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NUCLEAR ENERGY INSTITUTE

INDUSTRY GUIDELINE FOR IMPLEMENTING PERFORMANCE-BASED OPTION OF 10 CFR PART 50, APPENDIX J

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INDUSTRY GUIDELINE FOR
IMPLEMENTING PERFORMANCE-BASED
OPTION OF 10 CFR PART 50, APPENDIX J

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14 Appendix J guideline.
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33 **NOTICE**

34
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36 consultants make any warranty, expressed or implied, or assume any legal responsibility
37 for the accuracy or completeness of, or assume any liability for damages resulting from
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39 such may not infringe privately owned rights.

FOREWORD

The purpose of this guidance is to assist licensees in the implementation of Option B to 10 CFR 50, Appendix J, "Leakage Rate Testing of Containment of Light Water Cooled Nuclear Power Plants." In response to NRC data gathering inquiries, the industry collected, evaluated, and provided summary data that supported the NRC's independent data analysis.

During the development of this guideline, industry recognized the importance and relationship of several regulatory and industry initiatives that should be coordinated as they are planned and implemented. These initiatives are described in the following paragraphs.

The Maintenance Rule, 10 CFR 50.65, that will become effective on July 10, 1996, addresses the scope of systems, structures and components (SSCs) to be tested in accordance with 10 CFR 50, Appendix J requirements. As implemented under the guidance described in NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," SSCs are reviewed for applicability to the rule (containment and valve penetrations included), risk significance determined, performance criteria established, performance evaluated against the established criteria, cause determinations performed, and goals established as appropriate. In addition, containment integrity and the capability to prevent or mitigate offsite exposure are generally identified as risk significant.

10 CFR Part 54, License Renewal, regulatory activities, supported by the Maintenance Rule, will additionally address industry performance of the containment penetrations and valves in accordance with the requirements of Appendix J and License Renewal.

The surveillance frequencies required under ASME Inservice Inspection and Inservice Testing are being reviewed as another application of performance-based regulation.

Additionally, as 10 CFR 50, Appendix B, regulatory initiatives evolve, consideration of structure, system and component performance and risk will be further examined.

Licensees can minimize the redundant and overlapping engineering and evaluation efforts associated with these related regulatory requirements by internal coordination. NEI will continue to monitor these and other activities (e.g., changes to siting source terms) to provide focus on opportunities for safety improvement and cost avoidance.

EXECUTIVE SUMMARY

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APPENDIX A

NRC Rule for Implementing Performance-Based Leakage Test Requirements |

1 **1.0 INTRODUCTION**

2
3 **1.1 Background**

4
5 Currently, containment leakage rate testing is performed in accordance with 10
6 CFR 50, Appendix J, "Leakage Rate Testing of Containment of Light Water Cooled
7 Nuclear Power Plants," as a license condition. Appendix J specifies containment leakage
8 testing requirements, including the types of tests required. In addition, for each type of
9 test, Appendix J discusses leakage rate acceptance criteria, test methodology, frequency
10 of testing, and reporting requirements. The specific testing requirements are discussed in
11 a variety of sources, including Technical Specifications, Final Safety Analysis Reports
12 (FSARs), National Standards (e.g., ANSI/ANS 56.8-1993, "Containment System
13 Leakage Testing Requirements"), and licensee/NRC correspondence. These documents
14 require that periodic testing be conducted to verify the leakage integrity of the
15 containment and those containment systems and components which penetrate the
16 containment.

17
18 The reactor containment leakage test program includes performance of an
19 Integrated Leakage Rate Test (ILRT), also known as a Type A test; and performance of
20 Local Leakage Rate Tests (LLRTs), also known as Type B and Type C tests. The Type A
21 test measures overall leakage rate of the primary reactor containment. Type B tests are
22 intended to detect leakage paths and measure leakage for certain primary reactor
23 containment penetrations. Type C tests are intended to measure containment isolation
24 valve leakage rates.

25
26 The NRC has amended the regulations to provide an Option B to the existing
27 Appendix J. Option B is a performance-based approach to Appendix J leakage testing
28 requirements. This alternative option would allow licensees with good ILRT
29 performance history to extend the Type A testing interval from three tests in 10 years to
30 one test in 10 years. For Type B and Type C tests, NRC will allow licensees to extend
31 testing intervals on a plant-specific basis based on experience history of each component,
32 and established controls to ensure continued performance during the extended testing
33 interval.

34
35 Generally, a FSAR describes plant testing requirements, including containment
36 testing. In some cases, the FSAR testing requirements differ from the requirements of
37 Appendix J. Technical Specifications were approved that incorporated exemptions to
38 portions of Appendix J. Additionally, some licensees have requested and received
39 exemptions after their Technical Specifications were issued. The alternate performance

1 testing requirements contained in Option B of Appendix J will not invalidate such
2 exemptions.

