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AUTH.NAME AUTHOR AFFILIATION
MCCOLLUM,W.R. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION
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SUBJECT: Provides responses to RAIs re plant license renewal project for OLRP-1001 license renewal technical info topical rept. Draft program description provided in Attachment 3 provided as example to begin discussions.

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Duke Power
A Duke Energy Company

Duke Power Company
A Duke Energy Company
Oconee Nuclear Site
P.O. Box 1439
Seneca, SC 29679

(864) 885-3107 OFFICE
(864) 885-3564 FAX

W. R. McCollum, Jr.
Vice President

January 14, 1998

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

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
(TAC Nos. M99121, M99122, M99123, M99141)

By letter dated March 12, 1997, Duke Energy (formerly Duke Power Company) submitted for review, "Oconee Nuclear Station, Units 1, 2, & 3, License Renewal - Technical Information Topical Report," OLRP-1001, Revision 1, February 1997. Duke Energy requested that the staff review the section pertaining to the Oconee Reactor Buildings. By letter dated November 14, 1997, the NRC staff identified areas where additional information is needed to complete its review and requested that Duke Energy inform the staff of its plans and schedule for responding to the requests for additional information (RAI). By letter dated December 2, 1997, Duke Energy committed to provide responses to the staff RAIs by January 30, 1998. Accordingly, Attachment 1 provides our responses to these staff RAIs. Attachment 2 provides a List of Commitments that have been made in association with the review of the Oconee Reactor Building (Containment) submittal.

In addition to providing these responses, we are providing in Attachment 3 a draft program description that would be included in the UFSAR Supplement for license renewal in the event that an application for a renewed operating license were to be submitted. As background, the program descriptions that are provided in OLRP-1001, and the responses to the RAIs, form the basis for the staff decisions and the basis for the program descriptions that will be contained in the Oconee UFSAR Supplement and/or Technical Specifications. The program descriptions that will be contained in the UFSAR Supplement and Technical Specifications will define the aging management programs for license renewal. Duke believes that it is appropriate to begin discussions on the topic of program descriptions in the UFSAR Supplement and Technical Specifications, as they relate to commitments for license renewal. The draft program description provided in Attachment 3 is provided as an example to begin these discussions.

We will be prepared to discuss the responses to the staff RAIs, the draft program description for the UFSAR Supplement as they relate to commitments for license renewal with the staff in February 1998. If there are any questions regarding this response, please contact Bob Gill at 704-382-3339.

Very Truly Yours,

B W Pulk for

W. R. McCollum Jr., Site Vice President
Oconee Nuclear Station

xc: L. A. Reyes
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323-0199

C. I. Grimes
Director, License Renewal Project Directorate
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

M. A. Scott
Senior NRC Resident Inspector
Oconee Nuclear Station

D. E. La Barge
Project Manager
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

S. T. Hoffman
Project Manager
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Max Batavia
Bureau of Radiological Health
2600 Bull St.
Columbia, SC 29201

xc: GLRP Team
Bill Mackay - Entergy Operations, Inc.
Dave Masiero - GPU Nuclear Corporation
Dave Firth - Framatome Technologies, Inc., Lynchburg, VA (OF57)
Mark Rinckel - Framatome Technologies, Inc., Lynchburg, VA (OF51)
Bob Borsum - Framatome Technologies, Inc., Rockville, MD

Industry Contacts
John Carey - EPRI
Barth Doroshuk - BGE
Don Eggett - Commonwealth Edison
Mike Henig - VEPCO
Tricia Heroux
Terry Pickens - NSP
Chuck Pierce - Southern Nuclear
Fred Polaski - PECO
Doug Walters - NEI

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
2.3-1	For components, including weldments, which are identified as outside the scope of the evaluation boundary for the reactor building, please clarify where those components will be addressed in the Oconee Report OLRP-1001.	Chapter 2 of OLRP-1001 will contain the descriptions of all Oconee structures and components that have been determined to be subject to aging management review. Section 2.3 will describe the Reactor Building (Containment); Section 2.4 will describe all components associated with the Reactor Coolant System, including the structural supports; Section 2.5 will describe all mechanical system components (i.e., piping, valve bodies, pump casings, etc.); Section 2.6 will describe all electrical components; and Section 2.7 will describe all structural components including Reactor Building interior structures as well piping supports. Chapter 3 of OLRP-1001 will describe the applicable aging effects for the structures and components identified in Chapter 2. Chapter 4 of OLRP-1001 will describe the programs credited and provide the	Components outside the evaluation boundary for the Reactor Building (Containment) will be addressed in applicable sections of Revision 2 of OLRP-1001.

[1] Revision 2 of OLRP-1001 will contain substantial additional information that has not been provided previously. As such, this column contains only a brief statement rather than the complete text of what will be included in Revision 2 of OLRP-1001.

