

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: 50.0 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.

FACILITY NAME (1) Prairie Island Nuclear Generating Plant Unit 1	DOCKET NUMBER (2) 05000 282	PAGE (3) 1 OF 32
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TITLE (4)
Discovery That 32 Appendix R Related MOV's Are Susceptible to Physical Damage by Fire Induced Hot Shorts

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	07	98	98	-- 10 --		09	08	98	Prairie Island Unit 2	05000 306
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1

POWER LEVEL (10) 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (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 Jeff Kivi	TELEPHONE NUMBER (Include Area Code) 612-388-1121
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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)

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

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

As part of the PINGP Fire Protection self assessment a review was performed of Information Notice 92-18 "Potential for Loss of Remote Shutdown Capability During a Control Room Fire" with the new regulatory perspective. A calculation was initiated to determine the valve and operator thrust and torque values that may occur during a hot short that bypasses the limit switches and torque switches. The calculation addressed 48 Appendix R related MOV's and found that 32 of those may be physically damaged by a fire induced hot short. Affected systems include Residual Heat Removal, Component Cooling, Safety Injection, Reactor Coolant, and Auxiliary Feedwater.

Compensatory actions are in place pending further evaluation of this issue.

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LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 32
		98	-- 10	-- 00	

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

EVENT DESCRIPTION

On August 7, 1998, Prairie Island Nuclear Generating Plant (PINGP) Nonconformance Report (NCR) 19981794 was generated to address the results of an analysis that was also completed on August 7, 1998. The analysis documents that 32 motor operated valves¹ (MOV's) could potentially be damaged during a fire induced hot short. Affected systems include Residual Heat Removal², Component Cooling³, Safety Injection⁴, Reactor Coolant⁵, and Auxiliary Feedwater⁶.

The analysis was performed as part of a project to review the PINGP position with respect to Information Notice 92-18 "Potential for Loss of Remote Shutdown Capability During a Control Room Fire" and the current regulatory position with respect to the fire induced hot short issue. The project is part of a self assessment to support the Fire Protection Functional Inspection.

CAUSE OF THE EVENT

Information Notice (IN) 92-18, "Potential for Loss of Remote Shutdown Capability During a Control Room Fire," was originally assessed as not applicable to PINGP. The 1997 series of correspondence between NEI and NRC have led to a reinterpretation of the issue. IN 92-18 postulated a control circuit hot short scenario in which MOV's are operated without torque switch protection such that the motor thermal overload is the only protection for the MOV. In this postulated scenario, by the time the thermal overload stops the motor, there may be damage which could prevent subsequent manual operation of the valve.

ANALYSIS OF THE EVENT

PINGP staff performed a number of analyses to evaluate valve and operator mechanical characteristics after identifying the MOV's necessary for Appendix R safe shutdown. 32 MOV's were found to be susceptible to mechanical damage following a postulated hot short. Upon completion of the analysis for evaluating valve damage, the PINGP staff determined that this was reportable based on the guidance in NUREG-1022 Revision 1 regarding conditions that could potentially affect the ability to shutdown. Additional analyses show that none of the 32 susceptible MOV's would fail in a manner that would cause a breach of the valve's pressure boundary.

¹ (EISS Component Identifier: V)

² (EISS System Code: BP)

³ (EISS System Code: CC)

⁴ (EISS System Code: BQ)

⁵ (EISS System Code: AB)

⁶ (EISS System Code: BA)

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 32
		98 --	10 --	00	

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

Affected MOV's

The following is a preliminary list of the PINGP Fire Detection Zones (followed by their respective Fire Area) and the Motor Valves that could be affected by a fire induced hot short in each zone/area. Preliminary analysis indicates that 32 MOV's are affected by this issue. Ongoing work on the PINGP Safe Shutdown Analysis (e.g., due to subsequent issues identified in Fire Areas 31, 32, 58, and 73) could change which specific MOV's are affected. Any additional MOV's determined to be susceptible to hot shorts will be treated similarly (with respect to compensatory and corrective actions) to the MOV's identified below.

Fire Zone

Credited MOV's that may be Affected

Zone 57, FA 13
(Control Room)

MV-32064, 1 REAC VSL INJ ISOL MV A
 MV-32065, 1 REAC VSL INJ ISOL MV B
 MV-32084, 11 RWST TO 11 RHR PMP ISOL MV
 MV-32165, 1 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
 MV-32195, 1 PRZR PORV ISOL A MV
 MV-32196, 1 PRZR PORV ISOL B MV
 MV-32238, 11 AFW TO 11 SG MV
 MV-32239, 11 AFW TO 12 SG MV
 MV-32333, 11 TD AFW PMP SUCT FROM CST MV

MV-32167, 2 REAC VSL INJ ISOL MV A
 MV-32168, 2 REAC VSL INJ ISOL MV B
 MV-32187, 21 RWST TO 21 RHR PMP ISOL MV
 MV-32193, 2 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
 MV-32197, 2 PRZR PORV ISOL A MV
 MV-32198, 2 PRZR PORV ISOL B MV
 MV-32246, 22 AFW TO 21 SG MV
 MV-32247, 22 AFW TO 22 SG MV
 MV-32345, 22 TD AFW PMP SUCT FROM CST MV

Zone 12, FA 18
(Relay Room)

MV-32064, 1 REAC VSL INJ ISOL MV A
 MV-32065, 1 REAC VSL INJ ISOL MV B
 MV-32084, 11 RWST TO 11 RHR PMP ISOL MV
 MV-32165, 1 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
 MV-32195, 1 PRZR PORV ISOL A MV
 MV-32196, 1 PRZR PORV ISOL B MV
 MV-32238, 11 AFW TO 11 SG MV
 MV-32239, 11 AFW TO 12 SG MV