4 **1.2 Discussion**

6 This guideline describes an approach that may be used to meet the alternate testing
7 requirements described in Option B to Appendix J. The performance history of
8 containment, penetrations, and containment isolation valves is used as the means to
9 justify extending test intervals for containment Type A, Type B, and Type C tests. This
10 guideline provides a method for determining the extended test intervals based on
11 performance.

13 Under Option B, test intervals for Type A, Type B, and Type C testing may be
14 determined by using a performance-based approach. Performance-based test intervals
15 are based on consideration of operating history of the component and resulting risk from
16 its failure. Performance-based for Appendix J refers to both performance history
17 necessary to extend test intervals as well as criteria necessary to meet the requirements of
18 Option B. The performance-based approach to leakage rate testing discussed in
19 NUREG-1493, "Performance-Based Leak-Test Program," concludes that the impact on
20 public health and safety due to extended intervals is negligible.

22 The objective for monitoring performance of Type A tests focuses on assuring the
23 leakage integrity of a passive containment structure. Type B and C testing focuses on
24 assuring that containment penetrations are essentially leak tight.

25 **2.0 PURPOSE AND SCOPE**

27 This guideline describes an acceptable method for implementing the optional
28 performance-based requirements of Appendix J. This method uses industry performance
29 data, plant-specific performance data, and risk insights in determining the appropriate
30 surveillance frequency. Licensees may elect to use other suitable methods or approaches
31 to comply with Option B, but must obtain NRC approval prior to implementation.

33 The approach described in this guideline to implement Appendix J, Option B
34 includes:

- 36 • Continued assurance of the leakage integrity of the containment without
37 adversely affecting public health and safety;
- 38 • Licensee flexibility to implement cost-effective testing methods;
- 39

- A framework to acknowledge good performance; and
- Utilization of risk- and performance-based methods.

This guideline delineates the basis for a performance-based approach for Type A, Type B, and Type C containment leakage rate tests. It does not address how to perform the tests because these details can be found in existing documents (e.g., ANSI/ANS 56.8-1993). Licensees that select Option B are urged to coordinate the implementation of Appendix J, as described in this guideline, with their plans for implementation of the Maintenance Rule and other changes in the regulations (described in the Foreword of this guideline) as they are finalized.

3.0 RESPONSIBILITY

Each licensee should determine if the requirements of the existing Appendix J (Option A) or the alternate requirements (Option B) are most appropriate for its facility. If a licensee elects to implement the Option B requirements, the guidance described in this document has been reviewed and endorsed by the NRC as an acceptable method of implementing the requirements.

In addition, if a licensee elects to adopt Option B, it may elect to adopt the requirements that apply to a specific category of tests (i.e., Type A, Type B or Type C tests) only.

4.0 APPLICABILITY

This guideline is applicable to licensees holding an operating license issued in accordance with 10 CFR 50.21(b) and 50.22, and 10 CFR Part 52, Subpart C.

Industry operating experience and plant modifications that may affect Type A, Type B, and Type C testing program(s) should be reviewed to assure test and maintenance programs are appropriately adjusted to reflect these changes.

5.0 DEFINITIONS

Definitions of commonly accepted terms used in this guideline may be found in ANSI/ANS 56.8-1993.

1 **6.0 GENERAL REQUIREMENTS**

2
3 Option B of 10 CFR 50, Appendix J states, in part, that a Type A test which
4 measures both the containment system overall integrated leakage rate at the containment
5 pressure and system alignments assumed during a large break Loss of Coolant Accident
6 (LOCA), and demonstrates the capability of the primary containment to withstand an
7 internal pressure load may be conducted at a periodic interval based on the performance
8 of the overall containment system. The leakage rate must not exceed what is allowed as
9 specified in a plant's Technical Specifications.

10
11 A review of leakage rate testing experience indicates that only a small percentage
12 of Type A tests have excessive leakage. Furthermore, the observed leakage rates for the
13 few Type A test failures were only marginally above current limits. These observations,
14 together with the insensitivity of public risk to containment leakage rate at these low
15 levels, suggest that for Type A tests, intervals may be established based on performance.
16 Type A test is the primary test to detect significant leakage from the containment that
17 would not be detected by the Type B and Type C testing programs, and to verify at
18 periodic intervals the accident leakage (L_a) assumptions in the accident analysis. Specific
19 details of Type A test requirements are discussed in ANSI/ANS 56.8-1993.

20
21 An LLRT is a test performed on Type B and Type C components. An LLRT is not
22 required for the following cases:

- 23
- 24 • Primary containment boundaries that do not constitute potential primary
25 containment atmospheric pathways during and following a Design Basis
26 Accident (DBA);
 - 27
 - 28 • Boundaries sealed with a qualified seal system; and
 - 29
 - 30 • Test connection vents and drains between primary containment isolation
31 valves which are one inch or less in size, administratively secured closed
32 and consist of a double barrier.
 - 33

34 For Type B and Type C tests, intervals shall be established based on the
35 performance history of each component. Performance criterion for each component is
36 determined by designating an administrative leakage limit for leakage for each
37 component in the Type B and Type C testing program. The purpose of Type B and Type
38 C tests is to demonstrate the total of leakage rates at DBA pressure for containment
39 penetrations and valves that are testable, is less than the total allowable leakage rates
40 specified in the plant Technical Specifications.

