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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-007-00:on 920630,Tech Spec violated when inappropriate boric acid addition flow path was used.Caused mgt deficiency.Heat tracing added to piping in question & sys evaluated for heat trace needs./920805 ltr.

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DUKE POWER

August 5, 1992

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

Subject: Oconee Nuclear Site
Docket Nos. 50-269, -270, -287
LER 269/92-07

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 269/92-07, concerning a Technical Specification violation.

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,

J. W. Hampton
Vice President

/ftr

Attachment

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IE28 1/1

NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oconee Nuclear Station, All Units	0 5 0 0 0 2 6 9	1 OF 0 7

TITLE (4) Management Deficiency Leads To Technical Specification Violation When An Inappropriate Boric Acid Addition Flow Path Was Used

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 6	3 0	9 2	9 2	— 0 0 7	— 0 0	0 8	0 5	9 2	Oconee, Unit 2	0 5 0 0 0 2 7 0
									Oconee, Unit 3	0 5 0 0 0 2 8 7

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	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)(B)	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
S. G. Benesole, Safety Review Group	8 0 3 — 8 8 5 — 3 5 1 8

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)

ABSTRACT

On June 30, 1992 at 0750 hours, Oconee Units 1, 2 and 3 were operating at 100 percent Full Power. A visual inspection determined that heat tracing did not exist on part of the bleed flush header associated with the "B" bleed transfer pump for Unit 1. The same was assumed (and later verified) for Units 2 and 3. The original design did not include heat tracing because this section of piping was designed to move demineralized water. In 1977, the procedure was changed to allow this flow path to be used as a Technical Specification required flow path for highly concentrated boric acid. Heat tracing was overlooked during the procedure review. The heat tracing is required to prevent high concentrations of boron from crystallizing in the line. The absence of the heat tracing makes the line inoperable with respect to the requirements of Technical Specifications. The root cause of this event was Management Deficiency: Procedure Control Process (deficient procedure review and maintenance process). A contributing cause to this event is Design Deficiency: Deficient Documentation. Corrective actions include adding heat tracing to the piping in question and evaluating other Oconee systems for heat trace needs.

BACKGROUND

The Coolant Storage System (EIIS:KA) contains the Bleed Holdup Tanks (BHUT), the Concentrated Boric Acid Storage Tank (CBAST) and the associated pump (one per unit) and piping. Two BHUT's are supplied for each reactor unit. Each tank contains a volume approximately equal to one Reactor Coolant System (RCS) (EIIS:AB) volume. The tanks for all three units are interconnected.

Bleed Transfer Pumps are sized for 150 gallons per minute (gpm) of flow and are used to transfer liquids from the BHUT's. The pumps are interconnected on both the suction and discharge sides for flexibility of operation. The pumps can be aligned to take suction from the CBAST.

The "B" bleed transfer pump normally supplies:

* demineralized water for dilution and makeup to the RCS via the Letdown Storage Tank (LDST) in the High Pressure Injection (HPI) System (EIIS:BJ).

* water for rinsing and backflushing demineralizer resins.

The "A" bleed transfer pump normally:

* supplies makeup to the RCS with borated water for normal plant control.

* transfers the bleed to the Radwaste System for processing.

* transfers bleed to other holdup tanks as needed.

The CBAST is a 3000 cubic foot tank that can be used for makeup to the RCS. It normally contains 5 to 8 percent by weight boric acid. Technical Specifications require the temperature of the CBAST to be at least 10 degrees F above the crystallization temperature of the boron in solution. The CBAST pump is a 10 gpm positive displacement pump which can supply the highly concentrated boric acid to the LDST at a controlled rate.

Normally, the CBAST pump is used to borate the RCS. When the CBAST pump is out of service, a Technical Specification Interpretation allows the bleed transfer pumps (preferably the "A" bleed transfer pump) to take suction from the CBAST and borate the RCS.

Technical Specification 3.2.2 requires at least one source of concentrated soluble boric acid per unit. Also, system piping and valves necessary to establish a flow path from the tank to the HPI System shall be operable and shall have the same temperature requirements as the CBAST. To be operable, at least one channel of heat tracing (EIIS:FD) shall be in operation.

