



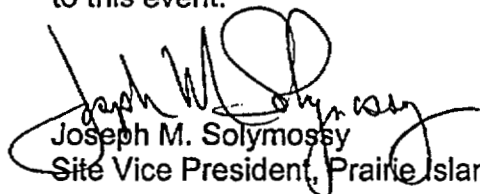
May 23, 2003

L-PI-03-047
10 CFR 50.73

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

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
DOCKET NOS. 50-282 AND 50-306
LICENSE NOS. DPR-42 AND DPR-60
LER 1-03-02, APPENDIX R SAFE SHUTDOWN ANALYSIS ISSUES

The Licensee Event Report for this occurrence is attached. In the report, we made no new NRC commitments. Please contact us if you require additional information related to this event.


Joseph M. Solymossy
Site Vice President, Prairie Island Nuclear Generating Plant

CC Regional Administrator, USNRC, Region III
Project Manager, Prairie Island Nuclear Generating Plant, USNRC, NRR
NRC Resident Inspector – Prairie Island Nuclear Generating Plant
Glenn Wilson, State of Minnesota

Attachment

JE22

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing collection and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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.

FACILITY NAME (1)

Prairie Island Nuclear Generating Plant Unit 1

DOCKET NUMBER (2)

05000 282

PAGE (3)

1 OF 5

TITLE (4)

APPENDIX R SAFE SHUTDOWN ANALYSIS ISSUES

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	26	03	03	02	00	05	23	03	Prairie Island Unit 2	05000 306
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)							
1			20.2201(b)		20.2203(a)(3)(ii)	√	50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)	
POWER LEVEL (10)			20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)	
100			20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)	
[REDACTED]			20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)	
			20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER	
			20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)			
			20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)			
			20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)			
			20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)			

LICENSEE CONTACT FOR THIS LER (12)

NAME
Jeff Kivi

TELEPHONE NUMBER (Include Area Code)
651-388-1121

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

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

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 15 single-spaced typewritten lines) (16)

In August 2002, a Nuclear Management Company (NMC) evaluation of potential flow diversion (an ongoing assessment of the extent of a similar condition reported in LER 1-98-15) was in progress. At this point in the evaluation, NMC identified (as a conservative measure prior to completing the detailed evaluation) interim actions to preclude the potential for adversely affecting safe shutdown. Before the interim actions were implemented the potential existed for adverse effects on safe shutdown.

On March 26, 2003, with both units operating at 100% power, the completed evaluation determined that, absent compensatory measures, the ability to safely shutdown could have been adversely affected in two cases. In the first case, a fire postulated in certain Fire Areas could result in a spurious start of a containment spray (CS) pump and spurious opening of its associated discharge motor-operated valve (MOV), which would divert the sole credited source of reactor coolant system (RCS) makeup - the refueling water storage tank (RWST) - into containment. In the second case, the scavenging and combustion air dampers for the diesel-driven emergency cooling water pumps (which are required to open when the associated pump operates) were found to be vulnerable to postulated fires in certain Fire Areas.

Upon completing the evaluation, the interim actions implemented in August 2002 were assessed and found to be effective compensatory measures until corrective actions are completed.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	03	02	00	2 OF 5

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

EVENT DESCRIPTION

In August 2002, a Nuclear Management Company (NMC) evaluation of potential flow diversion (an ongoing assessment of the extent of a similar condition reported in LER 1-98-15) was in progress. At this point in the evaluation, NMC identified (as a conservative measure prior to completing the detailed evaluation) interim actions to preclude the potential for adversely affecting safe shutdown. Before the interim actions were implemented the potential existed for adverse effects on safe shutdown.

On March 26, 2003, with both units operating at 100% power, the completed evaluation determined that, absent compensatory measures, the ability to safely shutdown could have been adversely affected in two cases. In the first case, a fire postulated in certain Fire Areas (FA 13/18 – Control Room/Relay Room complex or FA 58/73 – 695' elevation of the Auxiliary Building) could result in a spurious start of a containment spray¹ (CS) pump² and spurious opening of its associated discharge motor-operated valve³ (MOV), which would divert the sole credited source of reactor coolant system⁴ (RCS) makeup - the refueling water storage tank⁵ (RWST) - into containment.

In the second case, the scavenging and combustion air dampers⁶ (CD-34136 and CD-34139) for the diesel-driven emergency cooling water⁷ pumps (which are required to open when the associated pump operates) were found to be vulnerable to postulated fires in certain Fire Areas (FA 18 – Relay Room; FA 29 – Administrative Building, Electrical and Piping Room #1; FA 30 – Administrative Building, Electrical and Piping Room #2; FA 31 – Train A Hot Shutdown Panel and Air Compressor Room; FA 32 - Train B Hot Shutdown Panel and Air Compressor Room; FA 37 – Unit 1 480V Normal Switchgear Room; FA 38 – Unit 2 480V Normal Switchgear Room; FA 41B – Screenhouse Basement; and FA 58 – 695' elevation of the Auxiliary Building.)

Upon completing the evaluation, the interim actions implemented in August 2002 were assessed and found to be effective compensatory measures until corrective actions are completed.