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 32
		98	-- 10	-- 00	

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

MV-32333, 11 TD AFW PMP SUCT FROM CST MV

- MV-32167, 2 REAC VSL INJ ISOL MV A
- MV-32168, 2 REAC VSL INJ ISOL MV B
- MV-32187, 21 RWST TO 21 RHR PMP ISOL MV
- MV-32193, 2 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
- MV-32197, 2 PRZR PORV ISOL A MV
- MV-32198, 2 PRZR PORV ISOL B MV
- MV-32246, 22 AFW TO 21 SG MV
- MV-32247, 22 AFW TO 22 SG MV
- MV-32345, 22 TD AFW PMP SUCT FROM CST MV

- Zone 2, FA 31
B AFWP Room MV-32238, 11 AFW TO 11 SG MV
- MV-32383, 21 AFW TO 21 SG MV
- MV-32336, 21 MD AFW PMP SUCT FROM CST MV

- Zone 2, FA 32
A AFWP Room MV-32382, 12 AFW TO 12 SG MV
- MV-32247, 22 AFW TO 22 SG MV
- MV-32335, 12 MD AFW PMP SUCT FROM CST MV

- Zone 8, FA 58
695' Aux. Bldg. U1 MV-32085, 11 RWST TO 12 RHR PMP ISOL MV
- MV-32094, 12 RHR HX CC INLT MV
- MV-32202, SI TEST TO 11 RWST ISOL MV A
- MV-32203, SI TEST TO 11 RWST ISOL MV B
- MV-32382, 12 MD AFW PMP DISCH TO 12 SG MV

- Zone 40, FA 73
695' Aux. Bldg. U2 MV-32188, 21 RWST TO 22 RHR PUMP ISOL MV
- MV-32129, 22 RHR HX CC INLT MV
- MV-32204, SI TEST TO 21 RWST ISOL MV A
- MV-32205, SI TEST TO 21 RWST ISOL MV B

- Zone 19, FA 59
715' Aux. Bldg. U1 MV-32064, 1 REAC VSL INJ ISOL MV A
- MV-32065, 1 REAC VSL INJ ISOL MV B
- MV-32165, 1 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
- MV-32231, 1 RCS LP B HOT LEG RHR SPLY (OUTSIDE) MV
- MV-32195, 1 PRZR PORV ISOL A MV
- MV-32196, 1 PRZR PORV ISOL B MV

- Zone 46, FA 74
715' Aux. Bldg. U2 MV-32167, 2 REAC VSL INJ ISOL MV A
- MV-32168, 2 REAC VSL INJ ISOL MV B

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 32
		98	-- 10	-- 00	

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

MV-32193, 2 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
 MV-32233, 2 RCS LP B HOT LEG RHR SPLY (OUTSIDE) MV
 MV-32197, 2 PRZR PORV ISOL A MV
 MV-32198, 2 PRZR PORV ISOL B MV

Compensatory Actions

After identifying affected MOV's, a nonconformance report (NCR) was generated and a report notification was made. Compensatory measures were put in place for fire areas affected by the issue. Operations department instructions, and Alarm⁷ Response procedure changes were issued. If ongoing work on the PINGP Safe Shutdown Analysis identifies additional MOV's that are affected by this issue, appropriate compensatory actions will be taken (similar to those identified below). Adequacy of compensatory actions was based on:

1. Combustible load in the area
2. Fire detection in the area
3. Fire suppression in the area
4. Susceptibility to fire of cables⁸ in the area
5. Susceptibility to fire of redundant train equipment in the area
6. Guidance given in safe shutdown procedures for fires in the area
7. Existing personnel controls in the area
8. Existing administrative controls in the area

The detailed description is given below for each affected Fire Area:

Fire Area 13 (Zone 57) Control Room

1. **Combustible Load:** Combustibles in this area include cable and miscellaneous material. The fire load in this area is Light in the current PINGP Fire Hazards Analysis (FHA). Actual combustible load calculations show fire load to be Very Light (less than 40,000 Btu/sq. ft).
2. **Fire Detection:** Fire Detection in the area uses ion detectors⁹ in the general area and under the false floor where the subject valve control cables are located. The control room is also constantly manned.

⁷ (EIS Component Identifier: ALM)

⁸ (EIS Component Identifier: CBL)

⁹ (EIS Component Identifier: DET)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 32
		98	-- 10	-- 00	

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

3. Fire Suppression: Fire Suppression in the area is provided primarily by manual fire extinguishers and secondarily with hose stations just outside the control room.
4. Cable Susceptibility to Fire: A fire in the control room would probably be restricted to a cable fire in the panels¹⁰ or control board¹¹ and could be controlled with extinguishers. The subject valve control cables are in the area along the backside of the control board which has an open back and is readily visible and accessible. The cables are then routed downward under the false floor in cable tray¹², and through the floor into the relay room. The cables are not routed through any of the panels with other components in the control room. The subject cables are a highly fire resistant Teflon covered cable.

The control room circuits consist primarily of low energy instrumentation and control circuits that are run in 12, 14 or 16 gage wire. These circuits cannot provide enough fault current to cause ignition, even for sustained high impedance faults. The 120 volt AC lighting and equipment supply circuits are similarly designed in that 12 gage wire is used as standard distribution such that sustained high impedance faults also cannot cause ignition of the wires. Only a small number of 120 volt DC control circuits possess sufficient energy to cause a cable ignition and this occurs only under unlikely circumstances (i.e. during closing of a 4kV breaker¹³ with a coincident shorting of the close coil and failure of the operator control switch.) This condition has been reviewed and accounted for in the control board and under floor spacing criteria.

These factors limit the susceptibility of the cables to fire.

5. Redundant Train Susceptibility to Fire: The 18 valve cables are split between the units, and distributed among the control boards by system (RHR, SI, CD, RC, AF). The redundant trains are separated by the USAR required minimum distance on the control board. USAR required redundant cable tray train separation is maintained after leaving the boards. These factors limit the susceptibility of multiple components to sustain damage in a single fire.
6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:

¹⁰ (EIS Component Identifier: PL)

¹¹ (EIS Component Identifier: CBD)

¹² (EIS Component Identifier: TY)

¹³ (EIS Component Identifier: BRK)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	7 OF 32
		98	-- 10 --	00	

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

- a. MV-32064, 1 REAC VSL INJ ISOL MV A
- MV-32065, 1 REAC VSL INJ ISOL MV B
- MV-32167, 2 REAC VSL INJ ISOL MV A
- MV-32168, 2 REAC VSL INJ ISOL MV B

Failure open makes a parallel path via the Reactor Vessel¹⁴ injection lines in addition to the Loop B cold leg. The core will remain covered with injection. Some reduction in cooldown rate may be experienced because all flow will not be forced up through the core. Inability to realign these MOV's is not a safety concern.

