

50.72(b)(3)(i)(B) "Unanalyzed condition that seriously degrades
50.72(b)(3)(v) "Event or condition that @ the time of discovery, could [] plant safety"

PIR 20052757 INFORMATION prevented fulfillment of SCC

ORG: SU PIR/CARB Due Date: 10/31/2005 CARB Accepted: Closed

Significant Y/N: Y Level: III Problem Y/N: Y

System Affected: Resp Individual: Follow-up Due Date: Follow-up Complete:

needed for
SD, resid heat,
mitigation

A. Problem, Concern, Condition, or Recommendation

During a detailed review of the Post Fire Safe Shutdown (PFSSD) capability following a severe fire in fire area A-8 (2000' elevation of the Auxiliary Building) it was discovered that a design basis fire in the area could cause a number of spurious actuations to occur. For each spurious actuation, a diverse means (operator manual action) exists to mitigate the spurious actuation. However, due to the number of manual actions that may be required, the feasibility of performing all actions within required time margins is questioned.

The Wolf Creek commitment to 10CFR50, Appendix R, Section III.G states the following:

Redundant trains of systems required to achieve and maintain hot standby are separated by 3-hour rated fire barriers, or the equivalent provided by III.G.2, or else a diverse means of providing the safe shutdown capability exists and is unaffected by the fire.

Based on the above statement, Wolf Creek is allowed to credit "diverse means" to achieve post-fire safe shutdown. Diverse means has been interpreted by Wolf Creek to mean manual operator actions which are deemed feasible.

Wolf Creek document E-1F9900, Post Fire Safe Shutdown Manual Actions, identifies operator manual actions that may need to be performed if a fire occurs in the plant. Section 4.0 discusses the methodology used to develop the document. A feasibility determination, per Section 4.5 of this document, is performed for each manual action or set of manual actions for a given fire area. One aspect of the feasibility determination described in Section 4.5(d) states the following:

"One operator outside the control room who is not on the fire brigade was assumed to be available to perform diverse means actions. It was also assumed that one of the four available operators in the control room could exit the control room temporarily to perform some actions."

Due to the unpredictable nature of fire and the unknown point of origin, the NRC expectation is to assume a fire in a given area causes damage to every unprotected cable and component simultaneously at time 0. In reality, a fire of this scale is not credible in fire area A-8. However, considering a design-basis fire in area A-8, a number of Train A components, including the Train A motor driven auxiliary feedwater pump, are affected. Also, the turbine driven auxiliary feedwater pump may not be available. In addition, the following spurious actuations could occur:

1. Pressurizer PORV BBPCV0455A opens and block valve BBHV8000A fails to close.
2. Steam Generator A ARV ABPV0001 spuriously opens and cannot be controlled from the control room.
3. Steam Generator C ARV ABPV0003 spuriously opens and cannot be closed from the control room.
4. Both VCT outlet valves BGLCV0112B and BGLCV0112C fail to close and normal letdown isolates, causing a reducing inventory in the VCT and possible hydrogen intrusion into the charging pump suction.
5. Normal charging pump power cables pass thru this fire area and may be damaged, causing the NCP to trip.
6. RHR suction valve from the RWST, BNHV8812A, loses power and containment sump valve EJHV8811A opens, causing the RWST to drain to the containment sump.
7. BIT inlet valve EMHV8803B fails to open from the control room handswitch.

The mitigating strategy to assure safe shutdown can be achieved following a fire in area A-8 is to charge through the BIT using CCP B; stop the RCP's and perform natural circulation cooldown; isolate seal injection and RCP thermal barrier cooling (if seal injection was lost for a period of time); operate MDAFP B and feed steam generator D initially controlling steam release using ARV ABPV0004 and, within 60 hours, after performing a cold shutdown repair to regain control of ARV ABPV0001 in the control room, line up auxiliary feedwater to steam generator A.

