

Industry/TSTF Standard Technical Specification Change Traveler

Extending ESFAS Subgroup Relay Test Intervals

Classification: 1) Technical Change

Priority: 2) Medium

NUREGs Affected: 1430 1431 1432 1433 1434

Description:

The Frequency for testing ESFAS subgroup relays is revised to reflect Topical Report CEN-403 Rev 1A, ESFAS Subgroup Relay Test Interval Extension.

To accommodate the new Frequency, NUREG 1432 Surveillance Requirement is SR 3.3.5.1 (Analog) is divided into two surveillances. The original surveillance no longer requires testing of subgroup relays, and the new surveillance requires testing of subgroup relays every [] months on a STAGGERED TEST BASIS, where [] reflects one-half of the refueling outage frequency, so that both sets of Actuation Logic subgroup relays are tested once per refueling interval. The new Surveillance is modified by a Note excluding specific relays which cannot be tested at power and requiring those relays to be tested at the refueling frequency. A Reviewer's Note is added to the Bases explaining the Surveillance Frequency.

NUREG-1432 Surveillance 3.3.6.2 (Digital) Frequency is changed from [184] days to one-half of the refueling interval on a STAGGERED TEST BASIS, and the existing Note is modified to allow excluded relays to be tested at the refueling interval.

Justification:

Background

Topical Report CEN-403 Rev 1A, ESFAS Subgroup Relay Test Interval Extension, CEOG Task 664/750, concludes that the surveillance test interval may be extended to once per fuel cycle on a staggered test basis, such that each relay is tested once per fuel cycle. CEN-403 Rev 1A was approved by the NRC in a letter from Mr. Bruce A. Boger (USNRC) to Mr. D. F. Pilmer (CEOG) dated February 27, 1996, "Review of CE Owner's Group Topical Report CEN-403, Revision 1. ESFAS Subgroup Relay Test Interval Extension."

Need for Change

NUREG-1432 requires revision to reflect the allowances approved in the Topical Report.

Proposed Change

NUREG-1432 (analog) is modified by changing SR 3.3.5.1, adding SR 3.3.5.2 and modifying the existing SR 3.3.5.2 is modified. NUREG-1432 (digital) is modified by revising SR 3.3.6.2.

Justification

Based on the information provided in the Topical Report, it is acceptable to extend the Surveillance Frequency of the instruments described in the Topical Report provided licensees confirm the applicability of the CEN-403, Rev. 1-A analyses for their plant and confirm that the applicable setpoint calculations account for any increase in instrument drift caused by extended test interval.

The Safety Evaluation provides specific guidance for plants that use Potter and Brumfield MDR relays for ESFAS subgroup relay applications and guidance on adjusting Surveillance Frequencies following a subgroup relay failure.

5/19/2001

Determination of No Significant Hazards Considerations

A change is proposed to extend the Surveillance Frequency for ESFAS subgroup relays.

In accordance with the criteria set forth in 10 CFR 50.92, the Industry has evaluated these proposed Improved Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

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

A change is proposed to extend the Surveillance Frequency for ESFAS subgroup relays. ESFAS subgroup relays are not an initiator of any accident previously evaluated. Consequently, the probability of an accident previously evaluated is not significantly increased. The analyses in the Topical Report demonstrated that the reliability of the ESFAS subgroup relays is not significantly affected by the change in Surveillance Frequency. Therefore, the ability to mitigate accidents previously evaluated are not significantly affected. Therefore, the consequences of an accident previously evaluated are not significantly increased by this change. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

A change is proposed to extend the Surveillance Frequency for ESFAS subgroup relays. The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

A change is proposed to extend the Surveillance Frequency for ESFAS subgroup relays. The most likely outcome of any Surveillance is verification that the equipment is OPERABLE. The Topical Report demonstrated that the less frequency Surveillances on ESFAS subgroup relays do not significantly affect the reliability of the relays. Therefore, the margin of safety provided by the equipment initiated by these relays is not significantly affected. Therefore, this change does not involve a significant reduction in a margin of safety.

