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Indiana Michigan Power
Cook Nuclear Plant
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AEP.com

September 15, 2006

AEP:NRC:6331-04
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

SUBJECT: Donald C. Cook Nuclear Plant Units 1 and 2
Docket Nos. 50-315 and 50-316
Technical Specification Change to Reactor Trip System (RTS) Instrumentation and
Engineered Safety Feature Actuation System (ESFAS) Instrumentation

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant Units 1 and 2, proposes to amend Facility Operating Licenses DPR-58 and DPR-74. I&M proposes to modify Technical Specifications (TS) to change Required Action Notes in TS 3.3.1, RTS Instrumentation, and TS 3.3.2, ESFAS Instrumentation, to reflect installed bypass test capability, as well as correct one administrative error in TS 3.3.1 Condition Q. The proposed changes to the Required Action Notes are consistent with wording in Standard Technical Specifications (NUREG-1431, Revision 3) for plants with installed bypass test capability.

Enclosure 1 provides an affirmation statement pertaining to this letter. Enclosure 2 provides I&M's evaluation of the proposed change. Attachments 1A and 1B provide TS pages marked to show changes for Unit 1 and Unit 2, respectively. Attachments 2A and 2B provide TS pages with the proposed changes incorporated.

Installation of bypass test instrumentation is currently planned in two phases. The first phase will introduce bypass circuitry for the Foxboro analog / digital protection system and will be completed in both units with the completion of the Unit 1 Cycle 21 outage this Fall. The second phase will introduce bypass circuitry for the Nuclear Instrumentation System which is planned for the Unit 2 Cycle 17 outage (Fall 2007) and the Unit 1 Cycle 22 outage (Spring 2008). I&M requests approval of the proposed amendment prior to September 15, 2007. Implementation of the amendment is

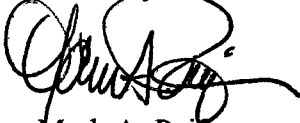
Ad 1

requested to be completed in two stages. The first stage consists of TS 3.3.1, Condition D and Condition Q, and TS 3.3.2, Condition D, and will be implemented within 45 days of approval. The second stage consists of TS 3.3.1, Condition C and will be implemented in Unit 2 after the Cycle 17 outage (Fall 2007) and in Unit 1 after the Cycle 22 outage (Spring 2008).

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

There are no commitments made in this letter. Should you have any questions, please contact Ms. Susan D. Simpson, Regulatory Affairs Manager, at (269) 466-2428.

Sincerely,



Mark A. Peifer
Site Vice President

KS/rdw

Enclosures:

1. Affirmation
2. Indiana Michigan Power Company's Evaluation

Attachments:

- 1A. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Pages Marked To Show Changes
- 1B. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages Marked To Show Changes
- 2A. Donald C. Cook Nuclear Plant Unit 1 Technical Specification Pages With the Proposed Changes Incorporated
- 2B. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages With the Proposed Changes Incorporated

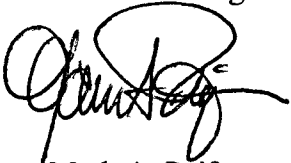
c: J. L. Caldwell, NRC Region III
K. D. Curry, Ft. Wayne AEP, w/o enclosures/attachments
J. T. King, MPSC
MDEQ – WHMD/RPMWS
NRC Resident Inspector
P. S. Tam, NRC Washington, DC

Enclosure 1 to AEP:NRC:6331-04

AFFIRMATION

I, Mark A. Peifer, being duly sworn, state that I am Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company



Mark A. Peifer
Site Vice President

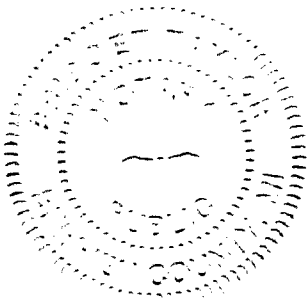
SWORN TO AND SUBSCRIBED BEFORE ME

THIS 15th DAY OF September, 2006



Notary Public

My Commission Expires 6/10/2007



Enclosure 2 to AEP:NRC:6331-04

INDIANA MICHIGAN POWER COMPANY'S EVALUATION

Subject: Technical Specification Change to Reactor Trip System (RTS) Instrumentation and Engineered Safety Feature Actuation System (ESFAS) Instrumentation

1.0 DESCRIPTION

2.0 PROPOSED CHANGE

3.0 BACKGROUND

3.1 System Descriptions

3.2 Reason for Requesting Amendment

4.0 TECHNICAL ANALYSIS

5.0 REGULATORY SAFETY ANALYSIS

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5.2 Applicable Regulatory Requirements / Criteria

6.0 ENVIRONMENTAL CONSIDERATIONS

7.0 REFERENCES

8.0 PRECEDENT

1.0 DESCRIPTION

This letter is a request by Indiana Michigan Power Company (I&M) to amend Facility Operating Licenses DPR-58 and DPR-74 for the Donald C. Cook Nuclear Plant (CNP) Units 1 and 2. The proposed change modifies Technical Specifications (TS) to reflect standard wording incorporated in NUREG-1431, Revision 3, "Standard Technical Specifications, Westinghouse Plants," (STS) for plants with installed bypass test capability. The proposed change also corrects an administrative error incorporated through implementation of an amendment approved by Reference 1. The proposed change to reflect installed bypass test capability will prevent unnecessary TS Action entry.

