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April 16, 2001

U.S. Nuclear Regulatory Commission  
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SUBJECT: Duke Energy Corporation  
Oconee Nuclear Station - Unit 1  
Docket No. 50-269  
Inservice Inspection Summary Report for Class CC  
Component Examinations (Refueling Outage 1EOC19)

Pursuant to 10 CFR 50.55a(b)(2)(viii), Duke Energy Corporation submits the attached ISI Summary Report for ASME Class CC examinations conducted on Unit 1 between October 30, 2000 and April 5, 2001. These examinations were performed prior to, during, and following the 1EOC19 refueling outage.

Please note that IWA-6000 of the ASME Code, Section XI, 1992 Edition with the 1992 Addenda requires an ISI Summary Report to be completed only for Class 1 and 2 components. As such, an ISI Summary Report is not required by the ASME Boiler and Pressure Vessel Code, Section XI, for Class CC components. However, because 10 CFR 50.55a (b) (2) (viii) (D) requires specific information regarding Class CC examinations to be included in the Summary Report, a Class CC ISI Summary Report has been prepared, but includes only that information required by 10 CFR 50.55a. There are no commitments contained in this submittal.

Questions regarding the attached report may be directed to M. J. Ferlisi at (704) 382-3923.

Very truly yours,

W. R. McCollum, Jr.  
Site Vice President

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Attachment:

Duke Energy Corporation  
Oconee Nuclear Station Unit 1  
Inservice Inspection Summary Report for Class CC Component  
Examinations (Refueling Outage 1EOC19)  
Pages 1 through 13

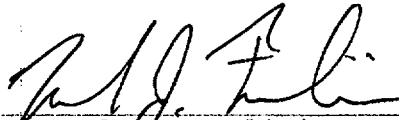
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**Oconee Nuclear Station, Unit 1**  
**Class CC ISI Summary Report**  
**(Refueling Outage 1EOC19)**

By:

  
(Mark J. Ferlisi, P.E.)

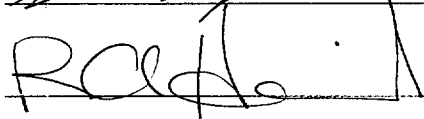
Date: 4-12-01

Reviewed By:



Date: 4-12-01

Approved By:



Date: 4-12-01

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**A. ASME Code and Regulatory Requirements for Class CC ISI  
Summary Reports**

10CFR50.55a(g)(4)(v)(C) requires that concrete containment pressure retaining components and their integral attachments, and the post-tensioning systems of concrete containments must meet the inservice inspection, repair, and replacement requirements applicable to components which are classified as ASME Code Class CC.

This inservice inspection summary report addresses requirements of 10CFR50.55a(b)(2)(viii) for inservice inspections conducted in accordance with the ASME Code, Section XI, Subsection IWL for the Oconee Unit 1 concrete containment.

Inservice inspections of Class CC components are performed in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWL, 1992 Edition with the 1992 Addenda. Article IWA-6000, Records And Reports, paragraph IWA-6210, requires the Owner to prepare inservice inspection summary reports for inservice inspections performed on Class 1 and 2 pressure retaining components and their supports.

IWA-6000 does not address inservice inspection summary reports for Class CC pressure retaining components and their supports, and the Code does not require preparation and submittal of summary reports for Class CC components. As such, this Class CC ISI Summary Report does not contain all of the information specified in IWA-6220 or IWA-6230. Please note that this report is being submitted within 90 calendar days following the completion of the refueling outage at Oconee Unit 1, in accordance with IWA-6240(b).

Duke Energy Corporation is maintaining a separate Inservice Inspection Program for Class CC pressure retaining components and their integral attachments. Therefore, this ISI Summary Report contains only that inservice inspection information applicable to Class CC components. ISI Summary Reports for other Code Class components are submitted separately.

This Summary Report includes all applicable information required by 10CFR50.55a (b)(2)(viii)(D).

**B. General Description of Examinations and Conditions Requiring Reporting**

Conditions were observed during Unit 1 examinations that require inclusion in this Class CC ISI Summary Report, as required by 10CFR50.55a(b)(2)(viii). These conditions were identified during the performance of ASME Code, Section XI, Table IWL-2500-1, Category L-A, Item L1.10 examinations.

