

April 12, 2002

10 CFR Part 50
Section 50.73

U S Nuclear Regulatory Commission
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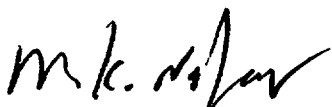
PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

LER 1-01-03, Supplement 1

Plant in Unanalyzed Condition Due to Flood Panel Deficiencies

Supplement 1 to the Licensee Event Report (originally submitted on September 10, 2001) for this occurrence is attached. Updated information is side-barred. In the report, we made no new NRC commitments. Please contact us if you require additional information related to this event.



Mano K. Nazar
Site Vice President
Prairie Island Nuclear Generating Plant

c: Regional Administrator - Region III, NRC
NRR Project Manager, NRC
Senior Resident Inspector, NRC
James Bernstein, State of Minnesota

Attachment

IB22

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 process 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 bj1@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)

Plant in Unanalyzed Condition Due to Flood Panel Deficiencies

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
07	10	01	01	- 03 - 01		04	12	02	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										
POWER LEVEL (10)			20.2201(b)							
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		01 - 03 - 01			

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

EVENT DESCRIPTION

On July 10, 2001, with both units at 100% power, an inspection per site preventive maintenance procedure PM 3586-10 identified a number of deficiencies with flood panels such that 16 of 17 panels could not adequately meet their design function without compensatory measures. [Note: subsequent evaluation identified deficiencies in all 17 flood panels and identified an additional flood protection issue.] The flood panel deficiencies include deteriorated gasket material, physical obstructions, and deficient bolting. Per the Prairie Island Probable Maximum Flood Study (Appendix F of the Prairie Island Updated Safety Analysis Report), flooding severe enough to require flood panels would only be the result of snow melt concurrent with heavy rains. Thus, there was no immediate operability concern at the time of discovery because there was no snow cover.

The additional issue identified while resolving the original concern with the flood panels was with removable steel panels that exist for covering the openings that allow the removal of the D5 and D6 emergency diesel generators from the D5/D6 building; the panels were found not to be watertight. The D5/D6 building removable panels were originally designed to be structurally sound, but investigation showed that some of the vendor shop fabricated areas on the panels were not seal welded – thus, the panels were not watertight. This issue has been resolved by completing the seal weld on the panels.

CAUSE OF THE EVENT

The root cause evaluation for this event determined that several root causes contributed to this event. The deficiencies (such as missing gaskets and anchor bolts) were attributed to: (1) a failure during original plant construction to adequately review drawings and drawing changes prior to release of the drawings and (2) a failure to verify drawing changes were properly incorporated into the plant prior to turnover to Plant Operations. Subsequent deficiencies (such as obstructions blocking flood panel installation) were attributed to: (1) inadequate oversight activities related to the flood preparedness procedures (as those procedures should be subject to oversight as part of the Prairie Island Emergency Preparedness Program) and (2) inadequate flood panel inspection procedures. Deficiencies (such as checkered plate under the bottom of one flood panel) were attributed to weaknesses in the existing corrective action procedures.

It appears the D5/D6 building removable panels were never designed to be watertight.

ANALYSIS OF THE EVENT

At the time of discovery there was limited safety impact due to the as-found condition of the flood panels. The probable maximum flood is the result of heavy rains in conjunction with melting snow. There was no snow cover at the time of discovery.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5
		01 - 03 - 01			

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

Significant deficiencies were found with the flood panels, such that they may not have been able to perform their design function (it may not have been possible to remove interferences, fix anchors, and install gasket material in time to install flood panels and mitigate the effects of the probable maximum flood). The degradation of the flood panels resulted in the plant being in an unanalyzed condition - plant design assumes flood panels capable of being installed in time to mitigate the effects of the maximum probable flood, thus, this event is reportable per 10CFR 50.73(a)(2)(ii)(B).

Performance Indicator Impact

Flood panels protect the safety function of residual heat removal. The systems, structures, and components (SSCs) required for residual heat removal in the event of the probable maximum flood would be safeguards AC power¹ (offsite power expected to be lost as a result of the flood) and the residual heat removal² (RHR) system. At Prairie Island, both Unit 1 and Unit 2 emergency diesel generators³ are at 695' elevation, whereas the probable maximum flood height is 704.1'. Also, the RHR pumps⁴ are in pits below the 695' elevation. These components must be protected from floodwater. Since the flood panels have been found non-functional, this condition is reportable per 10CFR50.73(a)(2)(v) as a safety system functional failure. That is, this condition could have (had the probable maximum flood occurred) resulted in the loss of safety function.

No safety system unavailability is attributed to this condition, since none of the affected safety systems was rendered unavailable as a result of this condition. None of the other Performance Indicators is affected by this event.

