Consumers Power
POWERING MICHIGAN'S PROGRESS
Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

March 1, 1996

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

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT
LICENSEE EVENT REPORT 96-005 - APPENDIX R ENHANCEMENT ANALYSIS - DC PANELS BREAKER/FUSE COORDINATION ISSUE

Licensee Event Report (LER) 96-005 is attached. This event is reportable to the NRC in accordance with 10CFR50.73(a)(2)(ii)(B) as a condition outside the plant design basis.

SUMMARY OF COMMITMENTS

This letter contains three new commitments as follows:

1. Replace main supply fuse to DC Panels ED-11-1 and ED-21-1 with a size and type that coordinate with panel circuit breakers.

2. Review the settings on branch circuit breakers and adjust as required to coordinate with the newly installed main supply fuses for DC Panels ED-11-1 and ED-21-1.

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3. Continue hourly fire tours in the 1F & 1G Bus Switchgear House, 1-C Switchgear Room, and the Turbine Building until permanent corrective actions are complete for the fuse coordination issue for DC Panels ED-11-1 and ED-21-1.

Richard W Smedley
Manager, Licensing

CC Administrator, Region III, USNRC
Project Manager, NRR, USNRC
NRC Resident Inspector - Palisades

Attachment

NRC FORM 366. (4/95) U.S. NUCLEAR REGULATORYCOMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 4/30/98

LICENSEE EVENT REPORT (LER)

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

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TITLE (4) LICENSEE EVENT REPORT 96-005 - APPENDIX R ENHANCEMENT ANALYSIS - DC PANELS BREAKER/FUSE COORDINATION ISSUE

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 05000
02	02	96	96	- 005 -	00	03	01	96	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N	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)(iii)
POWER LEVEL (10)	100		20.2203(a)(1)		20.2203(a)(3)(i)	X	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)
Dale E Engle, Licensing Engineer	(616) 764-8913

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 SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES If yes, COMPLETE EXPECTED COMPLETION DATE	X	NO				

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

On February 2, 1996, at 0950 a.m., with the plant operating at full power, it was determined that a fuse on the main supply to two safety related DC panels and the panel branch circuit breakers were not properly coordinated. This lack of coordination could allow fire induced faults in a branch circuit to cause the main supply panel fuse to clear before the branch circuit breaker opens. The clearing of the main supply panel fuse would cause the loss of the entire panel and, thus, deenergize the safe shutdown equipment to which it normally provides electrical power.

This condition was identified as part of the Palisades Plant Appendix R Enhancement Program. When this condition was discovered, compensatory measures were put in place to conduct fire tours in the areas that could be affected. These areas are the 1F & 1G Bus Switchgear House, the 1-C Switchgear Room and the Turbine Building.

Hourly fire tours had been previously implemented in those areas as a precautionary measure in conjunction with the Appendix R Enhancement Program, with the exception of the 1F & 1G Bus Switchgear House. Hourly fire tours in the 1F & 1G Bus Switchgear House commenced when the condition described in this document was first discovered.

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

EVENT DESCRIPTION

On February 2, 1996, at 0950 a.m., with the plant operating at full power, it was determined that the fuses on the main supplies to safety related DC panels ED-11-1 and ED-21-1 did not coordinate with the panel branch circuit breakers. The determination was made during performance of an associated circuit analysis as part of the Appendix R Enhancement Program. It was determined that fire induced faults occurring on branch circuits fed by a circuit breaker (Westinghouse type FB3100) could potentially cause the main supply panel fuse to clear before the downstream breaker and, as a result, cause the loss of the entire panel and deenergize all the safe shutdown equipment to which it normally supplies electrical power. The branch circuit breakers, in the event of a fire in that branch, should clear before the main supply panel fuse, allowing the remainder of the panel to stay in service and continue to perform its intended function.

This condition was identified during completion of the Palisades Plant Appendix R Enhancement Program. When this condition was discovered, compensatory measures were implemented to conduct fire tours in the areas that could be affected. These areas are the 1F & 1G Bus Switchgear House, the 1-C Switchgear Room and the Turbine Building.

CAUSE OF THE EVENT

The root causes of this situation were: (1) The lack of a thorough associated circuits analysis during the original implementation of the Appendix R rule, and (2) inadequate electrical/ Appendix R design review when the main supply fuses were added to their respective schemes.

ANALYSIS OF THE EVENT

Detailed breaker and fuse coordination studies are required to support the plant's safe shutdown analysis in accordance with the requirements of 10CFR50, Appendix R, Sections III-G and L, as interpreted in guidance provided by Generic Letter 81-12.