**Observed Conditions**

Grease leakage was detected during visual examination of the concrete surfaces. This requires reporting in accordance with 10CFR50.55a(b)(2)(viii)(D)(3). The locations of grease leakage are detailed later in this report.

### C. Detailed Description of Reportable Conditions

Grease leakage was detected at various locations on the exterior concrete surfaces of the Reactor Building during the performance of ASME Code, Section XI, IWL examinations in accordance with Table IWL-2500-1, Category L-A, Item L1.10. These locations are summarized below, and are grouped by Component I.D. number assigned to each concrete surface area identified in the Oconee First Interval Containment Inservice Inspection Plan. Most horizontal tendon end caps exposed to weather show indications of past grease leakage of varying degrees through bolt holes, filler plug, or at the base of the cap.

#### Component I.D. 1-CONC-001

- a) Tendon 1D46 leaking grease at grease cap gasket.
- b) Tendon 36H106 leaking grease at grease cap gasket.
- c) Tendon 36H97 leaking grease from grease cap gasket and filler plug.
- d) Tendon 36H89 leaking grease at grease cap stud.
- e) Tendons 35H84 to 35H11 leaking grease. 36H84 leaking at stud with heavy buildup. All caps below possibly are leaking from stud holes, gaskets or filler plugs due to staining from this cap.
- f) Grease leaking from concrete crack (<0.01" in width) near Main Steam penetration.
- g) Grease leaking from concrete along construction joint at top of Construction Opening at El 835'+0".
- h) Grease leaking from gaskets at caps for tendons 26H20, 26H28, 26H31, 26H35, 26H36, 26H37, 26H42, 26H44, 26H45, 26H49 to 26H54, 26HH56 to 26H62, 26H72 to 26H74, 26H76, 26H78, 26H91 and 26H92.
- i) Grease leaking from filler plugs at caps for tendons 26H47, 26H49, 26H62, 26H70, 26H77, 26H78, and 26H85.
- j) Grease leaking at one or more stud hole(s) at caps for tendons 26H35, 26H44, 26H62, 26H81, 26H82, 26H88, and 26H91.
- k) Grease leak at hole in concrete for lightning ground cable on cylinder wall near Buttress #2 at approximately El. 884'.

**Component I.D. 1-CONC-002**

- a) Grease leaking from Construction Joint (~18" long) at El. 950'+0", just left of center of Buttress #2.
- b) Grease leaking from gaskets at caps for tendons 24H35, 24H48, 24H50, 24H52, 24H64, 24H67, 24H68, 24H71, 24H73 through 24H75, 24H79 through 24H81, 24H95 through 24H98, 51H74, and 51H70.
- c) Grease leaking from tendon cap stud holes at tendons 24H30, 24H42, 24H44, and 24H93.
- d) Grease leaking from tendon cap filler plug at tendon 24H31.
- e) Heavy grease accumulation on tendon caps for tendons 51H49 through 51H59. Grease accumulation too heavy to determine if actively leaking.
- f) Heavy grease accumulation at tendon cap gasket for tendon 2D28.

**Component I.D. 1-CONC-003**

- a) Grease leaking from tendon cap gaskets, or gaskets are too covered with grease to determine whether active leakage is occurring on tendons 13H70, 13H74, 13H81, 13H84, 13H85, 13H88, 2D01, 3D28, 3D37, 1D5, 1D21, and all caps on Buttress #6 (except 46H96 through 46H98 and 46H94).
- b) Grease leaking from tendon cap filler plug on tendon 13H80.
- c) Heavy grease leakage from tendon cap gasket on tendon 13H92.
- d) Grease stain observed at Construction Joint near EL. 934'+0" where repair exists.

**Component I.D. 1-CONC-004**

- a) Grease leaking from tendon cap stud on tendon 1D28 is accumulating on face of Ring Girder.
- b) Grease leaking from gasket (and possible weld seam) on tendon cap on tendon 1D39.
- c) Grease leaking from tendon cap gasket on tendon 1D21.
- d) Grease leaking from tendon cap stud hole(s) on tendons 62H103, 62H102, 62H99, 62H94, 62H83, 62H81 through 62H79, 62H77, 62H76, 62H62 and 62H61.



