Industry/TSTF Standard Technical Specification Change Traveler

ECCS Response Time Testing

Classification: 1) Correct Specifications

NUREGs Affected: ☐ 1430 ☐ 1431 ☐ 1432 ☑ 1433 ☑ 1434

Description:

Incorporate allowances of NEDO-32291-A, System Analysis for the Elimination of Selected Response Time Testing Requirements, October 1995, and NEDO-32291-A, Supplement 1, October 1999, which eliminates required measurement of certain sensor response times. The implementation follows that approved by the NRC in TSTF-111 (a similar change for NUREG-1431, ISTS for Westinghouse plants.) As a result, the definitions for ECCS RESPONSE TIME, ISOLATION SYSTEM RESPONSE TIME and RPS RESPONSE TIME are modified, as well as the Bases for the associated SRs.

Justification:

As stated in NEDO-32291-A, analysis has demonstrated that other Technical Specification testing requirements (CHANNEL CALIBRATIONS, CHANNEL CHECKS, CHANNEL FUNCTIONAL TESTS, and LOGIC SYSTEM FUNCTIONAL TESTS) and actions taken in response to NRC Bulletin 90-01 Supplement 1 are sufficient to identify failure modes or degradation in instrument response times and assure operation of the analyzed instrument loops within acceptable limits. This Topical Report also identifies that there are no known channel sensor failure modes identified that can be detected by response time testing that cannot also be detected by other Technical Specification required surveillances. Therefore, certain sensor response times need not be measured, and can be assumed to be the designed response time. By revising the definitions for response time testing and the associated implementing SR Bases, the details of which channel sensors are measured and which are allowed to be assumed can be appropriately delineated

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Revision History

OG Revision 0 — Revision Status: Closed

Revision Proposed by:

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 27-Nov-95

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 27-Nov-95

TSTF Review Information

TSTF Received Date: 27-Nov-95 Date Distributed for Review 27-Nov-95

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:

NA PWRs

Approved by the TSTF on April 30, 1996. Subsequently, substantial comments were received from the

OG Revision 0 Revision Status: Closed

BWRs which will require a rewrite of the package.

TSTF Resolution: Withdrawn Date: 30-Apr-96

OG Revision 1 Revision Status: Closed

Revision Proposed by: BWROG

Revision Description:
Complete replacement of BWROG-15.

Owners Group Review Information

Date Originated by OG: 11-Feb-97

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 11-Feb-97

TSTF Review Information

TSTF Received Date: 16-May-97 Date Distributed for Review 16-May-97

OG Review Completed: ☐ BWOG ☑ WOG ☐ CEOG ☑ BWROG

TSTF Comments:
Rev 1 comment - WOG agrees with concept.

TSTF Resolution: Superceeded Date: 19-May-97

OG Revision 2 Revision Status: Closed

Revision Proposed by: BWROG

Revision Description:
Replaces description and justification. Adds additional changes.

Owners Group Review Information

Date Originated by OG: 19-May-97

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 19-May-97

TSTF Review Information

TSTF Received Date: 19-May-97 Date Distributed for Review 01-Dec-97

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:

1. NRC not inclined to approve changing "measure" to "verify" - consider going to a note specifically in each SR that is acceptable for response time testing
2. BWR 15R2 will be revised to reflect the markups for response time testing issue

OG Revision 2 Revision Status: Closed

3. BWR 13 will be revised to reflect the ECCS portion of change
Excel (Dan W) to revise BWR 13 and 15, and will address WOG change and TSTF 111

TSTF Resolution: Withdrawn Date: 05-Feb-98

OG Revision 3 Revision Status: Closed

Revision Proposed by: BWROG

Revision Description:
Revised to change the definition instead of using notes to address the allowance of not actually measuring all the response times.

Owners Group Review Information

Date Originated by OG: 19-May-98

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 19-May-98

TSTF Review Information

TSTF Received Date: 11-Aug-98 Date Distributed for Review

OG Review Completed: ☐ BWOG ☐ WOG ☐ CEOG ☐ BWROG

TSTF Comments:

Holding distribution to TSTF for NRC resolution on TSTF-111.
11/3/98 - Send to TSTF

TSTF Resolution: Superceeded Date:

OG Revision 4 Revision Status: Closed

Revision Proposed by: BWROG

Revision Description:
The format of this change is revised to to be similar to NRC approved TSTF-111, Rev. 3 in order to provide consistency between the ISTS NUREGs. This approach provides a generic allowance within the definition for the various Response Times in lieu of detail Note exceptions on each affected SR.