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		required demonstrations. Chapter 5 of OLRP-1001 will describe time-limited aging analyses and exemptions.	
2.3-2	Section 2.2.III.B of the working draft standard review plan for license renewal (SRP-LR) dated September 1997, discusses that plant items that are intended to be used during normal operation and maintenance of a system or structure and are not replaced based on calendar frequency or a predetermined qualified life. These items include sealing materials, gaskets, o-rings, and packing. The SRP-LR discusses that the applicant may either (1) identify these items as subject to aging management review, or (2) identify that degradation of these items may cause aging effects on the structure and component in which these items are installed and manage those aging effects accordingly. However, a plant	Tendon grease, seals, and joint sealants are not considered by Duke to be components that are subject to aging management review. Grease is considered to be a design feature that will be inspected as part of the Oconee tendon surveillance program that is implemented to meet the requirements of Subsection IWL of ASME Section XI. The requirements of Examination Category L-B, *Unbonded Post-Tensioning System,* apply. Grease is a design feature that is not subject to aging management review because it is periodically tested and replaced as necessary. Seals and gaskets are considered by Duke to be design features that will be inspected as part of the Oconee Containment surveillance program that is implemented to meet the requirements of 10 CFR 50 Appendix J and Oconee Technical	No changes to OLRP-1001 are required.

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
	item that specifically performs an intended function necessary for meeting 10 CFR 54.4 is to be identified as subject to an aging management review for renewal. Please discuss the treatment of items, such as tendon grease, seals, and joint sealants, for Oconee.	Specifications (ITS 3.6.2). Pressure testing is performed and if the specified test acceptance criteria are not met, then the seals and gaskets are replaced. These design features are thus not subject to aging management review for license renewal because they are replaced based on results of performance testing. Moisture barriers are considered by Duke to be design features that will be inspected as part of the Oconee Containment surveillance program that is implemented to meet the requirements of Subsection IWE of ASME Section XI. The requirements of Examination Category E-D, *Seals, Gaskets, and Moisture Barriers,* apply. Corrective actions, which are taken in the event acceptance criteria are not met, include replacement or refurbishment. Therefore, moisture barriers are not subject to aging management review.	
2.3-3	Section 2.3.1.3 of the report states,	The Oconee Reactor Buildings are	No changes to OLRP-1001 are required.

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
	"the lower tendon access gallery does not support the intended functions of the Containment and is therefore not within the scope of the Rule." Please provide additional information regarding the seismic classification of the gallery and, if not seismic Class I, the effects of gallery degradation on the integrity of the reactor building.	founded on bedrock. The tendon access gallery is not a plant component or structure, but a place provided simply for access to the lower ends of the vertical tendons, is not seismic Class 1, provides no structural support to the Reactor Building, and is not within the scope of license renewal. Therefore, degradation of the gallery concrete has no impact on the integrity of the Reactor Building.	
2.3-4	Please provide a discussion regarding "miscellaneous attachments to the liner" as stated in Section 2.3.2.2 of the report. Also provide a figure showing some typical details and the "evaluation boundary."	Miscellaneous attachments to the liner include pipe supports, cable tray supports, HVAC supports, and electrical component enclosures. The evaluation boundary for the Oconee Containment review excludes welds between the miscellaneous attachment and the liner. This boundary is consistent with the inspection requirements contained in ASME Section XI Examination Category E-A, *Containment Surfaces,* (Footnote 5) of Subsection IWE. Please see Figure 1 at the end of Attachment 1.	No changes to OLRP-1001 are required.
2.3-5	Please discuss why Section 2.3.2.5	The Reactor Building (Containment)	The intended functions of the Low

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
	of the report does not indicate that the sump piping has an intended function to maintain the leak-tight boundary of the containment.	evaluation boundary is shown on Figure 2.3-7 of OLRP-1001 and is at the weld at the intersection of the liner to the external surface of the piping and excludes the piping. The sump piping is considered to be part of the Low Pressure Injection system evaluation boundary because it is a mechanical system. The intended functions of the Low Pressure Injection system will be addressed in Section 2.5 of OLRP-1001.	Pressure Injection system will be identified and addressed in Section 2.5 of Revision 2 of OLRP-1001.
2.3-6	Please clarify the evaluation boundary for the electrical penetrations discussed in Section 2.3.2.6 of the report. Does it include all elements subject to containment internal pressure? If not, please justify any exclusion.	Elements subject to Containment internal pressure are considered to be part of the essentially leaktight barrier of Containment. The evaluation boundary of the electrical penetrations discussed in Section 2.3.2.6 includes all components of the electrical penetrations that are part of the essentially leaktight barrier of Containment. The non-metallic portions of the electrical penetrations (both inside and outside of Containment) are also considered to be within the Oconee Environmental Qualification program. Because all electrical penetrations are	Electrical penetrations will be addressed in Section 2.6 of Revision 2 of OLRP-1001. Time-limited aging analyses will be addressed in Chapter 5 of OLRP-1001.

