WOLF CREEK
NUCLEAR OPERATING CORPORATION

Terry J. Garrett
Vice President, Engineering

August 14, 2008

ET 08-0041

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

Subject: Docket No. 50-482: Revision to Technical Specification 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation"

Gentlemen:

Pursuant to 10 CFR 50.90, Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests an amendment to Operating License NPF-42 for the Wolf Creek Generating Station (WCGS) to incorporate proposed changes into the WCGS Technical Specifications (TS).

The proposed changes will revise TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS)" to extend the Surveillance Frequency on selected ESFAS slave relays from 92 days to 18 months. Justification for extending the slave relay Surveillance Frequency is based on information contained in the Westinghouse Electric Corporation reports WCAP-13878-P-A, Revision 2 (proprietary version) and WCAP-14117-NP-A, Revision 2 (nonproprietary version), "Reliability Assessment of Potter & Brumfield MDR Series Relays," dated August 2000.

Attachment I through IV provide the Evaluation, Markup of TSs, Retyped TS pages, and proposed TS Bases changes, respectively, in support of this amendment request. Attachment IV, proposed changes to the TS 3.3.2 Bases, is provided for information only. Final TS Bases changes will be implemented pursuant to TS 5.5.14, "Technical Specification (TS) Bases Control Program," at the time the amendment is implemented. Attachment V provides a List of Regulatory Commitments made by WCNOC in this submittal.

It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. The amendment application was reviewed by the WCNOC Plant Safety Review Committee. In accordance with 10 CFR 50.91, a copy of this application is being provided to the designated Kansas State official.

A001
NRR

WCNOC requests approval of this proposed amendment by July 31, 2009. Once approved, the amendment will be implemented within 90 days.

If you have any questions concerning this matter, please contact me at (620) 364-4084, or Mr. Richard D. Flannigan at (620) 364-4117.

Sincerely,

Terry J. Garrett

TJG/rlt

Attachments:
I - Evaluation
II - Markup of Technical Specification Pages
III - Retyped Technical Specification Pages
IV - Proposed TS Bases Changes (for information only)
V - List of Regulatory Commitments

cc: E. E. Collins (NRC), w/a
T. A. Conley (KDHE), w/a
V. G. Gaddy (NRC), w/a
B. K. Singal (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Terry J. Garrett, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By _____
Terry J. Garrett
Vice President Engineering

SUBSCRIBED and sworn to before me this 14th day of August, 2008.

NOTARY PUBLIC * OFFICIAL SEAL * STATE OF KANSAS
RHONDA L. TIEMEYER
MY COMMISSION EXPIRES
January 11, 2010

_____
Notary Public

Expiration Date January 11, 2010

EVALUATION

EVALUATION

1.0 SUMMARY DESCRIPTION

The amendment application involves changes to the Wolf Creek Generating Station (WCGS) Technical Specifications (TS) to revise TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS)" to extend the Surveillance Frequency on selected ESFAS slave relay from 92 days to 18 months. Justification for extending the slave relay Surveillance Frequency is based on information contained in the Westinghouse Electric Corporation reports WCAP-13878-P-A, Revision 2 (Reference 6.1) and WCAP-14117-NP-A, Revision 2 (nonproprietary version), "Reliability Assessment of Potter & Brumfield MDR Series Relays," dated August 2000.

2.0 DETAILED DESCRIPTION

WCAP-13878-P-A, Revision 2, provides the technical basis and methodology for revising the Surveillance Frequency for the Potter & Brumfield MDR series relays identified in the WCAP and used in engineered safety feature (ESF) applications. Slave relay testing has the potential to cause inadvertent ESF actuation and/or reactor trip. Extending the Surveillance Frequency reduces the number of tests performed on the relays, thus reducing the potential for unnecessary ESF actuation or reactor trip.

Proposed changes to the TSs are as follows:

- Table of Contents is revised to reflect repagination as a result of the proposed change.

- Surveillance Requirement (SR) 3.3.2.6 is revised by deleting the Note to the SR and changing the Frequency from 92 days to 18 months.

- SR 3.3.2.13 and SR 3.3.2.14 are deleted. The deletion of these two SRs result in deleting the "continued" on page 3.3-30 and placing a double line in the table to indicate the end of the Surveillance Requirements table.

- Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation," is revised as follows:

    - Function 1.b., Safety Injection – Automatic Actuation Logic and Actuation Relays – SR 3.3.2.13 is deleted as a required Surveillance.

    - Function 3.a.(2), Containment Isolation – Phase A Isolation – Automatic Actuation Logic and Actuation Relays - SR 3.3.2.13 is deleted as a required Surveillance.

    - Function 5.a., Turbine Trip and Feedwater Isolation – Automatic Logic and Actuation Relays (SSPS) – SR 3.3.2.14 is deleted as a required Surveillance.