The following actions outside the control room may be necessary to achieve safe shutdown:

1. An operator exiting the control room temporarily may need to open two DC breakers (NK0104 and NK0105) in the control building, two floors below the control room (room 3408), to cause PORV BBPCV0455A to close. (Needs to be complete within 5 minutes). This same operator then can go to valve KHV0096 in the turbine building and close it. This will prevent hydrogen from repressurizing the VCT if level falls in the VCT. A walkdown with operations has shown that this operator can make these two actions easily in 10 minutes.

Due to the possibility of losing seal injection, this operator may also need to open breakers PA0107, PA0108, PA0204 and PA0205 to trip the RCP's if they cannot be tripped from the control room.

2. A second operator may need to perform the following actions:

B-19

PIR 20052757 INFORMATION

ORG	SU	PIR/CARB Due Date:	10/31/2005	CARB Accepted:		Closed
Significant Y/N:	Y	Level:	II	Problem Y/N:	Y	
System Affected:		Resp Individual:		Follow-up Due Date:		Follow-up Complete:

- Proceed to the steam tunnel (fire area A-23) and fail close ABPV0001 by isolating air and nitrogen to the valve using KAV1435 (air) and KAV1364 (Nitrogen) then vent air from the regulator.
- Proceed to ABFHC0003 in the same fire area and close AEPV0003. Steam generator atmospheric relief valves are now controlled.
- Proceed down the stairway to the 1974 elevation of the auxiliary building. Enter the BIT room (1126) and manually open EMHV8803B to ensure a flow path is available to charge through the BIT using CCP B.
- Proceed to room 1115, Normal Charging Pump Room, and close BGFCV0121 using BGFHC0121 to isolate seal injection.
- Proceed to room 1107, CCP B room, and manually close BG8471B to isolate VCT suction from the pump (note: a ladder will be required to perform this action). After the control room opens the suction valve BNLCV112 to CCP B, a flow path will be lined up to charge through the BIT and seal injection is isolated. Minimum flow from the CCP will be directed to the VCT.
- Proceed to room 1111 and manually close BNHV8812A to prevent draindown of the RWST to the containment sump due to a hot short causing EJHV8811A to open. Power cables for BNHV8812A may be damaged due to the same fire. Per calculation XX-E-013 (CCN XX-E-013-000-CN005), there would be 28.5 minutes after EJHV8811A opens before the RWST level dropped to a level that would be unacceptable for boration to cold shutdown. This action may require donning PC's.

Because of the number of time-critical actions that could be required to mitigate a design-basis fire in area A-8, the available operations staff may be challenged if all spurious actuations occur at nearly the same time. Engineering is currently performing thermal-hydraulic evaluations and VCT draindown calculation to determine available time margins to complete each action. These evaluations are not yet completed. Therefore, this PIR is being written to identify the potential concern and ensure timely completion of the evaluations, and corrective actions, if necessary.

- The potential consequences of this issue are that the plant may not meet the commitments made in the USAR to protect one train of components needed for safe shutdown following a fire in the plant, or provide diverse means to achieve safe shutdown.
- This fire could impact several SSC's to perform their intended functions, which normally can be mitigated by the use of manual actions. However, if the manual actions are not feasible, then reliance on the manual actions cannot be assumed.
- If the feasibility of the operator actions identified cannot be determined, then this issue may be reportable.
- Organizations involved are Design Engineering, Safety Analysis Engineering, Fire Protection, and Operations.
- This issue was discovered while performing a detailed PFSSD analysis for the 2000' elevation in the Auxiliary Building.
- This specific issue is limited to the 2000' elevation in the Auxiliary Building. Other issues have been found during detailed analyses of specific fire areas and were addressed appropriately. Detailed analyses are continuing and, as fire areas are examined, other issues of manual action feasibility may be discovered.
- The possible cause of this issue is the assumptions used regarding combustible material and the interpretation of Appendix R during initial design of the plant. In addition, both the NRC and the Industry are becoming more educated on the issues of post fire safe shutdown.
- Reference USAR appendix 9.5E, cable raceway drawings E-1R1323B, E-1R1323D, E-1R1343B, E-1R1343C and E-15000.