2.0 PROPOSED CHANGE

TS 3.3.1, RTS Instrumentation, Condition C, Required Action C.1 Note would be changed to state, "One channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment." TS 3.3.1, Condition D, Required Action D.1 Note would be changed to have two notes. A new note, Note 1, would be added that states, "For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment." The current note, to be made Note 2, would be changed to state, "For Functions with no installed bypass test capability, the inoperable channel, except Function 11 channel, may be bypassed for up to 4 hours for surveillance testing of other channels." TS 3.3.2, ESFAS Instrumentation, Condition D, Required Action D.1 Note would also be changed to have two notes. A new note, Note 1, would be added that states, "For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment." The current note, to be made Note 2, would be changed to state, "For Functions with no installed bypass test capability, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels." Bypass test capability is installed or planned for installation for the following TS RTS and ESFAS Instrumentation Functions:

TS 3.3.1	Function 2	Power Range Neutron Flux
	Function 3	Power Range Neutron Flux – High Positive Rate
	Function 6	Overtemperature Differential Temperature
	Function 7	Overpower Differential Temperature
	Function 8	Pressurizer Pressure
	Function 9	Pressurizer Water Level – High
	Function 10	Reactor Coolant Flow – Low
	Function 14	Steam Generator Water Level –Low Low
	Function 15	Steam Generator Water Level coincident with Steam Flow /
		Feedwater Flow Mismatch

TS 3.3.2	Function 1.c	Safety Injection – Containment Pressure – High
	Function 1.d	Safety Injection – Pressurizer Pressure – Low
	Function 1.e	Safety Injection – Steam Line Pressure
	Function 4.d	Steam Line Isolation – Steam Line Pressure – Low
	Function 4.e	Steam Line Isolation – High Steam Flow in Two Steam Lines coincident with Tavg – Low Low
	Function 5.b	Turbine Trip and Feedwater Isolation – Steam Generator Water Level – High High
	Function 6.c	Auxiliary Feedwater – Steam Generator Water Level - Low Low
	Function 7.c	Containment Air Recirculation/Hydrogen Skimmer System – Containment Pressure – High

TS 3.3.1, Condition Q would be changed for the condition whereby the Required Action and associated Completion Time is not met for Condition D from “for Function 2.b, 3.a, 3.b, 6...” to “for Function 2.b, 3, 6...” By Reference 2, I&M requested changes to the reactor trip on turbine trip interlock from P-7 to P-8. Reference 3 supplemented Reference 2 by providing additional TS pages which added a new Condition and changed Condition P to Condition Q. As of the date of this license amendment request (LAR), the Reference 2 LAR has not been approved. Reference 2 requested approval of the TS changes to the reactor trip on turbine trip by October 1, 2006, in support of the Unit 1 Cycle 21 (Fall 2006) refueling outage. TS pages reflecting this proposed change are based on the TS pages provided in the Reference 2 LAR as supplemented by Reference 3.

In summary, the proposed change would modify TS to allow channels with installed bypass test capability to be bypassed while performing surveillance testing on the bypassed channel without unnecessary TS Action entry and correct an administrative error in a Condition statement. Changes to TS Bases 3.3.1 and 3.3.2 are required to reflect changes to the Required Action Note for bypassing channels with installed bypass test capability. These changes will be made in accordance with the CNP TS Bases Control Program.

3.0 BACKGROUND

3.1 System Descriptions

The CNP Updated Final Safety Analysis Report (UFSAR), Section 7.2, Protective Systems, states that the protective systems consist of both the RTS and ESFAS. The nuclear instrumentation system (NIS) and the Foxboro analog / digital protection system are part of the protection system which provide bistable output signals to the solid state protection system based on process measurement signals. Design criteria for protection systems permit maximum effective use of process measurements both for control and protection functions, thus enhancing the capability to provide an adequate system to deal with the majority of common mode failures as well as to provide redundancy for critical control functions. This diversity in the design

approach provides a protection system which monitors numerous system variables by different means.

The RTS and ESFAS utilize 1-out-of-2, 2-out-of-3, and 2-out-of-4 coincidence logic from redundant channels to initiate protective actions. Removal of one actuation channel for test is accomplished by either placing that channel in a tripped state, where a 2-out-of-3 logic becomes a 1-out-of-2 logic, or using bypass capability, where a 2-out-of-4 logic becomes a 2-out-of-3 logic. Within these systems, analog and digital channel comparators, with the exception of NIS 1-out-of-2 functions and the ESFAS containment spray function, are placed in the tripped state in response to an inoperable channel. With an inoperable channel in the tripped state, maintenance or testing cannot be performed on a redundant channel unless one of the channels is bypassed. In addition, with a channel in the tripped condition, a second comparator trip in a redundant channel caused by human error, a spurious transient, or channel failure would initiate a reactor trip or safeguards actuation. With bypass test capability, a channel may be bypassed for surveillance testing with an inoperable channel in the tripped state.