Industry Contact:	Weber, Tom	(602) 393-5764	tweber01@apsc.com
NRC Contact:	Schulten, Carl	301-415-1192	css1@nrc.gov

Revision History**OG Revision 0****Revision Status: Closed**

Revision Proposed by: CEOG

Revision Description:

Original Issue

Owners Group Review Information

Date Originated by OG: 16-Mar-99

Owners Group Comments
(No Comments)

Owners Group Resolution: Superseded Date: 30-Jun-99

OG Revision 1**Revision Status: Closed**

5/19/2001

OG Revision 1

Revision Status: Closed

Revision Proposed by: CEOG

Revision Description:
Complete replacement

Owners Group Review Information

Date Originated by OG: 30-Nov-99

Owners Group Comments
(No Comments)

Owners Group Resolution: Superceded Date: 08-Mar-00

TSTF Review Information

TSTF Received Date: 08-Mar-00 Date Distributed for Review

OG Review Completed: BWOG WOG CEOG BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Superceded Date:

OG Revision 2

Revision Status: Active

Next Action: NRC

Revision Proposed by: CEOG

Revision Description:
Created Safety Evaluation quality justification.

Owners Group Review Information

Date Originated by OG: 05-Dec-00

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 05-Dec-00

TSTF Review Information

TSTF Received Date: 05-Dec-00 Date Distributed for Review 06-Apr-01

OG Review Completed: BWOG WOG CEOG BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 02-May-01

NRC Review Information

NRC Received Date: 24-May-01

NRC Comments:
(No Comments)

5/19/2001

OG Revision 2

Revision Status: Active

Next Action: NRC

Final Resolution: NRC Action Pending

Final Resolution Date:

Incorporation Into the NUREGs

File to BBS/LAN Date:

TSTF Informed Date:

TSTF Approved Date:

NUREG Rev Incorporated:

Affected Technical Specifications

Ref. 3.3.5 Bases	ESFAS Logic and Manual Trip (Analog)
SR 3.3.5.1	ESFAS Logic and Manual Trip (Analog)
SR 3.3.5.1 Bases	ESFAS Logic and Manual Trip (Analog)
SR 3.3.5.2	ESFAS Logic and Manual Trip (Analog) Change Description: Renumbered 3.3.5.3
SR 3.3.5.2	ESFAS Logic and Manual Trip (Analog) Change Description: New
SR 3.3.5.2 Bases	ESFAS Logic and Manual Trip (Analog) Change Description: Renumbered 3.3.5.3
SR 3.3.5.2 Bases	ESFAS Logic and Manual Trip (Analog) Change Description: New
Ref. 3.3.6 Bases	ESFAS Logic and Manual Trip (Digital)
SR 3.3.6.2	ESFAS Logic and Manual Trip (Digital)
SR 3.3.6.2 Bases	ESFAS Logic and Manual Trip (Digital)

5/19/2001

Insert 1SR 3.3.5.2

-REVIEWER'S NOTE-

The Frequency for testing the subgroup relays shall be such that all of the subgroup relays are tested every refueling cycle. Given two trains of Actuation Logic, an 18 month refueling cycle would require the Surveillance Frequency to be "9 months on a STAGGERED TEST BASIS" and the test Frequency in the Note to SR 3.3.5.2 for those relays associated with equipment that cannot be operated at power would be 18 months. For a 24 month refueling cycle, these values would be 12 months on a STAGGERED TEST BASIS and 24 months, respectively.

Use of the extended Frequency is dependant on the licensee confirming the applicability of CEN-403, Rev. 1-A for their plant and confirming that the applicable setpoint calculations account for any increase in instrument drift caused by the extended test interval.

A CHANNEL FUNCTIONAL TEST is performed on each Actuation Logic subgroup relay every [] months on a STAGGERED TEST BASIS. These tests verify that the ESFAS is capable of actuating required components. The Frequency of [] months on a STAGGERED TEST BASIS is based on the reliability analysis presented in CEN-403, Rev. 1-A, ESFAS Subgroup Relay Test Interval Extension, (Ref. 3).