Risk Significance Determination

The risk significance associated with the degraded flood panels is very low. This conclusion is based on the following:

- 1) The likelihood of occurrence of the initiating event of concern is low. The Probable Maximum Flood (PMF) study for PINGP described in Appendix F of the USAR identifies the PMF as the hypothetical flood that would result if all the factors that contribute to the generation of the flood were to reach their most critical values concurrently. The PMF is derived from hydrometeorological studies and is independent of historical flood frequencies (the return period for such an event approaches infinity, and its probability of occurrence in any particular year approaches zero). Also, the portion of any year in which even the possibility for such flooding exists is small. Appendix F of the USAR indicates that the most critical flooding occurs during the spring snow melt period with concurrent heavy rainfall.

¹ EIS System Identifier: EB

² EIS System Identifier: BP

³ EIS Component Identifier: DG

⁴ EIS Component Identifier: P

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	01 - 03 - 01			4 OF 5

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

Flooding of the type required to reach the ground level of the plant (695' elevation), the level in which the protection provided by the flood barriers would be required, is very rare. The PINGP Individual Examination of External Events (IPEEE) states that, "according to estimates by the US Army Corps of Engineers, a flood in the vicinity of the site would have a 1000-year occurrence of approximately 693.5 mean sea level (MSL) (1929 Adjustment)". Analysis of more recent data from both the Army Corps of Engineers and the US Geological Survey (USGS) indicate that a flood reaching the ground elevation (695' elevation) would have a recurrence interval on the order of 10,000 years. The highest river level ever recorded at the PINGP site was approximately 687.7' in 1965.

- 2) Relative to other events, time for action to be taken in response to flooding is substantial, and site awareness of the potential for significant flooding onsite is virtually assured. The PMF study indicated that the maximum flood level would likely be reached about 12 days after the beginning of high temperatures. Failure of site personnel to become aware of the potential for emergency flood conditions would be extremely unlikely, due to weather and news reports, level indication on main control room panels and computer points, and through their own observation of external conditions.
- 3) Operators are procedurally required to take action well in advance of any potential flood-related loss of plant equipment. Plant procedures (AB-4) require that action be taken upon the prediction of (or actual) river level rise to 678' or higher. The preparatory actions taken are significant and well in advance of the actual river rise to the site ground elevation (695'). Both units are required to be shut down to Hot Shutdown when water levels reach 692'.
- 4) The site emergency plan is implemented when water levels reach 686' (NUE). At 692', an Alert classification is entered, and at 698', a Site Area Emergency is declared. The attention paid to the rising floodwaters encroaching into areas vital to critical plant equipment would be substantial.
- 5) The mere existence of floodwaters at or above 695' elevation by itself does not result in the inability to provide decay heat removal from the PINGP units. Areas of the plant at lower elevations receive additional surveillance for water intrusion as part of the AB-4 response actions. Verification of the availability and location of sump pumps for removing water entering affected areas is also required per AB-4. Sandbagging and other activities would be implemented to prevent or slow the intrusion of water into areas around the plant. Also, the flood panels, although found to be degraded, were still staged and could have been employed to slow the water intrusion into critical plant areas had the need arisen. These facts provide additional assurance that even if water levels did rise to ground elevation or above, critical equipment would still have been maintained available.

CORRECTIVE ACTION

1. This condition was entered into the Prairie Island Corrective Action Process as a Condition Report. Actions to Correct the Condition and Actions to Prevent Recurrence were recommended as part of the evaluation of the Root Cause. In addition to restoration of the flood protection panels (described below), the recommended actions include improvements to the following:

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		01 - 03 - 01			

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

- drawing additions, revisions, and deletions procedures (to require independent review of drawings and changes prior to issuance for use),
 - design change procedures (to require walk-down of completed modification by responsible engineer prior to turnover),
 - Emergency Preparedness Program documents (to add a reference to the flood response procedure, so deficiencies are more likely to be identified in quality assurance audits of the Emergency Preparedness Program),
 - flood panel inspection/installation procedures (to strengthen inspection requirements and move the flood panel installation procedure to a separate procedure), and
 - corrective action process procedures (to strengthen review and approval process).
- In addition, the extent of the root causes identified is addressed in a number of related Condition Reports, which include assessments of:
- adequacy of past inspections of plant structures,
 - timeliness of corrective actions,
 - independent verification of drawings, and
 - effectiveness of past corrective actions.
2. The affected flood panels have been restored to compliance (improvements to flood panels will be evaluated as part of the site continuous improvement philosophy).
3. The steel panels in the D5/D6 Building have been seal welded.

FAILED COMPONENT IDENTIFICATION

None.

PREVIOUS SIMILAR EVENTS

None.