With the implementation of test in bypass, additional time will be available to perform surveillance testing while preventing a spurious reactor trip or safeguards actuation since the partial trip conditions (e.g. one channel in a 2-out-of-4 logic placed in trip) that would have been present are eliminated. The logic requiring signals from two additional channels to actuate the protective function is maintained. This provides the benefits of reducing challenges to the plant safety systems that may result from spurious actuations and thus potentially increasing plant availability. Administrative controls will be provided to prevent the simultaneous bypassing of more than one redundant protection set at any one time, and to restore the system to normal operation.

The bypass test instrumentation modification is currently planned in two phases for installation during outages on each unit. The first phase will introduce bypass circuitry for the Foxboro analog / digital protection system reactor trip functions and engineered safety features functions and the second phase will introduce bypass circuitry for NIS functions. Procurement of an NIS Bypass panel is required to install bypass circuitry for NIS functions. Hardware modifications will be made to both the NIS and Foxboro analog / digital protection system to ensure that test in bypass may be accomplished without lifting leads or installing temporary jumpers. A bypass panel will be installed in the NIS to provide a second source of 118 VAC power in place of the output of a bistable function. The modification of the Foxboro analog / digital protection system involves installing bypass hardware to provide the bypass test capability; however, the channels will still have the capability to be put into trip, if necessary. These modifications will be made in accordance with the requirements of 10 CFR 50.59.

The status of a channel in the bypass condition will be provided both in the control room and locally. Both the NIS and Foxboro analog / digital protection system will retain the ability to test with a channel in trip. The design has also considered fault conditions, qualification, reliability

and credible failures. The systems are designed such that credible failures will not result in a function being automatically placed in a bypassed condition.

3.2 Reason for Requesting Amendment

Changing the Required Action Notes for applicable RTS and ESFAS instrumentation to reflect installed bypass test capability will allow surveillance testing to be performed without unnecessary TS Action entry. Changing the entry requirements for Condition Q clarifies the requirements if the Required Action and associated Completion Time of Condition D is not met for Function 3.

4.0 TECHNICAL ANALYSIS

TS Task Force (TSTF) generic change traveler TSTF-418, "Reactor Protection System and ESFAS Test Times and Completion Times (WCAP-14333)," Revision 2 established that bypass testing was an acceptable method of testing. TSTF-418 was incorporated into NUREG-1431, Revision 3 recognizing plants that have installed bypass test capability. By changing the Required Action Notes to reflect STS wording, the proposed change aligns the CNP TS with the STS, and prevents unnecessary TS Action entry.

No modifications to setpoint actuations, trip setpoints, surveillance requirements or channel response are associated with this change. Hardware changes necessary to be made to the NIS and Foxboro analog / digital protection system to facilitate testing in bypass will be implemented in accordance with 10 CFR 50.59. The hardware modifications to facilitate testing in bypass without lifting leads or the use of temporary jumpers meet the conditions specified by the U. S. Nuclear Regulatory Commission (NRC) Staff in the Safety Evaluation Reports issued during the review of WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," (Reference 4) and its supplements.

The change to Condition Q aligns the Condition entry requirements with TS 3.3.1, Table 3.3.1-1. By the Reference 1 Safety Evaluation, NRC approved the removal of Function 3.b, Power Range Neutron Flux – High Negative Rate from TS. This amendment also approved changing Function 3.a, Power Range Neutron Flux – High Positive Rate, to Function 3. Additional technical information supporting the removal of the Power Range Neutron Flux – High Negative Rate trip function is provided in Reference 5.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Indiana Michigan Power Company (I&M) has evaluated whether 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 change involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated?

Response: No

The proposed change reflects NUREG-1431, Revision 3, "Standard Technical Specifications, Westinghouse Plants," (STS) wording for plants with installed bypass test capability and aligns Technical Specification (TS) Condition entry requirements with other portions of the TS. The proposed changes do not modify how the reactor trip system (RTS) and engineered safety features actuation system (ESFAS) functions respond to any accident condition. The proposed changes to the TS Required Action Notes prevent unnecessary TS Action entry during performance of surveillance testing. The probability of accidents previously evaluated remains unchanged since the proposed change does not affect any accident initiators. The consequences of accidents previously evaluated are unaffected by this change because no change to any accident mitigation scenario has resulted and there are no additional challenges to fission product barrier integrity.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No

No changes are being made to the plant that would introduce any new accident causal mechanisms. The proposed change to the Required Action Notes and Condition entry requirements does not adversely affect previously identified accident initiators and does not create any new accident initiators. The change does not affect how the RTS and ESFAS functions operate. No new single failures or accident scenarios are created by the proposed change and the proposed change does not result in any event previously deemed incredible being made credible.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No

No safety analyses were changed or modified as a result of the proposed TS change to reflect STS wording for plants with installed bypass test capability or for aligning TS Condition entry requirements. All margins associated with the current safety analyses acceptance criteria are unaffected. The current safety analyses remain bounding. The safety systems credited in the safety analyses will continue to be available to perform their mitigation functions. The proposed change does not affect the availability or operability of safety-related systems and components.

Therefore, the proposed change does not involve a significant reduction in the margin of safety.

Based on the above, I&M concludes that 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.