1
2 Primary containment barriers sealed with a qualified seal system shall be
3 periodically tested to demonstrate their functionality in accordance with the plant
4 Technical Specifications. Test frequency may be set using a performance basis in a
5 manner similar to that described in this guideline for Type B and Type C test intervals.
6 Specific details of the testing methodology and requirements are also contained in
7 ANSI/ANS 56.8-1993 and should be adapted by licensees with applicable systems.
8
9

10 **7.0 UTILIZATION OF EXISTING PROGRAMS**

11
12 Licensees should use existing industry programs, studies, initiatives and data
13 bases, where possible.
14

15 **8.0 TESTING METHODOLOGIES FOR TYPE A, B, AND C TESTS**

16
17 Type A, Type B, and Type C tests should be performed using the technical
18 methods and techniques specified in ANSI/ANS 56.8-1993, or other alternative testing
19 methods that have been approved by the NRC. However, because ANSI/ANS 56.8-1993
20 is not performance based, certain exceptions and clarification to methods, techniques and
21 definitions contained in that document are required. These are discussed in the following
22 paragraphs.
23

24 Test intervals in ANSI/ANS 56.8-1993 are not performance-based. This
25 guideline should be implemented when establishing test intervals for Type A, Type B and
26 Type C testing.
27

28 ANSI/ANS 56.8-1993 testing methodology states that pathways open to the
29 primary containment atmosphere under post-DBA conditions shall be drained and vented
30 to the primary containment atmosphere during a Type A test. There are three exceptions
31 discussed in ANSI/ANS 56.8-1993 that allow penetrations to be tested under the LLRT
32 program and the results added to the Type A leakage rate Upper Confidence Limit
33 (UCL). One exception states that pathways in systems which are required for proper
34 conduct of the Type A test or to maintain the plant in a safe condition during the Type A
35 test may be operable in their normal mode. Proper outage planning should identify
36 systems that are important to shutdown safety. A sufficient number of systems should be
37 available so as to minimize the risk during the performance of the Type A test.
38

1 The As-found Type A test results described in ANSI/ANS 56.8-1993 are defined
2 to include the positive differences between the As-found and As-left LLRT leakage rates
3 for each pathway tested and adjusted prior to the performance of the Type A test (leakage
4 savings). For purposes of determining an acceptable Type A test for operability
5 considerations, the definitions and discussions found in ANSI/ANS 56.8-1993 for As-
6 found Type A leakage rate should be followed.

7
8 However, because of the performance-based emphasis on Type A testing, criteria
9 to determine Type A test intervals have been defined differently, and do not use the
10 leakage savings value. The performance criteria use a calculated performance leakage
11 rate, which is defined as the sum of the Type A UCL and As-left MNPLR leakage rate
12 for all Type B and Type C pathways that were in service, isolated or not lined up in their
13 test position (i.e., drained and vented to containment atmosphere) prior to performing the
14 Type A test. In addition, any leakage pathways that were isolated during performance of
15 the test because of excessive leakage must be factored into the performance
16 determination. If the leakage can be determined by a local leakage rate test, the As-left
17 MNPLR for that leakage path must also be added to the Type A UCL. If leakage cannot
18 be determined by local leakage rate testing, the performance criteria for the Type A test
19 were not met.

20
21 ANSI/ANS 56.8-1993 also specifies surveillance acceptance criteria for Type B
22 and Type C tests. The combined leakage rate for all penetrations subject to Type B or
23 Type C tests is limited to less than or equal to $0.60L_a$, when determined on a MNPLR
24 basis from As-found LLRT results; and limited to less than or equal to $0.60L_a$, as
25 determined on a Maximum Pathway Leakage Rate (MXPLR) basis from the As-left
26 LLRT results.

27
28 Due to the performance-based nature of this guideline, it is recommended that
29 surveillance acceptance criteria for the combined As-found leakage rate for all
30 penetrations subject to Type B or Type C testing be the same as that defined in
31 ANSI/ANS 56.8-1993, with the following additions. The combined As-left leakage rates
32 determined on a MXPLR basis for all penetrations shall be verified to be less than $0.60L_a$
33 prior to entering a mode where containment integrity is required following an outage or
34 shutdown that included Type B and Type C testing only. The combined As-found
35 leakage rates determined on a MNPLR basis for all penetrations shall be less than $0.60L_a$
36 at all times when containment integrity is required.

1 **9.0 DETERMINING PERFORMANCE-BASED TEST INTERVALS FOR**
2 **TYPE A TESTS**

3
4 **9.1 Introduction**

5
6 Determining the surveillance frequency of Type A tests is based upon satisfactory
7 performance of leakage tests that meet the requirements of Appendix J. Performance in
8 this context refers to both the performance history necessary to determine test intervals as
9 well as overall criteria needed to demonstrate leakage integrity performance.
10 Performance is also used as a basis for demonstrating negligible impact on public health
11 and safety.

