Industry/TSTF Standard Technical Specification Change Traveler

Extension of testing frequency of containment airlock interlock mechanism from 184 days to 24 months

Classification: 3) Improve Specifications

NUREGs Affected: ✓ 1430 ✓ 1431 ✓ 1432 ✓ 1433 ✓ 1434

Description:

Extension of testing frequency of containment airlock interlock mechanism from 184 days to 24 months

Justification:

SR 3.6.2.2 would be revised to require testing of the air lock door interlocks at an interval of 24 months. Typically, the interlock is installed after each refueling outage, verified operable with this surveillance and not disturbed until the next refueling outage. If the need for maintenance arises when the interlock is required, the performance of the interlock surveillance would be required following the maintenance. In addition, when an air lock is opened during times the interlock is required, the operator first verified that one door is completely shut and the door seals pressurized before attempting to open the other door. Therefore, the interlock is not challenged except during actual testing of the interlock. Consequently, it should be sufficient to ensure proper operation of the interlock by testing the interlock on a 24 month interval.

Testing of the airlock interlock mechanism is accomplished through having one door not completely engaged in the closed position, while attempting to open the second door. Failure of this surveillance effectively results in a loss of containment integrity. Procedures and training do not allow this interlock to be challenged for ingress and egress. One door is opened, all personnel and equipment as necessary are places into the airlock and then the door is completely closed prior to attempting to open the second door. This surveillance is contrary to processes and training of conservative operation when the interlock function is required. The door interlock mechanism cannot be readily bypassed, linkages must be removed which are under the control of station processes such as temporary modifications, containment closure procedures. and out of service practices. Failure rate of this physical device is very low based on the design of the interlock.

Historically, this interlock verification has had its frequency chosen to coincide with the frequency of the overall airlock leakage test. According to 10 CFR 50, Appendix J, Option A, this frequency is once per 6 months. However, Appendix J, Option B, allows for an extension of the overall airlock leakage test frequency to a maximum of 30 months.

For the above reasons, it is proposed to change the required frequency for this surveillance to 24 months (and, with the allowance of SR 3.0.2, this provides a total of 30 months, which corresponds to the overall air lock leakage test frequency under Option B). In this fashion, the interlock can be tested in a Mode where the interlock is not required.

With this change to the frequency, the need for the SR Note is eliminated. Testing would be done during a plant shutdown and would not be required until the following plant shutdown.

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NRC Contact: None Assigned

Revision History

OG Revision 0 Revision Status: Closed

Revision Proposed by: Ginna

Revision Description:
Original Issue

OG Revision 0 Revision Status: Closed

Owners Group Review Information

Date Originated by OG: 13-Oct-95

Owners Group Comments
(No Comments)

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

TSTF Review Information

TSTF Received Date: 30-Oct-95 Date Distributed for Review 30-Oct-95

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

TSTF Comments:
Accepted by all OGs

TSTF Resolution: Approved Date: 30-Oct-95

NRC Review Information

NRC Received Date: 30-Oct-95

NRC Comments:

11/30/95 - pkg approved with Bases changes
6/11/96 - C. Grimes comment: TSTF-17 approved. C. Grimes to write up why it is OK.
D. Hoffman, Excel comment: WNP-2 will stimulate a discussion on TSTF-17.
9/18/96 - NRC provided new Bases. MODIFY [proposed Bases description, as marked up]: "Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the containment air lock door is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed every 24 months. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of [primary {BWR only}] containment OPERABILITY if the Surveillance were performed with the reactor at power. {Delete the following:} Operating experience has shown these components usually pass the Surveillance when performed at the 24 month frequency. The 24 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during use of the airlock.{Insert the following:} The 24 month Frequency for the interlock is justified based on generic operating experience."
New Bases acceptable to TSTF except last sentence which will be removed. TSTF to provide revision.
10/15/96 - New revision forwarded to the TSTF for review.

