ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 611935
Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [ ] Direct Revision [X] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	R.D. KECK, 15510, T4-20, 373-1768	[X] Yes [ ] No	June 27, 1996
	5. Project Title/No./Work Order No.	6. Bldg./Sys./Fac. No.	7. Approval Designator
	SEISMIC FAN SHUTDOWN SYSTEM	234-5Z/99B	SQ
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.)	9. Related ECN No(s).	10. Related PO No.
	WHC-SD-CP-SDD-004 REV 3	NONE	NONE

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[ ] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

Design Baseline Document: YES

Complete update of Rev. 3 for installation of new annunciator for seismic system disabled alarm in room 714, 234-5ZA.

For USQ see 96-11.

13a. Justification (mark one)

Criteria Change	[ ]	Design Improvement	[X]	Environmental	[ ]	Facility Deactivation	[ ]
As-Found	[ ]	Facilitate Const	[ ]	Const. Error/Omission	[ ]	Design Error/Omission	[ ]

13b. Justification Details

Provide visual and audible alarm in new power control room with power fail alarm.

14. Distribution (include name, MSIN, and no. of copies)

RD KECK	T4-20	DA CONNERS	T5-11
LE EDVALSON	T5-48		
DR GROTH	T4-15		
JP KING	T5-51		
AO Anderson	T4-19		
GA Glover	T4-20		

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JAN 21 1997
DATE:
STA: 5
HANFORD RELEASE
ID: 12

A-7900-013-2 (11/94) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 611935

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	N/A $	Additional	N/A $	Improvement	N/A
[X] No	Savings	N/A $	Savings	N/A $	Delay	N/A

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[X]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[X]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	ISFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[X]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]	None	[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
ZSE-99B-001		
ZAR-001		
WHC-SD-CP-TI-108		

21. Approvals

	Signature	Date		Signature	Date
Design Authority	[signature]	8/16/96	Design Agent		
Cog. Eng.	[signature]	8/19/96	PE		
Cog. Mgr.			QA		
QA	[signature]	8-19-96	Safety		
Safety	[signature]	8/22/96	Design		
Environ.			Environ.		
Other			Other		
DSP Operations	Jeffrey P. King	8/20/96			
			DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

Definition and Means of Maintaining the Supply Ventilation System Seismic Shutdown Portion of the PFP Safety Envelope

R. D. Keck
Babcock and Wilcox Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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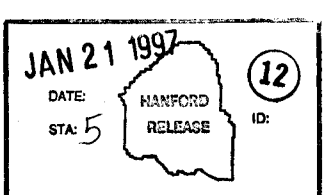
Org Code: 15510 Charge Code: K6001
B&R Code: EW7002010 Total Pages: 17

Key Words: HVAC, Ventilation, Seismic, Shutdown, Authorization Basis, Safety Envelope, OSR

Abstract: The Supply Ventilation System Seismic Shutdown ensures that the 234-5Z building supply fans and the dry air process fans are shutdown following a seismic event. This document defines the safety envelope for the Ventilation System Seismic Shutdown and identifies the operability requirements, components, and procedures which ensure this safety envelope is maintained.



Release Approval 1/21/97 Date

Release Stamp

Approved for Public Release

RECORD OF REVISION	(1) Document Number WHC-SD-CP-SDD-004	Page 1

(2) Title

Definition and Means of Maintaining the Supply Ventilation System Seismic Shutdown Portion of the PFP Safety Envelope

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT-140646		
1	Revised per ECN-166682		
2	Revised per ECN-614399 Incorporated ECN-702505		
3	Revised per ECN-611934		
RS 4	Revised per ECN-611935	[signature]	[signature] 8/22/96

Table of Contents

1.0. PURPOSE

The purpose of this document is to record the technical evaluation of the Limiting Condition for Operation (LCO) described in the Plutonium Finishing Plant (PFP) Operational Safety Requirements, WHC-SD-CP-OSR-010, Rev. 0. May 1994, Section 3.2.3, "Supply Ventilation System Seismic Shutdown." This document, with its appendices, provides the following:

1. The system functional requirements for determining system operability (Section 3).

2. Evaluations of equipment to determine the safety boundary for the system (Section 4).

3. A list of annotated drawings which show the safety envelope boundaries (Appendix C).

4. A list of the safety envelope equipment (Appendix B).

5. Functional requirements for the individual safety envelope equipment, including appropriate setpoints and process parameters (Section 4.1).