12
13 The purpose of Type A testing is to assure the leakage integrity of the containment
14 structure. The primary performance objective of the Type A test is not to quantify an
15 overall containment system leakage rate. The Type A testing methodology as described
16 in ANSI/ANS 56.8-1993, and the modified surveillance frequencies recommended by
17 this guideline, serves to ensure continued leakage integrity of the containment structure.
18 Type B and Type C testing assures that individual penetrations are essentially leak tight.
19 In addition, aggregate Type B and Type C leakage rates support the leakage tightness of
20 primary containment by minimizing potential leakage paths. Most containment leakage is
21 identified by local leakage rate testing.

22
23 This section discusses a method to determine a surveillance frequency for Type A
24 testing based on performance. The extended test interval is based upon industry
25 performance data that was compiled to support development of Option B to Appendix J,
26 and is intended for use by any licensee. In adopting extended test intervals recommended
27 in this guideline, a licensee should perform Type A testing in accordance with
28 recommended industry practices. Additional technical information concerning data
29 analysis may be found in NUREG-1493.

30
31 Consistent with standard surveillance scheduling practices for Technical
32 Specifications Required Surveillances, intervals for recommended surveillance frequency
33 for Type A testing given in this section may be extended by up to one year (12 months).
34 This option should be used only in cases where refueling schedules have been changed to
35 accommodate other factors. Otherwise, an exemption will be required.

36
37 **9.1.1 Performance Criteria**

38
39 Performance criteria for establishing Type A test intervals should provide both the
40 standard against which performance is to be measured and basis for determining that

1 performance is acceptable. Because of the performance-based emphasis on Type A
2 testing, the criteria to determine extended Type A test intervals have been defined
3 differently than the surveillance acceptance criteria discussed in ANSI/ANS 56.8-1993.
4 This is to make the performance leakage rate more of an indicator of the overall condition
5 of containment leakage integrity and performance of the Type A test.

6
7 Performance criteria for the Type A test are defined as two consecutive periodic
8 Type A tests where the calculated performance leakage rate is less than $1.0L_a$. The
9 elapsed time between the first and last tests in a series of consecutive passing tests used to
10 determine performance shall be at least 24 months. Performance leakage rate is defined
11 as the sum of the Type A UCL and As-left MNPLR leakage rate for all Type B and Type
12 C pathways that were in service, isolated, or not lined up in their test position (i.e.,
13 drained and vented to containment atmosphere) prior to performing the Type A test. In
14 addition, any leakage pathways that were isolated during performance of the test because
15 of excessive leakage must be factored into the performance determination. If the leakage
16 can be determined by a local leakage rate test, the As-found MNPLR for that leakage
17 path must also be added to the Type A UCL. If the leakage cannot be determined by
18 local leakage rate testing, the performance criteria were not met.

19
20 Performance criteria do not include addition of the positive differences between
21 the As-found MNPLR and the As-left MNPLR for each pathway tested and adjusted
22 prior to Type A testing (total leakage savings). Total leakage savings are identified
23 through performance of Type B and Type C testing and does not contribute significantly
24 to performance of a Type A test. Excessive Type B and Type C leakage detected during
25 performance of Type A testing which can be quantified by local leak rate testing is not
26 required to be included in determining Type A test intervals. Failure of Type B and Type
27 C test components found during performance of a Type A test should be reviewed for
28 cause determination and corrective actions.

30 **9.2 Type A Tests**

32 **9.2.1 Pretest Inspection and Test Methodology**

34 Prior to initiating a Type A test, an examination shall be conducted of accessible
35 interior and exterior surfaces of the containment system for structural deterioration which
36 may affect either the containment structure or leakage integrity. This inspection should
37 be a general visual inspection of accessible interior and exterior surfaces of the primary
38 containment and components.

1 ANSI/ANS 56.8–1993 testing methodology states that pathways open to the
2 primary containment atmosphere under post-DBA conditions shall be drained and vented
3 to the primary containment atmosphere during a Type A test. There are three exceptions
4 discussed in ANSI/ANS 56.8–1993 that allow penetrations to be tested under the LLRT
5 program and the results added to the Type A leakage rate Upper Confidence Limit
6 (UCL). One exception states that pathways in systems which are required for proper
7 conduct of the Type A test or to maintain the plant in a safe condition during the Type A
8 test may be operable in their normal mode. Proper outage planning should identify
9 systems that are important to shutdown safety. A sufficient number of systems should be
10 available so as to minimize the risk during the performance of the Type A test.

11 12 **9.2.2 Initial Test Intervals**

13
14 A preoperational Type A test shall be conducted prior to initial reactor operation.
15 If initial reactor operation is delayed longer than 36 months after completion of the
16 preoperational Type A test, a second preoperational Type A test shall be performed prior
17 to initial reactor operations. A preoperational Type A test may not be used as one of the
18 two Type A tests that must be successfully completed to extend the test interval.

