January 24, 2002

Mr. M. S. Tuckman
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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE MCGUIRE NUCLEAR STATION, UNITS 1 AND 2, AND CATAWBA NUCLEAR STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION (LRA)

Dear Mr. Tuckman:

By letter dated June 13, 2001, Duke Energy Corporation (Duke) submitted for Nuclear Regulatory Commission (NRC) review an application, pursuant to 10 CFR Part 54, to renew the operating licenses for the McGuire Nuclear Station, Units 1 and 2, and Catawba Nuclear Station, Units 1 and 2. The NRC staff is reviewing the information contained in this license renewal application and has identified, in the enclosure, areas where additional information is needed to complete its review. Specifically, the enclosed request for additional information (RAI) is from the following section(s) of the LRA:

Section 3.3, Aging Management of Auxiliary Systems

Please provide a schedule by letter, or electronic mail for the submittal of your response within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with Duke prior to the submittal of the response to provide clarification of the staff's request for additional information.

Sincerely,

/***RA***/

Rani L. Franovich, Project Manager
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

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

Enclosures: As stated

cc w/encl: See next page

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Request for Additional Information
McGuire Nuclear Station, Units 1 and 2, and
Catawba Nuclear Station, Units 1 and 2

3.3 Auxiliary Systems (General)

3.3-1 Numerous ventilation systems included in Section 3.3 do not list elastomer components associated with the ventilation system. Normally ventilation systems contain elastomer materials in duct seals, flexible collars between ducts and fans, rubber boots, etc. For some plant designs, elastomer components are used as vibration isolators to prevent transmission of vibration and dynamic loading to the rest of the system. The aging effects of concern for those elastomer components are hardening and loss of material. Please indicate where in the LRA the aging effects of hardening and loss of material to elastomer components is addressed, or provide a justification for excluding these components from an AMR.

3.3-2 Clarify whether or not any of the auxiliary systems discussed in Section 3.3 of the LRA are within the category of seismic II over I systems, structures or components (SSCs) as described in position C.2 of Regulatory Guide 1.29. Also, clarify how the aging management programs provided in the AMR results tables of LRA Section 3.3 apply to those seismic II over I piping system to ensure that plausible aging effects associated with those piping systems, if any, will be appropriately managed. The applicant's discussion should include both piping segments and their associated pipe supports.

3.3-3 According to page 3.3-69 and 3.3-70 Table 3.3-7, certain reactor coolant (NC) pump motor upper and lower bearing cooler components have a treated water internal environment with an oil external environment. Per Tables 3.3-9 (on pages 3.3-91 to 3.3-93) and 3.3-10 (on pages 3.3-103 to 3.3-104), certain Catawba and McGuire control room area chiller components (oil cooler tubes, tube sheets and shells) are subject to an internal/external environment of treated water/oil. According to Table 3.3-16, the Catawba D/G governor lube oil coolers (tubes) are subject to an internal/external environment of treated water/oil. According to Tables 3.3-16, 3.3-20 and 3.3-21, the D/G engine lube oil coolers (tubes, tube sheets and/or shells) are listed as subject to an internal/external environment of treated water/oil. According to these referenced tables, no aging effect is identified for components exposed to the oil external environment.

Oil systems subject to water contamination are typically subject to the aging effect of loss of material. Identify where in the LRA is the AMR for the aging effect of loss of material from general, pitting, crevice, and microbiologically influenced corrosion to carbon steel or other susceptible materials exposed to oil that is potentially contaminated with leaking water, or provide a justification for excluding this aging effect from the AMR results tables.

3.3-4 Per Table 3.3-8, the Catawba and McGuire carbon steel condenser circulating water system components are subject to an internal environment of raw water. Confirm that strainers do not perform a component function that may be degraded by the aging effect of fouling, neither of which is identified in Table 3.3-8 for strainers in a raw water environment. Similarly, confirm that neither orifices nor strainers, identified in Table 3.3-36, Aging Management Review Results - Nuclear Service Water System (McGuire Nuclear Station), and Table 3.3-37, Aging Management Review Results - Nuclear Service Water System (Catawba Nuclear Station), perform a component function that may be degraded by the aging effect of fouling from exposure to raw water.