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
		within the scope of the Environmental Qualification Program, they are considered to be time-limited aging analyses.	
2.3-7	Section 2.3.2.5 of the report indicates that there are no expansion bellows used on mechanical penetrations. Please confirm that bellows are not used on any other type of Oconee containment penetration.	Bellows are not used on any type of Oconee Containment penetration.	No changes to OLRP-1001 required.
3.3-1	Section 3.3.1.1.2 of the report concludes that there are no applicable aging effects for containment concrete components. The proposed justification is largely based on concrete construction meeting design codes and standards. The report indicated that NUREG-1522 and NUREG/CR-6424 were reviewed. However, NUREG-1522, Appendix A, documented containment concrete degradation in plants constructed to similar	(1) Section 3.3.II.B of the SRP-LR contains what Duke considers to be 'potential' rather than 'applicable' aging effects for PWR Containments. Of the eleven 'potential' aging effects listed, items numbered 1, 2, 4, 6, and 7 apply to concrete components. The remaining items apply to steel components and the tendons. Items 1, 2, 4, 6, and 7 discuss mechanisms which were considered by Duke to be aging mechanisms which could lead to cracking. Cracking of Containment concrete is discussed in Section	No changes to OLRP-1001 required.

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
	codes and standards. In addition, NUREG/CR-6424 states, "The performance of reinforced concrete structures in Nuclear Power Plants has been good. However, as these structures age, incidences of degradation due to environmental stressor effects are likely to increase to potentially threaten their durability." Further, 10 CFR 50.55a requires concrete containments be inspected according to Subsections IWE and IWL of the ASME Section XI Code. Section 3.3.II.B of the SRP-LR contains information on applicable aging effects for concrete containment components. Thus, the staff disagrees that there are no applicable aging effects on containment concrete components. The applicant should revise the assessment of applicable aging effects for Oconee concrete	3.3.1.1.1.2 of OLRP-1001 and has been determined not to be applicable to Oconee. Items 2 and 4 contain examples of mechanisms which could result in loss of material which are assessed in Section 3.3.1.1.1.1 of OLRP-1001. Loss of material of concrete has been determined to not be applicable to Oconee. Items 4 and 6 contain 'potential' aging mechanisms which could result in a change of material properties and are assessed in Section 3.3.1.1.1.3 of OLRP-1001. A change of material properties of concrete has been determined to not be applicable to Oconee. Thus, the 'potential' aging effects listed in Section 3.3.II.B of the SRP-LR are not considered to be 'applicable' aging effects at Oconee. (2) Duke recommends that the working draft of the SRP-LR be revised. The aging mechanisms listed in Section 3.3.II.B should be revised to list potential aging effects (e.g., cracking,	

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	components and propose aging management for the applicable aging effects.	loss of material, change of material properties, loss of prestress) with appropriate mechanisms listed under each effect. Applicable aging effects should be determined on a plant specific basis after a consideration of plant specific technical information and operating experience. A conforming change to Table 3.3-3 should also be made to reflect the new list of potential aging effects contained in Section 3.3.II.B. (3) In order to provide additional assurance that the concrete components of Containment are maintained through the period of extended operation, Duke will implement the Examination Category L-A, *Concrete,* inspection requirements of Subsection IWL of ASME Section XI. IWL examinations will be sufficient to detect surface indications of potential concrete degradation.	
3.3-2	Discuss any containment steel	Containment carbon steel components are	No changes to OLRP-1001 are required.

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	components that are not protected by coatings or encased in concrete. Describe how corrosion will being managed for those components?	either encased in concrete or coated in accordance with specifications contained in the Oconee Coatings Program. The Oconee Coatings Program is used to preclude corrosion of steel components. Inspections of the steel components will be conducted in accordance with the requirements of Subsection IWE, Examination Category E-A, *Containment Surfaces*. Repairs to areas where the coating is damaged will be made in accordance with the Oconee Coatings Program. Some areas of the Containment liner plate behind existing welded attachments are not coated because the areas cannot be restored following attachment of the welded item to the liner plate. In many cases, non-seal-welded attachments are protected by installation of sealant materials. However, not all of attachments are fully sealed around the peripheries. Degradation of these areas is possible. However, IWE visual	