19
20 The first periodic Type A test shall be performed within 48 months after the
21 successful completion of the last preoperational Type A test. Subsequent Type A tests
22 shall be performed at a frequency of at least once per 48 months, until acceptable
23 performance is established in accordance with Section 9.2.3. Each test interval begins
24 upon completion of a Type A test and ends at the start of the next test.

25
26 If the test interval ends while primary containment integrity is either not required
27 or it is required solely for shutdown activities, the test interval may be extended
28 indefinitely. However, a successful Type A test shall be completed prior to entering the
29 operating mode requiring primary containment integrity.

30 31 **9.2.3 Extended Test Intervals**

32
33 Type A testing shall be performed during a period of reactor shutdown at a
34 frequency of at least once per 10 years based on acceptable performance history.
35 Acceptable performance history is defined as completion of two consecutive periodic
36 Type A tests where the calculated performance leakage rate was less than $1.0 L_a$.
37 Elapsed time between the first and last tests in a series of consecutive satisfactory tests
38 used to determine performance shall be at least 24 months.

39

1 For purposes of determining an extended test interval, the performance leakage
2 rate is determined by summing the UCL (determined by containment leakage rate testing
3 methodology described in ANSI/ANS 56.8-1993) with As-left MNPLR leakage rates for
4 penetrations in service, isolated or not lined up in their accident position (i.e., drained and
5 vented to containment atmosphere) prior to a Type A test. In addition, any leakage
6 pathways that were isolated during performance of the test because of excessive leakage
7 must be factored into the performance determination. If the leakage can be determined by
8 a local leakage rate test, the As-found MNPLR for that leakage path must also be added
9 to the Type A UCL. If the leakage cannot be determined by local leakage rate testing, the
10 performance criteria for the Type A test were not met.

11
12 In reviewing past performance history, Type A test results may have been
13 calculated and reported using computational techniques other than the Mass Point method
14 from ANSI/ANS 56.8-1993 (e.g., Total Time or Point-to-Point). Reported test results
15 from these previously acceptable Type A tests can be used to establish the performance
16 history. Additionally, a licensee may recalculate past Type A UCL (using the same test
17 intervals as reported) in accordance with ANSI/ANS 56.8-1993 Mass Point methodology
18 and its adjoining Termination criteria in order to determine acceptable performance
19 history. In the event where previous Type A tests were performed at reduced pressure, at
20 least one of the two consecutive periodic Type A tests shall be performed at peak accident
21 pressure (P_{ac}).

22 23 9.2.4 Containment Repairs and Modifications

24
25 Repairs and modifications that affect the containment leakage integrity require
26 leakage rate testing (Type A testing or local leakage rate testing) prior to returning the
27 containment to operation. Testing may be deferred to the next regularly scheduled
28 Type A test for the following repairs or modifications:

- 29
30 • Welds of attachments to the surface of steel pressure-retaining boundary;
- 31
32 • Repair cavities, the depth that does not penetrate required design steel wall by
33 more than 10%; or
- 34
35 • Welds attaching to steel pressure-retaining boundary penetrations, where the
36 nominal diameter of the welds or penetrations does not exceed one inch.
- 37
38

1 **9.2.5 Surveillance Acceptance Criteria**

2
3 The As-found Type A test leakage rate must be less than the acceptance criterion
4 of $1.0 L_a$ given in the plant Technical Specifications. Prior to entering a mode where
5 containment integrity is required, the As-left Type A leakage rate shall not exceed 0.75
6 L_a . The As-left and As-found values are as determined by the appropriate testing
7 methodology specifically described in ANSI/ANS 56.8-1993.
8

9 **9.2.6 Corrective Action**

10
11 If the As-found Type A results are not acceptable, then a determination should be
12 performed to identify the cause of unacceptable performance and determine appropriate
13 corrective actions. Cause determination and corrective action should reinforce achieving
14 acceptable performance. Once the cause determination and corrective actions have been
15 completed, acceptable performance should be reestablished by performing a Type A test
16 at least 48 months following the unsuccessful Type A test. Following a successful Type
17 A test, the surveillance frequency may be returned to once per 10 years.
18

19 As discussed in Section 9.2.2, leakage paths detected during a Type A test that are
20 caused by failures of Type B and Type C test components are not required to be included
21 in determination of adequate performance and Type A test intervals. Corrective actions
22 for Type B and Type C failures should be taken in accordance with Sections 10.2.1.4,
23 10.2.2.4, or 10.2.3.4 of this guideline.