6. A list of the operational, maintenance and surveillance procedures necessary to operate and maintain the system equipment within the safety envelope (Sections 5 and 6 and Appendix A).

2.0. BACKGROUND

The 234-5Z building in the Plutonium Finishing Plant (PFP) has been analyzed to determine the consequences of a 0.20 g safe shutdown earthquake (SSE). WHC-SD-SQA-TI-013 Rev. 2, "Safety and Risk Assessment Technical Information to Support PFP Restart," concluded that the most serious spread of contamination from an SSE would occur if the building were pressurized by the main supply fans while the exhaust fans no longer functioned. In accordance with WHC-CM-4-46, section 9.0, the supply ventilation system seismic shutdown system is designated Safety Class.

3.0. SYSTEM FUNCTIONAL REQUIREMENTS

The supply ventilation system seismic shutdown is provided to mitigate the consequences of exhaust fan failures during a seismic event which breaches the structural confinement barriers. On receipt of a signal from either of two accelerometers, the ventilation control circuits must remove electrical power from fans which may pressurize the building. Each accelerometer has two sensors with one mounted in each the east-

west and north-south directions. A vertical sensor is not included[1]. Each accelerometer is set to actuate (open a circuit) if it detects an acceleration greater than 0.07g.

3.1. OSR REQUIREMENTS AND SYSTEM OPERATION

As specified in WHC-SD-CP-OSR-010, LCO 3.2.3, an accelerometer-activated system shall shut down the 234-5Z supply ventilation in the event of an earthquake greater than 0.07g. More specifically, the building supply fans and the dry air stage 2 process fans (supply fans) must be secured, preventing the pressurization of the building. Power is removed from the undervoltage coil of the circuit breaker for the supply fan motors. A detailed sequence of equipment operation is provided in Section 4.1. Exhaust fans and minor supply fans are also shut down by this system to provide an orderly shutdown of the ventilation system, but this function is not a safety requirement.

The supply ventilation system seismic shutdown is considered inoperable if it fails to shutdown the supply fans upon occurrence of a greater than 0.07 g seismic event. In the event that a seismic event is sensed by the power operator and the supply ventilation seismic shutdown system fails to shut down the supply fans, the supply fans will be shutdown manually using either the manual seismic shutdown switch (appendix A, required action A.1) or individual controls (appendix A, required action A.2). Although not required by the OSR, the operator should shutdown 234-5Z exhaust fans to maintain ventilation balance and avoid possible excessive differential pressures throughout the building.

3.2. OSR SURVEILLANCE AND RECOVERY ACTIONS

Annual functional testing of the accelerometer-activated shutdown is required. The LCO requirement specifies the 0.07 g acceleration at which the seismic shutdown is to occur, therefore a surveillance is also required to verify the calibration of the accelerometer.

If the functional test or calibration have not been performed within the required interval or are unsatisfactory, the supply ventilation seismic shutdown system shall be considered inoperable. Operations will be limited such that no additional plutonium is brought into the 234-5Z and 236-Z buildings. If the

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[1] A vertical sensor was not included for the following two reasons. First, seismic analyses determined that building damage that would result in a loss of containment are caused by the horizontal components of earthquakes (URS/John A. Blume and Associates, Engineers, 1987, "Seismic (SSE) Evaluation for the 234-5Z Building at the Hanford Site"). Second, tests determined that construction and general operating activities cause primarily vertical accelerations. Thus nuisance trips could be minimized without missing a potentially damaging earthquake by not including a vertical sensor.

system fails the functional test or calibration, repairs shall be initiated within 24 hours of failure. If the system is not returned to an OPERABLE condition within 10 days, the 234-5Z supply fans shall be shutdown or a written RECOVERY PLAN shall be initiated to remove DISPERSIBLE plutonium from the gloveboxes in 234-5Z and 236-Z.