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		examinations would detect evidence of degradation such as corrosion by detection of discoloration emanating from behind these non-sealed attachments.	
3.3-3	The report indicates that Subsections IWE and IWL of the ASME Section XI Code are necessary for managing aging for renewal. Please specify the code "examination categories" for all of the referenced ASME Section XI inspections relied on for aging management.	The following Examination Categories of Subsection IWE will be implemented for aging management of Oconee Containment steel surfaces during the period of extended operation: Examination Categories E-A *Containment Surfaces*, E-C *Containment Surfaces Requiring Augmented Examination*, E-D *Seals, Gaskets, and Moisture Barriers*, E-G *Pressure Retaining Bolting*, and E-P *All Pressure retaining Components*. Accessible surfaces of welds within the scope of Examination Categories E-B *Pressure Retaining Welds* and E-F *Pressure Retaining Dissimilar Metal Welds* will be examined within the scope of the Examination Category E-A examination. The following Examination Categories of Subsection IWL will be implemented for	The description of the Oconee Containment Inservice Inspection Program contained in OLRP-1001 will be revised to include the following: The following Examination Categories of Subsection IWE will be implemented for aging management of Oconee Containment steel surfaces during the period of extended operation: Examination Categories E-A *Containment Surfaces*, E-C *Containment Surfaces Requiring Augmented Examination*, E-D *Seals, Gaskets, and Moisture Barriers*, E-G *Pressure Retaining Bolting*, and E-P *All Pressure retaining Components*. Welds within the scope of Examination Categories E-B *Pressure Retaining Welds* and E-F *Pressure Retaining Dissimilar Metal Welds* will be examined within the scope of the Examination Category E-A

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		aging management of Oconee Containment concrete surfaces during the period of extended operation: Examination Categories L-A *Concrete* and L-B *Unbonded Post-Tensioning System.*	examination. The following Examination Categories of Subsection IWL will be implemented for aging management of Oconee Containment concrete surfaces during the period of extended operation: Examination Categories L-A *Concrete* and L-B *Unbonded Post-Tensioning System.*
3.3-4	The report discusses that Section XI "will continue to be maintained through the consensus process of the ASME Code" and are "expected to be effective in managing" aging during the period of extended operation. In addition, the report states, "the Commission's process of reviewing Editions and Addenda of the ASME Boiler and Pressure Vessel Code, and incorporating them into 50.55a with limitations and modifications as required, provide reasonable assurance that	The Oconee Containment Inservice Inspection Plan will implement the requirements of 10 CFR §50.55a (61 Federal Register 41303, dated August 8, 1996) and the 1992 Edition with the 1992 Addenda of Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Power Plants," and Subsection IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Power Plants." While specific paragraphs of 10 CFR §50.55a may be relied upon to manage	The description of the Oconee Containment Inservice Inspection Program contained in OLRP-1001 will be revised to include the following: The Oconee Containment Inservice Inspection Plan will implement the requirements of 10 CFR §50.55a (61 Federal Register 41303, dated August 8, 1996) and the 1992 Edition with the 1992 Addenda of Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Power Plants," and Subsection IWL, "Requirements for Class

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	required activities will adequately manage the aging effects." The report should identify the specific edition and addenda of the ASME code for staff review. Also, if certain paragraphs of 10 CFR 50.55a are relied on to manage aging for renewal, these paragraphs and the year of publication should be cited.	aging for renewal, Duke is crediting all paragraphs of §50.55a for renewal to simplify commitment management.	CC Concrete Components of Light-Water Cooled Power Plants."
3.3-5	Discuss the aging management programs to be relied on for inaccessible areas of steel components regarding corrosion and cracking.	Areas of the Containment steel liner may be inaccessible for maintenance and inspection. Though a conscious effort was made during design and construction to make all areas requiring inservice inspection accessible, competing design requirements meant it was not always possible to do so. For example, steel components embedded in concrete are not capable of being inspected. Steel components embedded in concrete are not expected to corrode due to the alkaline environment provided by the concrete. Steel components exposed to air are	No changes to OLRP-1001 are required.

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		coated to preclude loss of material due to corrosion. Accessible areas that are adjacent to inaccessible areas will be inspected for indications of the effects of aging. In the event that there are indications on accessible areas that could indicate the possibility that degradation may be occurring in an inaccessible area, an evaluation will be performed by a qualified individual. Corrective actions may consist of removal of the obstruction, repair of the affected area and inclusion of the area in future inspections. In the event that indications are identified in one inaccessible area, evaluations would be performed pursuant to §50.55a(b)(2)(x)(D) to determine if additional inspections are necessary. Information concerning the inspection of inaccessible areas will be provided in a report as required by §50.55a(b)(2)(x)(A).	
3.3-6	Section 3.3.2.2.1 of the report discusses loading cycles for the liner. However, Section 3.3.1.1.1.2 of the report indicates	The Type A loads are considered within the set of design loads whose cumulative total was assumed to be 500 cycles. There have been seven Type A tests performed	The discussion of the evaluation of fatigue of the Containment liner plate will be relocated to Chapter 5 of OLRP-1001 in Revision 2. This discussion will be

