

SURVEILLANCE REQUIREMENTS

-----NOTE-----  
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.  
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SURVEILLANCE	FREQUENCY
SR 3.3.2.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2 Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.3 -----NOTE----- Final actuation of pumps or valves not required. ----- Perform TADOT.	31 days
SR 3.3.2.4 Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.5 Perform COT.	92 days
SR 3.3.2.6 Perform SLAVE RELAY TEST.	92 days  <u>OR</u> 18 months for only Westinghouse AR and Potter & Brumfield MDR relay types
SR 3.3.2.7 Perform COT.	31 days

(continued)

**SURVEILLANCE REQUIREMENTS**

~~NOTE~~

Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Air Release and Addition Isolation Function.

SURVEILLANCE	FREQUENCY
SR 3.3.6.1 Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.6.2 Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.6.3 Perform SLAVE RELAY TEST.	92 days  <u>OR</u> 18 months for only Westinghouse AR and Potter & Brumfield MDR relay types
SR 3.3.6.4 <del>NOTE</del> Verification of setpoint is not required.  Perform TADOT.	18 months

BASES

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SURVEILLANCE REQUIREMENTS (continued)

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

The Frequency of 92 days is justified in Reference 7.

SR 3.3.2.6

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

For slave relays or any auxiliary relays in the ESFAS circuit that are of the type Westinghouse AR or Potter & Brumfield MDR, the SLAVE RELAY TEST is performed every 18 months. This test frequency is based on the relay reliability assessments presented in References 10, 11, and 12. These reliability assessments are relay specific and apply only to the Westinghouse AR and Potter & Brumfield MDR type relays. SSPS slave relays or any auxiliary relays not addressed by Reference 10 do not qualify for extended surveillance intervals and will continue to be tested at a 92 day Frequency.

SR 3.3.2.7

SR 3.3.2.7 is the performance of a COT on the RWST level and Containment Pressure Control Start and Terminate Permissives.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1. This test is performed every 31 days. The Frequency is adequate, based on operating experience, considering instrument reliability and operating history data.

BASES

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## SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions, AFW pump start on trip of all MFW pumps, AFW low suction pressure, Reactor Trip (P-4) Interlock, and Doghouse Water Level - High High Feedwater Isolation. It is performed every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. 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 Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

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. The applicable time constants are shown in Table 3.3.2-1.

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. Response Time testing acceptance criteria are included in the UFSAR (Ref. 2). Individual component response times are not modeled in the

BASES

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## SURVEILLANCE REQUIREMENTS (continued)

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 test may be performed with the transfer functions set to one with the resulting measured response time compared to the appropriate UFSAR response time. Alternately, the response time test can be performed with the time constants set to their nominal value provided the required response time is analytically calculated assuming the time constants are 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.

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 obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in-place, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. In addition, while not specifically identified in the WCAP, ITT Barton 386A and 580A-0 sensors were compared to sensors which were identified. It was concluded that the WCAP results could be applied to these two sensor types as well. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" 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

BASES

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## SURVEILLANCE REQUIREMENTS (continued)

time could be affected is replacing the sensing assembly of a transmitter.

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

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching 600 psig in the SGs.

SR 3.3.2.11

SR 3.3.2.11 is the performance of a COT on the NSW Suction Transfer - Low Pit Level.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1. This test is performed every 18 months. The Frequency is adequate based on operating experience.

SR 3.3.2.12

SR 3.3.2.12 is the performance of an ACTUATION LOGIC TEST on the NSW Suction Transfer-Emergency Low Pit Level.

An ACTUATION LOGIC TEST to satisfy the requirements of GL 96-01 is performed on each NSW Pit Suction Transfer instrumentation to ensure all combinations will initiate a transfer to the SNSWP. This test is performed every 18 months. The Frequency is adequate based on operating experience.

BASES

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- REFERENCES
1. UFSAR, Chapter 6.
  2. UFSAR, Chapter 7.
  3. UFSAR, Chapter 15.
  4. IEEE-279-1971.
  5. 10 CFR 50.49.
  6. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
  7. WCAP-10271-P-A, Supplement 1 and Supplement 2, Rev. 1, May 1986 and June 1990.
  8. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" Sep., 1995.
  9. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" Oct., 1998.
  10. WCAP-13900, "Extension of Slave Relay Surveillance Test Intervals," April 1994.
  11. WCAP-13877 Revision 2-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used As SSPS Slave Relays," August 2000.
  12. WCAP-13878-P-A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.

## BASES

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**SURVEILLANCE REQUIREMENTS (continued)**

For slave relays or any auxiliary relays in the circuit that are of the type Westinghouse AR or Potter & Brumfield MDR, the SLAVE RELAY TEST is performed every 18 months. This test frequency is based on the relay reliability assessments presented in References 3, 4, and 5. These reliability assessments are relay specific and apply only to the Westinghouse AR and Potter & Brumfield MDR type relays. SSPS slave relays or any auxiliary relays not addressed by Reference 3 do not qualify for extended surveillance intervals and will continue to be tested at a 92 day Frequency.

**SR 3.3.6.4**

SR 3.3.6.4 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).

The test also includes trip devices that provide actuation signals directly to the SSPS, bypassing the analog process control equipment. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.

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**REFERENCES**

1. 10 CFR 100.11.
2. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
3. WCAP-13900, "Extension of Slave Relay Surveillance Test Intervals," April 1994.
4. WCAP-13877 Revision 2-P-A, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays," August 2000.
5. WCAP-13878-P-A Revision 2, "Reliability Assessment of Potter & Brumfield MDR Series Relays," August 2000.