Because the ventilation seismic shutdown system consists of two redundant channels of instrumentation, each capable of shutting down the building supply fans and the dry air stage 2 process fans (supply fans), the system shall be considered OPERABLE if at least one of the two channels is fully operational. This allows maintenance to be performed on one channel of the system while the other channel ensures compliance with the LCO. However, the ventilation seismic shutdown system is designed to operate under normal circumstances with both channels of instrumentation. Therefore, Plant Manager and PFP Safety approval is required for facility operation of more than 24 hours duration with only one channel of the ventilation seismic shutdown system OPERATIONAL. The inoperable accelerometer channel must be restored to an OPERABLE condition within 30 days. If the inoperable channel cannot be returned to an OPERABLE condition, the inoperable channel is subject to event categorization and reporting requirements of WHC-CM-5-8, Section 1.4 "Occurrence Reporting."

4.0. SAFETY ENVELOPE (SE) EQUIPMENT

4.1. SELECTION OF SE EQUIPMENT

The following discussion describes the function of the equipment which forms the supply ventilation system seismic shutdown safety envelope and the justification for including this equipment in the safety envelope. Most safety envelope equipment for this system is relied upon in the FSAR to function to mitigate the uncontrolled release of radioactive materials following an earthquake which involves the failure of a physical barrier(s). The only exception to this is the "on-line/bypass" switches which indicate that the Seismic Shutdown System is not OPERABLE. (The information in parentheses indicates the location of the equipment on drawings H-2-78073 sheet 2, H-2-96422 sheet 1, and H-2-96436 sheet 4).

4.1.1 Accelerometers 1 and 2 (H-2-78073, sheet 2, lines 54 and 60) and contacts ACCLRM1 and ACCLRM2 (sheet 2, lines 51 and 57).

The accelerometers detect an earthquake greater than 0.07g and initiate the actions required to shutdown the 234-5Z ventilation supply fans and dry air process supply fans. When an earthquake greater than 0.07g has been detected, contacts ACCLRM1 and ACCLRM2 open.

4.1.2 Relays K1, K2, K3, K4 (H-2-78073, sheet 2, lines 51, 57, 52 and 58 respectively) and the associated contacts described below.

Relays K1, K2, K3, and K4 are normally energized. Following an earthquake of greater than 0.07g, relays K1, K2, K3, and K4 are deenergized when contacts ACCLRM1 and ACCLRM2 open. Deenergizing relays K1, K2, K3, and K4 opens their associated contacts as described below.

- Contacts K1-1, K2-1, K1-2 and K2-2 (H-2-78073, sheet 2, line 2).

  Contacts K1-1, K2-1, K1-2 and K2-2 are closed when relays K1 and K2 are energized. Deenergizing relays K1 and K2 opens contacts K1-1, K2-1, K1-2 and K2-2. Opening contacts K1-1 or K2-1 deenergizes the undervoltage relays for supply fans S1, S2, S3 and S4. Opening contacts K1-2 or K2-2 deenergizes the undervoltage relays for supply fans S5, S6, S7 and S8.

- Contacts K1-3 and K2-3 (H-2-96436, sheet 4, line 18).

  Contacts K1-3 and K2-3 are closed when relays K1 and K2 are energized. Deenergizing relays K1 and K2 opens contacts K1-3 and K2-3. Opening contacts K1-3 or K2-3 deenergizes the 15 HP, stage 2 process fan associated with the electric air dryer unit located on the second floor adjacent to column C19.

- Contacts K3-1 and K4-1 (H-2-96422, sheet 1, line 16).

  Contacts K3-1 and K4-1 are closed when relays K3 and K4 are energized. Deenergizing relays K3 and K4 opens contacts K3-1 and K4-1. Opening contacts K3-1 or K4-1 deenergizes the 15 HP, stage 2 process fan associated with the steam air dryer unit located on the second floor adjacent to column C19.