- Function 7.a., Automatic Switchover to Containment Sump – Automatic Logic and Actuation Relays – SR 3.3.2.13 is revised to SR 3.3.2.6.

3.0 TECHNICAL EVALUATION

3.1 System Description

The Solid State Protection System (SSPS) initiates the proper unit shutdown or engineered safety feature (ESF) actuation in accordance with the defined logic and based on the bistable outputs from the signal process control and protection system. The SSPS equipment is used for the decision logic processing of outputs from the signal processing equipment bistables. To meet the redundancy requirements, two trains of SSPS, each performing the same functions, are provided. If one train is taken out of service for maintenance or test purposes, the second train will provide ESF actuation for the unit. If both trains are taken out of service or placed in test, a reactor trip will result.

The SSPS performs the decision logic for most ESF equipment actuation; generates the electrical output signals that initiate the required actuation; and provides the status, permissive, and annunciator output signals to the control room.

The bistable outputs from the signal processing equipment are sensed by the SSPS equipment and combined into logic matrices that represent combinations indicative of various transients. If a required logic matrix combination is completed, the system will send actuation signals via master and slave relays to those components whose aggregate function best serves to alleviate the condition and restore the unit to a safe condition.

3.2 Relay Testing

The actuation of ESF components is accomplished through master and slave relays. The SSPS energizes the master relays appropriate for the condition of the unit. Each master relay then energizes one or more slave relays, which then cause actuation of the end devices. The master and slave relays are routinely tested to ensure operation. The test of the master relays energizes the relay, which then operates the contacts and applies a low voltage to the associated slave relays. The low voltage is not sufficient to actuate the slave relays but only demonstrates signal path continuity. The SLAVE RELAY TEST actuates the devices if their operation will not interfere with continued unit operation.

Surveillance testing can identify relay failures before the relay is required to perform its intended function. However, relay testing has the potential to cause inadvertent ESF actuation and/or reactor trip. Extending the Surveillance Frequency reduces the number of surveillances performed on the relays, thus reducing the potential for unnecessary ESF actuations.

Nuclear Regulatory Commission (NRC) Generic Letter 93-05, "Line Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During

Power Operation," (Reference 6.2) documents the results of a study of Surveillance testing required by TSs. The studies found that, while some testing at power is essential to verify equipment and system OPERABILITY, reducing the amount of testing at power will improve safety, decrease equipment degradation, and relieve personnel burden. Extending the Surveillance Frequency for slave relay testing is consistent with the recommendations of Generic Letter 93-05.

3.3 Technical Analysis

This application to extend the slave relay test intervals is based on information contained in WCAP-13878-P-A, Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," dated August 2000. WCAP-13878 documents a reliability assessment by Westinghouse to establish a basis for determining the reliability of Potter & Brumfield MDR series relays. A particular objective was to demonstrate that Surveillance testing of the relays at 18-month intervals would not adversely affect the reliability of the SSPS.

WCAP-13878 contains the technical basis and methodology for extending slave relay test requirements for Potter & Brumfield MDR slave relays. Following review of WCAP-13878, the NRC issued safety evaluations dated May 31, 1996, and July 12, 2000, which state the conclusion that the failure data and analysis provided for Potter & Brumfield MDR slave relays used in SSPS applications support the proposed test interval extension. Based on the conclusions of WCAP-13878, slave relay testing of Potter & Brumfield MDR relays on a refueling frequency (i.e., 18 months) is adequate to confirm reliability and continuing OPERABILITY of the slave relays. The WCAP specifies Potter & Brumfield MDR slave relay models 4103-1 and 4121-1.

For plant specific approval, the NRC specified in the May 31, 1996 safety evaluation that the following information be provided:

1. **Confirm the applicability of the WCAP-13878, Revision 1 analyses for their plant.**

   Potter & Brumfield MDR slave relays models 4103-1 and 4121-1 are used in WCGS ESFAS applications that require testing per TSs. These relays are bounded by WCAP-13878-P-A and have environmental conditions similar to those in the WCAP. WCGS slave relays are normally de-energized, with the exception of one relay which is normally energized (K637).

2. **Ensure that their procurement program for P&B MDR relays is adequate for detecting the types of failures that are discussed in References 9, 10, 11 and 12.**

   WCNOC has determined that the procurement program for Potter & Brumfield MDR relays used in TS applications is adequate for detecting the types of failures discussed in the NRC safety evaluation. Applicability of the referenced failure type to WCGS are as follows:

   - Relays in normally energized applications.

     All normally energized relays have been replace by post-1992 relays.

- Substandard or refurbished relays.

  Potter & Brumfield MDR relays currently installed in the plant have met application requirements. Should a relay require replacement, WCNOC currently procures qualified replacement relays from Westinghouse. Additionally, the MDR relays manufacturer (Tyco Electronics Corporation) is surveyed periodically under the Nuclear Utility Procurement Issues Committee joint survey program. The survey ensures that standards of control are met in design, procurement, materials, manufacturing process, inspection, testing, and measurement and test equipment.