3.3-5 All of the components of Table 3.3-14, “Aging Management Review for Diesel Generator Air Intake and Exhaust System,” are subject to an interior environment of ventilation, which is defined as ambient air that is conditioned to maintain a suitable environment for equipment operation and personnel occupancy. CN-1609-5.0, CN-2609-5.0, MCFD-1609-5.00 and MCFD-2609-5.00, “Flow Diagrams for Diesel Engine Air Intake and Exhaust System,” do not include equipment to condition the intake air or the exhaust air for the diesels to provide a ventilation internal environment. Typically these components are subject to a sheltered internal environment.

Similarly, Table 3.3-44, "Aging Management Review Results - Standby Shutdown Diesel Generator, Exhaust Sub-System,” components are subject to an internal environment of ventilation, which is defined as ambient air that is conditioned to maintain a suitable environment for equipment operation and personnel occupancy. CN-1560-1.0, CN-1560.20, MCFD-1560-1.00, MCFD-1560.20, and MCFD-1614-4, "Flow Diagrams for Standby Shutdown Diesel System,” do not include equipment to condition the intake air or the exhaust air for the diesels to provide a ventilation internal environment. Typically, these components are subject to a sheltered internal environment.

Provide justification for classifying the internal environment for these components as "ventilation.”

3.3-6 Table 3.3-44, "Aging Management Review Results - Standby Shutdown Diesel Generator," identifies that the cooling water and jacket water engine radiator heat exchanger has a function of HT that is managed by the AMP, "Chemistry Control Program." Similarly, Table 3.3-47, "Aging Management Review Results - Waste Gas System," identifies the hydrogen recombiner heat exchanger tubes as having a function of heat transfer. Heat transfer monitoring is not identified as a capability of the chemistry control program, as defined in Appendix B, Section B.3.6. Explain how the chemistry control program monitors the heat transfer function.

3.3.2 Boron Recycle System

3.3.2-1 Table 3.3-2 has a "Note (3),” which implies that portions of the boron recycle system may be subject to alternate wetting and drying; however, this note is not used anywhere in the table. Clarify if Note (3) is applicable to Table 3.3-2. If so, explain how this environment and associated aging effects are managed in the LRA.

3.3.2-2 Table 3.3-2 Note (1) contains a definition of a component function "HT;” however, there are no components in Table 3.3-2 listed as performing this function. Identify components in the boron recycle system that provide the function "HT,” or remove the function from Note (1).

3.3.9 Control Area Chilled Water System

3.3.9-1 Tables 3.3-9 and 3.3-10 indicate that the “Heat Exchanger Preventative Maintenance Activities - Control Area Chilled Water Program” is credited for managing the aging effects of fouling and loss of material for copper-nickel alloy materials. The Heat Exchanger Preventative Maintenance Activities - Control Area Chilled Water Program, as defined in Appendix B of the applicant's LRA, manages for the loss of material or fouling for admiralty brass, carbon steel, and stainless steel materials; but Appendix B's description does not include the material copper-nickel within the scope of the Heat Exchanger Preventative Maintenance Activities - Control Area Chilled Water Program. Explain how the Heat Exchanger Preventative Maintenance Activities - Control Area Chilled Water Program manages for the loss of material or fouling for copper-nickel alloy materials, or provide an AMP for managing these aging effects for this material.

3.3.14 Diesel Generator Air Intake and Exhaust System

3.3.14-1 Table 3.3-14, “Aging Management Review for Diesel Generator Air Intake and Exhaust System,” does not list an internal environment, which has the potential for exposure of components to hot diesel engine exhaust gasses containing moisture and particulates. Identify where in the LRA is the AMR for steel components exposed to a hot diesel exhaust environment that have the potential for experiencing loss of material from general, pitting and crevice corrosion, or provide a justification for excluding this environment and aging effects from Table 3.3-14 and an AMR.

3.3.14-2 Table 3.5-2, “Aging Management Review Results for Other Structures,” indicates rubber materials in a sheltered environment are subject to the aging effects of cracking and change in material properties. Please explain why the rubber and composite rubber materials of Table 3.3-14, that are also in a sheltered environment, are not subject to the aging effects of cracking and change in material properties.