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	that "the periodic Type A Integrated Leak Rate tests are the major sources of load changes." Where are the Type A loads included in Section 3.3.2.2.1?	per unit to date. The frequency of performing Type A tests has recently been revised to once every ten years. Four more tests may be performed per unit through their remaining licensed life. These additional load cycles on the liner plate are considered to be insignificant.	revised to include the Type A loads within the set of cyclic design loads considered during design.
3.3-7	Section 2.3.2.2 of the report indicates that the polar crane brackets and other miscellaneous attachments are within the scope of this report. Discuss whether there are periodic loads on these structures that need to be evaluated as part of the time-limited aging analysis in Section 3.3.2.2.1.	Periodic loads of the structural supports due to heavy load cycles of the Polar Crane have been identified as a time-limited aging analysis.	Periodic loads of the structural supports due to heavy load cycles of the Polar Crane will be addressed in Chapter 5 of OLRP-1001.
3.3-8	Section 3.3.2.2.1 of the report indicates that the projected number of heatup and cooldown cycles would not exceed the originally assumed 360 number even for 60 years. Please provide information on the number of heatup and cooldown cycles already experienced and the methodology	The number of reactor coolant system heatup and cooldown cycles projected to 60 years is considered by Duke to be a time-limited aging analysis associated with the Reactor Coolant System. Information associated with the Reactor Coolant System will be contained in Sections 2.4, 3.4, 4.4 and 5.4 of OLRP-1001, Revision 2.	Information on the time-limited aging analysis associated with the Reactor Coolant System will be provided in Chapter 5 of Revision 2 of OLRP-1001.

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	for projecting them to 60 years.		
3.3-9	Fretting and lockup of the personnel airlock and equipment hatch could result from mechanical wear. Provide appropriate aging management for these and any other aging effects applicable to the airlock.	Mechanical wear due to fretting and lockup has been assessed and determined not to be an aging effect that can cause a loss of intended function of the airlocks and equipment hatch of the Oconee Containments. The equipment hatch and airlocks are not subject to excessive vibration which could lead to wear and the sealing surfaces are not subject to wear. The equipment hatch and personnel airlocks are provided with seals to provide an essentially leaktight barrier. (See also our response to RAI 2.3-2). Seals are considered by Duke to be design features that will be inspected as part of the Oconee Containment surveillance program that is implemented to meet the requirements of 10 CFR 50 Appendix J and Oconee Technical Specifications (ITS 3.6.2). Corrective actions, which are taken in the event acceptance criteria are not met, include replacement or refurbishment.	No changes to OLRP-1001 are required.
3.3-10	Discuss whether expansion joint	Expansion joint sealants are currently	No changes to OLRP-1001 are required.

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	sealants have ever deteriorated causing degradation of the liner below the floor and, if so, what actions were taken.	inspected during the Oconee Containment surveillance program performed to meet the requirements provided in 10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Reactors." In November 1996, degraded expansion joint sealant between the basement slab/liner plate interface was identified during an inspection of the Unit 3 Containment. Corrective actions included the inspection of similar locations on Units 1 and 2. The liner plate in the vicinity of the Unit 1 normal sump was found to have corrosion while the Unit 2 liner plate had expansion joint sealants intact and no corrosion. Expansion joint sealant, expansion joint filler material and basement slab concrete were removed from the affected areas of the liner plate for both Units 1 and 3. Non-destructive examinations of the liner plate were performed and it was determined that the extent of corrosion of the liner plates of Units 1 and 3 were negligible, being much less than 10 % of	

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		the nominal wall thickness as allowed by IWE-3512. The affected areas of the liner plate were coated to protect against further corrosion.	
3.3-11	Discuss whether corrosion has ever been observed in crevices where the coating ends and steel is exposed and, if so, what actions were taken.	This question was clarified by the staff during a telephone call on December 3, 1997. The concern is in the area of welded joints which may not be coated. No documentation of inspections of these specific areas has been identified. Any corrosion of these specific locations would be detected during IWE visual examinations. Potential corrosion of areas behind such joints that would be detected during these examinations would likely be manifested by rust staining around the periphery of the affected location. (See also our response to RAI 3.3-5.)	No changes to OLRP-1001 are required.
3.3-12	Was a corrosion allowance specified for the liner? Describe any liner thickness surveys that have been conducted and, if conducted, the estimated corrosion rate from those surveys?	No corrosion allowance was specified for the liner plate. As described in 2.3.2.1 of OLRP-1001, the Oconee Containment Liner Plate is constructed of ASTM A36 steel plate and coated on the inside. The coatings installed on the liner plate preclude corrosion from occurring.	No changes to OLRP-1001 are required.