Secondary heat sink via SG's also remains available.

- b. MV-32084, 11 RWST TO 11 RHR PMP ISOL MV
- MV-32187, 21 RWST TO 21 RHR PMP ISOL MV

Manual valves are provided in the suction to RHR which could be used if these MOV's are not available. There is also a check valve downstream that would prevent back flow to the RWST when Loop supplies to RHR are opened.

- c. MV-32165, 1 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
- MV-32193, 2 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV

In the unlikely event that a fire affects both trains in spite of their separation, the core continues to be cooled by the Secondary heat sink while repairs could be put in place to make RHR available.

- d. MV-32195, 1 PRZR PORV ISOL A MV
- MV-32196, 1 PRZR PORV ISOL B MV
- MV-32197, 2 PRZR PORV ISOL A MV
- MV-32198, 2 PRZR PORV ISOL B MV

The spurious failure of the PORV block valves is already addressed by alternate actions to fail the PORV's closed by removal of DC power and air. Per PINGP procedure F5 Appendix B, Attachments B and E.

- e. MV-32238, 11 AFW TO 11 SG MV
- MV-32239, 11 AFW TO 12 SG MV

¹⁴ (EIS Component Identifier: RPV)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	8 OF 32
		98	-- 10 --	00	

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

MV-32246, 22 AFW TO 21 SG MV
MV-32247, 22 AFW TO 22 SG MV

If power was available to the motor driven pumps¹⁵, they could be used. Cross tie capability exists via manual valve lineup for both units if even one motor driven pump is available. 21 MDAFWP (Unit 2 Train A) would be available upon repowering of A-train buses¹⁶ by Emergency Diesel Generators¹⁷. Some time would also be available for restoration of power to supply the motor driven pump(s). Alternatively, a Main Feedwater pump on each unit remains running after a plant trip. If power is available to the non safeguard bus, local manual Feedwater flow control may be used to maintain SG level.

- f. MV-32333, 11 TD AFW PMP SUCT FROM CST MV
MV-32345, 22 TD AFW PMP SUCT FROM CST MV

If condensate is unavailable, Cooling water is an optional supply.

- 7. Existing Personnel Controls on the Area: The room is constantly manned by the Control Room Operators. These individuals provide early detection in addition to the installed detection system. Introduction of ignition sources and combustibles is closely scrutinized due to the operationally sensitive activities in the room in addition to the reviews required by PINGP Administrative Work Instruction (5AWI) 3.13.2 and 5AWI 3.2.4 as discussed below. The control room itself was designed to minimize combustible material. Through smell, sight, and sound operators have the best opportunity to limit the extent of any fire in the room through early detection and action.
- 8. Existing Administrative Controls on the Area: PINGP procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

PINGP procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

¹⁵ (EIS Component Identifier: P)

¹⁶ (EIS Component Identifier: BU)

¹⁷ (EIS Component Identifier: DG)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	9 OF 32
		98	-- 10 --	00	

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

PINGP procedure F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored.

- Compensatory Measures for the Area: An hourly fire watch is provided to monitor areas where the Control Room operators are not normally stationed, such as behind the board. The fire watch monitors for changes in transient combustible loading, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a control room fire on the subject MOV's are provided in a Temporary Change Notice to the Control Room Fire Alarm response procedure. This procedure suggests de-energizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly limit the consequences of a fire if one should occur. Alternate actions further minimize the impact of a fire.

- Conclusion: This area has a high number of cables for susceptible MOV's and redundant trains are in close proximity to each other. However, the fire load in the Control Room is very light and detection and suppression are available. The room is continuously manned. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The extensive administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Available alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

Fire Area 18 (Zone 12) Relay and Cable Spreading Room

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	10 OF 32
		98	-- 10 --	00	

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

1. **Combustible Load:** Combustibles in this area include cable and miscellaneous material. The fire load in this area is Extreme in the current PINGP FHA. Actual combustible load calculations show fire load to be Very Heavy (between 160,000 and 240,000 Btu/sq. ft.).
2. **Fire Detection:** Fire Detection in the area uses thermal and ion detectors in the ceiling area near the cable trays.
3. **Fire Suppression:** Fire Suppression in the area is provided primarily by an automatic CO2 system. Manual suppression (dry chemical and CO2 fire extinguishers and hose stations) is available just outside the room.
4. **Cable Susceptibility to Fire:** A fire in the Relay Room would probably be restricted to a cable fire in the trays or panels and could be controlled with extinguishers or the CO2 system. The MOV control cables are routed through trays in the overhead down into terminal cabinets¹⁸, and then back into the tray system where they exit the room en route to their MCC. The control cables coming into the cabinets from the Control Room are a highly fire resistant Teflon covered cable. Control cables leaving the cabinets are fire resistant IEEE 383 qualified cable. These factors limit the susceptibility of the cables to fire.
5. **Redundant Train Susceptibility to Fire:** The 18 valve cables are split between the units. The Relay Room cabinets are designed with a fundamental separation between A and B trains. The A train cables terminate in the cabinets along the wall of the computer room while the B train terminates in the cabinets along the outside wall of the Relay Room. It is highly unlikely that a fire in one of the trained cabinets would spread to the other train before it is detected and extinguished. In addition, a non-Appendix R barrier consisting of Kaowool wrap is installed in the tray system to mitigate spread of fire between Unit 1 and Unit 2 tray systems. USAR required redundant cable tray train separation exists in the Relay Room. These factors limit the susceptibility of both trains to sustain damage in a single panel or tray fire.

