NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	1 OF 5

TITLE (4)

Fire Areas 58/73 Appendix R Safe Shutdown Analysis Issues

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 NAME	DOCKET NUMBER
08	26	98	98	-- 12 --	0	09	25	98	Prairie Island Unit 2	05000 306
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING	1
POWER	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)	√	50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Jack Leveille	651-388-1121

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	MONTH	DAY	YEAR
√	YES (If yes, complete EXPECTED SUBMISSION DATE).		NO		10	26	98

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On August 26, 1998, site staff determined that some cables in two Fire Areas in the auxiliary building were not protected by a 1-hour fire barrier (as required by an exemption to 10CFR50 Appendix R granted for those areas). These cables had been originally protected but the protective barriers had been removed following revision to the Safe Shutdown Analysis which erroneously concluded that protection was not required.

During this event both units were operating at 100% power.

Appropriate compensatory measures had been established and will be maintained until the fire barrier issues are resolved.

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

EVENT DESCRIPTION

On August 26, 1998, while both Unit 1 and Unit 2 were operating at 100% power, the Prairie Island Nuclear Generating Plant (PINGP) staff determined that some cables in Fire Area 58 and 73 in the auxiliary building (695' elevation) were not protected by a one-hour fire barrier (as required by an exemption to 10CFR50 Appendix R granted for these areas). As a result of an action item generated by the Fire Protection Functional Inspection (FPFI) self-assessment team (on March 11, 1998), PINGP staff was re-evaluating the current Safe Shutdown Analysis (SSA) against the approved Appendix R exemptions and Appendix R compliance for Fire Areas 58 and 73. This issue was assessed via the PINGP nonconformance report (NCR) process (NCR 19981988). The assessment of NCR 19981988 determined that the current configuration for these areas did not provide an equivalent level of fire protection as that approved by the NRC's safety evaluation report (SER) for the exemption to 10CFR50 Appendix R.

The current SSA (which had been revised in 1997) allowed removing the one-hour fire barriers for motor operated valves (MOVs) associated with the Train B reactor coolant system (RCS) inventory makeup function (Train B SI pump) and local manual action was credited. Guidance for these manual actions was provided in F5, Appendix D. The one-hour fire barrier protection was removed in April 1998.

In addition to the non-compliance with the exemption to 10CFR50 Appendix R affecting these cables, crediting local manual action for these valves created a configuration which may have allowed a fire to result in loss of pressurizer level indication, a violation of Appendix R requirements. As a part of the continuing investigation associated with the FPFI self assessment PINGP staff compared the current (1998) compliance assessment for Fire Areas 58 and 73 against the compliance assessment in the 1983 approved exemption. PINGP staff then determined that removal of the one-hour fire barrier and the change in methodology to credit local manual actions would not provide a level of fire protection equivalent to that previously approved. The need to perform the local manual actions would have required an operator to enter the fire area affected by the fire. This operator action was estimated to be completed in 1.5 hours (one hour waiting for fire brigade activities and 30 minutes to align the valves). A preliminary transient analysis calculation for a postulated fire scenario in these fire areas determined that the pressurizer level could go off-scale low within approximately 35 minutes without RCS makeup and without component cooling (CC) flow. This would place the plant in a condition outside its performance goal of maintaining the RCS inventory within the level indication of the pressurizer.

CAUSE OF THE EVENT

The Appendix R SSA was completely reconstituted (finished in 1997) due to:

- Addition of two additional safety-related diesel generators for Station Blackout (SBO) coping.
- Installation of and/or relocation of new 480 volt electrical switchgear and new Unit 2 4kV electrical switchgear as part of the Electrical System Upgrade (ESU) modification.

- Resolution of issues associated with Thermo-Lag assessed in response to GL 92-08.

As part of this reconstitution effort, each fire area was re-evaluated and several changes were made to the original compliance strategy of the previous SSA. These changes were based on the new plant electrical configuration, the revised cable routing philosophy implemented in the SBO/ESU modifications and additional review of new regulatory guidance documents.

The cause of the non-compliance with the exemption to 10CFR50 Appendix R was crediting local manual actions in lieu of remote (control room) operation for compliance. While this crediting may be allowed under the guidance of Generic Letter 86-10, the exemptions for the areas claimed credit for remote operation.

The non-compliance (with the Appendix R requirement that pressurizer level indication be maintained throughout the fire) developed because the PINGP SSA failed to assume that reactor coolant pump seal leakage would occur during certain postulated fire scenarios, as required by guidance. Without that condition to cope with, pressurizer level indication would have been maintained even with the time delay that could result from using local manual action in this case.

