



Watts Bar Nuclear Plant
Pre-Submittal Teleconference for Proposed License
Amendment Request Regarding Technical
Specification 3.6.3, “Containment Isolation Valves,”
Surveillance Requirement 3.6.3.5

December 7, 2017

Agenda

- Opening Remarks and Purpose of the Proposed License Amendment Request (LAR)
- Proposed Surveillance Requirement (SR) 3.6.3.5 Changes
- Technical Analysis of the Proposed LAR
- Regulatory Precedent
- Schedule for Submittal
- Summary and Closing Remarks

Opening Remarks and Purpose of the Proposed LAR

- The proposed Technical Specification (TS) amendment revises the Watts Bar Nuclear Plant (WBN) Units 1 and 2 TS 3.6.3, “Containment Isolation Valves,” SR 3.6.3.5 and associated Bases to change the frequency to “In accordance with the Containment Leakage Rate Testing Program.”
- The WBN Containment Leakage Rate Testing (CLRT) Program is described in TS 5.7.2.19, “Containment Leakage Rate Testing Program,” and implemented in accordance with 10 CFR Part 50, Appendix J, Option B, and Regulatory Guide (RG) 1.163, “Performance-Based Containment Leak-Test Program.”
- RG 1.163 allows a nominal test interval of 30 months for containment purge and vent valves.

Proposed WBN 1 and WBN 2 SR 3.6.3.5 Changes

SURVEILLANCE REQUIREMENTS (continued)	
SURVEILLANCE	FREQUENCY
SR 3.6.3.5 Perform leakage rate testing for containment purge valves with resilient seals.	In accordance with the Containment Leakage Rate Testing Program 184 days <u>AND</u> Within 92 92 days after opening the valve
SR 3.6.3.6 Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	18 months
SR 3.6.3.7 Verify each 24 inch containment lower compartment purge supply and exhaust isolation valve is blocked to restrict the valve from opening > 50°.	18 months
SR 3.6.3.8 Verify the combined leakage rate for all shield building bypass leakage paths is $\leq 0.25 L_v$ when pressurized to ≥ 15.0 psig.	In accordance with the Containment Leakage Rate Testing Program

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Proposed

WBN 1

SR 3.6.3.5

Bases

Changes

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.4 (continued)

isolation time and Frequency of this SR are in accordance with the Inservice Testing Program or 92 days.

SR 3.6.3.5

For containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option B (Ref. 4), is required to ensure OPERABILITY.

Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), these valves will not be placed on the maximum extended test interval. Therefore, these valves will be tested in accordance with Regulatory Guide 1.163, which allows a maximum test interval of 30 months. ~~Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration." (Ref. 3).~~

~~Additionally, this SR must be performed within 92 days after opening the valve. The 92-day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure after a valve has been opened.~~

SR 3.6.3.6

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DSA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative control. 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.

(continued)

Watts Bar-Unit 1

B 3.6-25

Revision 10
Amendment 5, XX

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.8 (continued)

The frequency is required by Containment Leakage Rate Testing Program. This SR simply imposes additional acceptance criteria. Although not a part of the Shield Building Bypass leakage path combined leakage rate is determined using the 10 CFR 50, Appendix J, Option B, Type B and C leakage rates for the applicable barriers.

REFERENCES

1. Watts Bar FSAR, Section 15.0, "Accident Analysis."
2. Watts Bar FSAR, Section 6.2.4.2, "Containment Isolation System Design," and Table 6.2.4-1, "Containment Penetrations and Barriers."
3. Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program, September 1995, "Generic Issue B-20, "Containment Leakage Due to Seal Deterioration.""
4. Title 10, Code of Federal Regulations, Part 50 Appendix J, Option B, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors - Performance - Based Requirements."

Watts Bar-Unit 1

B 3.6-27

Revision 10
Amendment 5, XX

Proposed

WBN 2

SR 3.6.3.5

Bases

Changes

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.6.3.5

For containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, Option B (Ref. 4), is required to ensure OPERABILITY.

~~Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), these valves will not be placed on the maximum extended test interval. Therefore, these valves will be tested in accordance with Regulatory Guide 1.163, which allows a maximum test interval of 30 months. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 3).~~

~~Additionally, this SR must be performed within 92 days after opening the valve. The 92-day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure after a valve has been opened.~~

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Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative control. 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 this Surveillance when performed at the 18-month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

REFERENCES

1. Watts Bar FSAR, Section 15.0, "Accident Analysis."
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3. ~~Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program, September 1995. Generic Issue B-20, "Containment Leakage Due to Seal Deterioration."~~
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Technical Analysis of the Proposed LAR

- Each WBN Unit 1 and 2 Containment Purge System contains ten containment penetrations (i.e., X-4, X-5, X-6, X-7, X-9A, X-9B, X-10A, X-10B, X-11, and X-80).
- Each penetration contains redundant containment isolation valves (total of 20 valves per unit).
- The valves are pneumatically-operated POSI-SEAL butterfly valves with resilient seals.
- During normal plant operations, these valves are normally closed except containment penetration X-80 (containment vent penetration), which is normally open.

Technical Analysis of the Proposed LAR

- Table 1 of the LAR provides a table of the last ten years of as-found leak rate history of the WBN Unit 1 Containment Purge System valves.
- Table 2 of the LAR provides a similar table for the WBN Unit 2 Containment Purge System valves.
 - Two years of as-found leak rate history is provided due to the limited operating experience of WBN Unit 2.
 - The long term leakage performance of the WBN Unit 2 valves is expected to be similar to their WBN Unit 1 counterparts, because the valves are the same design including manufacturer and model number.

Technical Analysis of the Proposed LAR

- The administrative limit for the Containment Purge System valve leakage rate is 12.32 standard cubic feet per hour (scfh).
- Since the initial startup for Unit 1 (1996) and Unit 2 (2016), the administrative limit has never been exceeded.
- The largest leakage rate over the past ten years for Unit 1 was 3.18 scfh for penetration X-7 on 10/17/2008.
- The largest leak rate for Unit 2 was 8.84 scfh for penetration X-10A on 8/8/2016.
- The as-found leak rate history of these valves supports extending the test interval beyond the current frequency of 184 days and within 92 days of any opening, to the NRC Regulatory Guide 1.163 recommended frequency of once every 30 months.

Regulatory Precedent

- The proposed TS change is similar to those approved by NRC for the following nuclear power plants that also revised their SR frequency for the containment purge valves to be in accordance with the Containment Leakage Rate Testing Program:
 - McGuire Nuclear Station, Units 1 and 2 (ML022540102)
 - Catawba Nuclear Station, Units 1 and 2 (ML051590203)
 - River Bend Station, Unit 1 (ML051590203)
 - Waterford Steam Electric Station, Unit 3 (ML071290447)

Schedule for Submittal

- 12/7/17 – Pre-submittal teleconference with NRC
- 1/31/18 - Submit LAR to NRC
- Request NRC approval by 1/31/19 with a 30-day implementation date
- March 2018 – Telecon or meeting to discuss any NRC questions (if needed)

Closing Remarks

- Proposed LAR reflects the operating experience of the WBN Containment Purge System valves.
- Proposed LAR will result in decreased radiological exposure to personnel and reduces the safety risk associated with performing this SR in the WBN Unit1 and Unit 2 Annulus.
- Proposed LAR is consistent with industry precedence.