The Fire IPEEE analysis of the Relay Room found most cabinets to be adequately sealed and to have internal barriers that would prevent spread of fires starting in one panel from propagating to additional panels. There are exceptions to this, and these are accounted for in the Fire IPEEE analysis, however, none were identified in which fires could propagate to the other train of equipment. Those cabinets that have internal openings to other numbered panels are grouped together such that all equipment within the cabinets is assumed to be disabled by the postulated fire event. Large fires that were assumed to

¹⁸ (EIS Component Identifier: CAB)

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	11 OF 32
		98 --	10 --	00	

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

occur in the small number of cabinets that were found to have openings at the top were assumed to propagate to fail an entire train of plant safeguards equipment.

6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where procedures don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:

- a. MV-32064, 1 REAC VSL INJ ISOL MV A
 MV-32065, 1 REAC VSL INJ ISOL MV B
 MV-32167, 2 REAC VSL INJ ISOL MV A
 MV-32168, 2 REAC VSL INJ ISOL MV B

Failure open makes a parallel path via the Reactor Vessel injection lines in addition to the Loop B cold leg. The core will remain covered with injection. Some reduction in cooldown rate may be experienced because all flow will not be forced up through the core. Inability to realign these MOV's is not a safety concern.

Secondary heat sink via SG's also remains available.

- b. MV-32084, 11 RWST TO 11 RHR PMP ISOL MV
 MV-32187, 21 RWST TO 21 RHR PMP ISOL MV

Manual valves are provided in the suction to RHR which could be used if these MOV's are not available. There is also a check valve downstream that would prevent back flow to the RWST when Loop supplies to RHR are opened.

- c. MV-32165, 1 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
 MV-32193, 2 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV

In the unlikely event that a fire affects both trains in spite of their separation, the core continues to be cooled by the Secondary heat sink while repairs could be put in place to make RHR available.

- d. MV-32195, 1 PRZR PORV ISOL A MV
 MV-32196, 1 PRZR PORV ISOL B MV
 MV-32197, 2 PRZR PORV ISOL A MV
 MV-32198, 2 PRZR PORV ISOL B MV

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	12 OF 32
		98	-- 10	-- 00	

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

The spurious failure of the PORV block valves is already addressed by alternate actions to fail the PORV's closed by removal of DC power and air. Per PINGP procedure F5 Appendix B, Attachments B and E.

- e. MV-32238, 11 AFW TO 11 SG MV
- MV-32239, 11 AFW TO 12 SG MV
- MV-32246, 22 AFW TO 21 SG MV
- MV-32247, 22 AFW TO 22 SG MV

If power was available to the motor driven pumps, they could be used. Cross tie capability exists via manual valve lineup for both units if even one motor driven pump is available. 21 MDAFWP (Unit 2 Train A) would be available upon repowering of A-train buses by EDG. Some time would also be available for restoration of power to supply the motor driven pump(s). Alternatively, a Main Feedwater pump on each unit remains running after a plant trip. If power is available to the non safeguard bus, local manual Feedwater flow control may be used to maintain SG level.

- f. MV-32333, 11 TD AFW PMP SUCT FROM CST MV
- MV-32345, 22 TD AFW PMP SUCT FROM CST MV

If condensate is unavailable, Cooling water is an optional supply.

- 7. Existing Personnel Controls on the Area: The room is monitored by both unit Turbine Building Operators who each normally walk the area down twice per shift (total eight times per 24 hour period) to verify that all fire doors¹⁹ are closed, doors are free of obstruction, removal of combustible material, and any abnormal conditions. Reference PINGP Forms 195 and 196. The room is not a normal working area nor is it used for access to other plant areas. The room is a vital area with limited access for plant personnel. These requirements are in addition to the reviews required by 5AWI 3.13.2 and 3.2.4 as discussed below.
- 8. Existing Administrative Controls on the Area: PINGP procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

¹⁹ (EIS Component Identifier: DR)

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	13 OF 32
		98 --	10 --	00	

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

PINGP procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

PiNGP procedure F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored. If the suppression criteria cannot be met for this area a continuous fire watch with backup suppression equipment shall be established. F5 Appendix K requires any work in the room to bypass the automatic CO2 suppression system for personnel safety, log this bypass with the control room operators, and establish a continuous fire watch with backup suppression equipment.

9. Compensatory Measures for the Area: An hourly fire watch is provided to monitor the affected areas. The fire watch monitors for changes in transient combustible loading, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a Relay Room fire on the subject MOV's are provided in a Temporary Change Notice to the Relay Room Fire Alarm response procedure. This procedure suggests de-energizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly limit the consequences of a fire if one should occur.

10. Conclusion: This room has a high number of cables for susceptible MOV's and a high combustible load. However, the detection and suppression systems are operable. The design of the room and the cable system limit the susceptibility of the subject cables and the number of affected MOV's. The extensive administrative controls normally in place for this area and the extensive normal operations personnel monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	98	-- 10	-- 00	14 OF 32

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

Fire Area 31 (Zone 2) B train Aux. Feedwater Pump Room

1. **Combustible Load:** Combustibles in this area include cable, pump oil, and miscellaneous material. The fire load in this area is Very Light in the FHA. (less than 40,000 Btu/sq. ft)
2. **Fire Detection:** Fire Detection in the area uses thermal and ion detectors in the ceiling area near the cable trays.
3. **Fire Suppression:** Fire Suppression in the area is provided by a wet pipe sprinkler²⁰ system with sprinkler heads located above and below cable trays. Manual suppression (CO2 and dry chemical fire extinguishers and hose stations) is available just outside the room.
4. **Cable Susceptibility to Fire:** A fire in this room will be a low intensity fire due to either a cable, pump, or a compressor oil fire. An oil fire will probably not activate the wet pipe system, since it would likely result from an oil leak with minimal heat released. The fire would be contained with extinguishers. Most cables in the room are in rigid conduit²¹. The valve control cables are in rigid conduit. Cables are fire resistant IEEE 383 qualified cable. A cable insulation²² fire could activate the wet pipe system since the cables are in trays located near the ceiling. These factors limit the susceptibility of the cables to fire.
5. **Redundant Train Susceptibility to Fire:** USAR required redundant cable tray train separation is maintained in the room. This limits the susceptibility of both trains to sustain damage in a single fire.
6. **Safe Shutdown Procedures:** The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:

- a. MV-3223²⁰, 11 AFW TO 11 SG MV
MV-323²¹, 21 AFW TO 21 SG MV

For Appendix D provides guidance for use of other valves, and to de-energize redundant MOV's to prevent spurious operation due to additional shorts. In addition, if power was available to the motor driven pumps, they could be used.

