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DOCKET #
05000269

SUBJECT: LER 88-014-00: on 881114, sliding links discovered open due to
 mgt deficiency. W/890109 ltr.

W/8 ltr.

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9 1	PAGE (3) 1 OF 0 6
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TITLE (4) Sliding Links Discovered Open Due to Management Deficiency

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)
									Oconee Unit 2		0 5 0 0 0 2 7 0
1	1	4 8 8	8	0 1 4	0 0	0	1	0 9 8 9	Oconee Unit 3		0 5 0 0 0 2 8 7

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9) N	20.402(b)	20.406(e)	50.73(a)(2)(iv)	73.71(b)
	20.406(a)(1)(i)	50.38(e)(1)	50.73(a)(2)(v)	73.71(c)
	20.406(a)(1)(ii)	50.38(e)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iii)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)	
	20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)	
POWER LEVEL (10) 1 0 0	20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	Voluntary

LICENSEE CONTACT FOR THIS LER (12)

NAME Philip J. North, Regulatory Compliance	TELEPHONE NUMBER
	AREA CODE: 7 0 1 4 3 7 1 3 1 7 1 4 5 1 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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On March 11, 1988, a Problem Investigation Report (PIR) was initiated at Catawba Nuclear Station due to the discovery of open sliding links. This discovery was communicated to Oconee Nuclear Station during August, 1988 along with the request to investigate sliding links at Oconee. This inspection lead to the discovery of numerous sliding links which were open and not tagged. This inspection was begun on August 22, 1988 and completed on November 14, 1988. Units 1 and 2 were at approximately 100% power and Unit 3 was in a refueling outage at the start of the inspection. There were no instances of open sliding links on safety related circuits and no safety related equipment inoperabilities occurred due to open sliding links. The root cause of the open links was Management Deficiency, Inadequate Directive. The directive did not include sliding links in its tagging instructions and there was not an audit performed upon implementation of the tagging program. Corrective actions included revision of directives.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9	LER NUMBER (6)			PAGE (3)		
		YEAR 8 8	SEQUENTIAL NUMBER - 0 1 4	REVISION NUMBER - 0 0			
					0 2	OF 0 6	

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

INTRODUCTION:

On March 11, 1988, a Problem Investigation Report (PIR) was initiated at Catawba Nuclear Station due to open sliding links discovered. This discovery was communicated to Oconee Nuclear Station via the General Office Maintenance group during August along with the request to investigate sliding links at Oconee to see if a problem existed. This inspection lead to the discovery of numerous sliding links which were open and not tagged. This inspection was begun on August 22, 1988 and completed on November 14, 1988. Units 1 and 2 were at approximately 100% power and Unit 3 was in a refueling outage at the start of the inspection. There were no instances of open sliding links on safety related circuits and no safety related equipment inoperabilities occurred due to open sliding links. This inspection was in progress when a PIR was issued on October 24 at Oconee as a result of the open sliding links at Catawba Nuclear Station. The link inspection was completed on November 14, 1988. The links which were found open were evaluated and it was determined that there was no effect on the operability of any safety-related or other major equipment.

The root cause of the open links was Management Deficiency, Inadequate Directive. The directive did not include sliding links in its tagging instructions and there was not an audit performed upon implementation of the tagging program. This tagging program was started on February 9, 1984 with the issue of Maintenance Directive 7.5.3 (Work Request Implementation). Contributing causes were the lack of any tagging directive by the Projects group in conjunction with the Nuclear Station Modification process.

BACKGROUND:

During the performance of many maintenance activities, it is necessary to open plant circuits. It is possible to accomplish this through the use of sliding links. A sliding link is a component in an electrical circuit which has a slotted connector which can be loosened and slid to one side to open the circuit without having to lift the leads in a circuit. Sliding links which are opened and left unattended during the performance of the activity are tagged with a blue tag. There are a number of activities which require the opening of sliding links which include Nuclear Station Modifications, routine maintenance, Temporary Modifications, Exempt Changes, or during circuit troubleshooting.

Section 4.3.4 of Maintenance Directive 7.5.3 states that "Section V of the Work Request 'Additional Sheet' will be completed when it is required by a procedure on QA Condition 1 equipment or when a supervisor determines that this section is needed on non-QA Condition 1 work. The persons performing

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9	LER NUMBER (8)			PAGE (3)		
		YEAR 8 8	SEQUENTIAL NUMBER - 0 1 4	REVISION NUMBER - 0 0			
					0 3	OF	0 6

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the work will list the instrument valves to be operated, electrical jumpers to be installed or removed, and/or electrical circuits opened." This directive gives further guidance on the tagging requirements for lifted leads and jumpers.

DESCRIPTION OF INCIDENT:

On February 17, 1984, Maintenance Directive 7.5.3 on Work Request Implementation was issued. This directive gave guidance on the tagging of circuits which were opened as a result of maintenance activities. At the time of this issue, an audit of sliding links was not performed, therefore the number of sliding links which were open prior to this time was not known. On March 11, 1988, a Problem Investigation Report (PIR) was initiated at Catawba Nuclear Station due to the discovery of an open link in the Auxiliary Shutdown Panel. This discovery was communicated to Oconee Nuclear Station via the General Office Maintenance group on August 23, 1988, and resulted in the initiation of an audit of sliding links at Oconee.

During the time period of August 23 until November 14, 1988, a number of sliding links were determined to be open without being appropriately tagged. A PIR was generated on October 24 at Oconee to provide a means of tracking the results of this inspection. This PIR requested that a random inspection of safety related links be performed. Oconee I&E was already performing the link inspection at the time that this PIR was generated and had already adopted the philosophy that all links would be inspected.

