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A Duke Energy Company

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November 21, 2002

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

Subject: Supplemental 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. Duke letter dated November 18, 2002 provided a commitment to provide a response to the final interim staff guidance (ISG) when issued.

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 eight remaining issues. Duke letters dated November 14, 2002 and November 18, 2002 provided responses to these issues.

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Subsequently, on November 18, 2002 the staff indicated a need for more information with respect to Open Item 3.6.1-1. In addition, the staff in the telephone call on November 19, 2002 requested further information concerning New Open Item 3.0.3.10.2-1 and the aging management of pressurizer surge and spray nozzle thermal sleeves. Supplemental information in response to all of three of these additional staff requests is provided in Attachment 1.

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 21st day of November 2002.

Mary P. Nelms

Notary Public

My Commission Expires:

JAN 22, 2006

xc: (w/ Attachment)

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Attachment 1

Supplemental Response to NRC letter dated November13, 2002

1. Open Item 3.6.1-1, visual inspection of neutron flux and high-range radiation monitoring instrumentation cables

Note: Duke responses to this item have been provided by letters dated October 2, 2002 and November 14, 2002. On November 18, 2002, a telephone call was held wherein the staff identified more information that would be required in order for the staff to complete its review. The following information supercedes the information provided by Duke letter dated November 14, 2002.

The following information is provided to supplement Duke's response to Open Item 3.6.1-1 provided by letters 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 the *License Renewal Program for High-Range Radiation and Neutron Flux Instrumentation Circuits* to specifically address SER Open Item 3.6.1-1.

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

LICENSE RENEWAL PROGRAM FOR HIGH-RANGE RADIATION AND NEUTRON FLUX INSTRUMENTATION CIRCUITS

Note: This program is 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 and high-range radiation instrumentation circuits will be maintained in accordance with the current licensing basis during the period of extended operation.

Scope – The scope includes the non-EQ cables used in neutron flux instrumentation circuits and high-range radiation 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 High-Range Radiation and 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 High-Range Radiation and Neutron Flux Instrumentation Circuits* provides sufficient indication of the need for corrective actions.

The surveillances found in Technical Specification Section 3.3.1 (Reactor Trip System Instrumentation) and 3.3.3 (Post Accident Monitoring Instrumentation) at both McGuire and Catawba are credited for this program. These are existing technical specification surveillances that are currently being performed at each station and become effective, for license renewal, at the time each of the renewed licenses is issued.

Monitoring & Trending – The methods for performing the *License Renewal Program for High-Range Radiation and Neutron Flux Instrumentation Circuits* are described in Sections 3.3.1 and 3.3.3 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.

Trending actions are not included as part of this program because the ability to trend test results is dependent on the specific type of test chosen. Although not a requirement, test results that are trendable provide additional information on the rate of degradation.

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 High-Range Radiation and 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 High-Range Radiation and Neutron Flux Instrumentation Circuits	NA	ITS 3.3.1 ITS 3.3.3

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

In follow-up to a telephone discussion held between Duke and the staff on November 19, 2002, the following additional information is provided concerning the *Small Bore Piping Examination.*

The *Small Bore Piping Examination* will be an activity within the *Inservice Inspection Plan* during the period of extended operation as most recently described in Duke letter dated November 14, 2002. In order to establish the sample of small bore piping locations to be volumetrically inspected, Duke will first determine the population of Duke Class A piping that is less than 4-inch NPS for the unit to be inspected. This population of piping will then be reviewed by experienced engineers to determine the more likely locations that could be impacted by the various damage mechanisms described in Duke letter dated November 14, 2002. The determination will involve a review of the physical plant design such as piping layout, geometry and operating temperatures as well as both plant and industry operating experience that could indicate more optimum inspection locations. The set of most likely locations selected will comprise the scope of the *Small Bore Piping Examination* and will be identified within the Inservice Inspection plan for each station.

3. Steam generator divider plates and pressurizer surge and spray nozzle thermal sleeves

In follow-up to a telephone discussion held between Duke and the staff on November 19, 2002, the following additional information is provided concerning the aging management of the nickel-based alloy welds associated with the thermal sleeves in the pressurizer surge and spray nozzles most recently discussed in Duke letter dated November 14, 2002. No additional information was requested by the staff relative to the steam generator divider plates during this telephone call.

PRESSURIZER SURGE AND SPRAY NOZZLE ASSEMBLY DESCRIPTION

As background, the pressurizer surge and spray nozzles consist of an assembly of parts. Each nozzle includes the manufactured nozzle itself which forms the Reactor Coolant System pressure boundary along with thermal sleeves welded inside the nozzle. The thermal sleeves serve to protect the nozzle from damage due to thermal cycling. The nozzles themselves are constructed of alloy steel and clad inside with stainless steel. The thermal sleeves are constructed of stainless steel and are welded to the nozzle by a nickel-based alloy weld.

AGING MANAGEMENT REVIEW RESULTS

In the Application, two entries were provided for this assembly. One entry covered the nozzles themselves (Table 3.1-1, page 3.1-9, line 2). The other entry covered the thermal sleeves and welds (Table 3.1-1, page 3.1-9, line 4). In order to be more clear about the aging management programs applicable to the thermal sleeves and welds, this latter entry has been divided into two entries in the table below. As can be noted in the table below, the aging effects associated with the thermal sleeves are managed by the *Chemistry Control Program.* The potential cracking of

the welds will be managed by a combination of the existing *Chemistry Control Program* and the new *Alloy 600 Aging Management Review.*

For the welds, the *Chemistry Control Program* manages aging through control of the environment to which they are exposed. Additionally, the *Alloy 600 Aging Management Review* will serve to manage aging of the welds by including them in the review process for all nickel-based alloy components and parts in the Reactor Coolant System, meaning that they could ultimately receive a detailed physical inspection should it be warranted.