3. **Ensure that all pre-1992 P&B MDR relays which are used in either normally energized or a 20% duty cycle have been removed from ESFAS applications.**

   All normally energized or 20% duty cycle relays have been replaced with post-1992 relays.

4. **Ensure that the contact loading analysis for P&B MDR relays has been performed to determine the acceptability of these relays.**

   A technical review (TSA 20401-009) of the adequacy of contact loading of MDR relays which are subject to the TS slave relay test Surveillance has been performed. This review concluded that the slave relay contacts are adequate for their applications.

5. **Re-evaluate the adequacy of the extended surveillance interval if two or more P&B MDR ESFAS subgroup relays fail in a 12 month period.**

   To support implementation of the extended Surveillance Frequency, the Maintenance Rule program provides for monitoring performance results of the MDR slave relays. The Maintenance Rule Program implements the requirements of 10 CFR 50.65 and provides instructions for initiation, analysis, retrieval, trending, and periodic reporting of data relative performance indicators of plant systems and components. The program includes guidance for trending and reporting of repetitive preventable failures of functions that are within the scope of the Maintenance Rule. It also includes performance of cause determinations for failures to meet performance criteria and for repetitive failures.

   The functional failure guidance for ESFAS specifies that a functional failure is any failure that results in a complete loss of train actuation. The performance criteria for ESFAS is less than or equal to one functional failure of a train of actuation per 18 months. The failure of a MDR slave relay would be considered a functional failure and would result in an evaluation of the failure including the adequacy of the extended surveillance interval.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The regulatory basis for the Technical Specification surveillance requirements is to ensure that accident conditions are sensed and operation of systems and components important to safety is initiated in order to protect against violating core design limits, challenging the Reactor Coolant System boundary, and to mitigate the consequences of accidents.

GDC 20, "Protection system functions," requires that the protection system be designed to initiate the operation of systems and components important to safety.

GDC 21, "Protection system reliability and testability," requires that the protection system shall be designed for high functional reliability and inservice testability commensurate with the safety functions to be performed. GDC 21 also requires that the protection system be designed so as to permit functional testing during reactor operation in order to determine and identify failures and losses of redundancy.

GDC 29, "Protection against anticipated operational occurrences," requires that protection systems be designed to assure an extremely high probability of accomplishing their functions in the event of anticipated operational occurrences.

10 CFR 50.55a(h) requires that protection systems meet the requirements set forth in IEEE 279, "Criteria for Protection Systems for Nuclear Power Generating Stations." Section 4.10 of IEEE 279-1971 requires that capability be provided for testing and calibrating protection system equipment and indicates when such equipment must be tested during reactor operation.

The requirements of GDC 20, 21, and 29 continue to be met because the change being proposed will not affect the design capability, function, operation, or method of testing the Solid State Protection System or associated slave relays. The requirements of IEEE 279 continue to be satisfied because the only change being proposed is a reduction in the frequency of required testing; the frequency of required testing is not specified in IEEE 279.

4.2 Precedent

- Amendment No. 224 and Amendment No. 219 were issued on May 24, 2005, for the Catawaba Nuclear Station, Units 1 and 2. These amendments revise the Surveillance Frequency from 92 days to 18 months for certain Westinghouse Type AR slave relays and for certain Potter & Brumfield MDR series slave relays. The primary difference the Catawaba Nuclear Station amendments and this application is that WCNOC is not requesting approval for Westinghouse Type AR slave relays. WCGS does not use Westinghouse Type AR slave relays in any ESF application. (ADAMS Accession Number ML051020543)

- Amendment No. 152 and Amendment No. 140 were issued on May 19, 2003 for the South Texas Project, Units 1 and 2. The amendments extend the interval between slave relay tests in the ESFAS instrumentation from 3 months to 18 months. The primary difference between the South Texas Project amendments and this application is the South Texas Project included Model 4156 relays, which were not evaluated in WCSP-13878, in their application. WCNOC does not use Model 4156 relays in any ESF application. (ADAMS Accession Number ML031410592)

4.3 Significant Hazards Consideration

This amendment request involves changes to the Wolf Creek Generating Station (WCGS) Technical Specifications (TS) to revise TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS)" to extend the Surveillance Frequency on selected ESFAS slave relay from 92 days to 18 months. Justification for extending the slave relay Surveillance Frequency is based on information contained in the Westinghouse Electric Corporation reports WCAP-13878-P-A, Revision 2 (Reference 6.1) and WCAP-14117-NP-A, Revision 2 (nonproprietary version), "Reliability Assessment of Potter & Brumfield MDR Series Relays," dated August 2000.

WCNOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, Issuance of amendment, as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed change will not result in a condition where the design, material, and construction standards that were applicable prior to the change are altered. The same Engineered Safety Feature Actuation System (ESFAS) instrumentation will be used and the same ESFAS system reliability is expected. The same ESFAS instrumentation will be used and the same ESFAS reliability is expected. Overall protection system performance will remain within the bounds of the previously performed accident analyses since there are no design changes. There will be no changes to any design or operating limits.

   The proposed changes will not change accident initiators or precursors assumed or postulated in the Updated Safety Analysis Report (USAR) described accident analyses, nor will they alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed changes will not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended functions to mitigate the consequences of an initiating event within the assumed acceptance limits.

   The proposed changes do not physically alter safety related systems, nor do they affect the way in which safety related systems perform their functions. All accident analysis acceptance criteria will continue to be met with the proposed changes. The

proposed changes will not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. The proposed changes will not alter any assumptions or change any mitigation actions in the radiological consequence evaluations in the USAR. The applicable radiological dose acceptance criteria will continue to be met.

Based on the above considerations, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   There are no proposed design changes, nor are there any changes in the method by which any safety-related plant SSC performs its specified safety function. Changing the interval for periodically verifying the ESFAS slave relays will not create any new accident initiators or scenarios. The proposed changes will not affect the normal method of plant operation or change any operating parameters. No equipment performance requirements will be affected. The proposed changes will not alter any assumptions made in the safety analyses.

   No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety-related system as a result of this amendment. The proposed amendment will not alter the design or performance of the 7300 Process Protection System, Nuclear Instrumentation System, or Solid State Protection System used in the plant protection systems.

   Therefore, the proposed changes do not create the possibility of a new or different accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   Response: No

   The proposed change will not affect the total ESFAS response assumed in the safety analysis because the reliability of the slave relays will not be significantly affected by the increased surveillance interval. The relays have demonstrated a high reliability and insensitivity to short term wear and aging effects. The overall reliability, redundancy, and diversity assumed available for the protection and mitigation of accident and transient conditions is unaffected by this proposed change.

   There will be no effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling ratio (DNBR) limits, heat flux hot channel factor

(F_Q), nuclear enthalpy rise hot channel factor ($F\Delta H$), loss of coolant accident peak cladding temperature (LOCA PCT), peak local power density, or any other margin of safety. The applicable radiological dose consequence acceptance criteria for design-basis transients and accidents will continue to be met.

None of the acceptance criteria for any accident analysis will be changed.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

The proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of no significant hazards consideration is justified. In conclusion, based on the considerations discussed above, 1) there is a reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 2) such activities will be conducted in compliance with the Commission's regulations, and 3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

WCNOC has evaluated the proposed change and has determined that the change does not involve (i) a significant hazards consideration, (ii) a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

6.0 REFERENCES

6.1 WCAP-13878-P-A, Revision 2 "Reliability Assessment of Potter & Brumfield MDR Series Relays," dated August 2000.

6.2 NRC Generic Letter 93-05, "Line Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During Power Operation," September 27, 1993.

Markup of Technical Specification Pages

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.3	----------NOTE---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.4	Perform MASTER RELAY TEST.	92 days on a STAGGERED TEST BASIS
SR 3.3.2.5	Perform COT.	184 days
SR 3.3.2.6	----------NOTE---------- Not applicable to slave relays K602, K620, K622, K624, K630, K740, and K741. ---------- Perform SLAVE RELAY TEST.	18 months 92 days
SR 3.3.2.7	----------NOTE---------- Verification of relay setpoints not required. ---------- Perform TADOT.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.8	----------NOTE---------- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	18 months
SR 3.3.2.9	----------NOTE---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.2.10	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 900 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS
SR 3.3.2.11	----------NOTE---------- Verification of setpoint not required. ---------- Perform TADOT.	18 months
SR 3.3.2.12	Perform COT.	31 days

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.13	----------NOTE---------- Only applicable to slave relays K602, K622, K624, K630, K740, and K741. ---------- Perform SLAVE RELAY TEST.	18 months AND Prior to entering MODE 4 when in MODE 5 or 6 for > 24 hours, if not performed within the previous 92 days
SR 3.3.2.14	----------NOTE---------- Only applicable to slave relay K620. ---------- Perform SLAVE RELAY TEST.	18 months AND Prior to entering MODE 2 when in MODE 5 or 6 for > 24 hours, if not performed within the previous 92 days

Table 3.3.2-1 (page 1 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
1.	Safety Injection					
a.	Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.13	NA
c.	Containment Pressure - High 1	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 4.5 psig
d.	Pressurizer Pressure - Low	1,2,3(b)	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 1820 psig
e.	Steam Line Pressure Low	1,2,3(b)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 571 psig(c)
2.	Containment Spray					
a.	Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Containment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.