EVENT DESCRIPTION

In the early 1970's, a vendor designed the circuitry for heat tracing at Oconee based on criteria established by Duke Power Company. Heat tracing was not designed for pipe located in a pipe trench downstream of the "B" bleed transfer pumps nor was it installed when Duke Power Company installed the heat tracing.

On March 29, 1977, procedure OP/1/A/1103/04, "Soluble Poison Concentration Control," was revised to allow the "B" bleed transfer pump to align to the Concentrated Boric Acid Storage Tank (CBAST). OP/2/A/1103/04 (on April 20, 1977) and OP/3/A/1103/04 (on March 31,1977) had similar revisions. This alignment was considered acceptable if the CBAST pump was out of service and the "A" bleed transfer was out of service or lined up to the "A" Bleed Holdup Tank. Prior to the procedure change, the "B" bleed transfer line was not used to borate the Reactor Coolant System.

On May 7, 1981, a Technical Specification (TS) Interpretation was issued that clearly defined the "B" bleed transfer pump path as an acceptable flow path to meet the requirements of TS 3.2.2. Part of the bases for the interpretation states that heat tracing is installed on the necessary lines. The Interpretation was reissued in 1984 and again in 1986.

On December 29, 1988, personnel at the Catawba Nuclear Station discovered an error in their Technical Specifications. The Boric Acid Tank volume curves allowed a tank level below the level required for the pump net positive suction head. This was documented in LER 414/89-09 and subsequently entered into Duke Power's Operating Experience Program (OEP). As a result of this, Oconee Engineering began a review of Coolant Storage System with a particular focus on the pressure drop calculations for the pumps.

Independently, a design study on heat tracing was begun on December 6, 1990. The scope for the design study was to survey all electric heat trace circuits and determine the correct panelboard and breaker for each. This information was to be placed on Oconee flow diagrams. The scope was expanded to determine what piping systems require heat tracing and also the required temperature settings.

Early in 1992, the Nuclear Regulatory Commission's (NRC) Resident Inspector raised a question about the CBAST concentration curves at Oconee.

Because of the OEP item at Catawba, the independent design study and the NRC's questions, Engineering Supervisor A decided to review the heat tracing to verify the flow paths permitted by the Technical Specification Interpretation. In April, 1992, he sent a "red marked" copy of the flow diagrams to Engineer A (who was participating in the heat tracing Design Study) to verify that heat tracing existed on the lines. Engineer A could not verify from available documentation (or drawings) that heat tracing

existed in the pipe trenches downstream of the "B" bleed transfer pumps. He recommended that the heat tracing be visually verified.

On June 1, 1992, Work Requests (92033340 for Unit 1, 92033342 for Unit 2, and 92033345 for Unit 3) were written to visually determine if the heat tracing existed on the pipe in the trench. On June 7, 1992, a visual inspection discovered that heat tracing was not installed on Unit 1.

On June 30, 1992, it was assumed that a similar problem existed on Units 2 and 3 and a Problem Investigation Report (PIR) was initiated. It mistakenly indicated that the flow path through the "A" bleed transfer pump was not heat traced. On July 7, 1992, a letter was sent to the Unit Managers and Shift Supervisors to communicate that the "A" bleed transfer flow path was not available as the "operable" flow path per Technical Specifications.

The heat tracing was verified to be missing for Units 2 and 3 on July 20, 1992.

The PIR was discovered to be incorrect during this investigation and was corrected on July 23, 1992. Operations personnel were notified of the mistake. Further notifications of licensed personnel were made via Shift Turnovers. A subsequent review of the Reactor Operator's Log determined that the CBAST pumps were operable between June 7, 1992 and July 23, 1992. There was no indication that the "B" bleed transfer pump flow path was considered the "operable" TS flow path during this time.

CONCLUSIONS

The Technical Specification (TS) Interpretation for section 3.2.2 allows a flow path from the Concentrated Boric Acid Storage Tank (CBAST) through the "B" bleed transfer pump to the Reactor Coolant System. However, this is contrary to TS 3.2.2 which requires heat tracing for the flow path to be considered operable. Since part of the "B" bleed transfer pump flow path is not heat traced, it cannot be used as the "operable" flow path from the CBAST.

