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CP-202000437  
TXX-20070  
August 17, 2020

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Ref 10 CFR 50.90  
10 CFR 50.91(b)(1)  
10 CFR 50.92(c)

Subject: Comanche Peak Nuclear Power Plant (CPNPP)  
Docket Nos. 50-445 and 50-446  
SUPPLEMENT TO LICENSE AMENDMENT REQUEST (LAR) 20-001 TECHNICAL  
SPECIFICATION (TS) 1.1, "DEFINITIONS - ESF AND RTS RESPONSE TIME"

Reference: 1. Letter TXX-20043 from Thomas P. McCool to the NRC dated July 2, 2020, LICENSE  
AMENDMENT REQUEST (LAR) 20-001 TECHNICAL SPECIFICATION (TS) 1.1,  
"DEFINITIONS- ESF AND RTS RESPONSE TIME" (ML20184A064)

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Vistra Operations Company LLC (Vistra OpCo) hereby submits a supplement to the license amendment request for the Comanche Peak Nuclear Power Plant (CPNPP) Unit 1 and Unit 2 Technical Specifications in connection with LAR 20-001, Revision to TS 1.1, Definitions - ESF and RTS Response Time requested in Reference 1.

The Enclosure to this correspondence provides an executive summary for, revised Technical Specification Bases (TSB) for Surveillance Requirements, SR 3.3.1.16 - RTS Response Times and SR 3.3.2.10 - ESF Response Times, and Attachment 1 to TSFT-569-A, Revision 2 traveler to support the definition changes.

Attachment 1 provides TSB pages for SR 3.3.1.16, "RTS Response Times" marked to indicate the proposed changes, followed by revised (clean) pages showing the changes incorporated. Attachment 2 provides TSB pages for SR 3.3.2.10, "ESF Response Times" marked to indicate the proposed changes, followed by revised (clean) pages showing the changes incorporated. Attachment 3 provides Attachment 1 of TSTF-569-A, Revision 2, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing" to support NRC staff review. Attachments 1, 2, and 3 are provided for information only, approval of these attachments is not requested.

Vistra OpCo has determined this supplement does not change the significant hazards consideration pursuant to 10 CFR 50.92(c), or the "no significant environmental impacts" previously provided in the Enclosure to the Reference 1. In accordance with 10 CFR 50.91(b)(1), a copy of the supplement to the proposed license amendment is being forwarded to the State of Texas.

NRC staff review and approval of the proposed license amendment is requested within one year of the NRC acceptance date. Once approved, the amendment shall be implemented within 60 days.

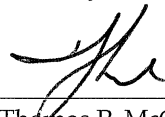
This letter contains no new regulatory commitments regarding CPNPP Units 1 and 2.

Should you have any questions, please contact Garry W Struble at (254) 897-6628 or [garry.struble@luminant.com](mailto:garry.struble@luminant.com).

I state under penalty of perjury that the foregoing is true and correct.

Executed on August 17, 2020.

Sincerely,



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Thomas P. McCool

Enclosure: SUPPLEMENT TO LICENSE AMENDMENT REQUEST (LAR) 20-001 TECHNICAL SPECIFICATION (TS) 1.1, "DEFINITIONS - ESF AND RTS RESPONSE TIME" DESCRIPTION AND ASSESSMENT

- Attachments:
1. TSB SR 3.3.1.16 Markup and Revised Pages [For Information Only]
  2. TSB SR 3.3.2.10 Markup and Revised Pages [For Information Only]
  3. Attachment 1 of TSTF-569-A, Revision 2 [For Information Only]

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SUPPLEMENT TO LICENSE AMENDMENT REQUEST (LAR) 20-001 TECHNICAL SPECIFICATION (TS) 1.1, "DEFINITIONS - ESF AND RTS RESPONSE TIME" ENCLOSURE TO TXX-20070

Executive Summary

The following items describe the supplemental changes to the original LAR 20-001 submittal based on information discussed between the Licensee (Vistra Operations Company LLC (Vistra OpCo)) and the Nuclear Regulatory Commission (NRC).

The original LAR Enclosure did not include changes to the Technical Specifications (TS) Bases. The original submittal was made under docketed correspondence TXX-20043. The attached markup TS Bases (TSB) for Surveillance Requirements, SR 3.3.1.16, "Reactor Trip System (RTS) Response Times" SR 3.3.2.10, "Engineered Safety Features (ESF) Response Times" are provided to support NRC staff review of the original license amendment request. This change is made to be consistent with the information found in TSTF-569-A, Revision 2.