Table 3.3.2-1 (page 2 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 ~~SR 3.3.2.10~~	NA
(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
b. Phase B Isolation					
(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
(3) Containment Pressure - High 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig
4. Steam Line Isolation					
a. Manual Initiation	1,2(i), 3(i)	2	F	SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2(i), 3(i)	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c. Automatic Actuation Logic (MSFIS)	1,2(i), 3(i)	2 trains	G	SR 3.3.2.6	NA
d. Containment Pressure - High 2	1,2(i), 3(i)	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.3 psig

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(i) Except when all MSIVs are closed.

Table 3.3.2-1 (page 3 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
4.	Steam Line Isolation (continued)					
	e. Steam Line Pressure					
	(1) Low	1,2(i),3(b)(i)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 571 psig(c)
	(2) Negative Rate - High	3(g)(i)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 125(h) psi
5.	Turbine Trip and Feedwater Isolation					
	a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2(j),3(j)	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6 SR 3.3.2.14	NA
	b. Automatic Actuation Logic (MSFIS)	1,2(k),3(k)	2 trains	G	SR 3.3.2.6	NA
	c. SG Water Level -High High (P-14)	1,2(j)	4 per SG	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 79.7% of Narrow Range Instrument Span
	d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on low steam line pressure is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) Except when all MSIVs are closed.
(j) Except when all MFIVs are closed and de-activated; and all MFRVs are closed and de-activated or closed and isolated by a closed manual valve; and all MFRV bypass valves are closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves.
(k) Except when all MFIVs are closed and de-activated.

Table 3.3.2-1 (page 5 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
7.	Automatic Switchover to Containment Sump					
a.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 ~~SR 3.3.2.13~~ SR 3.3.2.6	NA
b.	Refueling Water Storage Tank (RWST) Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 35.5% of instrument span
	Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
8.	ESFAS Interlocks					
a.	Reactor Trip, P-4	1,2,3	2 per train, 2 trains	F	SR 3.3.2.11	NA
b.	Pressurizer Pressure, P-11	1,2,3	3	L	SR 3.3.2.5 SR 3.3.2.9	≤ 1979 psig

(a) The Allowable Value defines the Limiting Safety System Settings. See the Bases for the Trip Setpoints.

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SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.3	----------NOTE---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.4	Perform MASTER RELAY TEST.	92 days on a STAGGERED TEST BASIS
SR 3.3.2.5	Perform COT.	184 days
SR 3.3.2.6	Perform SLAVE RELAY TEST.	18 months
SR 3.3.2.7	----------NOTE---------- Verification of relay setpoints not required. ---------- Perform TADOT.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.8	----------NOTE---------- Verification of setpoint not required for manual initiation functions. ---------- Perform TADOT.	18 months
SR 3.3.2.9	----------NOTE---------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ---------- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.2.10	----------NOTE---------- Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is ≥ 900 psig. ---------- Verify ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS
SR 3.3.2.11	----------NOTE---------- Verification of setpoint not required. ---------- Perform TADOT.	18 months
SR 3.3.2.12	Perform COT.	31 days

Table 3.3.2-1 (page 1 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE [a]
1.	Safety Injection					
a.	Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Containment Pressure - High 1	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 4.5 psig
d.	Pressurizer Pressure - Low	1,2,3[b]	4	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 1820 psig
e.	Steam Line Pressure Low	1,2,3[b]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 571 psig[c]
2.	Containment Spray					
a.	Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Containment Pressure High - 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.

Table 3.3.2-1 (page 2 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
3.	Containment Isolation					
	a. Phase A Isolation					
	(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8	NA
	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
	b. Phase B Isolation					
	(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8	NA
	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	(3) Containment Pressure - High 3	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 28.3 psig
4.	Steam Line Isolation					
	a. Manual Initiation	1,2[(i)], 3[(i)]	2	F	SR 3.3.2.8	NA
	b. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2[(i)], 3[(i)]	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	c. Automatic Actuation Logic (MSFIS)	1,2[(i)], 3[(i)]	2 trains	G	SR 3.3.2.6	NA
	d. Containment Pressure - High 2	1,2[(i)], 3[(i)]	3	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 18.3 psig

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(i) Except when all MSIVs are closed.

Table 3.3.2-1 (page 3 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
4.	Steam Line Isolation (continued)					
	e. Steam Line Pressure					
	(1) Low	1,2(i),3(b)(i)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 571 psig(c)
	(2) Negative Rate - High	3(g)(i)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 125(h) psi
5.	Turbine Trip and Feedwater Isolation					
	a. Automatic Actuation Logic and Actuation Relays (SSPS)	1,2(j),3(j)	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
	b. Automatic Actuation Logic (MSFIS)	1,2(k),3(k)	2 trains	G	SR 3.3.2.6	NA
	c. SG Water Level -High High (P-14)	1,2(j)	4 per SG	I	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ 79.7% of Narrow Range Instrument Span
	d. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.
(b) Above the P-11 (Pressurizer Pressure) Interlock and below P-11 unless the Function is blocked.
(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.
(g) Below the P-11 (Pressurizer Pressure) Interlock; however, may be blocked below P-11 when safety injection on low steam line pressure is not blocked.
(h) Time constant utilized in the rate/lag controller is ≥ 50 seconds.
(i) Except when all MSIVs are closed.
(j) Except when all MFIVs are closed and de-activated; and all MFRVs are closed and de-activated or closed and isolated by a closed manual valve; and all MFRV bypass valves are closed and de-activated, or closed and isolated by a closed manual valve, or isolated by two closed manual valves.
(k) Except when all MFIVs are closed and de-activated.

