

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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 FACIL: 50-269 Oconee Nuclear Station, Unit 1, Duke Power Co.
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 RECIP. NAME RECIPIENT AFFILIATION

DOCKET #
 05000269

SUBJECT: LER 87-007-00: on 870701, portion of low pressure svc water piping inside reactor bldg designated non-safety-related. Caused by design deficiency due to incorrect documentation of piping class. FSAR corrections drafted. W/870810 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 7
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: AEOD/Ornstein: 1cy.

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	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADE	1 0
	NRR/DEST/ADS	1 0	NRR/DEST/CEB	1 1
	NRR/DEST/ELB	1 1	NRR/DEST/ICSB	1 1
	NRR/DEST/MEB	1 1	NRR/DEST/MTB	1 1
	NRR/DEST/PSB	1 1	NRR/DEST/RSB	1 1
	NRR/DEST/SGB	1 1	NRR/DLPQ/HFB	1 1
	NRR/DLPQ/QAB	1 1	NRR/DOEA/EAB	1 1
	NRR/DREP/RAB	1 1	NRR/DREP/RPB	2 2
	NRR/PMAS/ILRB	1 1	REG FILE 02	1 1
	RES DEPY GI	1 1	RES TELFORD, J	1 1
	RES/DE/EIB	1 1	RGN2 FILE 01	1 1
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1

NOTES: 1 1

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) OCONEE NUCLEAR STATION										DOCKET NUMBER (2) 0 5 0 0 0 2 6 9										PAGE (3) 1 OF 0 5				
TITLE (4) MISCLASSIFICATION OF LOW PRESSURE SERVICE WATER SYSTEM PIPING																								
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 NAMES						DOCKET NUMBER(S)									
0	7	0	1	8	7	8	7	0	0	7	0	0	0	8	1	0	8	7	OCONEE UNIT 2 0 5 0 0 0 2 7 0					
											OCONEE UNIT 3 0 5 0 0 0 2 8 7													
OPERATING MODE (8) N			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																					
POWER LEVEL (10) 0 8 7			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)(vi)					XX OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
			20.405(a)(1)(iii)					50.73(a)(2)(i)					50.73(a)(2)(viii)(A)					VOLUNTARY						
			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)(ix)											
LICENSEE CONTACT FOR THIS LER (12)																								
NAME PHILIP J. NORTH, LICENSING															TELEPHONE NUMBER 7 0 4 3 7 1 3 - 1 7 4 5 6									
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														
B	B I			N																				
SUPPLEMENTAL REPORT EXPECTED (14)															EXPECTED SUBMISSION DATE (15)					MONTH	DAY	YEAR		
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)															<input checked="" type="checkbox"/> NO									

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

Due to an error in documentation a portion of the Low Pressure Service Water (LPSW) piping inside the Reactor Building was designated to be non-safety related.

The root cause of this incident was determined to be a design deficiency due to the incorrect documentation of the piping class.

Corrective actions were to revise appropriate design documents to show the correct piping classification and ISI class.

The design basis of the subject piping is that it will maintain its integrity for inleakage from the containment during a seismic event. This seismic qualification has been demonstrated by analysis. As such, the health and safety of the public was not affected by this incident.

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TEXT: If more space is required, use additional NRC Form 366A's (17)

Background:

The Low Pressure Service Water (LPSW) System at Oconee supplies raw lake water for cooling to various components. LPSW is supplied for normal plant operation to the following heat exchangers for each of the four Reactor Coolant (RC) Pump motors per unit:

Upper Bearing Oil Cooler
Lower Bearing Oil Cooler
Motor Air Coolers (2)

Although the RC Pump design for Unit 1 differs from Units 2 and 3, the motors and LPSW supplying them are identical.

LPSW enters the Reactor Building (RB) through a 10 inch header at Penetration 21, splits to supply the four RC Pump motors, comes back together in a common 10 inch header, then exits the RB through Penetration 22. The containment isolation valves LPSW-6 and -15 are fully qualified as containment isolation valves and receive an Engineered Safeguards (ES) signal to close when RB pressure exceeds 4 psig. The inside valves LPSW-7 through -14 are electric motor operated (EMO) valves but are not environmentally qualified and do not receive an ES signal to close. Penetrations 21 and 22 are defined in FSAR Section 6.2.3.2 as Type C penetrations:

Type C. "Each line not directly connected to the Reactor Coolant System or not open to the Reactor Building atmosphere has at least one valve either a check valve or remotely operated valve. This valve is located outside the Reactor Building."

Containment isolation for the design basis accident is based on the piping inside the RB being closed to the RB atmosphere. To assure this, all of the piping from Penetration 21 to 22 was design and installed as Class F (seismic).

The subject piping was designed and built to a verbal description in the original Power Piping Quality Assurance (PPQA) Manual, System 14V (2) which clearly defined the piping as Class F (seismic). General note (14) was referenced on the page allowing "lines embedded in concrete [to be] classified as Duke Class G," a note common on PPQA sheets involving Class F piping. When the PPQA Manual was rewritten in 1976 (final signatures applied in mid-1977) the general notes were renumbered and consolidated in a separate section of the PPQA Manual. The verbal description of System 14B (2) remained the same but the piping class was revised to read "F & G" with a reference in the Remarks column to see the general note regarding embedded lines for class separation. A handwritten "G" appeared next to the verbal description of the subject piping indicating the subject piping should be Class G. This is the first formal documentation of the error.

