

Vito A. Kaminskas
Vice President440-280-5382
Fax: 440-280-8029January 16, 2012
L-12-019

10 CFR 50.73(a)(2)(ii)(B)

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001SUBJECT:
Perry Nuclear Power Plant, Unit 1
Docket No. 50-440, License No. NPF-58
Licensee Event Report Submittal

Enclosed is Licensee Event Report (LER) 2011-004, Flooding Calculation Deficiency Results in Unanalyzed Condition. There are no regulatory commitments contained in this submittal.

If there are any questions or if additional information is required, please contact Mr. Robert Coad, Manager – Regulatory Compliance, at (440) 280-5328.

Sincerely,



Vito A. Kaminskas

Enclosure:
LER 2011-004cc: NRC Project Manager
NRC Resident Inspector
NRC Region IIILE22
NAA

LICENSEE EVENT REPORT (LER)
(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE
Flooding Calculation Deficiency Results in Unanalyzed Condition

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	16	2011	2011	- 004	- 00	01	16	2012	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)										
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)							
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)							
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)							
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)							
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)							
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER								
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A								

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Robert Swartz, Compliance Engineer, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) (440) 280- 7664
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE). <input type="checkbox"/> NO		03	19	2012

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

On November 16, 2011, at 2000 hours, it was determined that internal flooding calculation JL-083 contained undocumented assumptions regarding operator actions required to isolate a postulated Service Water system piping Moderate Energy Line Crack in the Control Complex Building.

The preliminary results of the ongoing investigation indicate that the cause of this event was a calculation deficiency that credited operator actions to perform the appropriate system isolations without the actions delineated in operating procedures. This deficiency existed since the original preparation and approval of the calculation (i.e., August 27, 1982). Corrective actions included development of procedural guidance to direct all required operator actions and installation of a temporary flood barrier. A permanent flood barrier will be installed in accordance with plant processes. A probabilistic risk assessment was performed and this condition was determined to have low safety significance.

This condition is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B) as a condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety. A supplemental report will be submitted after completion of the apparent cause evaluation.

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NARRATIVE

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

INTRODUCTION

On November 16, 2011, at 2000 hours, an immediate investigation was completed concerning the adequacy of internal flooding calculation JL-083 for Service Water [KG] system piping in the Control Complex Building [NA]. The investigation concluded that the original analysis assumed operator actions were required to mitigate flooding and existing procedures lacked guidance required to accomplish these actions.

This condition is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B) as a condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety.

EVENT DESCRIPTION

On November 16, 2011, at 2000 hours, with the plant operating in MODE 1 at 100 percent rated thermal power, a deficiency in internal flooding calculation JL-083 was identified. The deficiency could adversely affect the ability to achieve and maintain safe shutdown in the event of a Service Water system piping Moderate Energy Line Crack (MELC) in the Control Complex Building. The calculation presumed operator action is required to isolate the leak however, it did not prescribe what actions are necessary. The deficiency was determined to be reportable in accordance with 10 CFR 50.72(b)(3)(ii)(B) as an immediate notification (8 hour) and an Event Notification (ENF No. 47508) was made on December 7, 2011, at 1829 hours. This notification was made late.

Guidance was subsequently developed by engineering and provided to operators for a leak mitigation strategy in Operations Night Order, "Control Complex Flooding Evaluation." On November 22, 2011, at 1957 hours, a prompt functionality assessment was completed that provided more efficient compensatory measures for mitigating flooding from the Service Water system.

CAUSE OF EVENT

The preliminary results of the ongoing investigation indicate that the cause of this event was a calculation deficiency that credited operator actions to perform the appropriate system isolations without the actions delineated in operating procedures. This deficiency existed since the original preparation and approval of the calculation (i.e., August 27, 1982). The calculation did not specify what actions in the form of valve manipulations were required to ensure safe shutdown equipment was not compromised in the event of a line crack in the Service Water system.

EVENT ANALYSIS

Calculation JL-083 evaluates building flooding resulting from a postulated Service Water system pipe crack in the Control Complex Building. The concern associated with this event is the potential impact to safe shutdown equipment including Control Complex Chilled Water [KM] pump motors and Emergency Closed Cooling Water system (ECCW) [CC] pump motors located in Control Complex Building elevation 574. In addition, water may enter the Auxiliary Building [NF] by passing under door IB-103 and impact instrumentation for the Emergency Core Cooling and Reactor Core Isolation Cooling systems located on the Auxiliary Building elevation 568. On November 10, 2011, at 1355 hours, a review of this calculation determined that actions required to mitigate this postulated flooding scenario were not specified.