The Surveillance is modified by a Note which allows certain relays to be tested during a refueling outage because operating these relays during power operation could cause plant transients or equipment damage. Those relays that cannot be tested at power must be tested every [] months. These include [SIAS No. 5, SIAS No. 10, CIAS No. 5, and MSIS No. 1.]

These relays actuate the following components, which cannot be tested at power:

- RCP seal bleedoff isolation valves;
- Service water isolation valves;
- VCT discharge valves;
- Letdown stop valves;
- CCW to and from the RCPs;
- MSIVs and feedwater isolation valves; and
- Instrument air containment isolation valves.

The reasons that each of the above cannot be fully tested at power are stated in Reference 1.

Insert 2

-REVIEWER'S NOTE-

The Frequency for testing the subgroup relays shall be such that all of the subgroup relays are tested every refueling cycle. Given two trains of Actuation Logic, an 18 month refueling cycle would require the Surveillance Frequency to be "9 months on a STAGGERED TEST BASIS" and the test Frequency in the Note to SR 3.3.6.2 for those relays associated with equipment that cannot be operated at power would be 18 months. For a 24 month refueling cycle, these values would be 12 months on a STAGGERED TEST BASIS and 24 months, respectively.

Use of the extended Frequency is dependant on the licensee confirming the applicability of CEN-403, Rev. 1-A for their plant and confirming that the applicable setpoint calculations account for any increase in instrument drift caused by the extended test interval.

Insert 3

	SURVEILLANCE	FREQUENCY
SR 3.3.5.2	<p>-----</p> <p style="text-align: center;">- NOTE -</p> <p>Relays associated with plant equipment that cannot be operated during plant operation are required to be tested every [] months.</p> <p>-----</p> <p>Perform CHANNEL FUNCTIONAL TEST on each Actuation Logic's subgroup relay.</p>	<p>[] months on a STAGGERED TEST BASIS</p>

Insert 4

- NOTE -

Relays associated with plant equipment that cannot be operated during plant operation are required to be tested every [] months.

TSTF-407

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more Functions with two Manual Trip or Actuation Logic channel inoperable except AFAS. <u>OR</u> Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	6 hours
	<u>AND</u> D.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.5.1	<p style="text-align: center;">----- - NOTES - -----</p> <p>1/ Testing of Actuation Logic shall include verification of the proper operation of each initiation relay.</p> <p>2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested during the previous 6 months.</p> <p>Perform a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel.</p>	<p>is not required to</p> <p>[92] days</p>
SR 3.3.5.2	<p>Perform a CHANNEL FUNCTIONAL TEST on each ESFAS Manual Trip channel.</p>	[18] months

Insert 3

TSTF-407

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two Actuation Logic channels, inoperable. OR Required Action and associated Completion Time of Conditions for, Safety Injection Actuation Signal, Containment Isolation Actuation Signal, Recirculation Actuation Signal, or Containment Cooling Actuation Signal not met.	F.1 Be in MODE 3.	6 hours
	AND F.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.6.1	----- - NOTE - Testing of Actuation Logic shall include the verification of the proper operation of each initiation relay. ----- Perform a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel.	[92] days
SR 3.3.6.2	----- - NOTE - Relays exempt from testing during operation shall be tested during each MODE 5 entry exceeding 24 hours unless tested during the previous 6 months. ----- Perform a subgroup relay test of each Actuation Logic channel, which includes the de-energization of each subgroup relay and verification of the OPERABILITY of each subgroup relay.	[] Months on a STAGGERED TEST BASIS [184] days

Insert 4

TSTF-407

BASES

ACTIONS (continued)

within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

A CHANNEL FUNCTIONAL TEST is performed every 92 days to ensure the entire channel will perform its intended function when needed. Sensor subsystem tests are addressed in LCO 3.3.4. This SR addresses Actuation Logic tests. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Actuation Logic Tests