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		Periodic inspections of the Containment liner plate will be conducted during the period of extended operation in accordance with the inspection requirements contained in Subsection IWE of ASME Code Section XI. Corrosion found by the inspection will be evaluated by the inspectors and appropriate corrective actions will be taken. An explicit corrosion allowance was not specified in the original design of the liner plate. However, the thickness of the liner plate is sufficient to allow some loss of material to occur without a loss of the essentially leak tight barrier. A thickness survey of a portion of the liner plate has been performed as described in our response to question 3.3-10.	
3.3-13	Section 4.5 of the SRP-LR considers metal corrosion allowance as a time-limited aging analysis. Discuss whether this is applicable to the containment steel components.	The process which Duke used to identify Oconee specific time-limited aging analyses is described in Section 1.4 of OLRP-1001, Revision 1. Briefly, in order to determine the Oconee specific time-limited aging analyses, a review of several Oconee specific documents was	No changes to OLRP-1001 are required.

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		performed. The Oconee specific documents that were reviewed included the Oconee licensing correspondence file, the Oconee UFSAR, BWNT Topical Reports referenced in correspondence and the UFSAR, and ASME Section XI Summary Reports. Based on this review, metal corrosion allowance was not identified as a time-limited aging analysis for the steel components of the Oconee Containment.	
3.3-14	(1) Section 3.3.3.1.2 of the report indicates that "minor grease leakage through the concrete shell and at anchorages have been observed. ... The grease leakage is being monitored and there exists no evidence to date to show that the bulk-fill grease has any detrimental effect on concrete." Provide additional information on how the aging effects of grease leaked into concrete is being	(1) The bulkfill grease is a petroleum based product. ACI Report 515.1R-79, *Guide to the Use of Waterproofing, Damproofing, Protective, and Decorative Barrier Systems for Concrete,* indicates that products derived from petroleum, when free of fatty oil additives or other potentially acidic materials, are normally harmless to mature concrete. The bulkfill grease used at Oconee is routinely tested for potentially corrosive chemical contaminants as	No changes to OLRP-1001 are required.

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	managed and discuss how the elements in Section 3.0.II.C of the SRP-LR are met by the program. (2) Also, discuss the potential effects of grease on the shear load capability of the concrete structure.	part of the current tendon surveillance program and will be tested in the future in accordance with the requirements of ASME Code, Section XI, Subsection IWL. Therefore, there are no applicable aging effects associated with grease leakage that require an aging management program at Oconee. Grease is replaced as necessary during the inspections performed as part of the tendon surveillances. (2) As noted in (1) above, Duke has not identified any potential effects of grease on the load carrying capability of mature concrete.	
3.3-15	Section 3.3.III.C.4 of the SRP-LR indicates that an increase in temperature increases the prestress loss in prestressed tendons. It identifies sun exposure or proximity to hot penetrations as potential contributors. Please discuss management of this potential aging effect for renewal.	Average external ambient temperatures as well as Containment interior temperatures can increase the amount of prestress loss in tendons. These temperatures affect a large number of tendons and are considered in the calculations that are used to project loss of prestress of the three tendon groups in future years. The projected prestress for each tendon group	No changes to OLRP-1001 are required.

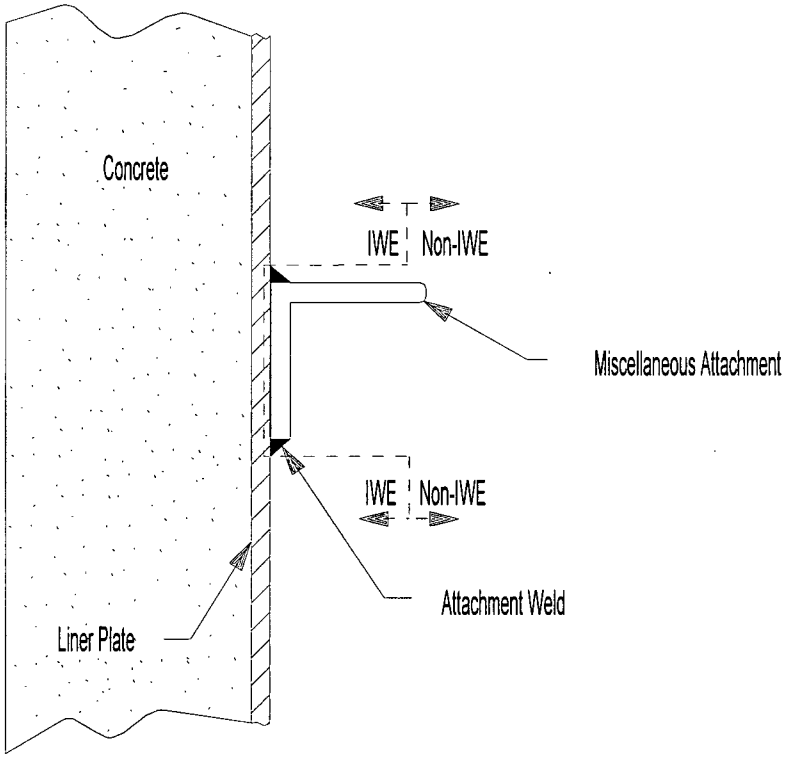
RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
		must remain above a minimum value. Surveillance data from the periodic testing of tendons are compared to the projected values of prestress and, if the actual measured value is less than 95% of the projected value, then corrective actions must be taken in accordance with Subsection IWL. The temperature impact of tendons in the vicinity of hot penetrations is not considered to be significant because of the limited number of tendons affected (<10 tendons out of a total of 176 vertical and 630 hoop tendons), the short length of the portion of tendon that would be affected, and the fact that the tendon prestresses are measured and calculated on each group.	
3.3-16	Section 3.3.3.1.3.1 of the report uses words "similar" and "similarities." Please discusses the intent of this wording and whether there are any differences between the selection of words.	No differences between the words was intended. The requirements of Subsection IWL of ASME Code Section XI, which is required to be implemented by regulation, are similar to the requirements of Regulatory Guide 1.35, which are currently contained in the Oconee	No changes to OLRP-1001 are required.