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36 requires that each license authorizing operation of a production or utilization facility include TS. The TS are required to include Surveillance Requirements (SRs), which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that the facility operation will be within safety limits, and that the limiting conditions for operation will be met. This amendment changes TS Required Action Notes to allow certain RTS and ESFAS Instrumentation SR to be performed without TS Action entry.

In conclusion, based on the considerations discussed above, (1) there is 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 NRC's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health or safety of the public.

6.0 ENVIRONMENTAL CONSIDERATIONS

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Letter from Peter S. Tam, NRC, to Mano K. Nazar, I&M, "Donald C. Cook Nuclear Plant, Units 1 and 2 - Issuance of Amendments to Delete the Power Range Neutron Flux High Negative Rate Trip Function (TAC NOS. MC8805 and MC8806)," dated February 10, 2006 (ML060230452).
2. Letter from Joseph N. Jensen, I&M, to U. S. NRC Document Control Desk, "Technical Specification Change of Interlock for a Reactor Trip on Turbine Trip," AEP:NRC:6331, dated March 7, 2006 (ML060760532).
3. Letter from Joseph N. Jensen, I&M, to U. S. NRC Document Control Desk, "Response to Request for Additional Information and Supplement Regarding Technical Specification Change of Interlock for a Reactor Trip on Turbine Trip," AEP:NRC:6331-03, dated August 3, 2006 (ML062200024).
4. Westinghouse Topical Report WCAP-10271-P-A, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection System Instrumentation," dated May 1986.
5. Letter from Daniel P. Fadel, I&M, to U. S. NRC Document Control Desk, "Deletion of the Power Range Neutron Flux High Negative Rate Trip Function," AEP:NRC:5331, dated August 10, 2005 (ML052300238).

8.0 PRECEDENT

The NRC has approved similar submittals for plants with installed bypass test capability adopting STS wording for Required Action Notes for RTS and ESFAS instrumentation.

South Texas Project
Comanche Peak

Accession No. ML020220399
Accession No. ML052380208

Attachment 1A to AEP:NRC:6331-04

**DONALD C. COOK NUCLEAR PLANT UNIT 1 TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW CHANGES**

3.3.1-1

3.3.1-2

3.3.1-5

3.3.2-2

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
C. One Power Range Neutron Flux - High channel inoperable.	<p>C.1 -----NOTE----- OneThe inoperable channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment of other channels. -----</p> <p>Place channel in trip.</p> <p><u>AND</u></p>	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>C.2</p> <p>-----NOTE----- Only required when the Power Range Neutron Flux input to QPTR is inoperable.</p> <p>-----</p> <p>Perform SR 3.2.4.2.</p>	<p>12 hours from discovery of THERMAL POWER > 75% RTP</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p>
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <p>1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment.</p> <p>2. For Functions with no installed bypass test capability, the inoperable channel, except for Function 11 channel, may be bypassed for up to 4 hours for surveillance testing of other channels.</p> <p>-----</p> <p>Place channel in trip.</p>	<p>6 hours</p>
E. One Intermediate Range Neutron Flux channel inoperable.	<p>E.1</p> <p>Reduce THERMAL POWER to < P-6.</p> <p><u>OR</u></p>	<p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. Required Action and associated Completion Time of Condition D not met for Function 16.a or 16.b.	O.1 Reduce THERMAL POWER to < P-7.	6 hours
P. Required Action and associated Completion Time of Condition L not met for Function 18.b, 18.c, or 18.e.	P.1 Be in MODE 2.	6 hours
<p>Q. Required Action and associated Completion Time of Condition B, J, K, or M not met in MODE 1 or 2.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 2.b, 3-a, 3-b, 6, 7, 8.b, 14, or 15.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition L not met for Function 18.a or 18.d.</p>	Q.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <p>1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>2. For Functions with no installed bypass test capability, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels.</p> <p>-----</p> <p>Place channel in trip.</p>	6 hours
E. One channel inoperable.	<p>E.1</p> <p>-----NOTE-----</p> <p>One additional channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>-----</p> <p>Place channel in bypass.</p>	6 hours
F. One channel per bus inoperable.	F.1 Place channel in trip.	1 hour
G. One or more channels inoperable.	G.1 Verify interlock is in required state for existing unit condition.	1 hour
H. Required Action and associated Completion Time of Condition B not met for Function 6.g.	H.1 Be in MODE 3.	6 hours
OR		

