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ACCESSION NBR: 9212280207 DOC. DATE: 92/12/18 NOTARIZED: NO DOCKET #
 FACIL: 50-269 Oconee Nuclear Station, Unit 1, Duke Power Co. 05000269
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 BENESOLE, S.G. Duke Power Co.
 HAMPTON, J.W. Duke Power Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-017-00: on 921118, discovered that Unit 2 & 3 battery racks were missing splice plates. Cause unknown. Missing splice plates installed. W/921218 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 8
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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DUKE POWER

December 18, 1992

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

Subject: Oconee Nuclear Site
Docket Nos. 50-269, -270, -287
LER 269/92-17

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 269/92-17, concerning inadequate seismic support of vital instrumentation and control batteries.

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

Very truly yours,

J. W. Hampton
Vice President

/ftr

Attachment

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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.

FACILITY NAME (1)

Oconee Nuclear Station, Unit 1

DOCKET NUMBER (2)

05000 269

PAGE (3)

1 OF 07

TITLE (4)

Inadequate Seismic Support Of Vital Instrumentation And Control Batteries
Due To Unknown Cause, Possible Installation Deficiency

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	18	92	92	-- 17 --	00	12	18	92	Oconee, Unit 2	05000 270
									Oconee, Unit 3	05000 287

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
N	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
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iv)	x 50.73(a)(2)(ii) (A)	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

S. G. Benesole, Safety Review Manager

TELEPHONE NUMBER (Include Area Code)

(803) 885-3518

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)

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 18, 1992, Oconee Units 1, 2, and 3 were at 100% full power. While in preparation for replacement of the Unit 2 Vital Instrumentation and Control (I&C) Batteries, Engineering discovered that the Unit 2 and 3 battery racks were missing splice plates. The capability of the (I&C) batteries to withstand a seismic event was indeterminate. Therefore, on November 19, 1992, at approximately 1200 hours, the Unit 2 and 3 (I&C) batteries were declared inoperable and all three Oconee Units entered Technical Specification 3.7.9. The root cause of this event is unknown, possible installation deficiency. Corrective actions included installing the missing splice plates. The (I&C) batteries were returned to operable status.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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Oconee Nuclear Station, Unit 1		05000 269		92	- 17 -	00	02 OF 07

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

BACKGROUND

The purpose of the 125V DC Vital Instrumentation and Control (I&C) Power System [EIIS:EJ] is to supply a source of reliable, continuous DC power for control and instrumentation during normal operation and orderly shutdown for each unit. Each Oconee Unit has two batteries (CA and CB) and three chargers (one for each battery and one standby). Each I&C battery is lead calcium consisting of 60 cells in clear housings with sealed covers. Each battery is supported on two racks fourteen feet long arranged end to end, constructed with Unistrut channel, steel angle legs and stabilizing steel, supplied by the battery manufacturer.

By design, all reactor protection [EIIS:JC] and engineered safety features [EIIS:JE] loads on this system can be powered from either the Unit 1 and Unit 2 or Unit 2 and Unit 3 or Unit 3 and Unit 1 I&C distribution centers. The I&C distribution centers are normally supplied from their associated battery and charger.

Each Unit's batteries are physically located in separate rooms to minimize their exposure to damage. The associated equipment, including the chargers, is also physically separated from its respective batteries.

To be considered operable, the batteries must be seismically qualified to withstand the maximum hypothetical earthquake as referenced in the Final Safety Analysis Report Section 3.10.

Technical Specification (TS) 3.7.1 (f) 5 states "The 125V DC I&C batteries with associated chargers shall be operable per all the following conditions: (a) Each unit, when in a cold shutdown condition, shall have at least one of that unit's I&C batteries operable; (b) For operation of two or more units, five of the six batteries shall be operable; (c) For operation of Unit 1, three of the following four batteries shall be operable: 1CA, 1CB, 2CA, and 2CB. For operation of Unit 2, three of the following four batteries shall be operable: 2CA, 2CB, 3CA, and 3CB. For operation of Unit 3, three of the following four batteries shall be operable: 3CA, 3CB, 1CA, and 1CB."

TS 3.7.2 (e) 3 states in part "One or more of the following DC distribution components may be inoperable for periods not exceeding 24 hours: Only one battery more than the number allowed to be inoperable per 3.7.1 (f) for the Station may be removed from service under this paragraph."