On November 7, the safety related link inspection was completed. A letter was generated which outlined the I&E tagging policy and personnel were trained on the contents of this letter. On November 14, the inspection of all links was completed. The inspection identified a large number of open links without appropriate tags. Upon the completion of the inspection, I&E evaluated all open links and concluded that there had been no major equipment inoperabilities caused as a result of open links.

CAUSE OF OCCURRENCE:

It is concluded that the root cause of this incident was a Management Deficiency, Inadequate Directive. This is due to the fact that sliding links were not included in the directions given on tagging in the

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 8	— 0 1 4	— 0 0	0 4	OF 0 6

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

directive and there was not an audit of open links performed upon implementation of Maintenance Directive (M.D.) 7.5.3. Had there been an audit of links at that time, all links which were open at that time would have been discovered. The majority of the links which were open had, per Instrument and Electrical Technical Support Group, probably been open since the implementation of M.D. 7.5.3. However there is no way to establish this as a fact.

There was a contributing cause due to the lack of a tagging policy for links opened during implementation of Nuclear Station Modifications (NSM). There were three instances of NSMs which permanently opened links and did not tag them. Presently there is no direction provided to the craft personnel for the tagging of links which are opened and left unattended during the implementation of a modification.

A review of the last three years shows that a similar incident has not occurred; therefore, this incident is not listed as a recurring event. It is also not NPRDS reportable since there was no Component Failure/Malfunction involved. No radioactive material releases, radiation exposures or personnel injuries occurred as a result of this incident; therefore, the health and safety of the public were not compromised.

CORRECTIVE ACTIONS:

Supplemental corrective action was to:

Perform a link inspection to determine what links in the plant were open and evaluate to determine if any equipment operability concerns existed.

Generate a letter which outlined the tagging policy and train I&E personnel to this policy.

Planned corrective action is for:

Projects to revise Station Directive (S.D.) 2.3.5 (Control of Temporary Modification) to provide tagging requirements for plant configuration control of sliding links.

Compliance to revise Station Directive 2.2.1 (Station Procedures) to provide tagging requirements for plant configuration control of sliding links.

Planning and Scheduling to revise Station Directive 3.2.1 (Work Request) to provide tagging requirements for plant configuration control of sliding links.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9 8 8	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 8	- 0 1 4	- 0 0	0 5	OF	0 6

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

Planning and Scheduling to revise Maintenance Directives as necessary to incorporate plant configuration control tagging requirements for sliding links.

Compliance to provide the lead to ensure that the above planned corrective actions will provide a consistent plant configuration control policy for sliding links at Oconee Nuclear Station.

Construction and Maintenance Department to conduct training on the above revisions to station directives for all personnel working on Nuclear Station Modifications.

Instrument and Electrical to evaluate all open, untagged links discovered and either tag the links or close the links.

Instrument and Electrical to conduct an audit of sliding links to confirm the effectiveness of the established program. Future actions will be determined on the basis of this audit.

Instrument and Electrical to train all personnel on revisions to station directives and maintenance directives changed as a result of this report.

ANALYSIS OF OCCURRENCE:

An evaluation of each affected circuit was performed by the Oconee Instrument and Electrical (I&E) section which stated "In no case were any safety significant circuits found with improperly opened links." The list of open links is extensive, but the vast majority of those links were to computer cables that transmitted indication signals and not control function signals. For many of those computer cables where the shield had open links at the cabinet, the links were closed at the computer; therefore, computer cable protection was not degraded (the desire is to have the links open at one and only one end of the computer cables). Other affected circuits were of a non-significant nature (e.g., circuit for office area page in the old security trailer, and open links to equipment that is no longer in service).

The most noteworthy open links are B-43, B-44, B-45 and B-46. These links are part of the Main Feeder Bus (MFB) monitoring relay 1RE-2 and, by being open, prevented the automatic start of the 1A High Pressure Injection (HPI) [EIIS:BQ] pump if power had been lost and restored to the MFB. (The automatic start function is valid only if the pump switch is in "AUTO"). The ability to start by manual initiation or by an Engineered Safeguards (ES) signal was not affected. The 1B HPI pump would have automatically started upon power returning to the main feeder buses and would have been

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9 8 8	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0	1	4	0	0 6 OF 0 6

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sufficient to provide all necessary flows for Reactor Coolant (RC) [EIIS:AB] Makeup and RC Pump Seal Injection. The need for only one pump is consistent with the instructions in "Loss of Power" procedure, which instructs the operator to verify that at least one HPI pump is operating. If for some unforeseen reason the 1B HPI pump did not start, the operator would have manually started the 1A and/or 1C HPI pump. Any ES signal generated before the verification of the HPI pumps would have started the pumps.

Coinciding with the open links, the 1RE-2 relay coil circuit was open. This open coil prevented the automatic starting of the standby Component Cooling (CC) [EIIS:CC] pump. The manual start capability was not affected. Like the 1A and 1B HPI pumps, the two CC pumps are designed to start, if selected, after power is lost and restored on the main feeder buses. Only one pump is needed and the normally operating pump would have automatically started. As before, the loss of power procedure instructs the operator to verify the status of the CC system and to start a pump if necessary.

The open links did not cause any incidents nor did they degrade any safety functions; therefore, the health and safety of the public were not affected.

Duke Power Company
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Hal B. Tucker
Vice President
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DUKE POWER

January 9, 1989

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

Subject: **Oconee Nuclear Station**
Docket Nos. 50-269, -270, -287
LER 269/88-14

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report (LER)269/88-14 concerning open sliding links. 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/1er2

Attachment

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11