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
		Technical Specifications.	
3.3-17	Section 3.3.3.1.1 of the report indicates that loss of materials due to corrosion is the only applicable aging effect for tendons. However, other aging effects have been observed at operating plants such as stress corrosion cracking, hydrogen embrittlement, stress relaxation of prestressing wire, and shrinkage creep that could result in loss of prestress. Revise the report to discuss these additional potentially applicable aging effects for the tendons.	Duke recognizes that stress corrosion cracking, hydrogen embrittlement, stress relaxation of prestressing wire, and shrinkage creep are potential aging effects for Containment tendons. Stress corrosion cracking results from the simultaneous presence of high tensile stresses and an aggressive environment. The high tensile stresses are caused by the prestressing of the tendons. The environmental factors known to contribute to stress corrosion cracking in carbon steel are hydrogen sulfide, ammonia, nitrate solutions, and seawater. The Oconee tendons are not exposed to these environmental factors; therefore cracking due to stress corrosion is not an aging effect applicable to Oconee. Hydrogen embrittlement occurs when hydrogen atoms, produced by corrosion or excessive cathodic protection potential, enter the metal lattice. Hydrogen	No changes to OLRP-1001 are required except that the time-limited aging analysis associated with the tendons will be relocated from Section 3.3.3.2 of Revision 1 of OLRP-1001 to Chapter 5 of OLRP-1001 in Revision 2.

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
		produced by corrosion is not usually sufficient to result in hydrogen embrittlement. Therefore, hydrogen embrittlement is not applicable to Oconee. In addition, tendon filler grease is sampled and tested for the presence of chlorides, nitrates, and sulfides per Subsection IWL. Wire samples have been removed and examined and no corrosion or cracking was observed. The aging effects determined to be applicable to the Oconee post-tensioning system will be managed by the inspection program implemented to meet the requirements of Subsection IWL of ASME Code Section XI. Loss of prestress (stress relaxation of prestressing wire) and shrinkage creep are addressed as part of the time-limited aging analysis for Oconee which has been addressed in Section 3.3.3.2 of Revision 1 of OLRP-1001.	

RAI #	Request for Additional Information	Duke Response	Proposed Revision to OLRP-1001[1]
3.3-18	Section 3.3.2.1.1.4 of the report discusses Oconee's "existing coating maintenance procedures." However, Table 3.3-1 of the report does not include this as an aging management program for renewal. If coatings are credited for preventing or minimizing corrosion of the coated steel, the coating maintenance procedure is considered an aging management program. Please clarify whether the coating procedure is credited as an aging management program, and. if so, discuss how the elements in Section 3.0.II.C of the SRP-LR are met.	The Oconee Coatings Program, which envelops the existing coatings maintenance procedures, is designed to protect the underlying structure or component from the detrimental effects of the environment to which it is exposed during normal operation and for coatings in containment, to remain intact during postulated design basis events. The Oconee Coatings Program is a Special Process maintained in accordance with the Duke Quality Assurance Program and as required by Criterion IX of 10 CFR 50, Appendix B. The Oconee Coatings Program will be credited as a program that precludes aging, but all of the elements in Section 3.0.II.C of the SRP-LR may not be applicable.	A description of the Oconee Coatings Program will be provided in Chapter 4 of Revision 2 of OLRP-1001.