Owners Group Review Information

Date Originated by OG: 03-Nov-98

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 03-Nov-98

TSTF Review Information

TSTF Received Date: 03-Feb-99 Date Distributed for Review 09-Mar-99

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

OG Revision 4 — Revision Status: Closed

TSTF Comments:

Approved. Add Reviewer's Note.

TSTF Resolution: Approved Date: 09-Apr-99

NRC Review Information

NRC Received Date: 30-Apr-99

NRC Comments:

12/21/99 - The NRC provided the following comments:
The TSTF proposes to incorporate allowances of NEDO-3229-A. This topical report eliminates required measurement of certain sensor response times. The staff agrees with the need to incorporate NEDO-3229-A, as approved by the staff SE. The TSTF package is missing RPS SR changes (SR 3.3.1.1.17 [BWR/4], SR 3.3.1.1.17 [BWR/6]) related to Insert 2 which adds a note to the RPS instrumentation SR for Response Time Testing stating those sensor response times are not required to be tested. This specific change was evaluated and approved for the topical report. The staff recommends adding the appropriate LCO SR Note to RPS instrumentation consistent with the approved topical report.

The TSTF proposes adding notes to response time SRs to clarify TS actions, based on whether response times are not met due to the instrumentation or due to actuated devices. This clarification was not part of the staff review and approval of NEDO-3229-A. The staff recommends removing the additional SR notes and Bases for the SR Notes from the TSTF-322 package by deleting the following:
1) Insert 1, Note to proposed SR 3.5.1.13 (BWR/4] SR 3.5.1.8 (BWR/6).
2) Insert 3B
3) Insert 4
4) Insert 5 Bases for proposed Note to SR 3.5.1.13 (BWR/4) SR 3.5.1.8 (BWR/6).
5) Proposed Note 2 to SR 3.3.6.1.8 (BWR/4) SR 3.3.6.1.7 (BWR/6) and Bases, and
6) Proposed Note 2 to SR 3.3.6.2.7 (BWR/4) SR 3.3.6.2.8 (BWR/6) and Bases.

1/10/00 - NRC to provide more information regarding their concerns.

6/14/00 - TSTF to revise to address NRC comments.

Final Resolution: NRC Requests Changes: TSTF Will Revise Final Resolution Date: 14-Jun-00

TSTF Revision 1 — Revision Status: Active — Next Action: TSTF

Revision Proposed by: NRC

Revision Description:
Revision 1 made the following changes:

The "reverse cascading" notes were deleted. This issue will be addressed in another Traveler.

The ECCS RESPONSE TIME test was left in the instrumentation specification.

All ISOLATION SYSTEM RESPONSE TIME testing relaxations included in the NEDO have been provided.

The changes in NEDO-32291-A, Supplement 1, have been included. The supplement was approved in October 1999.

Made editorial changes to Inserts 1, 3, 5, and 7 to address NRC comments.

TSTF Revision 1 **Revision Status: Active** **Next Action: TSTF**

TSTF Review Information

TSTF Received Date: 06-Aug-00 Date Distributed for Review 06-Aug-00

OG Review Completed: ☐ BWOG ☐ WOG ☐ CEOG ☐ BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Date:

Incorporation Into the NUREGs

File to BBS/LAN Date: TSTF Informed Date: TSTF Approved Date:

NUREG Rev Incorporated:

Affected Technical Specifications

1.0	Definitions - Emergency Core Cooling System (ECCS) Response Time	
1.0	Definitions - Isolation System Response Time	
1.0	Definitions - Reactor Protection System (RPS) Response Time	
Ref. 3.3.1.1 Bases	RPS Instrumentation	
SR 3.3.1.1.17 Bases	RPS Instrumentation	
Ref. 3.3.5.1 Bases	ECCS Instrumentation	
SR 3.3.5.1.7 Bases	ECCS Instrumentation	
Ref. 3.3.6.1 Bases	Primary Containment Isolation Instrumentation	
Ref. 3.3.6.2 Bases	Secondary Containment Isolation Instrumentation	
SR 3.3.6.1.8 Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1433 Only
SR 3.3.6.2.7 Bases	Secondary Containment Isolation Instrumentation	NUREG(s)- 1433 Only
SR 3.3.6.1.7 Bases	Primary Containment Isolation Instrumentation	NUREG(s)- 1434 Only
SR 3.3.6.2.6 Bases	Secondary Containment Isolation Instrumentation	NUREG(s)- 1434 Only

INSERT Definition

In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.

INSERT 1 (SR 3.3.1.1.17 Bases)

RPS RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[---------- Reviewer's Note ----------
The following Bases are applicable for plants adopting NEDO-32291-A and/or Supplement 1.