¹ EIS System Code: BE

² EIS Component Identifier: P

³ EIS Component Identifier: V

⁴ EIS System Code: AB

⁵ EIS Component Identifier: TK

⁶ EIS Component Identifier: DMP

⁷ EIS System Code: BI

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

CAUSE OF THE EVENT

The apparent cause of the condition was an oversight during the completion of the safe shutdown analysis (SSA). A similar flow diversion was previously identified and reported in Licensee Event Report (LER) 1-98-15. The current conditions were identified as a result of corrective actions taken in response to LER 1-98-15.

ANALYSIS OF THE EVENT

A fire may affect all components and result in a spurious start of both trains of both units' CS pumps and spurious opening of the pumps' discharge MOVs. While operator action can be taken to verify that the CS pumps are tripped at their source breakers, until the implementation of the interim actions in August 2002, these steps to specifically prevent the potential flow diversion were not included in plant procedures.

Potential flow diversion due to spurious CS pump and discharge MOV actuation can (absent compensatory measures) adversely affect safe shutdown (per 10 CFR 50 Appendix R) for a fire in Fire Areas 13, 18, 58, or 73. In this case, the sole credited source of RCS makeup – the RWST – could be diverted into containment due to inadvertent containment spray, thereby impacting the ability to safely shutdown. While not credited, there are other potential sources of RCS makeup that are potentially unaffected by the postulated fire, these include the Volume Control Tank⁸ (for FAs where the charging pumps⁹ are credited) and the Boric Acid Storage Tank¹⁰. Also, normal means of filling the RWST may be available and there may be means to reclaim inventory from containment via the Residual Heat Removal (RHR) system¹¹.

For postulated fires in Fire Areas 18, 29, 30, 31, 32, 37, 38, 41B, and 58, cables associated with CD-34136 and CD-34139 could be affected, such that the dampers would fail to the closed position (per the room heat-up analysis of record, the dampers must be open to support long term operability of the diesel-driven cooling water pumps.) While not credited, there are other means to open the scavenging air control dampers, these include existing guidance in an abnormal operating procedure to locally isolate the air supply and vent off the pressure to the solenoid valves associated with CD-34136 and CD-34139.

Per the guidance of NUREG 1022, Revision 2, both of these conditions have been determined to be reportable per 10CFR 50.73 (a)(2)(ii)(B) as conditions that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety.

⁸ EIS Component Identifier: TK

⁹ EIS Component Identifier: P

¹⁰ EIS Component Identifier: TK

¹¹ EIS System Code: BP

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

Impact on Safety System Functional Failure Performance Indicator

These conditions could not have (by themselves) prevented a safety function, because a postulated fire (in the fire areas of concern) would be required in addition to the as-found condition. Thus, this condition is not reportable per 10CFR 50.73 (a)(2)(v), and, therefore, does not impact the Safety System Functional Failure Performance Indicator.

Risk Significance

A risk assessment (using the plant-specific probabilistic risk assessment (PRA) model) was completed to ascertain the risk significance of the as-found condition. The assessment assumed:

1. Fires do not start concurrently in more than one fire area at a time.
2. Operator actions to locally fail air to CD-34136 and CD-34139 following fires in areas where cables to these dampers are located were not modeled.
3. Automatic fire suppression in FA 31 and FA 32 was not credited.
4. Automatic CO₂ fire suppression and fire brigade actions to suppress fires were not credited in FA 18.
5. 12 and 22 cooling water pumps are unavailable if their respective scavenging and combustion air damper (CD-34136 and CD-34139, respectively) does not open.
6. The possibility of a hot short causing spurious starting of a CS pump or spurious opening of the associated discharge valve is conservatively assumed to be 0.07.
7. Operator actions to stop flow diversion from the CS pumps into containment were not credited.

The results of the assessment indicate the resulting conditional core damage frequency (CCDF) for both units is 6.0E-07 per year. The conditional large early release frequency (CLERF) for the same events is 8.7E-08 per year for both units. The assumed time duration is one year, so the CCDF and CLERF are the same as the conditional core damage probability (CCDP) and conditional large early release probability (CLERP). Since CCDP is less than 1E-06 and CLERP is less than 1E-07, the events can be both be classified as non-risk significant.

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

CORRECTIVE ACTION

Immediate:

1. Prior to completing the evaluation of these conditions with respect to whether they potentially affected the ability to safely shutdown, interim actions were implemented as a conservative measure. These actions consisted of revising the plant procedures for responding to a catastrophic fire. The revisions included steps for the operators to verify that the Containment Spray pumps for the affected unit were de-energized at the breaker and steps for the operators to isolate air to CD-34136 and CD-34139 to fail the dampers open.

Subsequent:

2. Upon determining that these conditions did indeed have a potential to affect the ability to safely shutdown, the interim actions were evaluated as suitable compensatory measures. These measures will remain in effect until planned corrective actions are completed.

Planned:

3. With the compensatory measures in place, the affected components are considered to be operable, but degraded. Actions to restore full operability of the affected components will be selected and completed.

FAILED COMPONENT IDENTIFICATION

None.

PREVIOUS SIMILAR EVENTS

A similar issue related to flow diversion was identified in LER 1-98-15. The current conditions were identified as a result of completing corrective actions associated with LER 1-98-15.