Table 3.3.2-1 (page 4 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (a)
6.	Auxiliary Feedwater					
a.	Manual Initiation	1,2,3	1 per pump	O	SR 3.3.2.8	NA
b.	Automatic Actuation Logic and Actuation Relays (Solid State Protection System)	1,2,3	2 trains	G	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
c.	Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)	1,2,3	2 trains	N	SR 3.3.2.3	NA
d.	SG Water Level Low - Low	1,2,3	4 per SG	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 22.3% of Narrow Range Instrument Span
e.	Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
f.	Loss of Offsite Power	1,2,3	2 trains	P	SR 3.3.2.7 SR 3.3.2.10	NA
g.	Trip of all Main Feedwater Pumps	1	2 per pump	J	SR 3.3.2.8	NA
h.	Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	3	M	SR 3.3.2.1 SR 3.3.2.9 SR 3.3.2.10 SR 3.3.2.12	≥ 20.53 psia

(continued)

(a) The Allowable Value defines the Limiting Safety System Setting. See the Bases for the Trip Setpoints.

Table 3.3.2-1 (page 5 of 5)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE[a]
7.	Automatic Switchover to Containment Sump					
a.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA
b.	Refueling Water Storage Tank (RWST) Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ 35.5% of instrument span
	Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.				
8.	ESFAS Interlocks					
a.	Reactor Trip, P-4	1,2,3	2 per train, 2 trains	F	SR 3.3.2.11	NA
b.	Pressurizer Pressure, P-11	1,2,3	3	L	SR 3.3.2.5 SR 3.3.2.9	≤ 1979 psig

(a) The Allowable Value defines the Limiting Safety System Settings. See the Bases for the Trip Setpoints.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more Functions with two or more required channels inoperable.	C.1	Restore all but one channel to OPERABLE status.	7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1	Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	Be in MODE 4.	12 hours
F. As required by Required Action D.1 and referenced in Table 3.3.3-1.	F.1	Initiate action in accordance with Specification 5.6.8.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1.

	SURVEILLANCE	FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.3.2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	18 months

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
1.	Neutron Flux	2	E
2.	Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	2	E
3.	RCS Cold Leg Temperature (Wide Range)	2	E
4.	RCS Pressure (Wide Range)	2	E
5.	Reactor Vessel Water Level	2	F
6.	Containment Normal Sump Water Level	2	E
7.	Containment Pressure (Normal Range)	2	E
8.	Steam Line Pressure	2 per steam generator	E
9.	Containment Radiation Level (High Range)	2	F
10.	Not Used		
11.	Pressurizer Water Level	2	E
12.	Steam Generator Water Level (Wide Range)	4	E
13.	Steam Generator Water Level (Narrow Range)	2 per steam generator	E
14.	Core Exit Temperature - Quadrant 1	2[(a)]	E
15.	Core Exit Temperature - Quadrant 2	2[(a)]	E
16.	Core Exit Temperature - Quadrant 3	2[(a)]	E
17.	Core Exit Temperature - Quadrant 4	2[(a)]	E
18.	Auxiliary Feedwater Flow Rate	4	E
19.	Refueling Water Storage Tank Level	2	E

(a) A channel consists of two core exit thermocouples (CETs).

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System Functions in Table 3.3.4-1 and the required auxiliary shutdown panel (ASP) controls shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function and required ASP control.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions inoperable. OR One or more required ASP controls inoperable.	A.1 Restore required Function and required ASP controls to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.4.2	Verify each required auxiliary shutdown panel control circuit and transfer switch is capable of performing the intended function.	18 months
SR 3.3.4.3	----------NOTES---------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor Trip Breakers and RCP breakers are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	18 months

Table 3.3.4-1 (page 1 of 1)
Remote Shutdown System Functions

FUNCTION	REQUIRED CHANNELS
1. Source Range Neutron Flux[a]	1
2. Reactor Trip Breaker Position	1 per trip breaker
3. Pressurizer Pressure	1
4. RCS Wide Range Pressure	1
5. RCS Hot Leg Temperature	1
6. RCS Cold Leg Temperature	1
7. SG Pressure	1 per SG
8. SG Level	1 per SG
9. AFW Flow Rate	1
10. RCP Breakers	1 per pump
11. AFW Suction Pressure	1
12. Pressurizer Level	1

a. Not required OPERABLE in MODE 1 or in MODE 2 above the P-6 setpoint.