²⁰ (EIS Component Identifier: SRNK)

²¹ (EIS Component Identifier: CND)

²² (EIS Component Identifier: ISL)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	15 OF 32
		98	-- 10	-- 00	

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

Cross tie capability exists via manual valve lineup for both units if even one motor driven pump is available. Some time would also be available for restoration of power to supply the motor driven pump(s). Alternatively, a Main Feedwater pump on each unit remains running after a plant trip. If power is available to the non safeguard bus, local manual Feedwater flow control may be used to maintain SG level.

b. MV-32336, 21 MD AFW PMP SUCT FROM CST MV

If condensate is unavailable, Cooling water is an optional supply.

7. Existing Personnel Controls on the Area: The room is monitored by both unit Turbine Building Operators who each normally walk the area down twice per shift (total eight times per 24 hour period) to verify that all fire doors are closed, doors are free of obstruction, removal of combustible material, and any abnormal conditions. Reference PINGP Forms 195 and 196. The room is a vital area with limited access for plant personnel.
8. Existing Administrative Controls on the Area: PINGP procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

PINGP procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

PINGP procedure F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored. F5 Appendix K requires that if the suppression system is required or becomes inoperable a continuous fire watch shall be established until the system is restored.

9. Compensatory Measures for the Area: An hourly fire watch is provided to monitor the affected areas. The fire watch monitors for changes in transient combustible loading, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	16 OF 32	
		98 --	10 --	00		

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

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a fire for the subject MOV's are provided in a Temporary Change Notice to the Fire Alarm response procedure. This procedure suggests de-energizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly limit the consequences of a fire if one should occur.

- Conclusion: In conclusion, the fire load in the area is very light and detection and suppression are available. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

Fire Area 32 (Zone 2) A train Aux. Feedwater Pump Room

- Combustible Load: Combustibles in this area include cable, pump oil, and miscellaneous material. The fire load in this area is Very Light in the PINGP FHA (less than 40,000 Btu/sq. ft).
- Fire Detection: Fire Detection in the area uses thermal and ion detectors in the ceiling area near the cable trays.
- Fire Suppression: Fire Suppression in the area is provided by a wet pipe sprinkler system with sprinkler heads located above and below cable trays. Manual suppression using CO2 and dry chemical fire extinguishers and hose stations just outside the room is also provided.
- Cable Susceptibility to Fire: A fire in this room will be a low intensity fire due to either a cable, pump, or a compressor oil fire. An oil fire will probably not activate the wet pipe

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	17 OF 32
		98	-- 10 --	00	

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

system, since it would likely result from an oil leak with minimal heat released. The fire would be contained with extinguishers. Most cables in the room are in rigid conduit. The valve control cables are in rigid conduit. Cables are fire resistant IEEE 383 qualified cable. A cable insulation fire could activate the wet pipe system since the cables are in trays located near the ceiling. These factors limit the susceptibility of the cables to fire.

5. Redundant Train Susceptibility to Fire: USAR required redundant cable tray train separation is maintained in the room. This limits the susceptibility of both trains to sustain damage in a single fire.
6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:
 - a. MV-32382, 12 AFW TO 12 SG MV
MV-32247, 22 AFW TO 22 SG MV

F5 Appendix D provides guidance for use of other valves, and to de-energize redundant MOV's to prevent spurious operation due to additional shorts. If power was available to the motor driven pumps, they could be used. Cross tie capability exists via manual valve lineup for both units if even one motor driven pump is available. Some time would also be available for restoration of power to supply the motor driven pump(s). Alternatively, a Main Feedwater pump on each unit remains running after a plant trip. If power is available to the non safeguard bus, local manual Feedwater flow control may be used to maintain SG level.

- b. MV-32335, 12 MD AFW PMP SUCT FROM CST MV

If Condensate is unavailable, Cooling water is an optional supply.

7. Existing Personnel Controls on the Area: The room is monitored by both unit Turbine Building Operators who each normally walk the area down twice per shift (total eight times per 24 hour period) to verify that all fire doors are closed, doors are free of obstruction, removal of combustible material, and any abnormal conditions. Reference PINGP Forms 195 and 196. The room is a vital area with limited access for plant personnel.
8. Existing Administrative Controls on the Area: PINGP procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	18 OF 32
		98	-- 10 --	00	

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

when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

PINGP procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

PINGP procedure F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored. F5 Appendix K requires that if the suppression system is required or becomes inoperable a continuous fire watch with backup suppression equipment shall be established until the system is restored.

9. Compensatory Measures for the Area: An hourly fire watch is provided to monitor the affected areas. The fire watch monitors for changes in transient combustible loading, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a fire for the subject MOV's are provided in a Temporary Change Notice to the Fire Alarm response procedure. This procedure suggests de-energizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly limit the consequences of a fire if one should occur.