Attachment 1B to AEP:NRC:6331-04

**DONALD C. COOK NUCLEAR PLANT UNIT 2 TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW CHANGES**

3.3.1-1

3.3.1-2

3.3.1-5

3.3.2-2

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

NOTE

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
C. One Power Range Neutron Flux - High channel inoperable.	<p>C.1</p> <p>-----NOTE----- OneThe inoperable channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment of other channels.</p> <p>Place channel in trip.</p> <p><u>AND</u></p>	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>C.2</p> <p>-----NOTE----- Only required when the Power Range Neutron Flux input to QPTR is inoperable. -----</p> <p>Perform SR 3.2.4.2.</p>	<p>12 hours from discovery of THERMAL POWER > 75% RTP</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p>
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES----- 1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. 2. For Functions with no installed bypass test capability, the inoperable channel, except for Function 11 channel, may be bypassed for up to 4 hours for surveillance testing of other channels. -----</p> <p>Place channel in trip.</p>	<p>6 hours</p>
E. One Intermediate Range Neutron Flux channel inoperable.	<p>E.1 Reduce THERMAL POWER to < P-6.</p> <p><u>OR</u></p>	<p>24 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. Required Action and associated Completion Time of Condition D not met for Function 16.a or 16.b.	O.1 Reduce THERMAL POWER to < P-8.	6 hours
P. Required Action and associated Completion Time of Condition L not met for Function 18.b, 18.c, or 18.e.	P.1 Be in MODE 2.	6 hours
<p>Q. Required Action and associated Completion Time of Condition B, J, K, or M not met in MODE 1 or 2.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 2.b, 3-a, 3-b, 6, 7, 8.b, 14, or 15.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition L not met for Function 18.a or 18.d.</p>	Q.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <p>1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>2. For Functions with no installed bypass test capability, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels.</p> <p>-----</p> <p>Place channel in trip.</p>	6 hours
E. One channel inoperable.	<p>E.1</p> <p>-----NOTE-----</p> <p>One additional channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>-----</p> <p>Place channel in bypass.</p>	6 hours
F. One channel per bus inoperable.	F.1 Place channel in trip.	1 hour
G. One or more channels inoperable.	G.1 Verify interlock is in required state for existing unit condition.	1 hour
H. Required Action and associated Completion Time of Condition B not met for Function 6.g.	H.1 Be in MODE 3.	6 hours
OR		

Attachment 2A to AEP:NRC:6331-04

**DONALD C. COOK NUCLEAR PLANT UNIT 1 TECHNICAL SPECIFICATION PAGES
WITH THE PROPOSED CHANGES INCORPORATED**

3.3.1-1

3.3.1-2

3.3.1-3

3.3.1-4

3.3.1-5

3.3.2-2

3.3.2-3

3.3.2-4

3.3.2-5

3.3.2-6

3.3.2-7

3.3.2-8

3.3.2-9

3.3.2-10

3.3.2-11

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
C. One Power Range Neutron Flux - High channel inoperable.	C.1 -----NOTE----- One channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. ----- Place channel in trip. AND	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>C.2</p> <p>-----NOTE----- Only required when the Power Range Neutron Flux input to QPTR is inoperable. -----</p> <p>Perform SR 3.2.4.2.</p>	<p>12 hours from discovery of THERMAL POWER > 75% RTP</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p>
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. 2. For Functions with no installed bypass test capability, the inoperable channel, except for Function 11 channel, may be bypassed for up to 4 hours for surveillance testing of other channels. <p>-----</p> <p>Place channel in trip.</p>	<p>6 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One Intermediate Range Neutron Flux channel inoperable.	E.1 Reduce THERMAL POWER to < P-6.	24 hours
	<u>OR</u> E.2 Increase THERMAL POWER to > P-10.	24 hours
F. Two Intermediate Range Neutron Flux channels inoperable.	F.1 <u>-----NOTE-----</u> Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. <u>-----</u> Suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u> F.2 Reduce THERMAL POWER to < P-6.	2 hours
G. One Source Range Neutron Flux channel inoperable.	G.1 <u>-----NOTE-----</u> Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. <u>-----</u> Suspend operations involving positive reactivity additions.	Immediately
H. Two Source Range Neutron Flux channels inoperable.	H.1 Open reactor trip breakers (RTBs).	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One Source Range Neutron Flux channel inoperable.	I.1 Restore channel to OPERABLE status.	48 hours
J. One train inoperable.	J.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ----- Restore train to OPERABLE status.	6 hours
K. One RTB train inoperable.	K.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ----- Restore train to OPERABLE status.	24 hours
L. One or more channels inoperable.	L.1 Verify interlock is in required state for existing unit conditions.	1 hour
M. One trip mechanism inoperable for one RTB.	M.1 Restore inoperable trip mechanism to OPERABLE status.	48 hours
N. Required Action and associated Completion Time of Condition D not met for Function 8.a, 9, 10, 11, 12, or 13.	N.1 Reduce THERMAL POWER to < P-7.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. Required Action and associated Completion Time of Condition D not met for Function 16.a or 16.b.	O.1 Reduce THERMAL POWER to < P-8.	6 hours
P. Required Action and associated Completion Time of Condition L not met for Function 18.b, 18.c, or 18.e.	P.1 Be in MODE 2.	6 hours
<p>Q. Required Action and associated Completion Time of Condition B, J, K, or M not met in MODE 1 or 2.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 2.b, 3, 6, 7, 8.b, 14, or 15.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition L not met for Function 18.a or 18.d.</p>	Q.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <p>1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>2. For Functions with no installed bypass test capability, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels.</p> <p>-----</p> <p>Place channel in trip.</p>	6 hours
E. One channel inoperable.	<p>E.1</p> <p>-----NOTE-----</p> <p>One additional channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>-----</p> <p>Place channel in bypass.</p>	6 hours
F. One channel per bus inoperable.	F.1 Place channel in trip.	1 hour
G. One or more channels inoperable.	G.1 Verify interlock is in required state for existing unit condition.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>H. Required Action and associated Completion Time of Condition B not met for Function 6.g.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 6.f.</p>	H.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>I. Required Action and associated Completion Time of Condition B not met for Function 8.a.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met for Function 4.b, 5.a, 6.a, 6.b, or 7.b.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 1.c, 1.d, 1.e.(1), 1.e.(2), 4.d, 4.e, 5.b, 6.c, 7.c, or 8.c.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition E not met for Function 2.c, 3.b.(3), or 4.c.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition F not met for Function 6.e.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition G not met for Function 8.b.</p>	<p>I.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>I.2 Be in MODE 4.</p>	<p>6 hours</p> <p>12 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>J. Required Action and associated Completion Time of Condition B not met for Function 1.a, 2.a, 3.a.(1), 3.b.(1), or 7.a.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met for Function 1.b, 2.b, 3.a.(2), or 3.b.(2).</p>	J.1 Be in MODE 3.	6 hours
	AND J.2 Be in MODE 5.	36 hours
K. Required Action and associated Completion Time of Condition B not met for Function 4.a.	K.1 Declare associated steam generator stop valve (SGSV) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