1 **10.0 DETERMINING PERFORMANCE-BASED TEST FREQUENCIES FOR**
2 **TYPE B AND TYPE C TESTS**

3
4 **10.1 Introduction**

5
6 This section discusses the method to determine extended test intervals for Type B
7 and Type C tests based on performance. It presents a range of acceptable intervals based
8 upon industry data which have been analyzed through a process similar to that used by
9 NRC in NUREG-1493, and have been reviewed for safety significance. Individual
10 licensees may adopt a testing interval and approach as discussed in this guideline
11 provided that certain performance factors and programmatic controls are reviewed and
12 applied as appropriate. Programmatic controls may be necessary to ensure that
13 assumptions utilized in analysis of the industry data are reasonably preserved at
14 individual facilities.

15
16 The range of recommended surveillance frequencies for Type B and Type C tests
17 are discussed in Section 11.0. The proposed surveillance frequencies are in part based
18 upon industry performance data that was compiled to support the development of Option
19 B to Appendix J, and a review of their safety significance. A licensee should develop
20 bases for new surveillance frequencies based upon satisfactory performance of leakage
21 tests that meet the requirements of Appendix J. Additional considerations used to
22 determine appropriate surveillance frequency may include service life, environment, past
23 performance, design, and safety impact. These are consistent with the deterministic
24 factors considered in implementing the requirements of the Maintenance Rule contained
25 in NUMARC 93-01. Additional technical information concerning the data may be found
26 in NUREG-1493.

27
28 Consistent with standard scheduling practices for Technical Specifications
29 Required Surveillances, intervals for the recommended surveillance frequency for Type B
30 and Type C testing given in this section may be extended by up to 25 percent of the test
31 interval, not to exceed one year (12 months).

32
33 **10.2 Type B and Type C Surveillance Frequencies**

34
35 The test interval for each component begins after its Type B or Type C test is
36 completed and ends at the beginning of the next test. If the test interval ends while
37 primary containment integrity is not required or is required solely for cold shutdown or
38 refueling activities, testing may be deferred; however, the test must be completed prior to
39 the plant entering a mode requiring primary containment integrity.
40

1 Leakage rates less than the administrative leakage rate limits are considered
2 acceptable. Administrative limits for leakage rates shall be established and documented
3 for each Type B and Type C component. The administrative limits assigned to each
4 component should be specified such that they are an indicator of potential valve or
5 penetration degradation. Administrative limits for airlocks may be equivalent to the
6 surveillance acceptance criteria given for airlocks in the Technical Specifications.

7
8 Administrative limits are specific to individual penetrations or valves, and are not
9 the surveillance acceptance criteria for Type B and Type C tests. Due to the
10 performance-based nature of this guideline, it is recommended that surveillance
11 acceptance criteria for the combined As-found leakage rate for all penetrations subject to
12 Type B or Type C testing shall be less than or equal to $0.60L_a$, when determined on a
13 MNPLR basis. In addition, prior to entering a mode where containment integrity is
14 required, the combined As-left leakage rate for all penetrations subject to Type B or
15 Type C testing shall be less than or equal to $0.60L_a$, as determined on a MXPLR basis.
16 Periodic performance of Type B and Type C tests shall be on an As-found basis.
17 Combined leakage rates should use the latest LLRT leakage rates.

18
19 The surveillance acceptance criteria for airlocks are as specified in the Technical
20 Specifications. In addition, there are other leakage rate testing surveillances specified in
21 the Technical Specifications that contain Surveillance Acceptance Criteria and
22 Surveillance Frequencies. This guideline does not address the performance-based
23 frequency determination of those surveillances.

24 25 **10.2.1 Type B Test Intervals**

26 27 **10.2.1.1 Initial Test Intervals (Except Containment Airlocks)**

28
29 Type B tests shall be performed prior to initial reactor operation. Subsequent
30 periodic Type B tests shall be performed at a frequency of at least once per 24 months,
31 until acceptable performance is established per Section 10.2.1.2.

32 33 **10.2.1.2 Extended Test Intervals (Except Containment Airlocks)**

34
35 The test intervals for Type B penetrations may be increased based upon
36 completion of two consecutive periodic As-found Type B tests where results of each test
37 are within a licensee's allowable Administrative Limits. Elapsed time between the first
38 and last tests in a series of consecutive satisfactory tests used to determine performance
39 shall be 24 months or the nominal test interval (e.g., refueling cycle) for the component
40 prior to implementing Option B to Appendix J. An extended test interval for Type B tests

1 may be increased to a specific value in a range of frequencies from greater than once per
2 24 months up to a maximum of once per 120 months. The specific test interval for Type
3 B penetrations should be determined by a licensee in accordance with the discussions in
4 Section 11.0.

5 6 **10.2.1.3 Repairs or Adjustments (Except Containment Airlocks)**

7
8 In addition to the periodic As-found Type B test an As-found Type B test shall be
9 performed prior to any maintenance, repair, modification, or adjustment activity if the
10 activity could affect the penetration's leak tightness. An As-left Type B test shall be
11 performed following maintenance, repair, modification or adjustment activity. In
12 addition, if a primary containment penetration is opened following As-found testing, a
13 Type B test shall be performed prior to the time primary containment integrity is required.
14 If the As-found and As-left Type B test results are both less than a component's
15 allowable Administrative Limit, a change in test frequency is not required. If As-found
16 or As-left test results are greater than the allowable Administrative Limit, provisions of
17 Section 10.2.1.4 apply.