4.1.3 Motor starter 3M in the electric air dryer control cabinet (H-2-96436, sheet 4, line 18) and associated 480V, 3-phase contacts (H-2-96436, sheet 4, zone 6F).

Motor starter 3M is energized when the electric dry air system is operating. Following a seismic event which initiates a ventilation shutdown, motor starter 3M is deenergized when contact K1-3 or K2-3 opens. Deenergizing motor starter 3M opens 480 volt, 3 phase contacts, which deenergizes the electric dry air, 15 HP, stage 2 process fan.

4.1.4 Motor starter 3M in the steam air dryer control cabinet (H-2-96422, line 16) and associated 480V, 3-phase contacts (H-2-96422, zone 6F).

Motor starter 3M is energized when the steam dry air system is operating. Following a seismic event which initiates a ventilation shutdown, motor starter 3M is deenergized when contact K3-1 or K4-1 opens. Deenergizing motor starter 3M opens 480 volt, 3 phase contacts, which deenergizes the steam dry air, 15 HP, stage 2 process fan.

4.1.5 Undervoltage relays for supply fan breakers 1 through 8 (H-2-78073, sheet 2, lines 3, 4, 5, and 6).

The undervoltage relays for supply fan breakers 1 through 8 must be energized for the breakers to remain closed. Following a seismic event which initiates a ventilation shutdown, the undervoltage relays are deenergized when contacts K1-1, K2-1, K1-2 and K2-2 open. Deenergizing the undervoltage relays opens the associated supply fan breakers due to spring pressure actuating the tripper bars.

4.1.6 Supply fan breakers for fans S1 through S8.

The supply fan breakers for fans S1 through S8 provide electrical power to the supply fans when the breakers are closed. Following a seismic event which initiates a ventilation shutdown, the supply fan breakers are opened, deenergizing supply fans S1 through S8, when the undervoltage relay for each breaker is deenergized.

4.1.7 Accelerometer 1 and 2 "on-line/bypass" switches (H-2-78073, sheet 2, lines 52, 58; H-2-96401 sheet 2) and associated wiring.

The accelerometer 1 and 2 "on-line/bypass" switches allow the accelerometers to be tested while preventing relays K1, K2, K3 and K4 from being deenergized. Additional contacts on the "on-line/bypass" switches activate the "seismic fan shutdown system disabled" power control room annunciator window when both switches are placed in the bypass position. This latter function alerts plant personnel that the seismic fan shutdown system is not OPERABLE and justifies the inclusion of the switches and their associated wiring in the safety envelope.

This equipment is not required to function following a seismic event and therefore does not need to be seismically qualified.

4.1.8 Seismic fan shutdown system disabled Power Control Room Annunciator (ANN-714 window 30[15B]).

The seismic fan shutdown system disabled power control room annunciator (ANN-714 window 30[15B]) is activated when both accelerometer 1 and 2 "on-line/bypass" switches have been placed in the bypass position. This alerts plant personnel that the seismic fan shutdown system is not OPERABLE. This justifies the inclusion of the annunciator in the safety envelope.

This equipment is not required to function following a seismic event and therefore does not need to be seismically qualified.

4.2. JUSTIFICATION FOR EXCLUSION OF EQUIPMENT FROM SE

The components excluded from the safety envelope are not required to operate to satisfy WHC-SD-CP-OSR-010, LCO 3.2.3.

Specific components not included in the safety envelope and the reasoning behind their exclusion is discussed below.

4.2.1 120 VAC dedicated seismic shutdown uninterruptable power supply (UPS).

The seismic shutdown UPS is not included in the safety envelope because the seismic shutdown system utilizes a "fail-safe" design in which power is required to keep the fans operating. The seismic shutdown UPS is not required to ensure the shutdown of the 234-5Z supply fans and the dry air stage 2 process supply fans in the event of an earthquake greater than or equal to 0.07g. If the UPS power is lost, the seismic fan shutdown system will operate to deenergize the supply fans, as required. While an inadvertent loss of the seismic shutdown UPS and the resultant loss of ventilation in the facility will interrupt plant operations, this does not justify its inclusion in the safety envelope.