Final Resolution: Superceded by Revision Final Resolution Date: 23-Jan-97

TSTF Revision 1 Revision Status: Active Next Action:

Revision Proposed by: WOG

Revision Description:
Insert B to all OGs is revised. The current insert states that operating experience has shown that the airlocks usually pass the surveillance when performed at a 24 month frequency. However, this change extends the frequency to 24 months and testing is currently performed at a 6 month frequency. Therefore, there is no operating experience to support this statement. It is revised to state that operating experience shows that the airlocks usually pass the surveillance.
Note: Only the affected page is replaced with Rev. 1

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

10/3/96 - NRC requested changes are the same as this change.
12/19/96 - Approved by the TSTF with minor editorial comments.

TSTF Review Information

TSTF Received Date: 01-Jul-96 Date Distributed for Review 20-Nov-96

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

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 19-Dec-96

NRC Review Information

NRC Received Date: 23-Jan-97

NRC Comments:
3/13/97 - NRC approves.

Final Resolution: NRC Approves Final Resolution Date: 13-Mar-97

TSTF Revision 2 — Revision Status: Active — Next Action:

Revision Proposed by: TSTF

Revision Description:
TSTF-17, Rev. 1 was approved by the NRC on 3/13/97. This change extended the containment airlock testing Frequency from 184 days to 24 months. In one instance in the Bases, the SR 3.6.2.2 (PWR), SR 3.6.1.2.2 (BWR/4), and SR 3.6.1.2.3 (BWR/6) Frequency was not changed to 24 months in the Bases markup. This change corrects that oversight so that the Bases are internally consistent and consistent with the Surveillance.

TSTF Review Information

TSTF Received Date: 15-Jun-99 Date Distributed for Review 15-Jun-99

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

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 15-Jun-99

NRC Review Information

NRC Received Date: 16-Jun-99

NRC Comments:
(No Comments)

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

SR 3.6.2.2	Containment Air Locks	NUREG(s)- 1430 1431 1432 Only
SR 3.6.2.2 Bases	Containment Air Locks	NUREG(s)- 1430 1431 1432 Only
SR 3.6.1.2.3 Bases	Primary Containment Air Lock	NUREG(s)- 1433 1434 Only
SR 3.6.1.2.2	Primary Containment Air Lock	NUREG(s)- 1433 Only
SR 3.6.1.2.2 Bases	Primary Containment Air Lock	NUREG(s)- 1433 Only
SR 3.6.1.2.3	Primary Containment Air Lock	NUREG(s)- 1434 Only

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AIRLOCK BASES INSERTS

INSERT A

used for entry and exit (procedures require strict adherence to single door opening),

INSERT B

every 24 months. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of [primary {--BWR only}] containment OPERABILITY if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency.

INSERT C

given that the interlock is not challenged during use of the airlock.

ALL OGs INSERT

TSTF-17, Rev. 2

AIRLOCK JUSTIFICATION

SR 3.6.2.2 would be revised to require testing of the air lock door interlocks at an interval of 24 months. Typically, the interlock is installed after each refueling outage, verified operable with this surveillance and not disturbed until the next refueling outage. If the need for maintenance arises when the interlock is required, the performance of the interlock surveillance would be required following the maintenance. In addition, when an air lock is opened during times the interlock is required, the operator first verifies that one door is completely shut and the door seals pressurized before attempting to open the other door. Therefore, the interlock is not challenged except during actual testing of the interlock. Consequently, it should be sufficient to ensure proper operation of the interlock by testing the interlock on a 24 month interval.

Testing of the airlock interlock mechanism is accomplished through having one door not completely engaged in the closed position, while attempting to open the second door. Failure of this surveillance effectively results in a loss of containment integrity. Procedures and training do not allow this interlock to be challenged for ingress and egress. One door is opened, all personnel and equipment as necessary are placed into the airlock and then the door is completely closed prior to attempting to open the second door. This surveillance is contrary to processes and training of conservative operation, in that it requires an operator to challenge an interlock during a mode of operation when the interlock function is required. The door interlock mechanism cannot be readily bypassed, linkages must be removed, which are under the control of station processes such as temporary modifications, containment closure procedures, and out of service practices. Failure rate of this physical device is very low based on the design of the interlock.