3.3.15 Diesel Generator Cooling Water System

3.3.15-1 Table 3.3-15, “Aging Management Review Results for Diesel Generator Cooling Water System (McGuire Nuclear Station),” states that the aging effect loss of material in a raw water environment to the diesel generator cooling water heat exchangers is managed by the "Galvanic Susceptibility Inspection" aging management program (AMP). The scope of this program, as defined in Appendix B, Section B.3.16, does not include the diesel generator cooling water heat exchangers. Does the AMP, “Galvanic Susceptibility Inspection,” manage the aging effects to the diesel generator cooling water heat exchangers? If not, identify an appropriate AMP.

3.3.20 Diesel Generator Lube Oil System

3.3.20-1 Tables 3.3-20 and 3.3-21, “Aging Management Review Results for Diesel Generator Lube Oil System (McGuire Nuclear Station),” states that the aging effect of cracking and loss of material in a lube oil environment is managed by the AMP, "Chemistry Control Program." The scope of this program as defined in Appendix B, Section B.3.6, only refers to fuel oil environments and not lube oil.

Does the AMP, “Chemistry Control Program,” manage the aging effects in lube oil environments? If not, identify an appropriate AMP.

3.3.22 Diesel Generator Room Sump Pump System

3.3-22-1 Table 3.3-22, “Aging Management Review Results for the Diesel Generator Room Sump Pump System,” states that orifices provide the function "PB.” Typically, orifices also provide the function listed in Note 1 as "TH.” Explain why orifices in the diesel generator room sump pump system do not provide the function “TH,” or correct the component functions for orifices listed in Table 3.3-22.

3.3-22-2 Table 3.3-22, “Aging Management Review Results for the Diesel Generator Room Sump Pump System,” has a “Note (3), which implies that portions of the diesel generator room sump pump system may be subject to alternate wetting and drying; however, this note is not used in the table. Clarify if note (3) is applicable to Table 3.3-22. If so, explain how this environment and associated aging effects are managed in the LRA.

3.3.24 Diesel Generator Starting Air System

3.3.24-1 Table 3.3-24, “Aging Management Review Results for the Diesel Generator Starting Air System - Catawba,” identifies only a PB function for the D/G engine starting air aftercooler tubes. Explain why the heat transfer (HT) function, which ensures the system and/or component operating temperatures are maintained, is not considered in the AMR, or correct the component functions for D/G engine starting air aftercooler tubes listed in Table 3.3-24.

3.3.24-2 Table 3.3-24, “Aging Management Review Results for the Diesel Generator Starting Air System - Catawba,” identifies that the D/G engine starting air aftercooler tubes are stainless steel and subject to loss of material from exposure to a raw water internal environment. Typically, the aging effect, fouling, is also associated with raw water environments. Identify where in the LRA is the AMR for the aging effects fouling to these components, or provide a justification for excluding this aging effect from Table 3.3-24 and an AMR.

3.3.24-3 Table 3.3-24, “Aging Management Review Results for the Diesel Generator Starting Air System - Catawba,” identifies the Heat Exchanger Preventive Maintenance Program for Diesel Generator Starting Air as the aging management program to manage the aging effects of loss of material in a raw water environment for the D/G engine starting air aftercooler tubes and channel head, but not the tube sheet which is Monel 400 material. Section 18.2.12.5 of the UFSAR Supplement, “Diesel Generating Starting Air,” credits this program for managing aging of carbon steel, stainless steel and Monel materials. Does the AMP, “Heat Exchanger Preventive Maintenance Program for Diesel Generator Starting Air,” manage the aging effect loss of Monel 400 material to the D/G engine starting air aftercooler tube sheet exposed to a raw water environment? If not, please explain the intent of statements made in Section 18.2.12.5 of the UFSAR Supplement, “Diesel Generating Starting Air,” which indicates that this program is credited for managing aging of carbon steel, stainless steel and Monel materials.

3.3.24-4 Table 3.3-24, “Aging Management Review Results for the Diesel Generator Starting Air System - Catawba,” identifies several components where carbon steel is exposed to an air (moist) environment with no aging effects or aging management program required. Loss of material from general, pitting, and crevice corrosion is an applicable aging effect for carbon steel materials in air environments containing moisture. General corrosion results from chemical or electrochemical reaction between the material and the air environment when both oxygen and moisture are present. Identify where in the LRA is the AMR for these aging effects, or provide a justification for excluding this aging effect from Table 3.3-24 and an AMR.