10. Conclusion: In conclusion, the fire load in the area is very light and detection and suppression are available. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	19 OF 32
		98	-- 10 --	00	

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

Fire Area 58 (Zone 8) Auxiliary Building 695' elev. Unit 1

1. Combustible Load: Combustibles in this area include cable, pump oil, and miscellaneous material. The fire load in this area is Very Light. (less than 40,000 BTU/sq. ft.)
2. Fire Detection: Fire Detection in the area uses ion detectors in the ceiling area near the cable trays.
3. Fire Suppression: Fire Suppression in the area is provided by manual suppression using CO2 fire extinguishers and hose stations. Wet pipe sprinkler systems protect the elevator and stairwell areas.
4. Cable Susceptibility to Fire: A fire in this area will be low intensity. Cables are fire resistant IEEE 383 qualified cable. These factors limit the susceptibility of the cables to fire.
5. Redundant Train Susceptibility to Fire: USAR required redundant cable tray train separation is maintained in the area. The area is highly compartmentalized. These factors limit the susceptibility of both trains to sustain damage in a single fire.
6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:
 - a. MV-32085, 11 RWST TO 12 RHR PMP ISOL MV

Manual valves are provided in the suction (SI-1) to RHR which could be used if these MOV's are not available. There is also a check valve downstream that would prevent back flow to the RWST when Loop supplies to RHR are open.
 - b. MV-32094, 12 RHR HX CC INLT MV

In the unlikely event that the CC supply is lost to the RHR HX, with no alternate measure available, the core continues to be cooled by the secondary heat sink while repairs could be made to make RHR available.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	20 OF 32
		98	-- 10	-- 00	

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

- c. MV-32202, SI TEST TO 11 RWST ISOL MV A
MV-32203, SI TEST TO 11 RWST ISOL MV B

F5 Appendix D requires RCS Pressure be reduced to the point where adequate flow is ensured through the pump, with no credit taken for use of these MOV's. Therefore, these MOV's are not necessary. They are provided for operational convenience by the analysis.
- d. MV-32382, 12 MD AFW PMP DISCH TO 12 SG MV

12 MDAFWP is available as the primary AFW source with its discharge valves locally operated in the AFWP Room.
- 7. Existing Personnel Controls on the Area: The Auxiliary Building Operator is stationed in this area. The Auxiliary Building Operator normally walks the area down at least twice per shift (four times per 24 hour period) to verify that all fire doors are closed and free of obstruction, insure removal of combustible material, and identify any abnormal conditions. Reference PINGP Form 1180. This is a vital area and a radiological controlled area with limited access for plant personnel.
- 8. Existing Administrative Controls on the Area: PINGP procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

PINGP procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

PINGP procedure F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored.
- 9. Compensatory Measures for the Area: An hourly fire watch is provided to monitor the affected areas. The fire watch monitors for changes in transient combustible loading changes, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	21 OF 32
		98	-- 10	-- 00	

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

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a fire for the subject MOV's are provided in a Temporary Change Notice to the Fire Alarm response procedure. This procedure suggests deenergizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly limit the consequences of a fire if one should occur.

- Conclusion: In conclusion, the fire load in the area is very light and detection and suppression are available. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

Fire Area 73 (Zone 40) Auxiliary Building 695' elev. Unit 2

- Combustible Loading: Combustibles in this area include cable, pump oil, and miscellaneous material. The fire load in this area is Very Light.
- Fire Detection: Fire Detection in the area uses ion detectors in the ceiling area near the cable trays.
- Fire Suppression: Fire Suppression in the area is provided by manual suppression using CO2 fire extinguishers and hose stations. Wet pipe sprinkler systems protect the stairwell areas.
- Cable Susceptibility to Fire: A fire in this area will be low intensity. Cables are fire resistant IEEE 383 qualified cable. These factors limit the susceptibility of the cables to fire.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	22 OF 32
		98	-- 10 --	00	

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

5. Redundant Train Susceptibility to Fire: USAR required redundant cable tray train separation is maintained in the area. The area is also highly compartmentalized. These factors limit the susceptibility of both trains to sustain damage in a single fire.

6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:
 - a. MV-32188, 21 RWST TO 22 RHR PUMP ISOL MV

Manual valves are provided in the suction (SI-1) to RHR which could be used if these MOV's are not available. There is also a check valve downstream that would prevent back flow to the RWST when Loop supplies to RHR are open.
 - b. MV-32129, 22 RHR HX CC INLT MV

In the unlikely event that the CC supply is lost to the RHR HX, with no alternate measure available, the core continues to be cooled by the secondary heat sink while repairs could be made to make RHR available.
 - c. MV-32204, SI TEST TO 21 RWST ISOL MV A
 MV-32205, SI TEST TO 21 RWST ISOL MV B

F5 Appendix D requires RCS Pressure be reduced to the point where adequate flow is ensured through the pump, with no credit taken for use of these MOV's. Therefore, these MOV's are not necessary. They are provided for operational convenience.

7. Existing Personnel Controls on the Area: The Auxiliary Building Operator is stationed in this area. The Auxiliary Building Operator normally walks the area down at least twice per shift (four times per 24 hour period) to verify that all fire doors are closed and free of obstruction, insure removal of combustible material, and identify any abnormal conditions. Reference PINGP Form 1180. This is a vital area and a radiological controlled area with limited access for plant personnel.

8. Existing Administrative Controls on the Area: PINGP procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	23 OF 32
		98	-- 10 --	00	

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

when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

PINGP procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

PINGP procedure F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored.

9. Compensatory Measures for the Area: An hourly fire watch is provided to monitor the affected areas. The fire watch monitors for changes in transient combustible loading changes, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a fire for the subject MOV's are provided in a Temporary Change Notice to the Fire Alarm response procedure. This procedure suggests deenergizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly limit the consequences of a fire if one should occur.