Figure 1


Concrete
IWE
Non-IWE
Miscellaneous Attachment
IWE
Non-IWE
Attachment Weld
Liner Plate

LIST OF COMMITMENTS

1. Chapter 2 of OLRP-1001 will contain the descriptions of all Oconee structures and components that have been determined to be subject to aging management review. Section 2.3 will describe the Reactor Building (Containment); Section 2.4 will describe all components associated with the Reactor Coolant System, including the structural supports; Section 2.5 will describe all mechanical system components (i.e., piping, valve bodies, pump casings, etc.); Section 2.6 will describe all electrical components; and Section 2.7 will describe all structural components including Reactor Building interior structures as well piping supports. Chapter 3 of OLRP-1001 will describe the applicable aging effects for the structures and components identified in Chapter 2. Chapter 4 of OLRP-1001 will describe the programs credited and provide the required demonstrations. Chapter 5 of OLRP-1001 will describe time-limited aging analyses and exemptions.
(RAI 2.3-1)

2. The intended functions of the Low Pressure Injection system will be identified and addressed in Section 2.5 of Revision 2 of OLRP-1001. (RAI 2.3-5)

3. Electrical penetrations will be addressed in Section 2.6 of Revision 2 of OLRP-1001. Time-limited aging analyses will be addressed in Chapter 5 of OLRP-1001.
(RAI 2.3-6)

4. The description of the Oconee Containment Inservice Inspection Program contained in OLRP-1001 will be revised to include the following:

   The following Examination Categories of Subsection IWE will be implemented for aging management of Oconee Containment steel surfaces during the period of extended operation:

   Examination Categories E-A *Containment Surfaces*, E-C *Containment Surfaces Requiring Augmented Examination*, E-D *Seals, Gaskets, and Moisture Barriers*, E-G *Pressure Retaining Bolting*, and E-P *All Pressure retaining Components*. Welds within the scope of Examination Categories E-B *Pressure Retaining Welds* and E-F *Pressure Retaining Dissimilar Metal Welds* will be examined within the scope of the Examination Category E-A examination.

   The following Examination Categories of Subsection IWL will be implemented for aging management of Oconee Containment concrete surfaces during the period of extended operation:

   Examination Categories L-A *Concrete* and L-B *Unbonded Post-Tensioning System*. (RAI 3.3-3)

LIST OF COMMITMENTS

5. The description of the Oconee Containment Inservice Inspection Program contained in OLRP-1001 will be revised to include the following:

   > The Oconee Containment Inservice Inspection Plan will implement the requirements of 10 CFR §50.55a (61 Federal Register 41303, dated August 8, 1996) and the 1992 Edition with the 1992 Addenda of Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Power Plants," and Subsection IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Power Plants." (RAI 3.3-4)

   (Attachment 3 provides a draft description of the Oconee Containment Inservice Inspection Program that would be included in the UFSAR Supplement for license renewal in the event an application for a renewed operating license is submitted. It is being provided at this time to facilitate discussions of this portion of the application.)

6. The discussion of the evaluation of fatigue of the Containment liner plate will be relocated to Chapter 5 of OLRP-1001 in Revision 2. This discussion will be revised to include the Type A loads within the set of cyclic design loads considered during design. (RAI 3.3-6)

7. Periodic loads of the structural supports due to heavy load cycles of the Polar Crane will be addressed in Chapter 5 of OLRP-1001. (RAI 3.3-7)

8. Information on the time-limited aging analysis associated with the Reactor Coolant System will be provided in Chapter 5 of Revision 2 of OLRP-1001. (RAI 3.3-8)

9. The time-limited aging analysis associated with the tendons will be relocated from Section 3.3.3.2 of Revision 1 of OLRP-1001 to Chapter 5 of OLRP-1001 in Revision 2. (RAI 3.3-17)

10. A description of the Oconee Coatings Program will be provided in Chapter 4 of Revision 2 of OLRP-1001. (RAI 3.3-18)

11. The evaluation of the loss of prestress in the post-tensioning system for 60 years will be provided prior to or concurrent with the submittal of the application for a renewed operating license. (OLRP-1001, Revision 1, Section 3.3.3.2)

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Oconee UFSAR Supplement for License Renewal
Chapter 16, Selected Licensee Commitments

16.6 ENGINEERED SAFETY FEATURES

16.6.x CONTAINMENT STRUCTURAL INTEGRITY

The Oconee Containment Inservice Inspection Plan will implement the requirements of 10 CFR §50.55a (61 Federal Register 41303, dated August 8, 1996) and the 1992 Edition with the 1992 Addenda of Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Power Plants," and Subsection IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Power Plants."

Note: On December 3, 1997, NRC initiated rulemaking to revise 10 CFR Part 50, Industry Codes and Standards; Amended Requirements (62 FR 63892). Duke will provide a revised version of SLC 16.6.x to NRC within 90 days after completion of this rulemaking to reflect whatever changes may be appropriate.

References:

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