TS 3.7.9 states "Any degradation beyond Specifications 3.7.2, 3.7.4, 3.7.5, 3.7.6, 3.7.7, and 3.7.8 above shall be reported to the U.S. NRC Regional Office, Region II, within 24 hours. A safety evaluation shall be performed by Duke Power Company for the specific situation involved which justifies

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the safest course of action to be taken. The results of this evaluation together with plans for expediting the return to the unrestricted operating conditions of Specification 3.7.1 above shall be submitted in a written report to the Office of Nuclear Reactor Regulation with a copy to the U.S. NRC Regional Office, Region II, within five days."

EVENT DESCRIPTION

On November 18, 1992, with all three Oconee Units at 100% full power, Component Engineer A (CE-A) was assessing the Unit 2 Instrument and Control (I&C) Batteries for a planned replacement. CE-A was determining the work required for the removal and replacement using the available manufacturer drawing and manuals associated with the batteries.

CE-A noticed three discrepancies between the drawing, manuals and the as-built battery racks:

1. The drawing shows seven vertical front and back side rail supports but the battery rack for the 2CB battery had only six. The other battery in Unit 2 and the batteries in Units 1 and 3 had at least seven with some racks having eight.
2. The manual for "Assembling Earthquake Protection Equipment on Exide All-Steel Battery Racks" requires that a splice plate be bolted over the butt joint when two racks are butted end to end. The two battery racks in Unit 2 and the two battery racks in Unit 3 did not have splice plates. The Unit 1 battery racks had the splice plates.
3. The manual for assembling the typical racks notes that a cell should not be placed over a butt joint. All three units batteries have cells placed over butt joints.

CE-A reported these findings to his supervisor and an investigation was begun to determine the operability of the batteries.

The discrepancy involving a missing vertical support on the 2CB battery was analyzed by referring to the seismic test report (OM 320-145). It was found that six vertical rail supports were sufficient for the seismic operability of the battery. The discrepancy involving the cells mounted over the butt joints of the rack was determined to be a problem only when the racks lack earthquake protection. The discrepancy involving the splice plates missing on Unit 2 and 3 I&C battery racks was determined to be unsatisfactory for seismic qualifications, based on the lack of an engineering analysis for the as built condition.

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At approximately 1200 hours, on November 19, 1992, with all three Oconee Units at 100% full power, the Unit 2 and 3 batteries were declared inoperable. All three Oconee Units entered Technical Specification (TS) 3.7.9, because they share batteries, and notifications were made to the NRC. The missing splice plates and the vertical support were installed. At approximately 1730 hours the seismic deficiencies were corrected for the affected battery racks and the batteries were declared operable.

On November 23, 1992, a report was submitted to the NRC pursuant to TS 3.7.9. outlining the safest course of action and the plans for returning to unrestricted operating conditions as stated below:

"...the batteries were restored in a time commensurate with TS 3.0, shutdown of any Oconee Unit in response to this event would decrease the margin of safety for the power distribution system, the probability of a seismic event while the battery racks were undergoing repair was small, it was unlikely that an actual seismic event would result in the loss of all four batteries, and actual battery capacity is significantly greater than assumed in accident analysis."

A review of the previous work history and interviews with personnel indicated that all battery cells have been replaced on all three units. Interviews with personnel and review of documentation revealed that the racks had not been modified or worked on since the initial installation. The only other racks of this design currently installed at Oconee are non-safety related. They do not require the seismic protection that was found missing on the I&C batteries.

CONCLUSIONS

The root cause of this event is unknown, possible installation deficiency.

The Vital Instrumentation and Control (I&C) battery racks that were found to have missing parts apparently had been incorrect since the initial installation, before the Units were placed on line for commercial operation in 1973. The work history database was searched and no documentation was found to show that these racks had been modified or replaced since that date. However, batteries or individual cells have been replaced on all three units at least once. It may have been necessary to remove parts of the racks to allow cells to be replaced however, it does not appear it would be necessary to remove the splice plates. There were less stringent documentation requirements during the initial installation and during the early operation of the station.

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Current practices require procedural guidance for removal and re-installation on Nuclear Safety Related systems and components. There are no other safety related racks of this type construction at Oconee.