The *Alloy 600 Aging Management Review* consists of four major steps. The first step is to identify all the nickel based alloy components and parts in the Reactor Coolant System. The second step is to rank these items based on their susceptibility to primary water stress corrosion cracking – the aging effect of concern. Engineering evaluations will be used to predict the most susceptible locations. This approach is supported by industry operating experience to date. The susceptibility ranking is then used in step three to assure that the nickel-based alloy locations are adequately inspected. These thermal sleeve welds are not routinely inspected as a part of the *Inservice Inspection Plan.* Therefore, should the susceptibility ranking indicate a need for physical inspection, a supplemental inspection for the period of extend operation will be developed as noted in description of the *Alloy 600 Aging Management Review* in Section B.3.1 of the Application.

Should such a supplemental inspection be required for one or both of these welds, Duke will include the requirement in Chapter 7 of the appropriate station's *Inservice Inspection Plan.* For both McGuire and Catawba, Chapter 7 contains the augmented inservice inspection plan for that station. These augmented plans capture inspections which are accomplished using techniques similar to those prescribed in ASME Section XI, but which are motivated by requirements beyond the Code such as Generic Letters, Bulletins and operating experience.

COMMITMENT TO SUBMIT RESULTS

During the telephone call on November 19, 2002, the staff requested that Duke commit to provide the results of the *Alloy 600 Aging Management Review* for the pressurizer surge and spray nozzle thermal sleeves attachment welds. Accordingly, the following commitment will be added to the summary description of the *Alloy 600 Aging Management Review* contained in Section 18.2.1 of each station's UFSAR Supplement:

> Following the completion of the *Alloy 600 Aging Management Review* on each station, Duke will submit to the NRC the results for the pressurizer surge and spray nozzle thermal sleeves attachment welds. Duke understands that the staff will review these results and may request additional information to gain an understanding of the results.

For McGuire, the results for the pressurizer surge and spray nozzle thermal sleeves attachment welds will be submitted to the NRC following issuance of renewed operating licenses for McGuire Nuclear Station and by June 12, 2021 (the end of the initial license of McGuire Unit 1).

For Catawba, the results for the pressurizer surge and spray nozzle thermal sleeves attachment welds will be submitted to the NRC 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).

SUPPLEMENTAL RESPONSE TO NEW OPEN ITEM 3.0.3.10.2-2

During the telephone call on November 19, 2002, the staff also requested that Duke supplement its previous response to New Open Item 3.0.3.10.2-2. Accordingly, the results provided in the below table entry supplement the response to New Open Item 3.0.3.10.2-2 provided previously in Duke letter dated October 28, 2002.

TABLE 3.1-1 REVISION

Table 3.1-1, page 3.1-9, row 4 of the Application is revised to read as follows:

Component Type	Component Function	Material	Environment	Aging Effect	Aging Management Programs and Activities
Pressurizer Surge and Spray Nozzle Thermal Sleeves	Note 1	Stainless Steel	Borated Water	Loss of Material Cracking	Chemistry Control Program
Pressurizer Surge and Spray Nozzle Thermal Sleeves Attachment Welds	Note 2	Nickel Based Alloy Weld	Borated Water	Cracking	Chemistry Control Program Alloy 600 Aging Management Review

Note 1: The pressurizer surge and spray nozzle thermal sleeves support the pressurizer surge and spray nozzles as described in the above pressurizer surge and spray nozzle assembly description.

Note 2: The pressurizer surge and spray nozzle thermal sleeves attachment welds could degrade the Reactor Coolant System pressure boundary if cracking were to occur.

4. Duke Identified Item

During the review of the SER, Duke identified the following error of omission from the Application that resulted in an incorrect statement in the SER. Duke had previously identified this error in comments it provided to the staff informally as described in Duke letter dated October 28, 2002. Duke has reviewed all of the comments previously provided informally and did not identify any others that should have been formally docketed.

On page 3-149 of the SER, Section 3.1.5.1, the statement concerning the material of the flow restrictors should be revised to state that the D5 steam generators of Catawba Unit 2 have nickel based alloy steam flow restrictors rather than stainless steel as in the other units. As these steam flow restrictors are all located on secondary side of the steam generator, the *Chemistry Control Program* is credited to manage cracking and loss of material.

The following six-column table entry replaces the entry on Table 3.1-1, page 3.1-25, row 1 of the Application:

Component Type	Component Function	Material	Environment	Aging Effect	Aging Management Programs and Activities
Flow Restrictor (McGuire 1&2 and Catawba Unit 1)	Throttle (Note 1)	Stainless Steel	Treated Water	Loss of Material Cracking	Chemistry Control Program
Flow Restrictor (Catawba Unit 2)	Throttle (Note 1)	Nickel Based Alloy	Treated Water	Loss of Material Cracking	Chemistry Control Program

Note 1: The flow restrictor does not have a pressure boundary function because it is installed completely within the steam generator and is not attached to the secondary side pressure boundary. Further description of the installation of the flow restrictors is provided in Catawba UFSAR Section 5.4.4. and in McGuire UFSAR Section 5.5.4.