Immediate Actions Taken (if applicable)

PIR 20052757 INFORMATION

ORG SU PIR/CARB Due Date: 10/31/2005 CARB Accepted: Closed
Significant Y/N: Y Level: III Problem Y/N: Y
System Affected: Resp Individual: Follow-up Due Date: Follow-up Complete:

Initiated a calculation to determine the draindown time of the VCT in the case of a loss of letdown and failure of valves BGLCV112B and C to close.

Initiated this PIR.

C. Initiator/Mail Stop: SELBE, WILLIAM L / CC DES

Date: 09/29/2005 Phone: 8398

Reportability Evaluation Request

RER # 2005-032

I. INITIATION (Completed by Originator):

1. Initiating Corrective Action Document: PIR/WR (attach copy): 200527572. Date/Time of Discovery: 9/30/05 0945 Initiator's Name: Bill Selbe

II. SCREENING/NOTIFICATIONS (Completed by Shift Manager):

1. Potentially Reportable ☒ Yes ☐ NoPer (list applicable reporting criteria met) 50.72(b)(3)(ii); 50.72(b)(3)(v); 50.73(a)(2)(i)2. ☐ Plant Manager or ☒ Call Superintendent notified (check one)50.73(a)(2)(v)Person Contacted: RICK HUBBARD Date/Time: 9/30/05 10523. Corporate Services Notified ☐ Yes ☒ No

Person Contacted: _____ Date/Time: _____

4. ENS Reportability Determination per 10 CFR 50.72:

a. ☐ Immediate ☐ 1 hr. ☐ 4 hr. ☒ 8 hr. ☐ N/Ab. ENS Worksheet completed and attached: ☒ Yes ☐ N/Ac. Continuous open channel required: ☐ Yes ☒ No5. Shift Manager signature: [Signature] Date/Time: 9/30/05 1221

III. DISPOSITION (Completed by Licensing):

Reportable Event:

LER #: _____ Ltr. Number: _____ Submittal Date: _____

(No further processing required - send form to Document Services)

Non-Reportable Event - brief description:

♦ Reportability Evaluation Performed by _____ Date _____

Individuals signing above also indicate having verified that they are currently qualified to perform Reportability Evaluations. (Qualification may be verified using the "Qualified Personnel <\\MAINSYS\SHARED\APPS\IWCMENU\QUALIFY\ESPIESQuals.exe>" icon on Paperless Environment, or by contacting your Supervisor, Training Representative or the Training Department).

IV. REVIEW and APPROVAL (Non-Reportable Events only):

♦ Supervisor Licensing _____ Date _____

♦ Manager Regulatory Affairs _____ Date _____

V. POST-CLOSURE ACTIVITY (Completed by Licensing)

♦ ENS Retraction needed: ☐ Yes ☐ No (If yes, coordinate with the Control Room and attach the completed ENS form.)

1

PIR 20052757 INFORMATION

ORG	SU	PIR/CARB Due Date:	10/31/2005	CARB Accepted:	Closed
Significant Y/N:	Y	Level:	III	Problem Y/N:	Y
System Affected:		Resp Individual:		Follow-up Due Date:	
				Follow-up Complete:	
A. Problem, Concern, Condition, or Recommendation					

During a detailed review of the Post Fire Safe Shutdown (PFSSD) capability following a severe fire in fire area A-8 (2000' elevation of the Auxiliary Building) it was discovered that a design basis fire in the area could cause a number of spurious actuations to occur. For each spurious actuation, a diverse means (operator manual action) exists to mitigate the spurious actuation. However, due to the number of manual actions that may be required, the feasibility of performing all actions within required time margins is questioned.

The Wolf Creek commitment to 10CFR50, Appendix R, Section III.G states the following:

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"One operator outside the control room who is not on the fire brigade was assumed to be available to perform diverse means actions. It was also assumed that one of the four available operators in the control room could exit the control room temporarily to perform some actions."