It is important to note the included TSB markup pages are an integration of the current Comanche Peak Nuclear Power Plant (CPNPP) bases and the bases found in TSTF-569-A, Revision 2. The intent of the TSB changes from TSTF-569-A, Revision 2 are maintained with this integrated approach to the extent practicable.

Vistra OpCo will include the attached TSB revisions as part of implementing LAR 20-001, Technical Specification (TS) 1.1, "Definitions - ESF and RTS Response Time" Attachment 1 to TXX-20070 is the Technical Specification Bases for SR 3.3.1.16, "RTS Response Times." The TSB markup pages are included and followed by the revised (clean) pages.

Attachment 2 to TXX-20070 is the Technical Specification Bases for SR 3.3.1.10, "ESF Response Times." The TSB markup pages are included and followed by the revised (clean) pages.

Attachment 3 to TXX-20070 is Attachment 1 to TSTF-569-A, Revision 2, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing." CPNPP has the Nuclear Instrumentation System (NIS) and the 7300 Process Protection System (PPS) modified to include bypass capability during testing. This attachment is included to support NRC staff review.

Attachments 1, 2, and 3 are provided for information only, approval of these attachments is not requested.

**Attachment 1 to TXX-20070  
Technical Specifications Bases  
for SR 3.3.1.16  
Markup and Revised Pages  
[For Information Only]**

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.14 (continued)

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. This TADOT is as described in [SR 3.3.1.4](#), except that this test is performed prior to exceeding the P-9 interlock whenever the unit has been in MODE 3. This Surveillance is not required if it has been performed within the previous frequency specified in the SFCP. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock.

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. ~~The required trip initiation signals and acceptance criteria for response~~ Response time testing acceptance criteria are included in the Technical Requirements Manual, (Ref. 6). No credit was taken in the safety analyses for those channels with response time listed as N.A. No response time testing requirements apply where N.A. is listed in the TRM. Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor until loss of stationary gripper coil voltage.

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function time constants set at their nominal values.

-----REVIEWER'S NOTE-----

Portions of the following Bases are applicable for plants adopting WCAP-14036-P-A and the methodology contained in Attachment 1 to TSTF-569.

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Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.16 (continued)

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 10) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

The response time may be verified for components that replace the components that were previously evaluated in reference 10, provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 15).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Response time verification in lieu of actual testing may be performed on RTS components in accordance with [reference 10](#).

SR 3.3.1.16 is modified by a Note stating that neutron and N-16 gamma detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. ~~Response time of the neutron flux or N-16 signal portion of the channel shall be measured from detector output or input to the first electronic component in the channel. SR 3.3.1.16 is applied to Power Neutron Flux Rate - High Positive Rate based on NSAL 09-01 [Ref. 6].~~

## BASES

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- REFERENCES
1. [FSAR, Chapter 7.](#)
  2. [FSAR, Chapter 15.](#)
  3. IEEE-279-1971.
  4. 10 CFR 50.49.
  5. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
  6. Technical Requirements Manual.
  7. Not Used.
  8. WCAP-10271-P-A, Supplement 3, September 1990.
  9. "Westinghouse Setpoint Methodology for Protection Systems Comanche Peak Unit 1, Revision 1," WCAP-12123, Revision 2, April, 1989.
  10. "Elimination of Periodic Protection Channel Response Time Tests", WCAP-14036-P-A, Revision 1, October 6, 1998.
  11. "Probabilistic Risk Analysis of the RTS and ESFAS Test Times and Completion Times," WCAP-14333-P-A, Revision 1, October 1998.
  12. "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," WCAP-15376-P-A, Revision 1, March 2003.
  13. Westinghouse letter WOG-06-17, "WCAP-10271-P-A Justification for Bypass Time and Completion Time Technical Specification Changes for Reactor Trip on Turbine Trip (ITSWG Action Item #314)," dated January 20, 2006.
  14. Westinghouse Nuclear Safety Advisory Letter (NSAL) 09-1, "Rod Withdrawal at Power Analysis for Reactor Coolant System Overpressure," February 4, 2009.
  15. [Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel \(for Westinghouse Plants only\) Response Time Testing"](#)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.14 (continued)

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. This TADOT is as described in SR 3.3.1.4, except that this test is performed prior to exceeding the P-9 interlock whenever the unit has been in MODE 3. This Surveillance is not required if it has been performed within the previous frequency specified in the SFCP. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-9 interlock.