3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 Four channels per 4-kV NB bus of the loss of voltage Function and four channels per 4-kV NB bus of the degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per bus inoperable.	----------NOTE---------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ---------- A.1 Place channel in trip.	6 hours
B. One or more Functions with two or more channels per bus inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Declare associated load shedder and emergency load sequencer (LSELS) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	Not Used.	
SR 3.3.5.2	----------NOTE---------- Verification of time delays is not required. ---------- Perform TADOT.	31 days
SR 3.3.5.3	Perform CHANNEL CALIBRATION with nominal Trip Setpoint and Allowable Value as follows: a. Loss of voltage Allowable Value ≥ 82.5V, 120V bus with a time delay of 1.0 + 0.2, -0.5 sec. Loss of voltage nominal Trip Setpoint 83V, 120V bus with a time delay of 1.0 sec. b. Degraded voltage Allowable Value ≥ 105.9V, 120V bus with a time delay of 119 ± 11.6 sec. Degraded voltage nominal Trip Setpoint 106.9V, 120V bus with a time delay of 119 sec.	18 months
SR 3.3.5.4	Verify LOP DG Start ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS

3.3 INSTRUMENTATION

3.3.6 Containment Purge Isolation Instrumentation

LCO 3.3.6 The Containment Purge Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Only applicable in MODE 1, 2, 3, or 4. ---------- One or more Functions with one or more channels or trains inoperable.	A.1 Place and maintain containment purge supply and exhaust valves in closed position.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ----------NOTE---------- Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ---------- One or more Functions with one or more channels or trains inoperable.	B.1 Place and maintain containment purge supply and exhaust valves in closed position. OR B.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust valves made inoperable by isolation instrumentation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Purge Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.2	----------NOTE---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.6.3	Perform COT.	92 days
SR 3.3.6.4	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	18 months
SR 3.3.6.5	Perform CHANNEL CALIBRATION.	18 months
SR 3.3.6.6	Verify Containment Purge Isolation ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS

Table 3.3.6-1 (page 1 of 1)
Containment Purge Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1,2,3,4, (a),(b)	2	SR 3.3.6.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1,2,3,4, (a),(b)	2 trains	SR 3.3.6.2 SR 3.3.6.6	NA
3.	Containment Atmosphere - Gaseous Radioactivity	1,2,3,4, (a),(b)	1	SR 3.3.6.1 SR 3.3.6.3 SR 3.3.6.5	(c)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) Trip setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion rate would not exceed mR/h in the containment building.

3.3 INSTRUMENTATION

3.3.7 Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation

LCO 3.3.7 The CREVS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ----------NOTE---------- Not applicable to Function 3. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1 Place one CREVS train in the CRVIS mode. AND B.1.2 Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable by inoperable CREVS actuation instrumentation. OR B.2 Place both trains in CRVIS mode.	Immediately Immediately Immediately
C. Both radiation monitoring channels inoperable.	C.1.1 Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable by inoperable CREVS actuation instrumentation. AND C.1.2 Place one CREVS train in CRVIS mode. OR C.2 Place both trains in CRVIS mode.	Immediately 1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B or C not met in MODE 1, 2, 3, or 4.	D .1	Be in MODE 3.	6 hours
	AND		
	D .2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Condition A, B or C not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E .2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.7-1 to determine which SRs apply for each CREVS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2	Perform COT.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.7.3	----------NOTE---------- The continuity check may be excluded. ---------- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.7.4	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	18 months
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, 5, 6, and (a)	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, 5, 6, and (a)	2 trains	SR 3.3.7.3	NA
3.	Control Room Radiation-Control Room Air Intakes	1, 2, 3, 4, 5, 6, and (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.5	(b)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During movement of irradiated fuel assemblies.
(b) Trip Setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.

3.3 INSTRUMENTATION

3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

LCO 3.3.8 The EES actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one EES train in the Fuel Building Ventilation Isolation Signal (FBVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ----------NOTE---------- Not applicable to Function 3. ---------- One or more Functions with two channels or two trains inoperable.	B.1.1 Place one EES train in the FBVIS mode. AND B.1.2 Enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation. OR B.2 Place both trains in the FBVIS mode.	Immediately Immediately Immediately
C. Both radiation monitoring channels inoperable.	C.1.1 Enter the applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation. AND C.1.2 Place one EES train in the FBVIS mode. OR C.2 Place both EES trains in the FBVIS mode.	Immediately 1 hour 1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B or C not met during movement of irradiated fuel assemblies in the fuel building.	D.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.8-1 to determine which SRs apply for each EES Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.8.2	Perform COT.	92 days
SR 3.3.8.3	----------NOTE---------- The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.8.4	----------NOTE---------- Verification of setpoint is not required. ---------- Perform TADOT.	18 months
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.8-1 (page 1 of 1)
EES Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	(a)	2	SR 3.3.8.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	(a)	2 trains	SR 3.3.8.3	NA
3.	Fuel Building Exhaust Radiation - Gaseous	(a)	2	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.5	(b)

(a) During movement of irradiated fuel assemblies in the fuel building.
(b) Trip Setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion dose rate would not exceed 4 mR/hr in the fuel building.

