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Southern Nuclear Operating Company
the southern electric system

November 18, 1994

Docket No.: 50-348

10 CFR 50.73

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

Joseph M. Farley Nuclear Plant—Unit 1
Licensee Event Report No. 94-005-00
Missile Protection for Condensate Storage Tanks

Gentlemen:

Joseph M. Farley Nuclear Plant Licensee Event Report No. 94-005-00 is being submitted in accordance with 10 CFR 50.73. If you have any questions, please advise.

Respectfully submitted,

Dave Morey
Dave Morey

DPH/clt:lervasb.doc

Enclosure

cc: Mr. S. D. Ebnetter
Mr. B. L. Siegel
Mr. T. M. Ross

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH 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) Joseph M. Farley Nuclear Plant - Unit 1										DOCKET NUMBER (2) 05000348				PAGE (3) 1 OF 4						
TITLE (4) Missile Protection for Condensate Storage Tanks																				
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											
1	0	2	1	9	4	9	4	0	0	5	0	0	1	8	9	4	J.M. Farley Unit 2 05000364			
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 7: (Check one or more of the following) (11)																		
POWER LEVEL (10)		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)						
1		20.405(a)(1)(i)				50.38(c)(1)				50.73(a)(2)(v)				73.71(c)						
1		20.405(a)(1)(ii)				50.38(c)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
0		20.405(a)(1)(iii)				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)(vii)(B)										
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)										
LICENSEE CONTACT FOR THIS LER (12)																				
NAME R.D. Hill, General Manager - Nuclear Plant										TELEPHONE NUMBER										
										AREA CODE 205899-5156										
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																				
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD										
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR					
☐ YES (If yes, complete EXPECTED SUBMISSION DATE)												☒ NO								

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

On October 21, 1994, during a self-initiated safety system assessment (SSSA) of the auxiliary feedwater system [BA], the assessment team identified several connections to the Unit 1 and Unit 2 condensate storage tanks (CSTs) that were not missile protected. The lack of missile protection for these connections was an oversight of the design organization.

The Farley Nuclear Plant (FNP) Final Safety Analysis Report (FSAR), Section 9.2.6.6, states: "The lower 12 feet of the tank is designed to withstand any ruptures caused by missiles." The intent of the missile protection design requirement is to ensure a volume of 150,000 gallons is maintained in the CST, as required by Technical Specifications. Missile protection requirements had not been considered for the subject connections on the CSTs.

Probabilistic risk analysis techniques indicate that the increase in the probability of an accident due to the lack of missile protection on the subject connections to the CSTs is negligible. Therefore, the FNP FSAR has been revised to include the missile protection analysis results and to delete the requirement for missile protection for the subject CST connections.

FNP concludes that this is not a generic problem, in that eight SSSAs performed over the last five years have not revealed a generic deficiency in the area of missile protection for safety-related structures. Also, it has been verified that the refueling water storage tanks and the reactor makeup water storage tanks, structures similar to the CST, are adequately missile-protected.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH 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.

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

Plant and System Identification

Westinghouse -- Pressurized Water Reactor

Energy Industry Identification System codes are identified in the text as [XX].

Description of Event

On October 21, 1994, during a self-initiated safety system assessment (SSSA) of the auxiliary feedwater (AFW) system [BA], the assessment team identified several connections to the Unit 1 and Unit 2 condensate storage tanks (CSTs) that were not missile protected. The subject connections are:

1. drain connections on Unit 1 & 2 CSTs,
2. sensing lines for the level transmitters,
3. 6" diameter nozzle and isolation valve on Unit 2,
4. 6" diameter vacuum degasifier suction line on Unit 1

The Farley Nuclear Plant (FNP) Final Safety Analysis Report (FSAR) Section 9.2.6.6 states: "The lower 12 feet of the tank is designed to withstand any ruptures caused by missiles." The intent of the missile protection design requirement is to ensure a volume of 150,000 gallons is maintained in the CST, as required by Technical Specifications. Missile protection requirements had not been considered for the subject connections on the CSTs.

Probabilistic risk analysis techniques indicate that the increase in the probability of an accident due to the lack of missile protection on the subject connections to the CSTs is negligible. Therefore, the FNP FSAR has been revised to include the missile protection analysis results and to delete the requirement for missile protection for the subject CST connections.

Cause of Event

The lack of missile protection for these connections was an oversight of the design organization.

The drain lines and instrument sensing lines are part of the original plant design. Design documentation for the drain connections does not identify that the requirement for missile protection was considered, although the drains are enclosed in an open concrete barrier. The instrument lines are small diameter piping and tubing. The detail designs for their installation were prepared in the field during construction. The design documents prepared off-site and used for on-site design of the sensing lines did not indicate that missile protection was required.

The 1979 design to modify the CSTs for installation of a vacuum degasifier did not indicate that missile protection was required.

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TEXT (If more space is required, use additional NRC Form 356A's)(17)

Safety Assessment

Probabilistic risk analysis techniques indicate that the increase in the probability of an accident due to the lack of missile protection on the subject connections to the CSTs is negligible. This risk assessment is documented in Southern Nuclear Operating Company Technical Services calculations.

Calculations of the impact frequency with which a tornado-induced missile could strike the CST exposed connections and piping are on the order of $1.0E-08/\text{yr}$. An estimate of the core damage frequency (CDF), given a loss of offsite power with no AFW available (due to the tornado and the tornado-induced missile damaging the CST), is on the order of $1.0E-09/\text{yr}$. Both calculations are based on conservative assumptions. In particular, the CDF assumes a complete loss of AFW as a result of damage to the CST. A loss of CST inventory would be detected in a timely manner by plant operators via main control board (MCB) alarms, MCB CST level indicators and operator rounds in the area of the CST. Furthermore, service water is available as a back-up supply to the AFW pumps. These mitigating factors would allow the recovery of AFW which would result in lowering the calculated CDF considerably.

Corrective Action

Interim measures taken until the requirement for missile protection was removed from the FSAR included; a) the vacuum degasification isolation valve was closed and tagged, b) plugging apparatus for the applicable connections were stationed for each Unit's CST.

Probabilistic risk analysis techniques indicate that the increase in the probability of an accident due to the lack of missile protection on the subject connections to the CSTs is negligible. Therefore, the FNP FSAR has been revised to include the missile protection analysis results and to delete the requirement for missile protection for the subject CST connections.

FNP concludes that this is not a generic problem, in that eight SSSAs performed over the last five years have not revealed a generic deficiency in the area of missile protection for safety-related structures. Also, it has been verified that the refueling water storage tanks and the reactor makeup water storage tanks, structures similar to the CST, are adequately missile-protected.

The current Design Change Package (DCP) preparation process requires more rigorous attention to identification, documentation and verification of design inputs than at the time of this oversight. Specifically, before detailed design begins, a Design Input Record (DIR) is prepared and reviewed by the engineering disciplines. The intent is to identify and formally document design requirements before detailed design begins.

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0	5	0	0	0	3
4	8	9	4	-	0
0	5	-	0	0	0

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TEXT (if more space is required, use additional NRC Form 856A's)(17)

In addition, a Design Verification Record (DVR) is prepared during review of the DCP. This document is prepared by the disciplines involved in the detailed design to verify that the design inputs identified on the DIR are adequately addressed by the design information in the DCP. The formal review process in effect at the present time will reduce the chances of a similar type of oversight from recurring.

Additional Information

A one hour non-emergency notification was made pursuant to 10CFR50.72 (b)(1)(ii)(B).

No similar events have been reported by Farley Nuclear Plant.