Due to the unpredictable nature of fire and the unknown point of origin, the NRC expectation is to assume a fire in a given area causes damage to every unprotected cable and component simultaneously at time 0. In reality, a fire of this scale is not credible in fire area A-8. However, considering a design-basis fire in area A-8, a number of Train A components, including the Train A motor driven auxiliary feedwater pump, are affected. Also, the turbine driven auxiliary feedwater pump may not be available. In addition, the following spurious actuations could occur:

1. Pressurizer PORV BBPCV0455A opens and block valve BBHV8000A fails to close.
2. Steam Generator A ARV ABPV0001 spuriously opens and cannot be controlled from the control room.
3. Steam Generator C ARV ABPV0003 spuriously opens and cannot be closed from the control room.
4. Both VCT outlet valves BGLCV0112B and BGLCV0112C fail to close and normal letdown isolates, causing a reducing inventory in the VCT and possible hydrogen intrusion into the charging pump suction.
5. Normal charging pump power cables pass thru this fire area and may be damaged, causing the NCP to trip.
6. RHR suction valve from the RWST, BNHV8812A, loses power and containment sump valve EJHV8811A opens, causing the RWST to drain to the containment sump.
7. BIT inlet valve EMHV8803B fails to open from the control room handswitch.

The mitigating strategy to assure safe shutdown can be achieved following a fire in area A-8 is to charge through the BIT using CCP B; stop the RCP's and perform natural circulation cooldown; isolate seal injection and RCP thermal barrier cooling (if seal injection was lost for a period of time); operate MDAFP B and feed steam generator D initially controlling steam release using ARV ABPV0004 and, within 60 hours, after performing a cold shutdown repair to regain control of ARV ABPV0001 in the control room, line up auxiliary feedwater to steam generator A.

The following actions outside the control room may be necessary to achieve safe shutdown:

1. An operator exiting the control room temporarily may need to open two DC breakers (NK0104 and NK0105) in the control building, two floors below the control room (room 3408), to cause PORV BBPCV0455A to close. (Needs to be complete within 5 minutes). This same operator then can go to valve KHV0096 in the turbine building and close it. This will prevent hydrogen from repressurizing the VCT if level falls in the VCT. A walkdown with operations has shown that this operator can make these two actions easily in 10 minutes.

Due to the possibility of losing seal injection, this operator may also need to open breakers PA0107, PA0108, PA0204 and PA0205 to trip the RCP's if they cannot be tripped from the control room.

2. A second operator may need to perform the following actions:

PIR 20052757 INFORMATION

ORG	SU	PIR/CARB Due Date:	10/31/2005	CARB Accepted:	Closed
Significant Y/N:	Y	Level:	III	Problem Y/N:	Y
System Affected:		Resp Individual:		Follow-up Due Date:	
				Follow-up Complete:	

- Proceed to the steam tunnel (fire area A-23) and fail close ABPV0001 by isolating air and nitrogen to the valve using KAV1435 (air) and KAV1364 (Nitrogen) then vent air from the regulator.
- Proceed to ABFHC0003 in the same fire area and close AEIPV0003. Steam generator atmospheric relief valves are now controlled.
- Proceed down the stairway to the 1974 elevation of the auxiliary building. Enter the BIT room (1126) and manually open EMHV8803B to ensure a flow path is available to charge through the BIT using CCP B.
- Proceed to room 1115, Normal Charging Pump Room, and close BGFCV0121 using BGFHC0121 to isolate seal injection.
- Proceed to room 1107, CCP B room, and manually close BG8471B to isolate VCT suction from the pump (note: a ladder will be required to perform this action). After the control room opens the suction valve BNLCV112 to CCP B, a flow path will be lined up to charge through the BIT and seal injection is isolated. Minimum flow from the CCP will be directed to the VCT.
- Proceed to room 1111 and manually close BNHV8812A to prevent draindown of the RWST to the containment sump due to a hot short causing EJHV8811A to open. Power cables for BNHV8812A may be damaged due to the same fire. Per calculation XX-E-013 (CCN XX-E-013-000-CN005), there would be 28.5 minutes after EJHV8811A opens before the RWST level dropped to a level that would be unacceptable for boration to cold shutdown. This action may require donning PC's.

