that are described and evaluated in the SER.

Changes to the in-house license renewal engineering specification tables to reflect the results of this review are being made in accordance with the Duke QA program.