Subgroup (Initiation)

are not required to

Actuation subsystem testing includes injecting one trip signal into each two-out-of-four logic subsystem in each ESFAS Function and using a bistable trip input to satisfy the trip logic. Initiation relays associated with the affected channel will then actuate the individual ESFAS components. Since each ESFAS Function employs subchannels of Actuation Logic, it is possible to actuate individual components without actuating an entire ESFAS Function.

allows the

(A)

Note 1 requires that Actuation Logic tests include operation of initiation relays. Note 2 allows deferred at power testing of certain relays to allow for the fact that operating certain relays during power operation could cause plant transients or equipment damage. Those initiation relays that cannot be tested at power must be tested in accordance with Note 2. These include [SIAS No. 5, SIAS No. 10, CIAS No. 5, and MSIS No. 1.]

to not

These relays actuate the following components, which cannot be tested at power:

- RCP seal bleedoff isolation valves,
- Service water isolation valves,
- VCT discharge valves,

TSTF-407

BASES

SURVEILLANCE REQUIREMENTS (continued)

- Letdown stop valves,
- CCW to and from the RCPs,
- MSIVs and feedwater isolation valves, and
- Instrument air containment isolation valves.

The reasons that each of the above cannot be fully tested at power are stated in Reference 1.

These tests verify that the ESFAS is capable of performing its intended function, from bistable input through the actuated components. *up to*

The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 2).

Insert 1 →

SR 3.3.5.2 *3*

A CHANNEL FUNCTIONAL TEST is performed on the manual ESFAS actuation circuitry, de-energizing relays and providing Manual Trip of the Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the 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 a Frequency of once every [18] months.

TSTF-407

BASES

REFERENCES

1. FSAR, Section [7.3].
 2. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.
-

3. CEN-403, Revision 1-A, March, 1996.

TSTF-407

BASES

SURVEILLANCE REQUIREMENTS (continued)

Trip Path (Initiation Logic) Tests

These tests are similar to the Matrix Logic tests, except that test power is withheld from one matrix relay at a time, allowing the initiation circuit to de-energize, opening one contact in each Actuation Logic channel.

The initiation circuit lockout relay must be reset (except for EFAS, which lacks initiation circuit lockout relays) prior to testing the other three initiation circuits, or an ESFAS actuation may result.

Automatic Actuation Logic operation is verified during Initiation Logic testing by verifying that current is interrupted in each trip leg in the selective two-out-of-four actuation circuit logic whenever the initiation relay is de-energized. A Note is added to indicate that testing of Actuation Logic shall include verification of the proper operation of each initiation relay.

The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 2).

Insert 2

SR 3.3.6.2

Individual ESFAS subgroup relays must also be tested, one at a time, to verify the individual ESFAS components will actuate when required. Proper operation of the individual subgroup relays is verified by de-energizing these relays one at a time using an ARC mounted test circuit. Proper operation of each component actuated by the individual relays is thus verified without the need to actuate the entire ESFAS function.

of [] months
on a STAGGERED
TEST BASIS

The ~~184 day~~ Frequency is based on operating experience and ensures individual relay problems can be detected within this time frame. Considering the large number of similar relays in the ARC, and the similarity in their use, a large test sample can be assembled to verify the validity of this Frequency. The actual justification is based on CEN-403, "Relaxation of Surveillance Test Interval for ESFAS Subgroup Relay Testing" (Ref. 3).

Some components cannot be tested at power since their actuation might lead to plant trip or equipment damage. Reference 1 lists those relays exempt from testing at power, with an explanation of the reason for each

TSTF-407

BASES

SURVEILLANCE REQUIREMENTS (continued)

exception. Relays not tested at power must be tested in accordance with the Note to this SR.

SR 3.3.6.3

A CHANNEL FUNCTIONAL TEST is performed on the manual ESFAS actuation circuitry, de-energizing relays and providing manual actuation of the function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed. 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 a Frequency of once every [18] months.

REFERENCES

1. FSAR, Section [7.3].
2. CEN-327, May 1986, including Supplement 1, March 1989.
3. CEN-403.

, Revision 1-A, March 1996