Because of the number of time-critical actions that could be required to mitigate a design-basis fire in area A-8, the available operations staff may be challenged if all spurious actuations occur at nearly the same time. Engineering is currently performing thermal-hydraulic evaluations and VCT draindown calculation to determine available time margins to complete each action. These evaluations are not yet completed. Therefore, this PIR is being written to identify the potential concern and ensure timely completion of the evaluations, and corrective actions, if necessary.

- The potential consequences of this issue are that the plant may not meet the commitments made in the USAR to protect one train of components needed for safe shutdown following a fire in the plant, or provide diverse means to achieve safe shutdown.
- This fire could impact several SSC's to perform their intended functions, which normally can be mitigated by the use of manual actions. However, if the manual actions are not feasible, then reliance on the manual actions cannot be assumed.
- If the feasibility of the operator actions identified cannot be determined, then this issue may be reportable.
- Organizations involved are Design Engineering, Safety Analysis Engineering, Fire Protection, and Operations.
- This issue was discovered while performing a detailed PFSSD analysis for the 2000' elevation in the Auxiliary Building.
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- The possible cause of this issue is the assumptions used regarding combustible material and the interpretation of Appendix R during initial design of the plant. In addition, both the NRC and the Industry are becoming more educated on the issues of post fire safe shutdown.
- Reference USAR appendix 9.5E, cable raceway drawings E-1R1323B, E-1R1323D, E-1R1343B, E-1R1343C and E-15000.

B. Immediate Actions Taken (if applicable)

PIR 20052757 INFORMATION

ORG SU PIR/CARB Due Date: 10/31/2005 CARB Accepted: Closed
Significant Y/N: Y Level: II Problem Y/N: Y
System Affected: Resp Individual: Follow-up Due Date: Follow-up Complete:

Initiated a calculation to determine the draindown time of the VCT in the case of a loss of letdown and failure of valves BGLCV112B and C to close.

Initiated this PIR.

C. Initiator/Mail Stop: SELBE, WILLIAM L / CC DES

Date: 09/29/2005 Phone: 8398

NRC FORM 361
(12-2000)U.S. NUCLEAR REGULATORY COMMISSION
OPERATIONS CENTERREACTOR PLANT
EVENT NOTIFICATION WORKSHEET

EN# 42029

NRC OPERATION TELEPHONE NUMBER: PRIMARY - 301-816-5100 OR 800-532-3469*, BACKUPS - (1ST) 301-951-0550 OR 800-449-3694*
(2ND) 301-415-0550 AND (3RD) 301-415-0553

*Licensees who maintain their own ETS are provided these telephone numbers.

NOTIFICATION TIME 1304 EASTERN 1208 CDT	FACILITY OR ORGANIZATION Wolf Creek	UNIT 1	NAME OF CALLER James M. Kuras	CALL BACK # 620 364-8831 ext 4800
EVENT TIME & ZONE CDT	EVENT DATE 09/30/2005 0945	POWER / MODE BEFORE 100%, Mode 1	POWER / MODE AFTER 100%, Mode 1	
EVENT CLASSIFICATIONS		1-Hr. Non-Emergency 10 CFR 50.72(b)(1)		(v)(A) Safe S/D Capability AINA
GENERAL EMERGENCY	GEN/AAEC	TS Deviation ADEV		(v)(B) RHR Capability AINB
SITE AREA EMERGENCY	SIT/AAEC	4-Hr. Non-Emergency 10 CFR 50.72(b)(2)		(v)(C) Control of Rad Release AINC
ALERT	ALE/AAEC	(i) TS Required S/D	ASHU	(v)(D) Accident Mitigation AIND
UNUSUAL EVENT	UNU/AAEC	(iv)(A) ECCS Discharge to RCS	ACCS	(xii) Offsite Medical AMED
50.72 NON-EMERGENCY (see next column)		(iv)(B) RPS Actuation (scram)	ARPS	(xiii) Loss Comm/Asmt/Resp ACOM
PHYSICAL SECURITY (73.71)	DDDD	(xi) Offsite Notification	APRE	60-Day Optional 10 CFR 50.73(a)(1)
MATERIAL/EXPOSURE	B???	8-Hr. Non-Emergency 10 CFR 50.72(b)(3)		Invalid Specified System Actuation AINV
FITNESS FOR DUTY	HFIT	(ii)(A) Degraded Condition	ADEG	Other Unspecified Requirement (Identify)
OTHER UNSPECIFIED REQMT INFORMATION ONLY	(see last column) NINF	(ii)(B) Unanalyzed Condition	AUNA	(v) Prevent fulfillment of safety system A - D NONR
		(iv)(A) Specified System Actuation	AESF	NONR