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On November 16, 2011, at 2000 hours, an immediate investigation of this issue was accepted by the control room. Per the immediate investigation, leakage would be detected as a sump alarm that would initiate a control room annunciator and operators would respond in accordance with Alarm Response Instruction (ARI) ARI-H13-P970-0001-F8, "Control Complex Laundry Sump Water Level Hi." The procedure had operators check for flooding and, if flooding exists, either stop the running pumps or isolate the leak. The calculation considers that the system is isolated from the crack at 30 minutes but does not specify actions needed to limit system drain down.

A strategy for flood mitigation was provided in the immediate investigation and was given to operators via Operations Night Order, "Control Complex Flooding Evaluation." The strategy included closure of specific valves depending on the location of the crack and opening specific vent valves to break siphon and limit drain down volume. The immediate investigation concluded that with all required operator actions being completed within 90 minutes from the start of the event, no safe shutdown equipment would be adversely affected.

On November 22, 2011, at 1957 hours, a prompt functionality assessment was accepted by the control room. The assessment modified actions prescribed in the immediate investigation to increase efficiency. The modified actions included elimination of leakage into the Auxiliary Building by installation of a temporary flood barrier thereby eliminating the requirement to close valves to isolate the leak. On November 23, 2011, ARI-H13-P970-0001-F8 was revised to incorporate the modified actions.

A Probabilistic Risk Assessment (PRA) evaluation was performed for the condition in which a postulated flooding event associated with the Control Complex Building lower elevation could have been improperly addressed. The difference between the mitigating strategies put into place as a result of this condition and the previous strategies documented in procedures indicates a delta Core Damage Frequency (CDF) of 7.86E-07. Based on the analysis, the event is below the threshold for being risk significant (increase in CDF is less than 1.0E-06), and is viewed as having low safety significance.

CORRECTIVE ACTIONS

Operations Night Order, "Control Complex Flooding Evaluation," was developed as an interim action until procedure changes were implemented.

A temporary flood barrier has been installed to minimize required operator actions.

ARI-H13-P970-0001-F8 has been revised to delineate actions described in the prompt functionality assessment which include securing pumps and opening vent valves to break siphon.

A modification will be prepared to install a permanent 18 inch high flood barrier in the Control Complex Building at door IB-103.

Calculations JL-083 and JL-061 (Auxiliary Building Flooding Analysis) will be reviewed to ensure that implicit operator actions are included to mitigate postulated internal flooding due to moderate energy line cracks. The calculations will be revised to include the specific actions (including timing of the actions) and interfaced with Operations to ensure that they can be performed. Operations will be formally tied into the revisions via a Design Interface Evaluation. The need to review calculation JL-061 was identified during the transportability review of the ongoing investigation.

A supplemental report will be submitted upon completion of the ongoing apparent cause evaluation.

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PREVIOUS SIMILAR EVENTS

A review of Licensee Event Reports and the corrective action database for the past three years determined that two similar events had occurred.

LER 2009-002, "Diesel Generator CO2 Fire Suppression Control Panel Miswiring Results in an Unanalyzed Condition," documented a condition where a wiring error resulted in inappropriate response of Division 2 and 3 diesel generator ventilation upon CO2 actuation.

The corrective actions associated with this event focused on improved procedural guidance with respect to post maintenance/modification testing and the wire mark configuration control process. These corrective actions would not have reasonably been expected to have prevented the event documented in LER 2011-004.

LER 2011-001, "Fire Protection Design Vulnerability Results in an Unanalyzed Condition," documented a legacy design issue that made the plant vulnerable to a hot short in the event of a postulated control room fire, which could result in a loss of the capability to safely shutdown the plant.

The corrective actions associated with this event focused on implementation of a permanent plant modification to isolate the affected circuits and review of other circuits for similar condition. These corrective actions would not have reasonably been expected to have prevented the event documented in LER 2011-004.

COMMITMENTS

There are no regulatory commitments contained in this report. Actions described in this document represent intended or planned actions, are described for the NRC's information, and are not regulatory commitments.