Proposed TS Bases Changes (for information only)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.4 (continued)

large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The time allowed for the testing (4 hours) is justified in Reference 7. The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 13.

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

A COT is performed on each required channel to ensure the channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1.

The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The Frequency of 184 days is justified in Reference 13.

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the slave relay blocking circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every 92 days. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data. The SR is modified by a Note that excludes slave relays K602, K620, K622, K624, K630, K740, and K741 which are included in testing required by SR 3.3.2.13 and SR 3.3.2.14.

18 months

For Function 4.c (Steam Line Isolation – Automatic Actuation Logic (MSFIS)) and Function 5.b (Turbine Trip and Feedwater Isolation – Automatic Actuation Logic (MSFIS)), SR 3.3.2.6 is performed on the associated slave relays in the SSPS cabinets and includes verification that the slave relays are energized at the MSFIS cabinets.

This Frequency is based on relay reliability assessments presented in WCAP-13878-P-A, "Reliability Assessment of Potter & Brumfield MDR Series Relays," (Ref. 9). The reliability assessments are relay specific and apply only to Potter & Brumfield MDR series relays.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.10 (continued)

response time, is included in the testing of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 month Frequency is consistent with the typical refueling cycle and is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 900 psig in the SGs.

SR 3.3.2.11

SR 3.3.2.11 is the performance of a TADOT as described in SR 3.3.2.8, except that it is performed for the P-4 Reactor Trip Interlock, and the Frequency is every 18 months. This Frequency is based on operating experience.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint. This TADOT does not include the circuitry associated with steam dump operation since it is control grade circuitry.

SR 3.3.2.12

SR 3.3.2.12 is the performance of a monthly COT on ESFAS Function 6.h, "Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low."

A COT is performed to ensure the channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1.

The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

SR 3.3.2.13

SR 3.3.2.13 is the performance of a SLAVE RELAY TEST as described in SR 3.3.2.6, except that SR 3.3.2.13 has a Note specifying that it applies

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.13 (continued)

only to slave relays K602, K622, K624, K630, K740, and K741. These slave relays are tested with a Frequency of 18 months and prior to entering MODE 4 for Functions 1.b, 3.a.(2), and 7.a whenever the unit has been in MODE 5 or 6 for ≥ 24 hours, if not performed within the previous 92 days (Reference 9). The 18 month Frequency for these slave relays is based on the need to perform this Surveillance under the conditions that apply during a unit outage to avoid the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

SR 3.3.2.14

SR 3.3.2.14 is the performance of a SLAVE RELAY TEST as described in SR 3.3.2.6, except that SR 3.3.2.14 has a Note specifying that it applies only to slave relay K620. The SLAVE RELAY TEST of relay K620 does not include the circuitry associated with the main feedwater pump trip solenoids since that circuitry serves no required safety function. This slave relay is tested with a Frequency of 18 months and prior to entering MODE 2 for Function 5.a whenever the unit has been in MODE 5 or 6 for ≥ 24 hours, if not performed within the previous 92 days (Reference 9). The 18 month Frequency for this slave relay is based on the need to perform this Surveillance under the conditions that apply during a unit outage to avoid the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

REFERENCES

1. USAR, Chapter 6.
2. USAR, Chapter 7.
3. USAR, Chapter 15.
4. IEEE-279-1971.
5. 10 CFR 50.49.
6. WCNOC Nuclear Safety Analysis Setpoint Methodology for the Reactor Protection System, TR-89-0001.
7. WCAP-10271-P-A Supplement 2, Revision 1, "Evaluation of Surveillance Frequencies and Out of Service Times for the Engineered Safety Features Actuation System," June 1990.
8. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.

BASES

WCAP-13878-P-A, Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.

REFERENCES (continued)

9. ~~SLNRC 84-0038 dated February 27, 1984.~~

10. "Wolf Creek Setpoint Methodology Report," SNP (KG)-492, August 29, 1984.

11. Amendment No. 43 to Facility Operating License No. NPF-42, March 29, 1991.

12. WCAP-14333-P-A, Revision 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," October 1998.

13. WCAP-15376-P-A, Revision 1, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," March 2003.

14. 10 CFR 50.55a(b)(3)(iii), Code Case OMN-1.

15. Performance Improvement Request ~~(PIR)~~ PIR 2005-2067.

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by WCNOC in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

REGULATORY COMMITMENTS	DUE DATE / EVENT
Once approved, the amendment will be implemented within 90 days.	Within 90 days of NRC approval