However, the sensors for Functions [{**BWR/4:** } 3 and 4][{**BWR/6:** } 3, 4, and 5] are allowed to be excluded from specific RPS RESPONSE TIME measurement if the conditions of Reference 11 are satisfied. If these conditions are satisfied, sensor response time may be allocated based on either assumed design sensor response time or the manufacturer's stated design response time. When the requirements of Reference 11 are not satisfied, sensor response time must be measured. Furthermore, measurement of the instrument loops response times for Functions [{**BWR/4:** } 3 and 4][{**BWR/6:** } 3, 4, and 5] is not required if the conditions of Reference 12 are satisfied.]

INSERT 2 (3.3.1.1 Bases References)

[11. NEDO-32291-A, "System Analyses For the Elimination of Selected Response Time Testing Requirements," October 1995.

12. NEDO-32291-A, Supplement 1, "System Analyses for The Elimination of Selected Response Time Testing Requirements," October 1999.]

INSERT 3 (SR 3.3.5.1.7 Bases)

ECCS RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[---------- Reviewer's Note ----------
The following Bases are applicable for plants adopting NEDO-32291-A.

However, the measurement of instrument loop response times may be excluded if the conditions of Reference 6 are satisfied.]

INSERT 4 (3.3.5.1 Bases References)

[6. NEDO-32291-A, "System Analyses For the Elimination of Selected Response Time Testing Requirements," October 1995.]

INSERT 5 (BWR/4: SR 3.3.6.1.8, BWR/6: SR 3.3.6.1.7 Bases)

ISOLATION SYSTEM RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[---------- Reviewer's Note ----------
The following Bases are applicable for plants adopting NEDO-32291-A and/or Supplement 1.

However, the sensors for Functions 1.a, 1.b, and 1.c are allowed to be excluded from specific ISOLATION SYSTEM RESPONSE TIME measurement if the conditions of Reference 8 are satisfied. If these conditions are satisfied, sensor response time may be allocated based on either assumed design sensor response time or the manufacturer's stated design response time. When the requirements of Reference 8 are not satisfied, sensor response time must be measured. Furthermore, measurement of the instrument loops response time for Functions 1.a, 1.b. and 1.c is not required if the conditions of Reference 9 are satisfied. For all other Functions, the measurement of instrument loop response times may be excluded if the conditions of Reference 8 are satisfied.]

INSERT 6 (3.3.6.1 Bases References)

[8. NEDO-32291-A, "System Analyses For the Elimination of Selected Response Time Testing Requirements," October 1995.

9. NEDO-32291-A, Supplement 1, "System Analyses for The Elimination of Selected Response Time Testing Requirements," October 1999.]

INSERT 7 (BWR/4: SR 3.3.6.2.7, BWR/6: SR 3.3.6.2.6 Bases)

ISOLATION SYSTEM RESPONSE TIME may be verified by actual response time measurements in any series of sequential, overlapping, or total channel measurements.

[---------- Reviewer's Note ----------

The following Bases are applicable for plants adopting NEDO-32291-A.

However, the measurement of instrument loop response times may be excluded if the conditions of Reference **{BWR/4:** 8} **{BWR/6:** 6} are satisfied.]

INSERT 8 (3.3.6.2 Bases References)

[**{BWR/4:** 8} **{BWR/6:** 6}. NEDO-32291-A, "System Analyses For the Elimination of Selected Response Time Testing Requirements," October 1995.]

1.1 Definitions

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DOSE EQUIVALENT I-131 (continued)	conversion factors used for this calculation shall be those listed in [Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites" or those listed in Table E-7 of Regulatory Guide 1.109, Rev. 1, NRC, 1977, or ICRP 30, Supplement to Part 1, page 192-212, Table titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity"].
EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME	The ECCS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS initiation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
END OF CYCLE RECIRCULATION PUMP TRIP (EOC RPT) SYSTEM RESPONSE TIME	The EOC RPT SYSTEM RESPONSE TIME shall be that time interval from initial signal generation by [the associated turbine stop valve limit switch or from when the turbine control valve hydraulic oil control oil pressure drops below the pressure switch setpoint] to complete suppression of the electric arc between the fully open contacts of the recirculation pump circuit breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured, [except for the breaker arc suppression time, which is not measured but is validated to conform to the manufacturer's design value].
ISOLATION SYSTEM RESPONSE TIME	The ISOLATION SYSTEM RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its isolation initiation setpoint at the channel sensor until the isolation valves travel to their required positions. Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential,

INSERT DEFINITION

(continued)

