Duke Power
A Duke Energy Company

W. R. McCollum, Jr.
Vice President

Duke Power
Oconee Nuclear Site
7800 Rochester Highway
Seneca, SC 29672
(864) 885-3107 OFFICE
(864) 885-3564 FAX

December 15, 1999

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

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
Licensee Event Report 50-269/1999-09, Revision 0
Problem Investigation Process No.: PIP O-99-4558

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 50-269/1999-09, concerning operation of Units 1, 2 and 3 with unrepaired steam generator tube end anomalies contrary to Technical Specification (TS) 5.5.10, section e.6 due to an earlier failure to recognize the need to submit a TS change request to the NRC.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

W. R. McCollum, Jr.

Attachment

IE22

PDR ADOCK 05000269

cc: Mr. Luis A. Reyes
Administrator, Region II
U.S. Nuclear Regulatory Commission
61 Forsyth Street, S. W., Suite 23T85
Atlanta, GA 30303

Mr. D. E. LaBarge
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

INPO Records Center
700 Galleria Parkway, NW
Atlanta, GA 30339-5957

Mr. M. C. Shannon
NRC Resident Inspector
Oconee Nuclear Station

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMD NO. 3150-0104
EXPIRES: 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oconee Nuclear Station, Unit 1	05000-269	1 of 6

TITLE (4)
Operation with Unrepaired Steam Generator Tube Ends

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
									Unit 2	05000-270
11	15	99	1999	09	00	12	15	99	Unit 3	05000-287

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR *(Check one or more of the following)* (11)					
POWER LEVEL (10)	100	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)		
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)		
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER *(Specify in Abstract below and in Text, NRC Form 366A)*		
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)			
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)			
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
L.E. Nicholson, Regulatory Compliance Manager	(864)	885-3292

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES *(If yes, complete EXPECTED SUBMISSION DATE)*	X NO				

ABSTRACT *(Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines)* (16)

On November 15, 1999, Oconee Units 1 and 3 were operating at approximately 100 percent power. Unit 2 was shutdown for refueling. At 1605 management concluded that the units were operating, or had operated, with unrepaired Steam Generator (SG) Tube End Anomalies (TEAs) contrary to Technical Specification (TS) 5.5.10, section e.6, repair criteria. Since the existence of the SG TEAs are of no safety significance, Oconee requested and received a Notice of Enforcement Discretion on November 15, 1999.

The root cause of this event was Duke's failure to recognize the need to propose a TS change request to exclude axial SG TEAs from the TS SG tube repair criteria when SG TEAs were identified and characterized in May and June of 1998.

This event was of no significance to the health and safety of the public.

EVALUATION:

BACKGROUND

Oconee Nuclear Station uses the Babcock and Wilcox (B&W) Nuclear Steam Supply System [EIIS:AC], which includes two Once Through Steam Generators (SGs) [EIIS:SGI], for primary to secondary heat transfer per unit. Each SG is a vertical, straight tube heat exchanger. Inside the SG shell, there is an upper tube sheet, 15 tube support plates, a lower tube sheet, and 15531 tubes per steam generator.

The tube sheets are approximately two feet thick with an approximately 1/4 inch thick Inconel 600 clad on the primary wetted surface of the tube sheet. The tubes are nominally 0.625 inches in diameter. During construction, the tube sheets were drilled, individual SG tubes were inserted in one tube sheet, passed through openings in the tube support plates, through the other tube sheet, and then rolled in place and seal welded. The tube ends typically extend approximately 3/16 inch beyond the outer surface of the tube sheet clad.

Technical Specification (TS) 5.5.10, Section e.6, says in part:

> Repair Limit means the imperfection depth beyond which the tube shall be either removed from service by plugging or repaired by sleeving or rerolling because it may become unserviceable prior to the next inspection; it is equal to 40% of the nominal tube or sleeve wall thickness.

TS 3.0.3 requires, in part, that anytime an ACTION statement is not provided for a limiting condition for operation which is not met, action shall be initiated within one hour to initiate shutdown of the unit.

This report describes the circumstances and events associated with operation of Units 1, 2 and 3 in technical violation of TS 5.5.10, Section e.6.

EVENT DESCRIPTION

In early May 1998, operating experience data based on events at Arkansas Nuclear One (ANO) were received by Duke Energy Corporation (Duke). This information indicated that previous Eddy Current (EC) indications classified as Tube End Anomalies (TEAs) had exhibited primary-to-secondary leakage at ANO, thus indicating they were in the pressure boundary. Based on re-analysis of Oconee EC data, some TEA indications were confirmed to extend below the primary surface of the tube sheet clad and were in service. The detailed circumstances of this event are described in LER 50-269/1998-08, dated July 1, 1998.

Duke then developed an analysis methodology and guidelines capable of distinguishing between tube end anomalies located beyond the primary wetted surface of the tube sheet clad and indications in the tube sheet clad. These two types of EC tube indications were re-classified: Repairable indications below the surface of the tube sheet clad were defined as Tube End Cracks (TECs); Axial indications in tubes beyond the primary surface of the clad were defined as Tube End Anomalies (TEAs). TECs located below the surface of the clad and tube circumferential EC indications are repaired. Although Duke inspects SG tubes completely from end to end, a methodology was established and used that allowed for no repair of indications of potential SG tube axial defects between the tube end and the primary surface of the cladding.