4.2.2 Seismic status and corridor 14 seismic fan shutdown system disabled horns and alarm light.

The seismic status provides individual accelerometer bypass alarms, seismic detectors on line indication, seismic alarms, UPS available indication, and power available indication. None of the above alarms or indications are required to function to ensure that the seismic fan shutdown system operates properly or to alert personnel of the system's inability to operate properly. The corridor 14 seismic fan shutdown disabled horn and alarm light provides notification to personnel working on the system that the system is disabled. The primary safety class indication is provided separately by Power Control Room Annunciator (ANN-714). Therefore none of seismic status panel indications, alarms or components discussed above are included in the safety envelope.

4.2.3 Relays KES-5, KES-9, KES-10, and KES-13 and their associated contacts.

Relays KES-5, KES-9, KES-10 and KES-13 and their associated contacts function to shut down the 234-5Z exhaust fans following a 0.07g earthquake. The exhaust fans are not a safety concern since the fans cannot cause a pressurization of the building. As noted in section 2.0, pressurization of the building as the result of an earthquake is the safety concern that this system mitigates. Therefore, relays KES-5, KES-9, KES-10 and KES-13 and their associated contacts are not included in the safety envelope.

4.2.4 Relays KES-1, KES-4 and KES-6 and their associated contacts.

Relays KES-4 and KES-6 and their associated contacts function to shut down the electric and steam stage 1 process supply fans, filter frame supply fan (S-10) and the air conditioning supply fan to the inspection area (S-11) following a 0.07g earthquake.

The stage 1 process fans for the electric and steam dry air systems are 2 horsepower fans. The fans move air through the first drying stage of the air dryers. The stage 2, 15 horsepower fans (see 4.1.3 and 4.1.4) provide the motive force to supply air to the gloveboxes. Without the stage 2 fans operating, the stage 1 fans do not have the capacity to move a large volume of air to the gloveboxes. Thus the stage 1 fans will not cause a significant release of radioactive material following a seismic event.

Fan S-10 is driven by a ¼ horsepower motor. When in service, it uses air from Zone 1 to pressurize an annular

space around each Zone 3 and Zone 4 filter in the final filter rooms. This prevents leakage during normal operation even if a filter gasket fails to seal. It does not provide any mechanism for a significant release after a seismic event.

Fan S-11 is driven by another small motor, and while it provides air to the Zone 3A inspection area, it is not fed from the supply plenum unless an adequate differential pressure is maintained in Zone 3A. If the pressure differential is lost and the fan continues to operate, any air that S-11 moves will come from the same zone. In view of the flow path and the volume of air moved by this fan, will not cause a significant release of radioactive material following a seismic event.

For these reasons, relays KES-4 and KES-6 and their associated contacts are not included in the safety envelope.

4.2.5 Relays KES-7, KES-11, and timing module KTD-8 and their associated contacts.

Relays KES-7, KES-11, and timing module KTD-8 and their associated contacts function to delay the shutdown of the exhaust fans for about 20 seconds after the supply fans have been shutdown by the seismic fan shutdown system. The shutdown of the exhaust fans is not a safety concern since the fans cannot cause a pressurization of the building. As noted in section 2.0, pressurization of the building as the result of an earthquake is the safety concern that this system mitigates. Therefore relays KES-7, KES-11, and timing module KTD-8 and their associated relays are not included in the safety envelope.

4.2.6 The wiring and junction boxes which connect safety envelope components.

The wiring and junction boxes which connect the seismic shutdown control panels, seismic status panel, undervoltage relays for supply fans S1 through S8, and the electric and steam air dryer starter cabinets are excluded from the safety envelope because the seismic shutdown system utilizes a "fail-safe" design in which power is required to keep the fans operating. The continuity of connecting wiring is not required to ensure the shutdown of the 234-5Z supply fans and the dry air process supply fans in the event of a 0.07g earthquake. If any of the connecting wiring in a conduit is severed or shorted together, the seismic fan shutdown system will operate to deenergize the required supply fans. While an inadvertent break in this wiring and the resultant loss of ventilation in the facility will interrupt plant operations, this is not justification for including the

seismic shutdown systems connecting wiring in the safety envelope. Associated wiring identified in Section 4.1.13 is excluded from this section since the wiring is required to alert operators when the seismic shutdown system is not OPERABLE. Therefore, the wiring addressed in Section 4.1.13 is included in the safety envelope.