ANALYSIS OF THE EVENT

Fire Areas 58 and 73 are located at the 695-ft elevation of the Auxiliary Building for Units 1 and 2, respectively. The boundary between the fire areas is an open space; thus, Fire Areas 58 and 73 can essentially be treated as one fire area. This area contains redundant equipment and circuits associated with component cooling (CC), chemical and volume control (VC), safety injection (SI), and residual heat removal (RH) systems.

A one-hour fire barrier was originally installed to protect circuits associated with the Train B (12) SI pump and its RWST supply valve (MV-32080) and SI suction valve (MV-32163). As a result of the SSA reconstitution effort the one-hour rated fire barriers were removed from these cables.

A. Deterministic Evaluation of the Safety Significance of the Non-compliance

An evaluation of the sequence that could have occurred if a fire in this area had affected these cables is being performed. The purpose of the evaluation is to determine the safety significance of the non-compliance which could have caused the pressurizer level going off scale with restoration of RCS inventory makeup not occurring until later.

This evaluation will be provided in a supplement to this LER by October 26, 1998.

B. Risk Significance Evaluation

(1) Fires in Fire Area 58

The results of the IPEEE Fire PRA, Rev. 2, show that fires in Fire Area 58 are not significant contributors to Unit 1 plant risk. The total core damage frequency (CDF) for fires in Fire Area 58 was 6.3E-7/rx-yr, which is below the IPEEE area screening criteria of 1E-6/rx-yr. The area contains a large number of safe shutdown components and cables, and the majority of the area is not protected by an automatic fire suppression system. However, an assessment of credible fire events in this fire area shows that the extent of system failures would be limited due to the specific physical features of the area (including the large distances between diverse equipment, intervening walls, berms, etc.), the spatial arrangement of circuits and equipment, and the volume of and distribution of combustible materials. In addition, a fire watch had been established in this area throughout the period of non-compliance that provides further assurance that the risk due to fires in this fire area is very low.

(2) Fires in Fire Area 73

The discussion presented above for Fire Area 58 also applies to Fire Area 73. A nearly identical set of major equipment and combustible hazards to that in Fire Area 58 also exists in Fire Area 73. Also, the equipment arrangement and barrier configurations are nearly identical. The total Unit 1 CDF for fires in Fire Area 73 was calculated to be 1.3E-6/rx-yr, which is above the IPEEE area screening criteria of 1E-6/rx-yr. However, it should be understood that no specific fire modeling was credited in Fire Area 73, other than that necessary to determine that fire propagation from 58 to 73 and vice-versa was not credible. If fire modeling had been performed for Fire Area 73, it is expected that the results for this fire area would have also fallen below the screening criteria (and would likely have been below that calculated for Fire Area 58). It would be expected that fires in Fire Area 73 would be more significant to Unit 2 risk than to Unit 1 risk, but would be on the same order as that seen for Fire Area 58 relative to Unit 1.

C. Compensatory Measures Established

As part of the resolution program for Thermo-Lag issues, Special Order SO-236, was put in effect in 1992 and continued to be in effect when the subject cables were unwrapped. Therefore the one-hour fire barrier protection that was removed in April 1998, was automatically compensated for by the presence of the roving hourly fire watch. In addition, NCR 19981794 (IN 92-18 MOV Hot Shorts issue submitted to NRC as LER 1-98-10), also has compensatory measures in place for this area which consists of utilization of the roving fire watch under SO-236. The adequacy of the hourly fire watch is evaluated and justified as part of the assessment of NCR 19981794.

Since one-hour barriers (as required by an exemption to 10CFR50, Appendix R) were missing from some cables in Fire Area 58 and 73 and pressurizer level going off-scale could be postulated, this nonconformance is reportable per 10CFR50.73(a)(2)(v) as affecting the safe shutdown capability and per 10CFR50.73(a)(2)(ii)(B) as being outside of the PINGP design basis for 10CFR50, Appendix R.

CORRECTIVE ACTIONS

1. One-hour fire rated barriers to protect MV-32080 and MV-32163 for the Unit 1 Train B SI Pump flow path have been installed.

2. ***Review compliance with exemptions to 10CFR50 Appendix R for all Fire Areas. This review will be completed by March 31, 1999. Operability/compensatory measure determinations will be documented by the NCR process. Following completion of this review, necessary changes to the SSA and implementing procedures will be made. Reportable findings will be submitted within 30 days of the completion of the review as a supplement to this LER.***

   The compensatory actions that are in place shall remain in effect until the above review is complete and its resulting corrective actions have been implemented.

FAILED COMPONENT IDENTIFICATION

None.

PREVIOUS SIMILAR EVENTS

Cases of missing Appendix R fire barriers have been identified previously as LERs 19810 and 29803.