10. Conclusion: In conclusion, the fire load in the area is very light and detection and suppression are available. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	24 OF 32
		98	-- 10 --	00	

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

Fire Area 59 (Zone 19) Auxiliary Building 715' elev. Unit 1

1. Combustible Loading: Combustibles in this area include cable and miscellaneous material. The fire load in this area is Very Light. (less than 40,000 BTU/sq. ft.)
2. Fire Detection: Fire Detection in the area uses ion detectors in the ceiling area near the cable trays.
3. Fire Suppression: Fire Suppression in the area is provided by manual suppression using CO2 fire extinguishers and hose stations. Wet pipe sprinkler systems protect the elevator and stairwell areas and the anti-contamination clothing rack.
4. Cable Susceptibility to Fire: A fire in this area will be a low intensity. Cables are fire resistant IEEE 383 qualified cable. This limits the susceptibility of the cables to fire.
5. Redundant Train Susceptibility to Fire: USAR required redundant cable tray train separation is maintained in the area. This limits the susceptibility of both trains to sustain damage in a single fire.
6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:

- a. MV-32064, 1 REAC VSL INJ ISOL MV A
MV-32065, 1 REAC VSL INJ ISOL MV B

Failure open makes a parallel path via the Reactor Vessel injection lines in addition to the Loop B cold leg. The core will remain covered with injection. Some reduction in cooldown rate may be experienced because all flow will not be forced up through the core. Inability to realign these MOV's is not a safety concern.

Secondary heat sink via SG's also remains available.

- b. MV-32165, 1 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
MV-32231, 1 RCS LP B HOT LEG RHR SPLY (OUTSIDE) MV

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	25	OF 32
		98	-- 10	-- 00		

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

In the unlikely event that a fire affects both trains in spite of their separation, the core continues to be cooled by the Secondary heat sink while repairs could be put in place to make RHR available.

- c. MV-32195, 1 PRZR PORV ISOL A MV
MV-32196, 1 PRZR PORV ISOL B MV

The spurious failure of the PORV block valves is already addressed by alternate actions to fail the PORV's closed by removal of DC power and air. Per PINGP procedure F5 Appendix D.

- 7. Existing Personnel Controls on the Area: The Auxiliary Building Operator is stationed in this area. The Auxiliary Building Operator normally walks the area down at least twice per shift (four times per 24 hour period) to verify that all fire doors are closed and free of obstruction, insure removal of combustible material, and identify any abnormal conditions. Reference PINGP Form 1180. This is a vital area and a radiological controlled area with limited access for plant personnel.
- 8. Existing Administrative Controls on the Area: Existing procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

Existing procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored.

- 9. Compensatory Measures for the Area: An hourly fire watch is provided to monitor the affected areas. The fire watch monitors for changes in transient combustible loading changes, monitors for evidence of smoke or fires, is trained, equipped, and capable of extinguishing incipient stage fires, and is knowledgeable in notification procedures for reporting fires and other plant emergencies.

Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	26 OF 32
		98	-- 10 --	00	

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

possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a fire on the subject MOV's are provided in a Temporary Change Notice to the Fire Alarm response procedure. This procedure suggests deenergizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly reduce the probability of a fire and limit the consequences of a fire if one should occur.

- Conclusion: In conclusion, the fire load in the area is very light and detection and suppression are available. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Available alternate actions further minimize the impact of a fire. The combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

Fire Area 74 (Zone 46) Auxiliary Building 715' elev. Unit 2

- Combustible Loading: Combustibles in this area include cable and miscellaneous material. The fire load in this area is Light in the current PINGP FHA. Actual loading calculations show Very Light loading less than 40,000 Btu/sq. ft..
- Fire Detection: Fire Detection in the area uses ion detectors in the ceiling area near the cable trays.
- Fire Suppression: Fire Suppression in the area is provided by manual suppression using CO2 fire extinguishers and hose stations. Wet pipe sprinkler systems protect the stairwell areas.
- Cable Susceptibility to Fire: A fire in this area will be a low intensity. Cables are fire resistant IEEE 383 qualified cable. These factors limit the susceptibility of the cables to fire.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	27 OF 32
		98	-- 10 --	00	

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

5. Redundant Train Susceptibility to Fire: USAR required redundant cable tray train separation is maintained in the area. This limits the susceptibility of both trains to sustain damage in a single fire.

6. Safe Shutdown Procedures: The Safe Shutdown procedures often supply alternate methods for achieving the affected MOV's function in these areas. Where they don't give specific direction, available options or consequences of the valve inability to be realigned are discussed:

- a. MV-32167, 2 REAC VSL INJ ISOL MV A
MV-32168, 2 REAC VSL INJ ISOL MV B

Failure open makes a parallel path via the Reactor Vessel injection lines in addition to the Loop B cold leg. The core will remain covered with injection. Some reduction in cooldown rate may be experienced because all flow will not be forced up through the core. Inability to realign these MOV's is not a safety concern.

Secondary heat sink via SG's also remains available.

- b. MV-32193, 2 RCS LP A HOT LEG RHR SPLY (OUTSIDE) MV
MV-32233, 2 RCS LP B HOT LEG RHR SPLY (OUTSIDE) MV

In the unlikely event that a fire affects both trains in spite of their separation, the core continues to be cooled by the Secondary heat sink while repairs could be put in place to make RHR available.

- c. MV-32197, 2 PRZR PORV ISOL A MV
MV-32198, 2 PRZR PORV ISOL B MV

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LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	28	OF 32
		98	-- 10 --	00		

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

8. Existing Administrative Controls on the Area: Existing procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

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Heightened awareness of the control room operators has been ensured through the issuance of a Temporary Instruction which advises them of the NCR on this issue and the possible consequences of a fire on the subject MOV's. PINGP Fire Protection program staff are also aware of the issue.

In addition, possible actions that could be taken to limit the consequences of a fire on the subject MOV's are provided in a Temporary Change Notice to the Fire Alarm response procedure. This procedure suggests deenergizing the subject MOV's to prevent their damage if deemed necessary by the Control Room Operator. These factors significantly reduce the probability of a fire and limit the consequences of a fire if one should occur.

10. Conclusion: In conclusion, the fire load in the area is very light and detection and suppression are available. The design of the room and the cable system limit the susceptibility of the subject cables and the extent of damage to the group of MOV's. The administrative controls normally in place for this area and the normal operations monitoring of this area, in addition to the compensatory measures established for an hourly fire watch, heightened awareness, and fire alarm response actions significantly reduce the probability and potential consequences of a fire in the unlikely event that one should occur. Available alternate actions further minimize the impact of a fire. The

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Prairie Island Nuclear Generating Plant Unit 1	05000 282	98	-- 10	-- 00	29	OF 32

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

combination of all of these measures provides adequate assurance that the ability to shutdown is maintained.