NOTE

Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	NOTE Verification of relay setpoints not required.	31 days
	Perform TADOT.	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.3	Perform ACTUATION LOGIC TEST.	92 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	<p>-----NOTE----- Verification of relay setpoints not required. -----</p> <p>Perform TADOT.</p>	92 days
SR 3.3.2.6	<p>-----NOTE----- For Functions 1.c, 2.c, 3.b.(3), 4.c, and 7.c, the associated transmitters shall be exercised during the performance of SR 3.3.2.6. -----</p> <p>Perform COT.</p>	184 days
SR 3.3.2.7	Perform CHANNEL CALIBRATION.	184 days
SR 3.3.2.8	Perform SLAVE RELAY TEST.	24 months
SR 3.3.2.9	Perform TADOT.	24 months
SR 3.3.2.10	Perform CHANNEL CALIBRATION.	24 months
SR 3.3.2.11	Perform ACTUATION LOGIC TEST.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.2.12 -----NOTE-----</p> <p>Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 850 psig in the steam generator.</p> <p>-----</p> <p>Verify ESF RESPONSE TIMES are within limit.</p>	<p>24 months on a STAGGERED TEST BASIS</p>

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Safety Injection (SI)					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure - High	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 1.17 psig
d. Pressurizer Pressure - Low	1,2,3 ^(a)	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 1765 psig
e. Steam Line Pressure					
(1) Low	1,2,3 ^(b)	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 481.3 ^(c) psig
(2) High Differential Pressure Between Steam Lines (per steam line)	1,2,3 ^(b)	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 112 psig
2. Containment Spray					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure - High High	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 2.97 psig

(a) Above the P-11 (Pressurizer Pressure) interlock.

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(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 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
(3) SI Input from ESFAS	1,2,3,4	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
b. Phase B Isolation					
(1) Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
(3) Containment Pressure - High High	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 2.97 psig
4. Steam Line Isolation					
a. Manual Initiation (per steam line)	1,2 ^(d) ,3 ^(d)	2	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2 ^(d) ,3 ^(d)	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure - High High	1,2 ^(d) ,3 ^(d)	4	E	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 2.97 psig
d. Steam Line Pressure - Low	1,2 ^(d) ,3 ^{(b)(d)}	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 481.3 ^(c) psig

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(c) Time constants used in the lead/lag controller are $t_1 \geq 50$ seconds and $t_2 \leq 5$ seconds.

(d) Except when all SGSVs are closed.

Table 3.3.2-1 (page 3 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Steam Line Isolation					
e. High Steam Flow in Two Steam Lines (per steam line)	1,2 ^(d) ,3 ^{(b)(d)}	2	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	(e)
Coincident with T _{avg} - Low Low	1,2 ^(d) ,3 ^{(b)(d)}	1 per loop	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≥ 538.8°F
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	1,2 ^(f) ,3 ^(f)	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
b. SG Water Level - High High (per SG)	1,2 ^(f) ,3 ^(f)	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 68.0%
c. SI Input from ESFAS	1,2 ^(f) ,3 ^(f)	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
6. Auxiliary Feedwater					
a. Automatic Actuation Logic and Actuation Relays (Solid State Protection System)	1,2,3	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)	1,2,3	2 trains	C	SR 3.3.2.11	NA

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(d) Except when all SGSVs are closed.

(e) Less than or equal to a function defined as ΔP corresponding to 1.56E6 lb/hr below 20% load, ΔP increasing linearly from 1.56E6 lb/hr at 20% load to 3.93E6 lb/hr at 100% load.

(f) Except when all main feedwater isolation valves or main feedwater regulating valves are closed and de-activated or isolated by a closed manual valve.