- e) Grease leaking from tendon cap gasket, or gasket is too stained to determine whether active leaking is occurring on tendons 62H106, 62H105, 62H104, 62H97 through 62H95, 62H93 through 62H81, 62H79 through 62H76, 62H74 through 62H72, and 62H62 through 62H51. 62H97 has heavy grease deposits below cap.
- f) Grease leaking from tendon cap filler plug on tendon 62H98.
- g) Grease leaking from tendon caps, or caps are too heavily coated with grease to determine whether active leaking is occurring on tendons 62H50 through 62H62.
- h) Grease leaking from tendon cap gaskets on tendons 35H50 through 35H93, 35H96, and 35H100 through 35H105. Heavy deposits of grease on tendon cap 35H90 and all tendon caps beneath 35H90 make it difficult to determine whether active leaking is occurring from these tendon caps.
- i) Grease leaking from tendon cap stud hole on tendons 35H95 and 35H98.
- j) Grease leak at construction joint on cylinder wall located at elevation 924'+0", approximately 3' from Buttress #5 to corner of Buttress #5, then 12" along Buttress #5.

**Component I.D. 1-CONC-005**

- a) Grease leak from construction joint (5' long) at El. 854'+0", beginning 22' left of Buttress #4.
- b) Grease leak from construction joint (8' long) at El. 844'+0", beginning 29' left of Buttress #4.
- c) Inactive grease leaks from tendon cap gaskets, filler plugs, or stud holes observed at the following tendon caps: 2D8, 2D10, 2D16, 2D27, 2D30, 2D34, 2D36, 2D33, 2D52, 1D44, 51H105, 51H103, 51H85, 51H80, 51H75, 51H71, 24H102, 24H99, 24H96, 24H94, 24H89, 24H84, 24H82, 24H81, 24H70, 24H67, 24H61, and 24H54.
- d) Heavy grease leakage from gaskets, filler plug, or stud holes on caps for tendons 2D28, 2D32, 2D26, and 1D53.

**Component I.D. 1-CONC-006**

- a) Small grease stain observed on center of Buttress #4 near El. 914'+0".
- b) Small grease stain observed on center of Buttress #4 near approximate El. 948'.
- c) Small area of grease staining (3" x 5") observed at concrete crack near El. 858'+0", approximately 21' from Buttress #3.
- d) Grease staining observed at concrete crack near El. 852'+0", approximately 32' from Buttress #3.
- e) Two foot long grease stain observed along construction joint near El. 844'+0", approximately 33' from Buttress #3.
- f) Grease leaking from tendon cap gaskets at tendons 46H103 and 46H102.
- g) Grease leaking from tendon cap stud holes at tendons 46H89 and 46H90.
- h) Grease leaking from tendon cap filler plugs at tendons 46H73, 46H82, 46H83, 46H86, and 46H95.

**Component I.D. 1-CONC-007**

- a) Minor grease leakage from tendon cap stud holes on tendons 13H36 through 51H47. Grease leaking from tendon cap filler plug on tendon 51H41.
- b) Minor grease leakage from 2 tendon cap stud holes on tendon 31H47. Oil from leaks in floor above at EL. 858'+0" make actual status of grease leakage from tendons 31H40 through 31H47 indeterminable.

**Component I.D. 1-CONC-008**

No grease leaks were noted in this area.

**Component I.D. 1-CONC-009**

- a) Grease leaking from tendon cap stud holes or filler plugs on tendons 51H38, 51H41, 51H42, and 51H44 through 51H47.
- b) Grease leaking from tendon cap stud holes, or caps are too oily to determine whether grease is leaking on tendons 35H40 through 35H47.

- c) Slight oil leak observed from ceiling near south face of Buttress #5.
- d) Grease leaking from tendon cap stud holes on tendons 62H40, 62H41, and 62H45 through 62H47.
- e) Grease leaking from tendon cap stud holes or filler plugs on tendons 46H38, 46H39, 46H41, and 46H43 through 46H47. Leak from floor above makes actual source of all leakage indeterminate.
- f) Grease stain observed on southeast face of Buttress #6 from underside of ceiling above. Grease staining runs from the ceiling down approximately 15'; near left and right corners about 18" from each corner.
- g) Oil stains observed on cylinder wall between Buttresses 5 and 6, from El. 844'+0" to 854'+0".