Historically, this interlock verification has had its frequency chosen to coincide with the frequency of the overall airlock leakage test. According to 10 CFR 50 Appendix J, Option A, this frequency is once per 6 months. However, Appendix J, Option B, allows for an extension of the overall air lock leakage test frequency to a maximum of 30 months.

For the above reasons, it is proposed to change the required frequency for this surveillance to 24 months (and, with the allowance of SR 3.0.2, this provides a total of 30 months, which corresponds to the overall air lock leakage test frequency). In this fashion, the interlock can be tested in a Mode where the interlock is not required.

With this change to the frequency, the need for the SR Note is eliminated. Testing would be done during a plant shutdown and would not be required until the following plant shutdown.

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.1 ----------NOTES---------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria of SR 3.6.1.1 in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions. ----------	
Perform required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions.	-----NOTE----- SR 3.0.2 is not applicable ----------
The acceptance criteria for air lock testing are: a. Overall air lock leakage rate is $\leq$ [0.05 L_a] when tested at $\geq P_a$. b. For each door, leakage rate is $\leq$ [.01 L_a] when tested at $\geq$ [10.0 psig].	In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions
SR 3.6.2.2 ----------NOTE---------- Only required to be performed upon entry or exit through the containment air lock. ----------	
Verify only one door in the air lock can be opened at a time.	24 months ~~184 days~~

BASES

TSTF-17, Rev.2

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is ~~only~~ challenged when the containment air lock door is ~~opened~~, this test is only required to be performed ~~upon entering or exiting a containment air lock but is not required more frequently than every 184 days~~. The (184 day) Frequency is based on engineering judgment and is considered adequate ~~in view of other indications of door and interlock mechanism status available to operations personnel.~~

not normally

INSERT A

INSERT B

INSERT C

24 month

REFERENCES

1. 10 CFR 50, Appendix J.
2. FSAR, Sections [14.1 and 14.2].
3. FSAR, Section [5.6].

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.1 ----------NOTES---------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria of SR 3.6.1.1 in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions. ---------- Perform required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions.	-----NOTE----- SR 3.0.2 is not applicable ----------
The acceptance criteria for air lock testing are: a. Overall air lock leakage rate is $\leq$ [0.05 L_a] when tested at $\geq P_a$. b. For each door, leakage rate is $\leq$ [.01 L_a] when tested at $\geq$ [psig].	In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions
[SR 3.6.2.2 ~~----------NOTE----------~~ ~~Only required to be performed upon entry or exit through the containment air lock~~ ~~----------~~ Verify only one door in the air lock can be opened at a time.]	[24 months ~~184 days~~]

BASES (continued)

TSTF-17, Rev 2

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J (Ref. 1), as modified by approved exemptions. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during initial air lock and containment OPERABILITY testing. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by Appendix J (Ref. 1), as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply.

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria of SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the overall containment leakage rate.

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is ~~only~~ challenged when the containment air lock door is ~~opened~~, this test is only required to be performed ~~upon entering or exiting a containment air lock but is not required more frequently~~

not normally

INSERT A

INSERT B

(continued)

BASES

TSTF-17, Rev. 2

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

~~than every 184 days.~~ The ~~184 day~~ 24 month Frequency is based on engineering judgment and is considered adequate ~~in view of other indications of door and interlock mechanism status available to operations personnel~~.

INSERT C

REFERENCES

1. 10 CFR 50, Appendix J.
2. FSAR, Section [6.2].

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.2.2	~~NOTE~~ ~~Only required to be performed upon entry or exit through the containment air lock.~~ Verify only one door in the air lock can be opened at a time.	24 months ~~184 days~~

BASES

TSTF-17, Rev. 2

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1 (continued)

SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the overall containment leakage rate.