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Auxiliary Feedwater					
c. SG Water Level - Low Low (per SG)	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 4.0%
d. SI Input from ESFAS	1,2,3	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
e. Loss of Voltage (per bus)	1,2,3	3	F	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.7 SR 3.3.2.12	≥ 3238.9 V and ≤ 3332.6 V with ≥ 1.8 sec and ≤ 2.2 sec time delay
f. Undervoltage Reactor Coolant Pump	1,2	1 per bus	D	SR 3.3.2.5 SR 3.3.2.7 SR 3.3.2.12	≥ 2725 V
g. Trip of all Main Feedwater Pumps (per pump)	1,2	2	B	SR 3.3.2.9 SR 3.3.2.12	NA
7. Containment Air Recirculation/Hydrogen Skimmer (CEQ) System					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure – High	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 1.17 psig
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	1 per train	B	SR 3.3.2.9	NA
b. Pressurizer Pressure, P-11	1,2,3	3	G	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 1915 psig
c. T _{avg} - Low Low, P-12	1,2,3 ^(b)	1 per loop	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≥ 538.8°F

(b) Above the P-12 (T_{avg} - Low Low) interlock.

Attachment 2B to AEP:NRC:6331-04

**DONALD C. COOK NUCLEAR PLANT UNIT 2 TECHNICAL SPECIFICATION PAGES
WITH THE PROPOSED CHANGES INCORPORATED**

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3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

NOTE

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
C. One Power Range Neutron Flux - High channel inoperable.	C.1 <u>NOTE</u> One channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. Place channel in trip. <u>AND</u>	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>C.2</p> <p>-----NOTE----- Only required when the Power Range Neutron Flux input to QPTR is inoperable. -----</p> <p>Perform SR 3.2.4.2.</p>	<p>12 hours from discovery of THERMAL POWER > 75% RTP</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p>
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. 2. For Functions with no installed bypass test capability, the inoperable channel, except for Function 11 channel, may be bypassed for up to 4 hours for surveillance testing of other channels. <p>-----</p> <p>Place channel in trip.</p>	<p>6 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One Intermediate Range Neutron Flux channel inoperable.	E.1 Reduce THERMAL POWER to < P-6.	24 hours
	<u>OR</u> E.2 Increase THERMAL POWER to > P-10.	24 hours
F. Two Intermediate Range Neutron Flux channels inoperable.	F.1 -----NOTE----- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. Suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u> F.2 Reduce THERMAL POWER to < P-6.	2 hours
G. One Source Range Neutron Flux channel inoperable.	G.1 -----NOTE----- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. Suspend operations involving positive reactivity additions.	Immediately
H. Two Source Range Neutron Flux channels inoperable.	H.1 Open reactor trip breakers (RTBs).	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One Source Range Neutron Flux channel inoperable.	I.1 Restore channel to OPERABLE status.	48 hours
J. One train inoperable.	J.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ----- Restore train to OPERABLE status.	6 hours
K. One RTB train inoperable.	K.1 -----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ----- Restore train to OPERABLE status.	24 hours
L. One or more channels inoperable.	L.1 Verify interlock is in required state for existing unit conditions.	1 hour
M. One trip mechanism inoperable for one RTB.	M.1 Restore inoperable trip mechanism to OPERABLE status.	48 hours
N. Required Action and associated Completion Time of Condition D not met for Function 8.a, 9, 10, 11, 12, or 13.	N.1 Reduce THERMAL POWER to < P-7.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. Required Action and associated Completion Time of Condition D not met for Function 16.a or 16.b.	O.1 Reduce THERMAL POWER to < P-8.	6 hours
P. Required Action and associated Completion Time of Condition L not met for Function 18.b, 18.c, or 18.e.	P.1 Be in MODE 2.	6 hours
<p>Q. Required Action and associated Completion Time of Condition B, J, K, or M not met in MODE 1 or 2.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 2.b, 3, 6, 7, 8.b, 14, or 15.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition L not met for Function 18.a or 18.d.</p>	Q.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable.	<p>D.1</p> <p>-----NOTES-----</p> <p>1. For Functions with installed bypass test capability, one channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>2. For Functions with no installed bypass test capability, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels.</p> <p>-----</p> <p>Place channel in trip.</p>	6 hours
E. One channel inoperable.	<p>E.1</p> <p>-----NOTE-----</p> <p>One additional channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>-----</p> <p>Place channel in bypass.</p>	6 hours
F. One channel per bus inoperable.	F.1 Place channel in trip.	1 hour
G. One or more channels inoperable.	G.1 Verify interlock is in required state for existing unit condition.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>H. Required Action and associated Completion Time of Condition B not met for Function 6.g.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 6.f.</p>	H.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>I. Required Action and associated Completion Time of Condition B not met for Function 8.a.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met for Function 4.b, 5.a, 6.a, 6.b, or 7.b.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition D not met for Function 1.c, 1.d, 1.e.(1), 1.e.(2), 4.d, 4.e, 5.b, 6.c, 7.c, or 8.c.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition E not met for Function 2.c, 3.b.(3), or 4.c.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition F not met for Function 6.e.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition G not met for Function 8.b.</p>	<p>I.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>I.2 Be in MODE 4.</p>	<p>6 hours</p> <p>12 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>J. Required Action and associated Completion Time of Condition B not met for Function 1.a, 2.a, 3.a.(1), 3.b.(1), or 7.a.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition C not met for Function 1.b, 2.b, 3.a.(2), or 3.b.(2).</p>	J.1 Be in MODE 3.	6 hours
	AND J.2 Be in MODE 5.	36 hours
K. Required Action and associated Completion Time of Condition B not met for Function 4.a.	K.1 Declare associated steam generator stop valve (SGSV) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