3.3.24-5 Table 3.3-24, “Aging Management Review Results for the Diesel Generator Starting Air System - Catawba,” identifies environments air (dry) and air (moist) as potential environments for the diesel generator starting air system. Descriptions for these environments are not provided in Section 3.3.1 “Aging Management Review Results Tables,” of the LRA. Identify where in the LRA these environments are defined, or provide additional information in Section 3.3.1 of the LRA.

3.3.26 Fire Protection System

3.3.26-1 Table 3.3-26, “Aging Management Review Results for the Fire Protection System - McGuire,” indicate that sprinklers have a spray flow function. The last sprinkler component in Table 3.3-26 (page 3.3-164) is missing the SP designation. Correct the table, or justify why the spray flow function is not applicable to these sprinklers.

3.3.26-2 The fire protection program is credited in the LRA with managing the aging effect fouling in raw water environments for carbon steel, brass and bronze valves. In Table 3.3-26, “Aging Management Review Results for the Fire Protection System - McGuire,” there are carbon steel, brass and bronze valve body components identified in the exterior fire protection section that do not include fouling as an aging effect. Identify where in the LRA is the AMR for the aging effects fouling to these components, or provide a justification for excluding this aging effect from Table 3.3-26 and an AMR.

3.3-26-3 Table 3.3-27, “Aging Management Review Results for the Fire Protection System - Catawba,” indicates a Note (4) is applicable in several locations in the table where components experience the aging effect fouling. There is no definition for Note (4) at the end of Table 3.3-27. Clarify if note (4) is applicable to Table 3.3-27. If so, explain how this “alters” the established definition for the aging effect fouling.

3.3.32 Liquid Waste System

3.3.32-1 Table 3.3-32, "Aging Management Review Results - Liquid Waste System,” identifies stainless steel piping and loop seals at the McGuire plant that have the aging effects of loss of material and cracking due to exposure to wet/dry conditions. Identify where in the LRA the AMR for the wet/dry aging effect is and explain how it is managed by the chemistry control program, or provide a

justification for excluding this environment/aging effect from Table 3.3-32 and an AMR.

3.3.32-2 Table 3.3-32, "Aging Management Review Results - Liquid Waste System," identifies the aging effects of loss of material and cracking of stainless steel due to exposure to wet/dry conditions. Clarify if this aging effect is also applicable to the sump pump components identified in Table 3.3-32.

3.3.36 Nuclear Service Water System (McGuire Nuclear Station)

3.3.36-1 Per Table 3.3-36, "Aging Management Review Results - Nuclear Service Water System (McGuire Nuclear Station)," centrifugal and reciprocating charging pumps and safety injection pump oil coolers (tubes and tube sheets) have a raw water internal/external environment with an oil internal/external environment. No aging effect is identified for these environments. Oil systems subject to water contamination are typically subject to the aging effect loss of material. Identify where in the LRA is the AMR for the aging effect of loss of material from general, pitting, crevice, and microbiologically influenced corrosion to stainless steel and copper-nickel materials for oil coolers potentially contaminated with leaking water, or provide a justification for excluding this aging effect from Table 3.3-36 and an AMR.

3.3.36-2 Per Table 3.3-36, "Aging Management Review Results - Nuclear Service Water System (McGuire Nuclear Station)," the copper-nickel centrifugal and reciprocating charging pump and safety injection pump bearing oil cooler and centrifugal charging pump speed reducer oil cooler tubes are subject to an internal environment of raw water. Identify where in the LRA is the AMR for the aging effect of selective leaching for copper-nickel components in a raw water environment, or provide a justification for excluding this aging effect from Table 3.3-36 and an AMR.

3.3.36-3 Per Table 3.3-36, "Aging Management Review Results - Nuclear Service Water System (McGuire Nuclear Station)," the copper-nickel reciprocating charging pump bearing oil cooler and fluid drive oil cooler tubes are subject to an internal environment of raw water. Identify where in the LRA the AMR for the aging effect of fouling for the copper-nickel tubes in a raw water environment is, or provide a justification for excluding this aging effect from Table 3.3-36 and an AMR.

3.3.36-4 Per Table 3.3-36, "Aging Management Review Results - Nuclear Service Water System (McGuire Nuclear Station)," the cast iron reciprocating charging pump fluid drive oil cooler channel covers are subject to an internal environment of raw water. Identify where in the LRA the AMR for the aging effect of selective leaching for cast iron components in a raw water environment is, or provide a justification for excluding this aging effect from Table 3.3-36 and an AMR.