From discussions with Operations personnel, it was determined that this option of using the bleed transfer pumps has been utilized in the past when the CBAST pump was unavailable. The "A" bleed transfer pump is the preferable back-up because the "B" bleed transfer lines are usually used for demineralized water. The "A" bleed transfer pump is usually available but, it would be difficult to prove that it was always the available flow path. Further discussions indicated that there have not been any problems with boron crystallizing in the line.

Although the flow path exists, it was not originally designed to be used for this purpose. The procedure was changed in 1977 to exercise the flexibility of the system without realizing the design limitations of the system. The root cause of this event is Management Deficiency: Procedure Control Process (deficient procedure review and maintenance process). The reviews done for the procedure changes and the TS Interpretation were not adequate to assure consistency with the design of that line. While the flow drawings were vague and unclear, there were other drawings and resources available which better defined where heat tracing was installed.

The procedure review process has been enhanced in the last few years. Some of these enhancements are:

* Qualified Reviewer Training.
* Enhanced 10CFR50.59 evaluation process for procedure review.
* Design Basis Documents are available for several systems to explain the design and operation of the systems.

These enhancements should reduce the probability of a recurrence of this event.

A contributing cause of this event is Design Deficiency: Deficient Documentation. The flow drawings used at the time of the procedure change and TS Interpretations were vague and not clearly marked with heat tracing. The current flow diagrams do not clearly show where heat tracing is installed. In the case of the Unit 2 flow diagrams, heat tracing is incorrectly shown as installed on the pipe in the trench. If the drawings were clearly marked, the event could have been prevented.

The problems associated with the timelyness of reporting of this event appear to be the result of assigning a low priority to the Work Request and less than adequate communications.

This is a non-recurring event based on a review of the Problem Investigation Report database.

This event did not involve the failure of equipment; therefore, there is no NPRDS reportability. There were no radioactive releases, radiation overexposures, or personnel injuries associated with this event.

CORRECTIVE ACTIONS

Immediate

None

Subsequent

1) The Shift Supervisors and Unit Managers were notified that the "B" bleed transfer pumps and associated flow path cannot be utilized as the "operable" Concentrated Boric Acid Storage Tank flow path. This information was communicated to other licensed personnel via the shift turnover sheets.

Planned

1) Heat tracing will be added to the piping in order to qualify the "B" bleed transfer flow path for boric acid addition.

2) Design Study ONDS-0295, "Heat Trace Design Study" will be completed. The associated recommendations will be evaluated for implementation.

3) Technical Specification Interpretations will be reviewed for technical adequacy and to assure that references are adequately documented.

SAFETY ANALYSIS

The Concentrated Boric Acid Storage Tank (CBAST) contains 5 to 8 percent by weight boric acid which is used to control excess reactivity in the reactor. The CBAST (or an alternate source of borated water) is necessary to borate the reactor during forced shutdowns and can be used to mitigate a deboration accident.

Section 9.3.1 of the Final Safety Analysis Report (FSAR) states that the Chemical Addition System (and therefore the CBAST) performs no emergency function. The CBAST is not addressed in the design basis accidents defined in section 15 of the FSAR.

The bleed transfer pumps are interconnected on both the suction and discharge sides for flexibility of operation. They can also take suction from the CBAST. The "A" bleed transfer pump is the preferred back-up to the CBAST pump because the "B" bleed lines are usually for demineralized water. The "A" bleed transfer line is normally available when the CBAST is out of service but, it could not be verified that the "B" bleed alignment was never used.

Besides the CBAST, boron can be added from the Bleed Holdup Tanks, the Borated Water Storage Tank, the Boric Acid Mixing Tank and similar tanks from the other units. So there are redundant sources and flow paths for boration of the reactor.

Discussions with operations personnel indicate that there has never been a problem with boron crystallizing in the "B" bleed transfer pump flow path. The health and safety of the public was not affected by this event.