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in the Technical Requirements Manual, (Ref. 6). No credit was taken in the safety analyses for those channels with response time listed as N.A. No response time testing requirements apply where N.A. is listed in the TRM. Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor until loss of stationary gripper coil voltage.

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function time constants set at their nominal values.

-----REVIEWER'S NOTE-----

Portions of the following Bases are applicable for plants adopting WCAP-14036-P-A and the methodology contained in Attachment 1 to TSTF-569.

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Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.



BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.16 (continued)

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 10) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

The response time may be verified for components that replace the components that were previously evaluated in reference 10, provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 15).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Response time verification in lieu of actual testing may be performed on RTS components in accordance with reference 10.

SR 3.3.1.16 is modified by a Note stating that neutron and N-16 gamma detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

## BASES

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- REFERENCES
1. FSAR, Chapter 7.
  2. FSAR, Chapter 15.
  3. IEEE-279-1971.
  4. 10 CFR 50.49.
  5. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
  6. Technical Requirements Manual.
  7. Not Used.
  8. WCAP-10271-P-A, Supplement 3, September 1990.
  9. "Westinghouse Setpoint Methodology for Protection Systems Comanche Peak Unit 1, Revision 1," WCAP-12123, Revision 2, April, 1989.
  10. "Elimination of Periodic Protection Channel Response Time Tests", WCAP-14036-P-A, Revision 1, October 6, 1998.
  11. "Probabilistic Risk Analysis of the RTS and ESFAS Test Times and Completion Times," WCAP-14333-P-A, Revision 1, October 1998.
  12. "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," WCAP-15376-P-A, Revision 1, March 2003.
  13. Westinghouse letter WOG-06-17, "WCAP-10271-P-A Justification for Bypass Time and Completion Time Technical Specification Changes for Reactor Trip on Turbine Trip (ITSWG Action Item #314)," dated January 20, 2006.
  14. Westinghouse Nuclear Safety Advisory Letter (NSAL) 09-1, "Rod Withdrawal at Power Analysis for Reactor Coolant System Overpressure," February 4, 2009.
  15. Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing"

**Attachment 2 to TXX-20070  
Technical Specifications Bases  
for SR 3.3.2.10  
Markup and Revised Pages  
[For Information Only]**

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.2.9 (continued)

A CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.9 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.2-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note (r) requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis.

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.2.10 (continued)

Response Time testing, required channels, and acceptance criteria are included in the Technical Requirements Manual (Ref. 7). For each Functional Unit to which this SR applies, at least one ESF function has a required response time but not necessarily all associated ESF functions. No credit was taken in the safety analyses for those channels with response time listed as N.A. When the response time for a function in the TRM is NA, no specific testing need be performed to comply with this SR. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time testing may be performed with the transfer functions set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

-----REVIEWER'S NOTE-----

Portions of the following Bases are applicable for plants adopting WCAP-14036-P-A and the methodology contained in Attachment 1 to TSTF-569.

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 11) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.2.10 (continued)

The response time may be verified for components that replace the components that were previously evaluated in reference 11, provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF- 569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 14).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Response time verification in lieu of actual testing may be performed on ESFAS components in accordance with [reference 11](#).

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 532 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. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

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BASES (continued)

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REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 7.
3. FSAR, Chapter 15.
4. IEEE-279-1971.
5. 10 CFR 50.49.
6. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
7. Technical Requirements Manual.
8. WCAP-10271-P-A, Supplement 3, September 1990.
9. "Westinghouse Setpoint Methodology for Protection Systems Comanche Peak Unit 1, Revision 1," WCAP-12123, Revision 2, April, 1989.
10. WCAP-13877-P-A, Revision 2, August 2000.
11. "Elimination of Periodic Protection Channel Response Time Tests", WCAP-14036-P-A, Revision 1, October 6, 1998.
12. "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," WCAP-14333-P-A, Revision 1, October 1998.
13. "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," WCAP-15376-P-A, Revision 1, March 2003.
14. Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing"

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.2.9 (continued)

A CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.9 for selected Functions is also modified by two Notes (q and r) as identified in Table 3.3.2-1. The selected Functions are those Functions that are LSSS and whose instruments are not mechanical devices (i.e. limit switches, float switches, and proximity detectors). Mechanical devices are excluded since it is not possible to trend these devices and develop as-left or as-found limits in the same manner as other instrumentation. The first Note (q) requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of instrument performance will verify that the instrument will continue to behave in accordance with design-basis assumptions. The purpose of the assessment is to ensure confidence in the instrument performance prior to returning the instrument to service. These channels will also be identified in the Corrective Action Program. In accordance with procedures, entry into the Corrective Action Program will require review and documentation of the condition for OPERABILITY. The second Note (r) requires that the as-left setting for the instrument be returned to within the as-left tolerance of the Nominal Trip Setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left instrument setting cannot be returned to a setting within the as-left tolerance, then the instrument channel shall be declared inoperable. This second Note (r) requirement identifies the Limited Safety System Setting and allows an independent verification that the Allowable Value is the appropriate least conservative as-found value during SR testing.