5.0. SAFETY ENVELOPE PROCEDURES

The following procedures and practices are required to ensure compliance with LCO 3.2.3 is achieved during all MODES. The procedures include operating procedures, alarm response procedures and maintenance procedures. Each procedure included in the Safety Envelope and the justification for its inclusion is presented below.

5.1. SE ALARM RESPONSE PROCEDURE

5.1.1 ZAR-001, ANN-714 Panel Alarms

This procedure provides instructions for responding to the seismic system disabled alarm.

5.2 EQUIPMENT MAINTENANCE AND REPAIR

In house repair or attempted repair of the Safety Class equipment except for the supply fan circuit breakers is not permitted. Repair of supply fan circuit breakers is permitted if followed by satisfactory performance of ZSE-12A-001 or ZSE-12A-002. Other Safety Class equipment or parts within the equipment may only be replaced with like equipment or parts by in house work forces.

6.0. SAFETY ENVELOPE SURVEILLANCE REQUIREMENTS

6.1. SURVEILLANCE REQUIREMENT SR 3.2.3.1

OSR Surveillance Requirement SR 3.2.3.1 requires an annual FUNCTIONAL TEST of the accelerometer activated supply ventilation system seismic shutdown system. This test is performed by procedure ZSE-99B-001, "Annual Seismic Shutdown System In-Service-Test." To satisfy this requirement the procedure must exercise every component in the system from the accelerometers to the supply fan circuit breakers. The procedure must verify that a signal from either accelerometer results in a trip signal to each supply fan motor controller and that each motor controller interrupts power to its motor on receipt of a trip signal. ZSE-12A-001 and ZSE-12A-002 perform an annual test of the supply fan breakers undervoltage (UV) trip to ensure a loss of voltage to the undervoltage relay will open the circuit breaker.

6.2. SURVEILLANCE REQUIREMENT SR 3.2.3.2

OSR Surveillance Requirement SR 3.2.3.2 requires an annual calibration of each accelerometer channel. This calibration is performed by procedure ZSE-99B-002, "Annual Functional Test of Terra Technology Accelerometers." To satisfy the surveillance requirement, this procedure verifies the calibration of the accelerometer to ensure it provides a trip signal when stimulated by a force equivalent to a 0.07 g seismic event. If an accelerometer is found to be out of calibration, it is sent back to the manufacturer for calibration.

REFERENCES

Rev 0, January 1995, Plutonium Finishing Plant Final Safety Analysis Report, WHC-SD-CP-SAR-021.

Plutonium Finishing Plant Operational Safety Requirements, WHC-SD-CP-OSR-010, Rev 0, May 1994

Operating Procedure, ZAR-001, ANN-714 Panel Alarms

Maintenance Procedure, ZSE-99B-001, Annual Seismic Shutdown System In-Service Test.

Maintenance Procedure, ZSE-99B-002, Annual Functional Test of Terra Technology Accelerometer.

Maintenance Procedure, ZSE-12A-001, Annual Inspection and Testing Electrical Switchgear Breakers for Supply Fans SF-1 through SF-4

Maintenance Procedure, ZSE-12A-002, Annual Inspection and Testing Electrical Switchgear Breakers for Supply Fans SF-5 through SF-8

PFP Safety Equipment List, WHC-SD-CP-TI-108.

Design Criteria PFP Seismic Fan Shutdown System, WHC-SD-CP-CR-028 Rev. 2A, December 12, 1989.

Appendix A - OSR Systems Compliance Sheet

OSR LCO COMPLIANCE SHEET

APPLICABLE OSR LCO (WHC-SD-CP-OSR-010 Section 3.0):

3.2.3 Supply Ventilation System Seismic Shutdown

LCO 3.2.3 The accelerometer activated 234-5Z supply ventilation system seismic shutdown shall be OPERABLE and set to shutdown building supply and dry air process fans (supply fans) in the event of a greater than 0.07 g seismic event.