18
19 Surveillance frequency for Type B testing shall be in accordance with Section
20 10.2.1.1 if the penetration is replaced or engineering judgment determines that
21 modification of the penetration has invalidated the performance history. Testing shall
22 continue at this frequency until adequate performance is established in accordance with
23 Section 10.2.1.2.

24 25 **10.2.1.4 Corrective Action**

26
27 If Type B test results are not acceptable, then a determination should be performed
28 and corrective actions identified that focus on those activities that can eliminate the
29 identified cause of failure¹ with appropriate steps to eliminate recurrence. Cause
30 determination and corrective action should reinforce achieving acceptable performance.
31 Once the cause determination and corrective actions have been completed, acceptable
32 performance should be reestablished by performing a Type B test at least 24 months
33 following the unsuccessful Type B test. Following a successful Type B test, the
34 surveillance frequency may be returned to the extended frequency identified in Section
35 10.2.1.2.
36

¹ A failure in this context is exceeding an administrative limit and not the total failure of the penetration. Administrative limits are established at a value low enough to identify and allow early correction of potential total penetration failures.

1 Failures of Type B penetrations discovered during performance of a Type A test
2 should be considered as failures of a Type B test for purposes of cause determination and
3 corrective action. This includes failures of penetrations that were not previously
4 identified by a Type B testing program.

5 6 **10.2.2 Containment Airlocks**

7 8 **10.2.2.1 Test Interval**

9
10 Containment airlock(s) shall be tested at an internal pressure of not less than P_{ac}
11 prior to a preoperational Type A test. Subsequent periodic tests shall be performed at a
12 frequency of at least once per 24 months. Containment airlock tests should be performed
13 in accordance with ANSI/ANS 56.8-1993. In addition, equalizing valves, door seals, and
14 penetrations with resilient seals (i.e., shaft seals, electrical penetrations, view port seals
15 and other similar penetrations) which are testable, shall be tested at a frequency of once
16 per 24 months.

17
18 Airlock door seals should be tested prior to a preoperational Type A test. When
19 containment integrity is required, airlock door seals should be tested within 7 days after
20 each containment access.

21
22 For periods of multiple containment entries where the airlock doors are routinely
23 used for access more frequently than once every 7 days (e.g., shift or daily inspection
24 tours of the containment), door seals may be tested once per 30 days during this time
25 period.

26
27 Door seals are not required to be tested when containment integrity is not required,
28 however they must be tested prior to reestablishing containment integrity. Door seals
29 shall be tested at P_{ac} , or at a pressure stated in the plant Technical Specifications.

30 31 **10.2.2.2 Repairs or Adjustments of Airlocks**

32
33 Following maintenance on an airlock pressure retaining boundary, one of the
34 following tests shall be completed:

- 35
36 • Airlock shall be tested at a pressure of not less than P_{ac} ; or
- 37
38 • Leakage rate testing at P_{ac} shall be performed on the affected area or
39 component.

1 **10.2.2.3 Corrective Action**

2
3 If containment airlock Type B test results are not acceptable, then a cause
4 determination should be performed and corrective actions identified that focus on those
5 activities that can eliminate the identified cause of a failure² with appropriate steps to
6 eliminate recurrence. Cause determination and corrective action should reinforce
7 achieving acceptable performance. Once the cause determination and corrective actions
8 have been completed, acceptable performance should be reestablished by performing a
9 containment airlock Type B test at least 6 months following the unsuccessful containment
10 airlock Type B test. Following a successful containment airlock Type B test, the
11 surveillance frequency may be returned to the extended frequency identified in Section
12 10.2.2.1.

13
14 **10.2.3 Type C Test Interval**

15
16 **10.2.3.1 Initial Test Interval**

17
18 Type C tests shall be performed prior to initial reactor operation. Subsequent
19 periodic Type C tests shall be performed at a frequency of at least once per 24 months,
20 until adequate performance has been established consistent with Section 10.2.3.2.

21
22 **10.2.3.2 Extended Test Interval**

23
24 Test intervals for Type C valves may be increased based upon completion of two
25 consecutive periodic As-found Type C tests where the result of each test is within a
26 licensee's allowable Administrative Limits. Elapsed time between the first and last tests
27 in a series of consecutive passing tests used to determine performance shall be 24 months
28 or the nominal test interval (e.g., refueling cycle) for the valve prior to implementing
29 Option B to Appendix J. Test intervals for the Type C testing may be increased to a
30 specific value in a range of frequencies from greater than 24 months up to a maximum of
31 120 months. Test intervals for Type C valves should be determined by a licensee in
32 accordance with the discussions in Section 11.0.