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis.

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.2.10 (continued)

Response Time testing, required channels, and acceptance criteria are included in the Technical Requirements Manual (Ref. 7). For each Functional Unit to which this SR applies, at least one ESF function has a required response time but not necessarily all associated ESF functions. No credit was taken in the safety analyses for those channels with response time listed as N.A. When the response time for a function in the TRM is NA, no specific testing need be performed to comply with this SR. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time testing may be performed with the transfer functions set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

-----REVIEWER'S NOTE-----  
Portions of the following Bases are applicable for plants adopting WCAP-14036-P-A and the methodology contained in Attachment 1 to TSTF-569.  
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Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be used for selected components provided that the components and methodology for verification have been previously NRC approved.

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 11) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.2.10 (continued)

The response time may be verified for components that replace the components that were previously evaluated in reference 11, provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF- 569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 14).

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Response time verification in lieu of actual testing may be performed on ESFAS components in accordance with [reference 11](#).

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 532 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. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

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BASES (continued)

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- REFERENCES
1. FSAR, Chapter 6.
  2. FSAR, Chapter 7.
  3. FSAR, Chapter 15.
  4. IEEE-279-1971.
  5. 10 CFR 50.49.
  6. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
  7. Technical Requirements Manual.
  8. WCAP-10271-P-A, Supplement 3, September 1990.
  9. "Westinghouse Setpoint Methodology for Protection Systems Comanche Peak Unit 1, Revision 1," WCAP-12123, Revision 2, April, 1989.
  10. WCAP-13877-P-A, Revision 2, August 2000.
  11. "Elimination of Periodic Protection Channel Response Time Tests", WCAP-14036-P-A, Revision 1, October 6, 1998.
  12. "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," WCAP-14333-P-A, Revision 1, October 1998.
  13. "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," WCAP-15376-P-A, Revision 1, March 2003.
  14. Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing"
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**Attachment 3 to TXX-20070  
Attachment 1 of TSTF-569-A,  
Revision 2  
[For Information Only]**

## **Attachment 1 to TSTF-569**

### **Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing**

#### **Background**

Section 6.3.4 of IEEE Standard 338-1977, "Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems," states the following regarding eliminating response time testing (RTT):

Response time testing of all safety-related equipment, per se, is not required if, in lieu of response time testing, the response time of safety system equipment is verified by functional testing, calibration check, or other tests, or both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics which are detectable during routine periodic tests.

Clause 6.3.4 of IEEE 338-1987 states the following regarding eliminating RTT:

Response time testing shall be required only on safety systems or subsystems to verify that the response times are within the limits given in the Safety Analysis Report including Technical Specifications. Response time testing of all safety-related equipment is not required if, in lieu of response time testing, the response time of safety system equipment is verified by functional testing, calibration checks, or other tests, or both.

Section 5.3.4, "Response time verification tests," of IEEE Standard 338-2012, "IEEE Standard for Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems," Item c), states the following regarding eliminating RTT:

Response time testing of all safety-related equipment is not required if, in lieu of response time testing, the response time of safety system equipment is verified by functional testing, calibration checks, or other tests. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics that are detectable during routine periodic tests.

#### **Methodology for Evaluating the Elimination of Response Time Testing for Pressure Transmitters for Westinghouse and Combustion Engineering NSSS Plants**

The methodology for evaluating whether RTT can be eliminated for pressure transmitters (or sensors) consists of the following:

- 1) If response time measurement data is available, evaluate the measurement data with respect to the results, failure mechanisms, testing techniques, and failure trends.

If response time measurement data is available, the review of the data should conclude that no response time failures were identified during RTT. If a pressure transmitter(s)

was replaced due to a failure, it should be confirmed that the failure was detected by a channel check or other instrument surveillance testing. It should be concluded that although the response time was degraded by the failure, RTT was not a factor in identifying the failed transmitter.