APPLICABILITY: ALL MODES

ACTIONS:

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The accelerometer activated supply ventilation system seismic shutdown system is inoperable.	A.1 Enter MODE 2, Limited Plutonium Handling Operations in the affected process areas in the 234-5Z and 236-Z buildings. Limit operations such that no additional DISPERSIBLE plutonium is brought into the 234-5Z and 236-Z buildings.	IMMEDIATELY 10 days
	AND	
	A.2.1 Restore supply ventilation system seismic shutdown OPERABILITY	10 days
	OR	
	A.2.2 Reduce DISPERSIBLE plutonium to below accepted risk envelope quantities in accordance with a RECOVERY PLAN.	
	OR	
	A.2.3 Shutdown the 234-5Z supply fans.	10 days

SURVEILLANCE REQUIREMENTS:

SURVEILLANCE		
SR 3.2.3.1	Perform FUNCTIONAL TEST of the accelerometer activated supply ventilation system seismic shutdown.	
SR 3.2.3.2	calibrate each accelerometer channel.	Annually

APPLICABLE ACCIDENT ANALYSES (WHC-SD-CP-021, CH 9) SECTION/TITLE:

9.2.4 Seismic Event
9.2.4A.6 Seismic Accident Analysis.

OSR LCO COMPLIANCE SHEET

APPLICABLE OSR LCO (WHC-SD-CP-OSR-010 Section 3.0):

3.2.3 Supply Ventilation System Seismic Shutdown

APPLICABLE PLANT/PROCESS DESIGN/OPERATION DESCRIPTION(S) [FSAR CHAPTER/SECTION]:

2.1.1.2	Earthquake
2.4.5	Seismic Event
4.2.5	Seismic Design
4.4	Classifications of Structures, Components, and Systems
5.4.1.2.4	Seismic Fan Shutdown System

BOUNDARY IDENTIFICATION DRAWINGS:

H-2-78073, sheet 2, Seismic shutdown system, electrical
H-2-16318, sheet 1, Fan Control Schematic and Control Panel
H-2-16318, sheet 3, Fan Control Schematic Emergency Shutdown
H-2-96422, Steam dry air controller, electrical
H-2-96436, sheet 4, Electric dry air controller, electrical
H-2-96401, sheet 2 Annunciator AMN-714

SYSTEM DRAWINGS:

H-2-78073, sheet 2, Seismic shutdown system, electrical
H-2-16318, sheet 1, Fan Control Schematic and Control Panel
H-2-16318, sheet 3, Fan Control Schematic Emergency Shutdown
H-2-96422, Steam dry air controller, electrical
H-2-96436, sheet 4, Electric dry air controller, electrical
H-2-26538, sheet 1 - 54, One-line diagram
H-2-96401, sheets 1, 2, 3, Annunciator AMN-714

IMPLEMENTING PROCEDURES/COMPLIANCE VERIFICATION

OPERATING:

ZAR-001, AMN-714 Panel Alarms
ZO-060-811, Alarm Responses for Seismic Panel Alarms
ZO-060-117, Perform Power Equipment Surveillance
ZO-060-119, Perform Emergency Shutdown of Ventilation System
ZO-060-102, Startup/Shutdown Ventilation System
ZO-100-400, Perform Nuclear Operations Surveillance and Responses

LABORATORY: None

HEALTH PHYSICS: None

OPERATING SPECIFICATION(S): None

ADMINISTRATIVE: None

MAINTENANCE: None

SURVEILLANCE REQUIREMENTS	PROCEDURE NUMBER	DESCRIPTION	PROCEDURE FREQUENCY
SR 3.2.3.1	ZSE-99B-001	Functional test	Annual
	ZSE-12A-001	Electrical switchgear breaker functional test, SFs 1 through 4	Annual