**Component I.D. 1-CONC-010**

- a) Grease leaking from tendon cap stud holes on tendons 13H25, 13H31, 13H34, and 13H35. Surfaces of tendon cap 13H35 are oily from oil leakage from the floor above.
- b) Surfaces of tendon caps 51H23 through 51H34 are oily from leaks in the floor above at El. 838'+0".

**Component I.D. 1-CONC-011**

- a) Streaky, dry oil stains observed on cylinder wall north of Main Steam Penetration. Oil drops observed on beam in the Auxiliary Building in this area.
- b) Grease leaking from tendon cap stud holes, filler plugs, or tendons are too covered with oil to determine whether leakage is occurring at tendons 51H23 through 51H34. Heavy grease leakage from tendon cap filler plug on tendon 51H29.
- c) Very minor, fresh oil film observed on wall in penetration area, north of Buttress #5, approximately 5' to 25' above floor. Origin of oil cannot be determined.
- d) Oil stains observed on east face of Buttress #5, from location approximately 14' above floor. Oil drops observed on pipe across buttress face at El. 817'+0". Cannot determine origin of observed oil.

- e) Grease leaking from tendon cap stud holes, filler plugs, or tendons are too covered with oil to determine whether leakage is occurring at tendons 35H23 through 35H35.
- f) Oil stains observed on wall (east of Buttress #6) in Penetration area. Cannot determine origin of oil.
- g) Grease leaking from tendon cap stud holes, filler plugs, or tendons are too covered with oil to determine whether leakage is occurring at tendons 62H23 through 62H35. Leak appears to be from floor above near northeast face of Buttress #6.
- h) Grease leaking from tendon cap stud holes, filler plugs, or tendons are too covered with oil to determine whether leakage is occurring at tendons 46H23 through 46H35. Grease leak appears to be from floor above near southwest face of Buttress #6. Tendon cap 46H29 is leaking from stud hole.
- i) Dry inactive oil stains observed on cylinder wall and on support/restraints at cross-over to West Penetration Room. Stains are assumed to originate in ceiling.

**Component I.D. 1-CONC-012**

- a) Slight minor oil leaks observed from the stud holes and filler plugs of caps on tendons 51H16, 51H15, and 51H14.
- b) Slight minor oil leaks observed from the stud holes of caps on tendons 51H13 and 51H12.
- c) Minor oil leak observed from the tendon cap filler plug on tendon 13H14.

**Component I.D. 1-CONC-013**

Grease leaking from tendon cap stud holes on tendons 46H9 through 46H11, and 46H13 through 46H17. Additional oil stains/leakage near southwest face of Buttress #6 from ceiling above near El. 809'+3" makes actual status of leakage and source of leakage indeterminable.

**Component I.D. 1-CONC-014**

- a) Tendon caps on tendons 62H2 through 62H18 are oily. Oil from ceiling above near El. 809'+3" near

northeast face of Buttress #6 makes actual number and source of cap leaks indeterminable.

- b) Tendon caps on tendons 35H7 through 35H10 are oily due to possible leaks from tendon cap filler plugs. Cap on tendon 35H8 is leaking slightly from stud hole.
- c) Tendon caps on tendons 51H7 through 51H17 are leaking slightly from stud holes and/or filler plugs.

**Component I.D. 1-CONC-015**

Grease leaking from tendon cap stud holes on tendons 35H11, 35H13, 35H15 to 35H18. Additional oil from ceiling above at El. 809'+3" near south face of Buttress #5 makes actual number and source of cap leaks indeterminable.

**Component I.D. 1-CONC-016**

Inactive, old, dry oil stain observed on cylinder wall in Room 206 between El. 796'+6" to 790'+0" and below.

**Component I.D. 1-CONC-017**

No grease leaks were noted in this area.

**Component I.D. 1-CONC-018**

No grease leaks were noted in this area.

**Component I.D. 1-CONC-019**

- a) Minor grease leakage from tendon cap stud holes on tendon 35H1, and from tendon cap gasket on tendon 35H2. Tendon cap 35H3 is oily due to leaks from ceiling above at EL. 784'+0" near south face of Buttress #5.
- b) Tendon cap 62H2 is oily due to possible leaks from ceiling above at EL. 784'+0" near northeast face of Buttress #6. Cannot access buttress face due to piping interference in this area.

**Component I.D. 1-CONC-020**

No grease leaks were noted in this area.