NOTE

Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	NOTE Verification of relay setpoints not required.	31 days
	Perform TADOT.	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.3	Perform ACTUATION LOGIC TEST.	92 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	<p>-----NOTE----- Verification of relay setpoints not required. -----</p> <p>Perform TADOT.</p>	92 days
SR 3.3.2.6	<p>-----NOTE----- For Functions 1.c, 2.c, 3.b.(3), 4.c, and 7.c, the associated transmitters shall be exercised during the performance of SR 3.3.2.6. -----</p> <p>Perform COT.</p>	184 days
SR 3.3.2.7	Perform CHANNEL CALIBRATION.	184 days
SR 3.3.2.8	Perform SLAVE RELAY TEST.	24 months
SR 3.3.2.9	Perform TADOT.	24 months
SR 3.3.2.10	Perform CHANNEL CALIBRATION.	24 months
SR 3.3.2.11	Perform ACTUATION LOGIC TEST.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.2.12</p> <p>-----NOTE-----</p> <p>Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 850 psig in the steam generator.</p> <p>-----</p> <p>Verify ESF RESPONSE TIMES are within limit.</p>	<p>24 months on a STAGGERED TEST BASIS</p>

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Safety Injection (SI)					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure - High	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 1.17 psig
d. Pressurizer Pressure - Low	1,2,3 ^(a)	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 1765 psig
e. Steam Line Pressure					
(1) Low	1,2,3 ^(b)	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 481.3 ^(c) psig
(2) High Differential Pressure Between Steam Lines (per steam line)	1,2,3 ^(b)	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 112 psig
2. Containment Spray					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure - High High	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 2.97 psig

(a) Above the P-11 (Pressurizer Pressure) interlock.

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(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 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. Containment Isolation					
a. Phase A Isolation					
(1) Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
(3) SI Input from ESFAS	1,2,3,4	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
b. Phase B Isolation					
(1) Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
(3) Containment Pressure – High High	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 2.97 psig
4. Steam Line Isolation					
a. Manual Initiation (per steam line)	1,2 ^(d) ,3 ^(d)	2	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2 ^(d) ,3 ^(d)	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure - High High	1,2 ^(d) ,3 ^(d)	4	E	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 2.97 psig
d. Steam Line Pressure - Low	1,2 ^(d) ,3 ^{(b)(d)}	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 481.3 ^(c) psig

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(c) Time constants used in the lead/lag controller are t₁ ≥ 50 seconds and t₂ ≤ 5 seconds.

(d) Except when all SGSVs are closed.

Table 3.3.2-1 (page 3 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Steam Line Isolation					
e. High Steam Flow in Two Steam Lines (per steam line)	1,2 ^(d) ,3 ^{(b)(d)}	2	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	(e)
Coincident with T _{avg} - Low Low	1,2 ^(d) ,3 ^{(b)(d)}	1 per loop	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≥ 538.8°F
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	1,2 ^(f) ,3 ^(f)	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
b. SG Water Level - High High (per SG)	1,2 ^(f) ,3 ^(f)	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 71.6%
c. SI Input from ESFAS	1,2 ^(f) ,3 ^(f)	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
6. Auxiliary Feedwater					
a. Automatic Actuation Logic and Actuation Relays (Solid State Protection System)	1,2,3	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)	1,2,3	2 trains	C	SR 3.3.2.11	NA

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(d) Except when all SGSVs are closed.

(e) Less than or equal to a function defined as ΔP corresponding to 1.75E6 lb/hr below 20% load, ΔP increasing linearly from 1.75E6 lb/hr at 20% load to 4.55E6 lb/hr at 100% load.

(f) Except when all main feedwater isolation valves or main feedwater regulating valves are closed and de-activated or isolated by a closed manual valve.

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Auxiliary Feedwater					
c. SG Water Level - Low Low (per SG)	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 20.8%
d. SI Input from ESFAS	1,2,3	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
e. Loss of Voltage (per bus)	1,2,3	3	F	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.7 SR 3.3.2.12	≥ 3207.2 V and ≤ 3302.7 V with ≥ 1.8 sec and ≤ 2.2 sec time delay
f. Undervoltage Reactor Coolant Pump	1,2	1 per bus	D	SR 3.3.2.5 SR 3.3.2.7 SR 3.3.2.12	≥ 2725 V
g. Trip of all Main Feedwater Pumps (per pump)	1,2	1	B	SR 3.3.2.9 SR 3.3.2.12	NA
7. Containment Air Recirculation/Hydrogen Skimmer (CEQ) System					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure – High	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 1.17 psig
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	1 per train	B	SR 3.3.2.9	NA
b. Pressurizer Pressure, P-11	1,2,3	3	G	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 1915 psig
c. T _{avg} - Low Low, P-12	1,2,3 ^(b)	1 per loop	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≥ 538.8°F

(b) Above the P-12 (T_{avg} - Low Low) interlock.