Basis for Reporting

It has been determined that a number of MOV's required to meet 10 CFR 50, Appendix R are susceptible to damage from fire induced hot shorts which could conceivably affect the ability to shut down the reactor and maintain it in a safe shutdown condition. Thus, this condition is reportable under 10CFR50.73(a)(2)(v)(A).

CORRECTIVE ACTION

The following corrective actions will be taken:

1. ***Compensatory actions will be maintained in each affected Fire Area until the MOV's affected in that Fire Area have been evaluated or modified as described below.***
 - a. ***Re-evaluate MOV's to identify alternate shutdown systems, components, or flowpaths that are not susceptible to damage and revise the Safe Shutdown Analysis accordingly, or***
 - b. ***Modify MOV's mechanically to prevent mechanical damage (e.g. smaller motor), or***
 - c. ***Modify MOV's electrically to prevent hot short susceptibility (e.g. hold the MOV circuit breaker open or rewire the MOV control circuit).***

Significant engineering review remains to determine the best solution for each group of MOV's. The PINGP expects that engineering review will continue for approximately six months.

2. ***When the engineering review is completed, the PINGP will submit a schedule for our corrective actions.***

The following is a preliminary summary of the currently preferred corrective action for each

Group1 -- RHR Vessel Injection valves MV-32064, 32065, 32167, 32168

The valves are normally OPEN valves and are required to be CLOSED for Safe Shutdown. These valves can be damaged from a spurious OPEN signal. No presently analyzed alternate methods are available for this function. These valves will be considered for reanalysis or rewiring to prevent spurious OPEN operations from bypassing the torque or limit switches.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	30	OF 32
		98	-- 10	-- 00		

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

Group 2 -- RWST to RHR valves MV-32084, 32085, 32187, 32188

The valves are normally OPEN valves and are required to be CLOSED for Safe Shutdown. These valves can be damaged from a spurious OPEN signal. No presently analyzed alternate methods are available for this function. These valves will be considered for reanalysis or rewiring to prevent spurious OPEN operations from bypassing the torque or limit switches.

Group 3 -- CC to RHR HX valves MV-32093, 32094, 32128, 32129

The valves are normally CLOSED valves and are required to be OPEN for Safe Shutdown. These valves can be damaged from a spurious CLOSE signal. Only the B train valves are needed for a fire in a fire areas where they are susceptible to hot short induced damage. No presently analyzed alternate methods are available for this function. Therefore, the valves MV-32094 and MV-32129 will be considered for reanalysis or rewiring to prevent spurious CLOSE operations from bypassing their torque and limit switches.

Group 4 -- LOOP HOT LEG RHR SUCTION valves MV-32165, 32231, 32193, 32233

Each of these valves is part of a pair of in-series valves in the RHR pump suction lines from the hot legs. The valves closest to the reactor ("inside" on the flow diagram) have their breakers held open and are normally closed. These valves ("outside" on the flow diagram) have their breakers closed with the valves also closed. Our first choice for these valves is to prepare a safety evaluation to justify opening the breakers for these valves. If this is done, no other work will be necessary. No presently analyzed alternate methods are available for this function. If the safety evaluation is not successful for some unforeseen reason, then these valves can be damaged from a spurious CLOSE signal and they will be considered for reanalysis or rewiring to prevent spurious CLOSE operations from bypassing their torque and limit switches.

Group 5 -- PRESSURIZER PORV BLOCK valves MV-32195, 32196, 32197, 32198

These valves are normally OPEN. The valves may need to be CLOSED for Safe Shutdown. These valves can be damaged from a spurious OPEN signal. No presently analyzed alternate methods are available for this function. These valves will be considered for reanalysis or rewiring to prevent spurious OPEN operations from bypassing their torque and limit switches.

Group 6 -- SI TEST LINE TO RWST valves MV-32202, 32203, 32204, 32205

The valves are normally OPEN valves and are required to be OPEN for Safe Shutdown. These valves can be damaged from a spurious CLOSE signal. No presently analyzed alternate methods are available for this function. These valves will be considered for reanalysis or rewiring to prevent spurious CLOSE operations from bypassing their torque and limit switches.

Group 7 -- TDAFP DISCH to SG valves MV-32238, 32239, 32246, 32247

The valves are normally OPEN valves and are required to be OPEN for Safe Shutdown. These valves can be damaged from a spurious CLOSE signal. No presently analyzed alternate methods

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	31	OF 32
		98	-- 10	-- 00		

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

are available for this function. These valves will be considered for reanalysis or rewiring to prevent spurious CLOSE operations from bypassing their torque and limit switches.

Group 8 -- CD to AFWP valves MV-32333, 32335, 32336, 32345

The valves are normally OPEN valves and are required to be OPEN for Safe Shutdown. These valves can be damaged from a spurious CLOSE signal. These valves will be considered for reanalysis or rewiring to prevent spurious CLOSE operations from bypassing their torque and limit switches.

Group 9 -- MDAFP DISCH to SIG valves MV-32381, 32382, 32383, 32384

The valves are normally OPEN valves and are required to be OPEN for Safe Shutdown. These valves can be damaged from a spurious CLOSE signal. Only the Unit 1 valve 32382 and the Unit 2 valve 32383 are required for a fire area where they are susceptible to fire induced hot short operation and damage. No presently analyzed alternate methods are available for this function. Valves 32382 and 32383 will be considered for reanalysis or rewiring to prevent spurious CLOSE operations from bypassing their torque and limit switches.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Prairie Island Nuclear Generating Plant Unit 1	05000 282	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	32 OF 32
		98	-- 10	-- 00	

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

FAILED COMPONENT IDENTIFICATION

None.

PREVIOUS SIMILAR EVENTS

None.