Subsequent discussions in 1998 with NRC personnel at NRR and Region II led Duke to incorrectly conclude a consensus existed regarding axial TEA indications identified between the tube end and primary surface of the tube sheet clad. Specifically, Duke concluded that TEA indications identified in the "point of entry to point of exit inspections" need not be repaired per TS 5.5.10, e.6, since they were not part of the pressure boundary and could therefore be excluded from the TS inspection requirements of TS 5.5.10. On September 7, 1999, Duke submitted a letter to the NRC that said, in part:

> "... the portion of a SG tube end that extends beyond the top of the cladding is not part of the pressure boundary since it is beyond the point of exit from the SG secondary side. The SG tube end beyond the top cladding is therefore excluded from the SG tube inspections."

On November 10, 1999, in a telephone conference concerning the letter with the NRC staff, the NRC suggested the above position may be contrary to the requirements of the 40 percent tube repair criteria of TS 5.5.10, Section e.6. The NRC indicated the above 40% repair criteria was applicable to the TEAs such that operation with such TEAs may be contrary to TS since Oconee's TS require inspection of SG tubes from point of entry completely to the point of exit per TS 5.5.10, Section e.8.

In a subsequent call with the NRC on November 15, 1999, the NRC informed Duke they had concluded TS 5.5.10, Section e.8 required the SG tubes to be inspected from point of entry completely to point of exit (i.e., from tube end to tube end). Consequently, the repair criteria of TS 5.5.10, Section e.6 applied to the entire tube regardless of the fact that any repairable indications in this region of the tubes were likely to have little or no safety significance.

At approximately 1605 hours on November 15, 1999, with Units 1 and 3 at approximately 100 percent power, and Unit 2 in Mode 6 for refueling, Duke concluded Units 1, 2 and 3 had operated with unrepaired SG TEAs contrary to the requirements TS 5.5.10, e.6. Units 1 and 3 were operating at this time with unrepaired SG TEAs. TEAs were first identified in May 1998 as the result of advances in EC technology and EC data analysis methodology.

As a consequence of the above described non-compliance with TS 5.5.10, e.6, Units 1 and 3 started preparing for shutdown per TS 3.0.3 at approximately 1610 hours on November 15, 1999. At this time, Duke was requesting enforcement discretion from these requirements from the NRC. At approximately 1705 hours, the NRC approved enforcement discretion to permit continued operation of Units 1 and 3 until NRC approval of a TS change request which would revise the TS 5.5.10, e.6 repair criteria to exclude SG TEAs for Units 1, 2 and 3. Duke submitted this TS change request within 48 hours of enforcement discretion approval by the NRC. At 1707 hours on November 15, 1999, Units 1 and 3 exited TS 3.0.3 before shutdown of the units had been initiated.

CAUSAL FACTORS

The root cause of the TS discrepancy resulted from a failure to recognize the need for a TS change.

Although Duke had developed a technical basis for not repairing SG TEAs when the existence of SG TEAs was identified in May of 1998, the need to revise TS 5.5.10, e.6 was not recognized and therefore a License Amendment Request (LAR) was not proposed to correct the TS. At that time, Duke concluded that TS 5.5.10, e.8 required inspection from "point of entry completely to point of exit" from the reactor coolant pressure boundary since axial EC indications in the tube ends beyond the pressure boundary have no safety significance. This conclusion is consistent with another provision of TS 5.5.10, e.8 that permits tube regions outside the pressure boundary due to reroll to be excluded from the inspection requirement. Although the tube end regions were inspected, Duke incorrectly concluded that SG TEAs need not be repaired per TS 5.5.10, e.6 since there was no apparent requirement in the TSs to inspect the tube ends.

CORRECTIVE ACTIONS

Immediate:

Duke requested and received a Notice of Enforcement Discretion from the NRC allowing continued operation of Units 1 and 3 on November 15, 1999. This notice was effective until approval of the TS change request described in the following subsequent action.

Subsequent:

Duke submitted TS Change Request 99-12 to the NRC on November 17, 1999, which would exclude axial SG TEAs from the repair criteria of TS 5.5.10, e.6 for Units 1, 2 and 3. This TS change request was approved by the NRC on December 3, 1999.

Planned:

None.

This LER contains no commitments.

SAFETY ANALYSIS

Axial SG TEAs that are left in service were evaluated for contribution to primary-to-secondary leakage during a postulated worse case accident condition. This contribution is expected to be zero. Burst and failure by bending are precluded by the location of TEAs. It is therefore concluded the existence of the TS deficiency had no impact on the health and safety of the public

ADDITIONAL INFORMATION

There were no releases, exposures, or injuries associated with this event.

A search of prior Oconee LERs submitted in the past five years reveal no prior events involving a failure to recognize need for change. LER 50-269/1998-08 reported operation of Units 1 and 3 with newly identified and unrepaired SG TEAs (now classified as TECs) contrary to TSs. The cause of the 1998 event is unrelated to those discussed above except that the 1998 circumstances were the foundation for the TS violation reported in this LER.