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports containment OPERABILITY while the air lock is being used for personnel transit into and out of containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is ~~only~~ challenged when containment is ~~entered~~, this test is only required to be performed ~~upon entering containment but is not required more frequently than every 184 days~~. The 184 day Frequency is based on engineering judgment and is considered adequate ~~in view of other indications of door and interlock mechanism status available to operations personnel~~.

INSERT A → not normally

INSERT B → 24 month

INSERT C

REFERENCES

1. 10 CFR 50, Appendix J.
2. FSAR, Section [ ].
3. FSAR, Section [ ].

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.1	----------NOTE---------- An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. ---------- Perform required primary containment air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions. The acceptance criteria for air lock testing are: a. Overall air lock leakage rate is $\leq$ [0.05 L_a] when tested at $\geq P_a$. b. For each door, leakage rate is $\leq$ [0.01 L_a] when the gap between the door seals is pressurized to [$\geq$ 10 psig for at least 15 minutes].	-----NOTE----- SR 3.0.2 is not applicable ---------- In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions
SR 3.6.1.2.2	----------NOTE---------- Only required to be performed upon entry into primary containment air lock when the primary containment is de-inerted. ---------- Verify only one door in the primary containment air lock can be opened at a time.	24 months ~~184 days~~

BASES (continued)

TSTF-17, Rev. 2

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.1

Maintaining primary containment air locks OPERABLE requires compliance with the leakage rate test requirements of 10 CFR 50, Appendix J (Ref. 2), as modified by approved exemptions. This SR reflects the leakage rate testing requirements with respect to air lock leakage (Type B leakage tests). The acceptance criteria were established [during initial air lock and primary containment OPERABILITY testing]. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The Frequency is required by 10 CFR 50, Appendix J (Ref. 2), as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply.

The SR has been modified by a Note that states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA.

SR 3.6.1.2.2

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure, closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is ~~only~~ challenged when primary containment is ~~entered~~ this test is only required to be performed ~~upon entering primary containment, but is not required more frequently than 184 days when primary containment is de-inerted~~. The ~~184 day~~ Frequency is based on engineering judgment and is considered adequate ~~in view of other administrative controls~~

not normally

INSERT A

INSERT B

24 month

INSERT C

(continued)

BASES

TSTF-17, Rev. 2

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.2 (continued)

~~[such as indications of interlock mechanism status, available to operations personnel]~~

REFERENCES

1. FSAR, Section [3.8.2.8.2.2].
2. 10 CFR 50, Appendix J.
3. FSAR, Section [6.2].

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.2.3	~~----------NOTE----------~~ ~~Only required to be performed upon entry or exit through the primary containment air lock.~~ ~~----------~~ Verify only one door in the primary containment air lock can be opened at a time.	24 months ~~184 days~~
[SR 3.6.1.2.4	Verify, from an initial pressure of [90] psig, the primary containment air lock seal pneumatic system pressure does not decay at a rate equivalent to > [2] psig for a period of [48] hours.	[18] months]

BASES

TSTF-17, Rev.2

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.2.2

The seal air flask pressure is verified to be at ≥ [90] psig every 7 days to ensure that the seal system remains viable. It must be checked because it could bleed down during or following access through the air lock, which occurs regularly. The 7 day Frequency has been shown to be acceptable through operating experience and is considered adequate in view of the other indications available to operations personnel that the seal air flask pressure is low.

SR 3.6.1.2.3

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure (Ref. 3), closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is ~~only~~ challenged when the primary containment air lock door is ~~opened~~, this test is only required to be performed ~~upon entering or exiting a primary containment air lock, but is not required more frequently than once per 184 days~~. The (184 day) Frequency is based on engineering judgment and is considered adequate ~~in view of other administrative controls [such as indications of interlock mechanism status available to operations personnel]~~.

not normally

INSERT A

INSERT B

24 month

INSERT C

SR 3.6.1.2.4

A seal pneumatic system test to ensure that pressure does not decay at a rate equivalent to > [2] psig for a period of [48] hours from an initial pressure of [90] psig is an effective leakage rate test to verify system performance. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a

(continued)