**Component I.D. 1-CONC-021**

No grease leaks were noted in this area.

**Component I.D. 1-CONC-022**

- a) Grease (oil) leaking from tendon cap gaskets at tendons 61V27, 61V20, 45V14, 45V7, 45V8, 34V30, 34V28, 34V29, 34V27, 34V25, 34V23, and 34V22.
- b) Grease (oil) leaking from weld seam in tendon cap for tendon 12V23.

**Component I.D. 1-CONC-023**

No grease leaks were noted in this area.

**Component I.D. 1-CONC-024 (Tendon Gallery)**

Grease leaking from tendon cap stud holes, filler plugs, or gaskets on tendons 12V1, 12V2, 12V3, 12V4, 12V5, 12V6, 12V7, 12V8, 12V9, 12V10, 12V11, 12V12, 12V13, 12V14, 12V15, 12V16, 12V17, 12V18, 12V19, 12V20, 12V21, 12V22, 12V23, 12V24, 12V26, 12V27, 12V28, 12V29, 23V1, 23V2, 23V3, 23V4, 23V5, 23V6, 23V7, 23V8, 23V9, 23V10, 23V11, 23V12, 23V13, 23V14, 23V15, 23V16, 23V17, 23V19, 23V20, 23V21, 23V22, 23V23, 23V24, 23V25, 23V26, 23V27, 23V28, 23V29, 34V1, 34V2, 34V3, 34V4, 34V6, 34V7, 34V8, 34V9, 34V10, 34V11, 34V12, 34V15, 34V16, 34V17, 34V18, 34V19, 34V20, 34V21, 34V22, 34V23, 34V24, 34V25, 34V26, 34V27, 34V28, 34V29, 45V1, 45V2, 45V3, 45V4, 45V5, 45V7, 45V8, 45V9, 45V10, 45V11, 45V12, 45V13, 45V14, 45V15, 45V16, 45V17, 45V18, 45V19, 45V20, 45V21, 45V22, 45V23, 45V24, 45V25, 45V26, 45V27, 45V28, 45V29, 56V1, 56V2, 56V3, 56V4, 56V5, 56V6, 56V7, 56V8, 56V9, 56V10, 56V11, 56V12, 56V13, 56V14, 56V15, 56V16, 56V17, 56V18, 56V19, 56V20, 56V21, 56V22, 56V23, 56V24, 56V25, 56V26, 56V27, 56V28, 56V29, 61V1, 61V2, 61V3, 61V4, 61V5, 61V6, 61V7, 61V8, 61V9, 61V10, 61V11, 61V12, 61V15, 61V16, 61V17, 61V19, 61V20, 61V21, 61V22, 61V23, 61V24, 61V26, 61V27, 61V28, and 61V29.

**Discussion of Identified Grease/Oil Leakage and Staining**

Grease/oil leakage from tendon end caps was observed at gaskets, installation screw holes in caps, and/or threaded vent/fill fittings attached to the caps. Because leakages observed at hoop tendon caps has stained other hoop tendon caps and bearing plates on each Buttress, the precise number and location of hoop tendons that are actually leaking grease cannot be accurately determined without additional examinations or maintenance.

Because grease leakage was also identified during inspections on Unit 2 in 1999, Oconee has already begun to plan the following corrective actions to address the problem of leaking tendon caps. These corrective actions are being planned for all three Oconee units.

1. Reinspection of leaking/stained hoop tendon caps to identify which caps are the likely source of the majority of grease leakage, if this determination cannot be readily made from existing inspection records.
2. Cleaning of tendon bearing plates, tendon caps, and concrete surfaces in the vicinity of leaking hoop tendons.
3. Periodic reinspection of hoop tendon end caps and bearing plates to identify any additional leaking end caps requiring corrective action.
4. Removal of caps from tendon ends with significant leakage to perform an inspection of anchorage hardware. It should be noted that Oconee's experience has been that tendon cap grease leakage of the type indicated in this report has not resulted in an unacceptable level of grease coverage on tendon anchorage components and wires (The oil in the original grease tends to separate from the grease, but the residual viscous grease continues to provide a sufficient coating on the tendon wires and anchorage components).
5. Replacing existing tendon caps removed for anchorage inspections with an improved design to prevent or minimize future grease leakage.
6. Complete regreasing or addition of grease to those tendons that have been fitted with new caps.