3.3.37 Nuclear Service Water System (Catawba Nuclear Station)

3.3.37-1 Loss of material from pitting corrosion is an applicable aging effect for admiralty brass, brass, bronze, carbon steel, cast iron, copper, 90-10 copper-nickel, ductile cast iron, and stainless steel materials in a raw water environment. Pitting corrosion can be inhibited by maintaining an adequate flow rate, which prevents

impurities from adhering to the material surface. The more susceptible locations for pitting corrosion to occur in materials in a raw water environment are locations of low or stagnant flow. Identify where in the LRA the AMR for the aging effect of pitting corrosion is in low flow or stagnant conditions, or provide a justification for excluding this aging effect from Table 3.3-36 and an AMR.

3.3.40 Reactor Coolant Pump Motor Oil Collection Subsystem

3.3.40-1 Per Table 3.3-40, "Aging Management Review Results - Reactor Coolant Pump Motor Oil Collection Sub-System," flexible hoses are of the material type of stainless steel. Per CN-1553-1.3 and CN2553.1-3, "Flow Diagram of Reactor Coolant System (NC)," line listings for the flexible hoses between the upper bearing oil enclosures and the reactor coolant pump motor drain tank are carbon steel. Identify where in the LRA is the AMR for the reactor coolant pump motor oil collection sub-system carbon steel flexible hoses, or provide a justification for excluding these components from Table 3.3-40 and an AMR.

3.3.40-2 Per Table 3.3-40, "Aging Management Review Results - Reactor Coolant Pump Motor Oil Collection Sub-System," all components are subject to an internal environment of ventilation and an external environment of reactor building or ventilation. Explain why these components of the reactor coolant pump motor oil collection sub-system are not subject to an internal and/or external environment of oil.

3.3.41 Reactor Coolant System (Non-Class1 Components)

3.3.41-1 Per Table 3.3-41, "Aging Management Review Results - Reactor Coolant System (Non-Class1 Components)," Note 3, orifices may be subjected to a borated water or steam environment. Identify where in the LRA is the AMR for the reactor coolant system orifices in a borated water or steam environment, or provide a justification for excluding these environments from Table 3.3-41 and an AMR.

3.3.44 Standby Shutdown Diesel System

3.3.44-1 Table 3.3-44, "Aging Management Review Results - Standby Shutdown Diesel Generator, Exhaust Sub-System," does not list an internal environment, which has the potential for exposure of components to hot diesel engine exhaust gasses containing moisture and particulates. Identify where in the LRA is the AMR for steel components exposed to a hot diesel exhaust environment that have the potential for experiencing loss of material from general, pitting, and crevice corrosion, or provide a justification for excluding this environment and aging effects from Table 3.3-44 and an AMR.

3.3.44-2 Table 3.3-44, "Aging Management Review Results - Standby Shutdown Diesel Generator, Fuel Oil Sub-System," identifies that the shutdown diesel generator fuel oil valve bodies, fuel oil (duplex filters) (CNS only) (p 3.3-254) has a “PB” component function. This component also provides filtration of process fluids so that downstream equipment and/or environments are protected. Explain why this component does not have a "FI" component function as defined in the notes

section for other AMR tables, or correct the component functions for filters listed in Table 3.3-44.

3.3.47 Waste Gas System

3.3.47-1 Table 3.3-47, "Aging Management Review Results - Waste Gas System," identifies an internal environment described as gas. The definition for air-gas environments identified at the beginning of the tables does not adequately describe the gas environment found in the waste gas system. The waste gas system contains mixed radioactive fission gases (e.g., Kr, Xe, I, Cs) in addition to those listed in the air-gas definition. Clarify if the air-gas environment described at the beginning of the tables includes fission gases or add a new definition for the gas environment found in the waste gas system.

3.3.47-2 Table 3.3-47, "Aging Management Review Results - Waste Gas System," identifies that for the Catawba plant, the orifices for waste gas compressor seal and make-up have a pressure boundary "PB" component function. Typically, orifices also provide the function listed as "TH" (provide throttling so that sufficient flow and/or sufficient pressure is delivered, provide backpressure, provide pressure reduction, or provide differential pressure). Explain why orifices in the Catawba waste gas system do not provide the function "TH," or correct the component functions for orifices listed in Table 3.3-47.

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