- 2) Perform a failure modes and effects analyses (FMEAs) on the pressure transmitter to demonstrate that the pressure transmitter component failure modes which can affect the transmitter response time will also affect the transmitter output and therefore, would be detectable by other required surveillance tests.
- 3) Identify any exceptions (i.e., pressure transmitter failure modes that may not be detected by other surveillance tests) and identify specific recommendations to address these exceptions.
- 4) Perform a similarity analysis that compares the design and the functionality of the principal components of the pressure transmitter, to the transmitters that were evaluated in EPRI Report NP-7243, WCAP-13632-P-A, or NPSD-1167-A. If the similarity analysis does not confirm the functionality of the principal components of the pressure transmitter, as compared to the transmitters that were evaluated in EPRI Report NP-7243, WCAP-13632-P-A, or NPSD-1167-A, a FMEA or additional test data will be used to demonstrate that the response time would not be significantly affected by the degradation of components or that such changes would be detectable by other surveillance tests.

This methodology verifies the total instrument channel response time by using a combination of "allocated response times" for the specified pressure transmitters and actual tests (in any series of sequential or overlapping measurements) for the remainder of the instrument channel. The "allocated response times" can be used in lieu of actual measured response times for those pressure transmitters when performing the RTT surveillance.

The "allocated response times" will be determined as follows:

The response time allocated in lieu of response times obtained through actual measurement may be obtained from:

- (1) If available, historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests),
- (2) If available, inplace, onsite, or offsite (e.g., vendor) test measurements, or
- (3) Utilizing vendor engineering specifications.

This methodology is only applicable to pressure sensors and is not applicable to any other type of sensor (e.g., temperature sensors (RTDs)).

### **Methodology for Evaluating the Elimination of Response Time Testing for Protection Channels for Westinghouse NSSS Plants**

This methodology justifies the elimination of periodic RTT of the electronic signal processing hardware between the primary sensor and the final actuated device. This signal processing

hardware includes the process analog/digital rack, excore nuclear instrumentation system, and associated solid state and relay trip logic circuitry up to the slave relay output.

Note that this methodology only includes the electronics/relays between the sensor and the final actuated device and does not include the individual channel pressure or temperature sensors.

The methodology is applicable to the following systems:

- 7100 Process Protection System (PPS)
- 7300 Process Protection System (PPS)
- Nuclear Instrumentation System (NIS)
- Eagle-21 Process Protection System (PPS)
- Solid State Protection System (SSPS)
- Relay Protection System (RPS)

The methodology for evaluating whether RTT can be eliminated for protection channels consists of the following:

- 1) Analyze the system modules for their function in providing the protection function. System modules which do not contribute to the protection functions, such as modules used only for test or for interface with non-safety systems, will be excluded.
- 2) A Failure Modes and Effects Analysis (FMEA) will be performed on the modules that perform a protection function to determine whether individual component degradation has no impact on the response time or whether the individual component may contribute to the system response time degradation.

The FMEA should confirm the following:

- Identify any components on the cards and modules that are sensitive to response time,
  - Evaluate the impact on response time if the component fails or degrades,
  - Determine whether the degraded component can be detected via a channel calibration,
  - Identify the components that impact a channel calibration, but not the response time.
- 3a) If the individual component potentially impacts the system response time, perform testing to determine the magnitude of the response time degradation,

If required to be performed, the testing, which verifies and further quantifies the results of the FMEA should confirm the following:

- Measure the response time of the calibrated production modules and provide response time base-line data,

- Measure the response time and obtain calibration data for the card or module if the component is identified to have an impact on response time is degraded,
- Measure the response time of a simulated protection channel from input to output with the component degraded.

OR

- 3b) Determine a bounding response time limit for the system or component if the individual component does not impact the system response time. The results of the FMEA must conclude that component degradation will not increase the response time beyond the bounding response time without the response time degradation being detected by other periodic surveillance tests, such as channel checks and channel calibrations.

The bounding response time allocations are determined from response time design specifications for the components. It must be confirmed that the bounding response times that were determined for the specific components that were approved by the NRC in WCAP-14036-P-A are applicable to the replacement component. If the bounding response times are not applicable to the replacement component, new bounding response times must be determined for the replacement component. The bounding response time will be justified because of its small magnitude as compared to the total system response time limit.

The application of the methodology must conclude that RTT is redundant to other periodic surveillance tests; channel checks and channel calibrations, in lieu of performing RTT such that the response time is verified for the components.