OSR LCO COMPLIANCE SHEET			
APPLICABLE OSR LCO (WHC-SD-CP-OSR-010 Section 3.0):			
3.2.3 Supply Ventilation System Seismic Shutdown			
	ZSE-12A-002	Electrical switchgear breaker functional test, SFs 5 through 8	Annual
SR 3.2.3.1	ZSE-998-002	Functional test/Calibration	Annual
OTHER: None			
NOTES/COMMENTS: None			

Appendix B - Master Component Index Input List

APPLICABLE OSR LCO (WHC-SD-CP-OSR-010 Section 3.0):

3.2.3 Supply Ventilation System Seismic Shutdown

OSR SYSTEM EQUIPMENT/COMPONENT LIST

MASTER COMPONENT INDEX NUMBER	FUNCTIONAL DESCRIPTION	MANUFACTURER PART/MODEL NUMBER	DRAWING NUMBER
ACCELEROMETER-1	Accelerometer 1	Terra Technology DCA-333	H-2-78073 Sheet 2
ACCELEROMETER-2	Accelerometer 2	Terra Technology DCA-333	H-2-78073 Sheet 2
RLY-K1-99B	Seismic shutdown control panel, relay K1	Nutherm, Inc #EGPI-003	H-2-78073 Sheet 2
RLY-K2-99B	Seismic shutdown control panel, relay K2	Nutherm, Inc #EGPI-003	H-2-78073 Sheet 2
RLY-K3-99B	Seismic shutdown control panel, relay K3	Nutherm, Inc #EGPI-003	H-2-78073 Sheet 2
RLY-K4-99B	Seismic shutdown control panel, relay K4	Nutherm, Inc #EGPI-003	H-2-78073 Sheet 2
MS-SEL1-99B	Seismic shutdown control panel, Accelerometer 1 ONLINE\BYPASS switch	Westinghouse #PB1KEN2AF101	H-2-78073 Sheet 2
MS-SEL2-99B	Seismic shutdown control panel, Accelerometer 2 ONLINE\BYPASS switch	Westinghouse #PB1KEN2AF10	H-2-78073 Sheet 2
ANN-714	Room 714 Alarm Annunciator Panel	Ronan 65X12SM-2000	H-2-96401 Sheet 2
ANN-714-HORN	Room 714 Alarm Annunciator Horn	Ronan 65X12SM-2000	H-2-96401 Sheet 2
ANN-714-RESET	Room 714 Alarm Annunciator Reset/Silence (Acknowledge) Button	Ronan 65X12SM-2000	H-2-96401 Sheet 2
ANN-714-W30	Window 30 (15B) of ANN-714 in room 714, 234-5ZA	Ronan 65X12SM-2000	H-2-96401 Sheet 2
RLY-UV1-12A	S1 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
RLY-UV2-12A	S2 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
RLY-UV3-12A	S3 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
RLY-UV4-12A	S4 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
RLY-UV5-12A	S5 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
RLY-UV6-12A	S6 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
RLY-UV7-12A	S7 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2

APPLICABLE OSR LCO (WHC-SD-CP-OSR-010 Section 3.0):

3.2.3 Supply Ventilation System Seismic Shutdown

RLY-UV8-12A	88 breaker undervoltage relay	Westinghouse DK-25 Style Nos 1332 874 and 1241 581	H-2-78073 Sheet 2
FBX103	81 circuit breaker	Westinghouse DK-25	H-2-26538
FBX105	82 circuit breaker	Westinghouse DK-25	H-2-26538
FBX106	83 circuit breaker	Westinghouse DK-25	H-2-26538
FBX107	84 circuit breaker	Westinghouse DK-25	H-2-26538
FBX205	85 circuit breaker	Westinghouse DK-25	H-2-26538
FBX206	86 circuit breaker	Westinghouse DK-25	H-2-26538
FBX207	87 circuit breaker	Westinghouse DK-25	H-2-26538
FBX211	88 circuit breaker	Westinghouse DK-25	H-2-26538
RLY-3ME-230	Electric dry air controller, motor starter 3M	General Electric CR4G2WP	H-2-96436 sheet 4
RLY-3MS-230	Steam dry air controller, motor starter 3M	General Electric CR4G2WP	H-2-96422

NOTES/COMMENTS: None