During performance of the associated circuits analysis which documents the plant breaker and fuse coordination as part of Appendix R Enhancement Program, the condition described above was identified. In the event of a fire in the 1F & 1G Bus Switchgear House, 1-C Switchgear Room, or certain locations in the Turbine Building, faults occurring on the branch circuits fed by identified breakers could cause the main supply panel fuse to the DC Panel to clear before the branch circuit breaker opens. Fire induced faults are the only events of concern for this condition. The premature clearing of the main supply panel fuse would cause the loss of the entire DC panel and deenergize the safe shutdown equipment powered by the panel, such as the Power Operated Relief Valves.

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When a modification was completed which added fuses on the main supply to the panels, detailed reviews did not adequately verify proper coordination with the branch circuit breakers. The level of coordination required for general equipment protection existed, but it was not sufficient to assure compliance with requirements of 10CFR50 Appendix R.

The cumulative impact on plant safety of other Appendix R and fire related deficiencies in the affected areas was evaluated to verify that hourly fire tours would continue to provide adequate assurance of safety.

SAFETY SIGNIFICANCE

A fire in the 1F & 1G Bus Switchgear House, the 1-C Switchgear Room, or the Turbine Building could induce faults on non-safe shutdown branch circuits that could cause the main supply panel fuse to clear prior to an individual feeder breaker opening, thus causing the loss of the entire DC panel. The affected main feeder panels provide DC power to many safe shutdown components including the Power Operated Relief Valves which could be required to depressurize the Primary Coolant System during the transition from hot to cold shutdown while providing low temperature over-pressure protection.

Although this is considered a condition outside of the Appendix R design basis, it is considered to be of low safety significance for the following reasons.

1. 1F & 1G bus Switchgear House is located in a separate all-metal building away from other structures and has a low probability of causing a loss of offsite power; therefore, no collateral damage is expected and no safe shutdown implications are anticipated for a fire in this equipment.

2. Any fire occurring in the 1-C Switchgear Room would be detected early by the automatic smoke detection system which annunciates in the Control Room, or would be controlled or extinguished by the automatic wet pipe sprinkler system.

3. The circuits of concern in the Turbine Building are located in the South and East sides of the building in areas protected by an automatic wet pipe sprinkler system equipped with water flow switches that annunciate in the Control Room. Any fire that could occur in these areas would be detected early, and would be controlled and/or extinguished by the fusible link sprinkler system.

4. The 1-C Switchgear Room has a moderate fire load and the Turbine Building has a low fire load. The 1F & 1G Bus Switchgear House has a minimal fire load located in an all-metal building with only switchgear, associated cubicles, and small amounts of exposed cable. The protective features designed for these areas are adequate for the minimal fire hazards presented.

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5. The plant maintains on site, at all times, a fully trained and equipped five-man fire brigade that is available to respond to a fire in any of these areas.

6. To add assurance that any fire that could occur is detected early, an hourly fire tour was implemented or confirmed to be existing in the areas of concern.

7. Loss of the Power Operated Relief Valves (PORV) would not jeopardize the plant's ability to maintain hot or cold shutdown. Final depressurization of the Primary Coolant System following cooldown to achieve conditions necessary for initiation of Shutdown Cooling can be accomplished whether or not PORVs are available. For example, a charging pump would remain available to supply auxiliary spray flow to the pressurizer.

In summary, while the Appendix R fire of concern is postulated to induce faults on the circuits described above, it is unlikely that a realistic fire could cause two unrelated cable faults.

CORRECTIVE ACTIONS

Interim corrective action consisted of implementing hourly fire tours in the 1F & 1G Bus Switchgear House and confirming hourly fire tours in the 1-C Switchgear Room and the Turbine Building. Fire tours had already been implemented in the 1-C Switchgear Room and the Turbine Building for previously identified fire protection concerns and the Appendix R analysis effort. These fire tours will remain in place until permanent corrective actions are complete and implementation of the Enhanced Appendix R Program.

The cumulative impact on plant safety of other Appendix R and fire related deficiencies in these areas was assessed. This assessment confirmed the adequacy of hourly fire tours to minimize the probability and severity of potential fires in the areas of concern.

Long term corrective actions include:

1. Replace main supply fuse to DC Panels ED-11-1 and ED-21-1 with a size and type that coordinate with panel circuit breakers.

2. Review settings on branch circuit breakers and adjust as required to coordinate with the newly installed main supply fuses for DC Panel ED-11-1 and ED-21-1.