1.1 Definitions

INSERT DEFINITION

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ISOLATION SYSTEM RESPONSE TIME (continued)	overlapping, or total steps so that the entire response time is measured.
L_a	The maximum allowable primary containment leakage rate, L_a, shall be [ ]% of primary containment air weight per day at the calculated peak containment pressure (P_a).
LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE into the drywell, such as that from pump seals or valve packing, that is captured and conducted to a sump or collecting tank; or 2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; b. Unidentified LEAKAGE All LEAKAGE into the drywell that is not identified LEAKAGE; c. Total LEAKAGE Sum of the identified and unidentified LEAKAGE; d. Pressure Boundary LEAKAGE LEAKAGE through a nonisolable fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall.
[LINEAR HEAT GENERATION RATE (LHGR)	The LHGR shall be the heat generation rate per unit length of fuel rod. It is the integral of the heat flux over the heat transfer area associated with the unit length.]

(continued)

1.1 Definitions

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PHYSICS TESTS (continued)	These tests are: a. Described in Chapter [14, Initial Test Program] of the FSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.6. Plant operation within these operating limits is addressed in LCO 3.4.10, "RCS Pressure and Temperature (P/T) Limits."
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of [2436] MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical assuming that: a. The reactor is xenon free; b. The moderator temperature is 68°F; and c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn.

INSERT DEFINITION

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.16 (continued)

bypass valves must remain closed at THERMAL POWER ≥ 30% RTP to ensure that the calibration remains valid.

If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 30% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve—Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel is considered OPERABLE.

The Frequency of 18 months is based on engineering judgment and reliability of the components.

SR 3.3.1.1.17

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. This test may be performed in one measurement or in overlapping segments, with verification that all components are tested. The RPS RESPONSE TIME acceptance criteria are included in Reference 10.

Insert 1

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time.

RPS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Note 2 requires STAGGERED TEST BASIS Frequency to be determined based on 4 channels per trip system, in lieu of the 8 channels specified in Table 3.3.1.1-1 for the MSIV Closure Function. This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

(continued)

BASES (continued)

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REFERENCES

1. FSAR, Figure [ ].

2. FSAR, Section [15.1.2].

3. NEDO-23842, "Continuous Control Rod Withdrawal in the Startup Range," April 18, 1978.

4. FSAR, Section [5.2.2].

5. FSAR, Section [15.1.38].

6. FSAR, Section [6.3.3].

7. FSAR, Chapter [15].

8. P. Check (NRC) letter to G. Lainas (NRC), "BWR Scram Discharge System Safety Evaluation," December 1, 1980.

9. NEDO-30851-P-A , "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988.

10. FSAR, Table [7.2-2].

Insert 2

BASES

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SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.6 (continued)

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.5.1.7

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Reference 4.

Insert 3

ECCS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

REFERENCES

1. FSAR, Section [5.2].
2. FSAR, Section [6.3].
3. FSAR, Chapter [15].
4. NEDC-31376-P, "Edwin I. Hatch Nuclear Power Plant, SAFER/GESTR-LOCA, Loss-of-Coolant Accident Analysis," December 1986.
5. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988.

Insert 4

Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.7 (continued)

Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.6.1.8

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the PCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME.

Insert 5 → ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7. This test may be performed in one measurement, or in overlapping segments, with verification that all components are tested.

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response times for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

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BASES (continued)

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REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.

4. FSAR, Section [4.2.3.4.3].

5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

7. FSAR, Section [7.3].

Insert 6

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.6 (continued)

Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.6.2.7

This SR ensures that the individual channel response times are less than or equal to the maximum value assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the SCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7.

Insert 7

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is based on plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

(continued)

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BASES

REFERENCES (continued)

3. FSAR, Section [15.1.40].

4. FSAR, Sections [15.1.39 and 15.1.41].

5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

7. FSAR, Section [7.3].

Insert B

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1.1 Definitions

DOSE EQUIVALENT I-131 (continued)	conversion factors used for this calculation shall be those listed in [Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites" or those listed in Table E-7 of Regulatory Guide 1.109, Rev. 1, NRC, 1977, or ICRP 30, Supplement to Part 1, page 192-212, Table titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity"].
EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME	The ECCS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS initiation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
END OF CYCLE RECIRCULATION PUMP TRIP (EOC-RPT) SYSTEM RESPONSE TIME	The EOC-RPT SYSTEM RESPONSE TIME shall be that time interval from initial signal generation by [the associated turbine stop valve limit switch or from when the turbine control valve hydraulic oil control oil pressure drops below the pressure switch setpoint] to complete suppression of the electric arc between the fully open contacts of the recirculation pump circuit breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured, [except for the breaker arc suppression time, which is not measured but is validated to conform to the manufacturer's design value].
ISOLATION SYSTEM RESPONSE TIME	The ISOLATION SYSTEM RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its isolation initiation setpoint at the channel sensor until the isolation valves travel to their required positions. Times shall include diesel generator starting and sequence loading

Insert Definition

(continued)

TSTF-332, Rev. 1

1.1 Definitions

ISOLATION SYSTEM RESPONSE TIME (continued)

delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

L_a

Insert Definition

The maximum allowable primary containment leakage rate, L_a, shall be [ ]% of primary containment air weight per day at the calculated peak containment pressure (P_a).