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TEXT: If more space is required, use additional NRC Form 366A's (117)

Revision 5 (issued November 13, 1978) and subsequent revisions to the Safety Related Structures, Systems and Components (SRSSC) document showed the subject piping as Class G. On January 1, 1983 the PPQA Manual was superseded and the verbal descriptions were copied over to the Oconee Piping Summaries (OPS sheets). The Class G error on the subject piping was carried over to OPS-14.B-2. On December 23, 1985 the new Oconee Flow Diagrams (OFD's) for the Low Pressure Service Water System (LPSW) were transmitted under the Oconee Document Upgrade Program. The new drawings show both the Oconee piping class and the Inservice Inspection (ISI) Class. The piping class was copied from OPS-14.B-2 (Class G) and the ISI class was taken from the SRSSC (none).

Description of Occurrence:

The discovery that the subject piping was misclassified was prompted by a letter dated January 9, 1987 from Nuclear Production Department (NPD) Licensing to Design Engineering, Mechanical & Nuclear Division, Station Support Section (MBOE) which questioned the qualification of the containment isolation design as stated in the Final Safety Analysis Report (FSAR) in light of conflicting documentation, namely:

- a) The FSAR stated the line was not open to the Reactor Building atmosphere.
- b) The Oconee Flow Diagrams (OFD's) showed the subject lines as non-seismic.
- c) The inside isolation valves were not environmentally qualified and did not receive an Engineered Safeguards (ES) signal to close.

Subsequently, it was determined that the error in design documentation had occurred in the 1976-77 time frame. The MBOE response dated January 26, 1987 noted that the FSAR and Oconee Flow Diagrams OFD-124B-1.4, -2.4, and -3.4 should be revised after confirmation was obtained on two issues:

- (1) seismic qualification of the subject piping, and
- (2) Section XI inspection of any welding modifications that may have been made since the mid-1970's.

Revisions to OFD-124B-1.4, -2.4, -3.4 were transmitted on June 18, 1987. Revisions to figures in Chapter 6 of the Oconee FSAR were prepared on June 16, 1987 and will be included in the 1987 update of the FSAR.

Cause of Occurrence:

The root cause of this incident was determined to be a design deficiency due to the incorrect documentation of the piping class.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

The subject piping was not indicated as being safety-related in the Safety Related Structures, Systems and Components (SRSSC) document, a document controlled by the Steam Production Department (later the Nuclear Production Department). This error in the SRSSC was in turn based on the same error in the Power Piping Quality Assurance (PPQA) Manual, which was controlled by the Design Engineering Department.

The exact reason for the handwritten "G" being erroneously added to the PPQA after the original version was typed is not known. Of the three persons who reviewed or checked the sheet only one is currently living. He was unable to identify who wrote in the "G" or why, but agreed on the probable cause described in the paragraph below.

Four separate LPSW lines are described on PPQA Manual sheet 14B (2): one line serving the Reactor Coolant (RC) Pumps (and including the subject piping) is not functionally safety related; the other three lines serving the three Reactor Building Cooling Units (RBCU's) are functionally safety related. All four lines are similar in that they form a closed piping system within the Reactor Building for containment isolation. The preparers of PPQA sheet 14B (2) had written "F & G" for the Duke piping class. It is assumed that whoever wrote in the "G" recognized that the piping to the RC Pump motors was not functionally safety related and was attempting to clarify which piping was F and which was G.

An extensive review of Design Engineering Department correspondence files did not uncover documentation to verify the assumption stated in the paragraph above; however, the same reasoning was later documented by a task force of engineers reviewing documentation of piping classifications in response to IE Bulletin 79-14. In 1980 the task force, formed to evaluate discrepancies between the Final Safety Analysis Report (FSAR), Power Piping Quality Assurance (PPQA) Manual, and Safety Related Structures Systems and Components list (SRL), concluded that the subject piping was not safety related. The justification stated for resolution of the discrepancy was:

"Valves LPSW-7, 9, 11, 13, 8, 10, 12, 14 serve as isolation for the LPSW. Piping and valves in between are Class G because they are not required for safety functions."

In the absence of more extensive design documentation common to newer plants and given the evidence available at this time it is likely that these erroneous conclusions were reached in this manner.

Corrective Actions:

No immediate action was required as this incident did not involve an unstable, degraded, or unsafe condition.

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Subsequent corrective actions were to revise and transmit the Oconee Flow Diagrams showing the subject piping as safety related. Corrections to the FSAR were drafted for inclusion in the 1987 FSAR update.

Analysis of Occurrence:

The subject piping is a low temperature, low pressure piping system (100°F, 100 psig) subjected to about 60 psig in continuous service for normal plant operation. Gross leakage in the subject piping would be detected during normal operation by an increase in Reactor Building sump levels.

The design basis of the subject piping is that it will maintain its integrity for inleakage from the containment during a seismic event. This seismic qualification has been demonstrated by analysis.

The health and safety of the public was in no way affected by this incident.

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HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

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August 10, 1987

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

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -289
LER 269/87-07

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 269/87-07 concerning the misclassification of Low Pressure Service Water System piping.

This report is submitted on a voluntary basis. This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

PJN/214/jgc

Attachment

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August 10, 1987
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