A search of the database for previous events of this nature was conducted. Previous events were not identified over the last two years associated with the Instrumentation and Control batteries however, events were noted where installation deficiencies existed. Considering this event is likely to have been an installation deficiency the event is classified as recurring. The following Licensee Event Reports (LERs) and Problem Investigation Reports (PIRs) were noted to involve installation deficiencies:

LER 287/91-03 "High Pressure Injection System Crossover Flow Transmitter Inoperable Due to Installation Deficiency"

LER 270/91-02 "Flow Orifice Installed Backwards Due to Unknown Cause Results in Degraded Emergency Core Cooling System During Certain Small Break Loss of Coolant Accident Scenarios"

PIR 0-092-0053 "Improperly Installed Penetration Firestops"

Although the event described in this LER is recurring, the corrective actions for the other similar events listed above could not have been expected to prevent this event since the installation occurred many years before the first discovery date. This is considered an event of low frequency and not a wide spread problem.

This event did not involve a component failure or malfunction, therefore it is not NPRDS reportable. This event did not result in the release of any radioactive materials, any radiation exposures or personnel injuries.

CORRECTIVE ACTIONS

Immediate

1. Upon the determination that the seismic capabilities of the racks were suspect, Technical Specification (TS) 3.7.9 was entered on all three units.

Subsequent

1. The missing splice plates and the support were attached to the racks.
2. A report was submitted to the NRC as directed in TS 3.7.9.

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Planned

1. Revise the drawing associated with the positioning of the batteries over the butt joints of the battery racks.

SAFETY ANALYSIS

The potential result of the event described in this report is the inoperability of the Unit 2 and 3 125V DC Vital Instrumentation and Control (I&C) System as the result of a seismic event. The Final Safety Analysis Report (FSAR) Section 15.8 analyzes two scenarios where the 125V DC Vital I&C System is required to assure that safety systems are available to mitigate the consequences of an accident. The scenarios are: a Loss of Coolant Accident (LOCA) on one unit simultaneous with a Loss of Offsite Power (LOOP) on all three Oconee Units and a Station Blackout.

For the Station Blackout scenario, a total loss of AC power is assumed. FSAR Section 15.8.3 states that "Each reactor can sustain a complete electrical power loss without emergency cooling for about 23 minutes before the steam volume in the pressurizer is filled with reactor coolant" and that "beyond this time reactor coolant will boil off, and an additional 83 minutes will have elapsed before the boil off will start to uncover the core". Therefore, the 106 minutes given in the FSAR for core uncovering would allow time for establishing manual actions needed, due to the loss of the I&C batteries and to activate the Standby Shutdown Facility (SSF).

The Standby Shutdown Facility (SSF) could be in service after 10 minutes. It is designed as an independent system to bring all three units to hot shutdown and safely maintain them for 72 hours. The SSF contains independent emergency AC/DC power systems including a diesel generator sized to carry all the loads of the SSF, a Reactor Coolant volume control system, a Steam Generator volume control system, all the necessary controls for operation and support systems.

For the LOCA/LOOP scenario the inoperability of the 125V DC Vital I&C System could result in the complete loss of AC Power. For the units with the LOOP only, the result would be a Station Blackout. For the LOCA unit the possibility exists for exceeding the 10 CFR 100 limits.

The design of Oconee is such that safety related systems are designed to withstand a seismic event, therefore, it is assumed that a seismic event cannot cause a LOCA. The probability of a LOCA and a concurrent independent seismic event is very low.

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The as built condition of the battery racks was reviewed and it was determined that differential movement between racks could damage battery terminals connected by bus bars between battery cells on separate racks. There are two racks fourteen feet long arranged end to end with six support frames spaced at approximately two feet. Thus the frames essentially have continuous support with minimal anticipated differential movement. In addition, the batteries and spacers are in continuous contact along both frames. Due to the size and shape of the batteries and confinement provided by the racks, differential movement between racks would be reduced. Therefore, it is unlikely that the design basis event would have caused all four seismically questionable batteries to fail. An analysis has shown that the functions provided by the batteries could be satisfied with less than all four seismically questionable batteries. The DC systems of all three units are interconnected so that the load of each unit can be shared between batteries in that unit and another unit.

The potential consequences of the event may have been high, but these consequences were mitigated by the probability of failure. The likelihood of the event coupled with station design and inherent strength of the racks resulted in the reduced probability of occurrence. Therefore, the health and safety of the public was unaffected by this event.