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE into the drywell such as that from pump seals or valve packing, that is captured and conducted to a sump or collecting tank; or

2. LEAKAGE into the drywell atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE;

b. Unidentified LEAKAGE

All LEAKAGE into the drywell that is not identified LEAKAGE;

c. Total LEAKAGE

Sum of the identified and unidentified LEAKAGE;

d. Pressure Boundary LEAKAGE

LEAKAGE through a nonisolable fault in a Reactor Coolant System (RCS) component body, pipe wall, or vessel wall.

[LINEAR HEAT GENERATION RATE (LHGR)

The LHGR shall be the heat generation rate per unit length of fuel rod. It is the integral of the heat flux over the heat transfer area associated with the unit length.]

(continued)

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1.1 Definitions (continued)

PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter [14, Initial Test Program] of the FSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.6. Plant operation within these operating limits is addressed in LCO 3.4.11, "RCS Pressure and Temperature (P/T) Limits."
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of [3833] MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME Insert Definition	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical assuming that: a. The reactor is xenon free; b. The moderator temperature is 68°F; and

(continued)

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SR 3.3.1.1.16 (continued)

first stage pressure), the main turbine bypass valves must remain closed at THERMAL POWER ≥ 40% RTP to ensure that the calibration remains valid.

If any bypass channel setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 40% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve, Trip Oil Pressure—Low and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel is considered OPERABLE.

The Frequency of 18 months is based on engineering judgment and reliability of the components.

SR 3.3.1.1.17

Insert 1

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The RPS RESPONSE TIME acceptance criteria are included in Reference [1]. 10 Editorial

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time.

RPS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Note 2 requires STAGGERED TEST BASIS Frequency to be determined based on 4 channels per trip system, in lieu of the 8 channels specified in Table 3.3.1.1-1 for the MSIV Closure Function. This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious time degradation, but not channel failure, are infrequent.

(continued)

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BASES (continued)

REFERENCES

1. FSAR, Figure [ ].

2. FSAR, Section [5.2.2].

3. FSAR, Section [6.3.3].

4. FSAR, Chapter [15].

5. FSAR, Section [15.4.1].

6. NEDO-23842, "Continuous Control Rod Withdrawal in the Startup Range," April 18, 1978.

7. FSAR, Section [15.4.9].

8. Letter, P. Check (NRC) to G. Lainas (NRC), "BWR Scram Discharge System Safety Evaluation," December 1, 1980.

9. NEDO-30851-P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988.

Insert 2

10. FSAR, Table [ ]. Editorial

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SR 3.3.5.1.6 (continued)

The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for unplanned transients if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency.

SR 3.3.5.1.7

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Reference 5.

Insert 3

ECCS RESPONSE TIME tests are conducted on an [18] month STAGGERED TEST BASIS. The [18] month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent.

REFERENCES

1. FSAR, Section [5.2].
2. FSAR, Section [6.3].
3. FSAR, Chapter [15].
4. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part 2," December 1988.
5. FSAR, Section [6.3], Table [6.3-2].

Insert 4

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SR 3.3.6.1.7 (continued)

Insert 5

ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 7.

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detection channels shall be measured from detector output or the input of the first electronic component in the channel.

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month test Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent.

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.

4. FSAR, Section [9.3.5].

5. NEDC-31677-P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," June 1989.

6. NEDC-30851-P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

Insert 6

7. FSAR, Section [7.3].

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SR 3.3.6.2.5

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing, performed on SCIVs and the SGT System in LCO 3.6.4.2 and LCO 3.6.4.3, respectively, overlaps this Surveillance to provide complete testing of the assumed safety function.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.6.2.6

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the SCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 5.

Insert 7

A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is

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SR 3.3.6.2.6 (continued)

based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

REFERENCES

1. FSAR, Section [6.3].

2. FSAR, Chapter [15].

3. NEDC-31677-P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

4. NEDC-30851-P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentations Common to RPS and ECCS Instrumentation," March 1989.

5. FSAR, Section [7.3].

Insert 8