DESCRIPTION

Include: Systems affected, actuations and their initiating signals, causes, effect of event on plant, actions taken or planned, etc (Continue on back)

During a design-basis fire in area A-8 (2000 level auxiliary Building), a number of Train A components, including the Train A motor driven auxiliary feedwater pump (control and power cables), are affected. Also, the turbine driven auxiliary feedwater pump (control cables) may not be available. In addition, the following spurious actuations could occur:

1. Pressurizer PORV BBPCV0455A opens and block valve BBHV8000A fails to close (Train A).
2. Steam Generator A ARV ABPV0001 spuriously opens and cannot be controlled from the control room (Train A).
3. Steam Generator C ARV ABPV0003 spuriously opens and cannot be closed from the control room (Train A).
4. Both VCT outlet valves BGLCV0112B and BGLCV0112C fail to close and normal letdown isolates, causing a reducing inventory in the VCT and possible hydrogen intrusion into the charging pump suction (Trains A & B).
5. Normal charging pump power cables pass thru this fire area and may be damaged, causing the NCP to trip.
6. RHR suction valve from the RWST, BNHV8812A, loses power and containment sump valve EJHV8811A opens, causing the RWST to drain to the containment sump (train A).
7. BIT inlet valve EMHV8803B fails to open from the control room handswitch (Train B).

Actions taken or planned: 1) Detection / Suppression systems available in area A-8 are functional. 2) Hourly fire watch established LAW AP 10-104, Breech procedure.

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD?
NRC RESIDENT	X			<input type="checkbox"/> YES (explain above) <input checked="" type="checkbox"/> NO
STATE(s)		X		DID ALL SYSTEMS FUNCTION AS REQUIRED?
LOCAL		X		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (explain above)
OTHER GOV AGENCIES		X		MODE OF OPERATION
MEDIA/PRESS RELEASE		X		UNTIL CORRECTED: 1
				ESTIMATED RESTART DATE: N/A
				ADDITIONAL INFO ON BACK? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

RADIOLOGICAL RELEASES:		CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description).					
LIQUID RELEASE	GASEOUS RELEASE	UNPLANNED RELEASE	PLANNED RELEASE	ONGOING	TERMINATED		
MONITORED	UNMONITORED	OFFSITE RELEASE	T.S. EXCEEDED	PM ALARMS	AREAS EVACUATED		
PERSONNEL EXPOSED OR CONTAMINATED		OFFSITE PROTECTIVE ACTIONS RECOMMENDED				* State release path in description	
	Release Rate (Ci/sec)	% T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT	HOO GUIDE	
Noble Gas			0.1 Ci/sec			1000 Ci	
Iodine			10 uCi/sec			0.01 Ci	
Particulate			1 uCi/sec			1 mCi	
Liquid (excluding tritium and dissolved noble gases)			10 uCi/min			0.1 Ci	
Liquid (tritium)			0.2 Ci/min			5 Ci	
Total Activity							
	PLANT STACK	CONDENSER/AIR EJECTOR	MAIN STEAM LINE	SG BLOWDOWN	OTHER		
RAD MONITOR READINGS							
ALARM SETPOINTS							
% T.S. LIMIT (if applicable)							
RCS OR SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS: (specific details/explanations should be covered in event description)							
LOCATION OF THE LEAK (e.g., SG #, valve, pipe, etc)							
LEAK RATE	UNITS: gpm/gpd	T.S. LIMITS	SUDDEN OR LONG-TERM DEVELOPMENT				
LEAK START DATE	TIME	COOLANT ACTIVITY AND UNITS:	PRIMARY	SECONDARY			
LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL							

EVENT DESCRIPTION (Continued from front)