33
34 **10.2.3.3 Repairs or Adjustments**

35
36 In addition to the periodic As-found Type C test, an As-found Type C test shall be
37 performed prior to any maintenance, repair, modification, or adjustment activity if it
38 could affect a valve's leak tightness. An As-left Type C test shall be performed
39 following maintenance, repair, modification or adjustment activity unless an alternate

² A failure in this context is exceeding performance criteria for the airlock, not a total failure.

1 testing method or analysis is used to provide reasonable assurance that such work does
2 not affect a valve's leak tightness and a valve will still perform its intended function.
3

4 If As-found and As-left Type C test results are both less than a valve's allowable
5 Administrative Limit, a change of the test frequency is not required. If As-found or As-
6 left test results are greater than the allowable Administrative Limit, then provisions of
7 Section 10.2.3.4 apply.
8

9 The surveillance frequency for Type C testing shall be in accordance with Section
10 10.2.3.1 if a valve is replaced or engineering judgment determines that modification of a
11 valve has invalidated the valve's performance history. Testing shall continue at this
12 frequency until adequate performance is established in accordance with Section 10.2.3.2.
13

14 **10.2.3.4 Corrective Action**

15
16 If Type C test results are not acceptable, then a cause determination should be
17 performed and corrective actions identified that focus on those activities that can
18 eliminate the identified cause of a failure³ with appropriate steps to eliminate recurrence.
19 Cause determination and corrective action should reinforce achieving acceptable
20 performance. Once the cause determination and corrective actions have been completed,
21 acceptable performance should be reestablished by performing Type C test at least 24
22 months following the unsuccessful Type C test. Following a successful Type C test, the
23 surveillance frequency may be returned to the extended frequency identified in Section
24 10.2.3.2.
25

26 Failures of Type C valves that are discovered during the performance of a Type A
27 test should be considered as a failure of a Type C test for purposes of cause determination
28 and corrective action. This includes failures of valves that were not previously identified
29 by a Type C test program.
30
31

³ A failure in this context is exceeding an administrative limit and not the total failure of the valve. Administrative limits are established at a value low enough to identify and allow early correction of total valve failures.

1 **11.0 BASIS FOR PERFORMANCE AND RISK-BASED SURVEILLANCE**
2 **FREQUENCIES FOR TYPE A, TYPE B, AND TYPE C TESTS**

3
4 **11.1 Introduction**

5
6 This section provides guidance on establishing leakage test surveillance
7 frequencies and provides information regarding the risk impact of extending surveillance
8 intervals. Extended test intervals in Sections 9.0 and 10.0 have been selected based on
9 performance, and have been assessed for risk impact using historical performance data
10 provided by the industry. The various factors and discussion in this section should be
11 considered when establishing different plant-specific surveillance frequencies.

12
13 Section 10.0 presents a range of acceptable extended test intervals for Type B and
14 Type C tests. Individual licensees may adopt specific testing intervals of up to 60 months
15 as discussed in Section 10.0 without additional detailed analysis provided the
16 performance factors discussed in Section 11.3.1 are considered. Additional programmatic
17 controls are discussed in Section 11.3.2 and should be considered when the extended test
18 intervals are greater than 60 months.

19
20 **11.2 Discussion**

21
22 The effect of extending containment leakage rate testing intervals is a
23 corresponding increase in the probability of containment leakage. The degree to which
24 intervals can be extended, if at all, is a direct function of the potential effects on the health
25 and safety of the public that occur due to an increased probability of containment leakage.

26
27 In order to determine the acceptability of extended testing intervals, the
28 methodology described in NUREG-1493 was applied, with some modifications, to
29 historical representative industry leakage rate testing data gathered from approximately
30 1987 to 1993, under the auspices of NEI. The range of testing intervals recommended for
31 Type B and Type C testing was evaluated to determine the level of increased risk in the
32 event of an accident. The same methodology was also applied to the 10-year interval for
33 Type A testing. In all cases, the increased risk corresponding to the extended test interval
34 was found to be small and compare well to the guidance of the NRC's Safety Goals.

35
36 NUREG-1493 provides the technical basis to support rulemaking to revise leakage
37 rate testing requirements contained in Option B to Appendix J. The basis consisted of
38 qualitative and quantitative assessments of the risk impact (in terms of increased public
39 dose) associated with a range of extended leakage rate testing intervals.

1 NUREG-1493 found the effect of Type B and Type C testing on overall accident
2 risk is small and concluded that:

- 3
- 4 • Performance-based alternatives to local leakage rate testing requirements are
5 feasible without significant risk impacts; and
- 6
- 7 • Although extended testing intervals led to minor increases in potential off-site
8 dose consequences, the actual decrease in on-site (worker) doses exceeded
9 (by at least an order of magnitude) the potential off-site dose increases.
- 10

11 NEI, in conjunction with EPRI, undertook a similar study in order to supplement
12 NRC's rulemaking basis and provide added assurance the more detailed elements in this
13 guideline have an adequate basis. Results of the EPRI study are documented in EPRI
14 Research Project Report 4114-22, "Risk Impact Assessment of Revised Containment
15 Leak Rate Testing Intervals."

16

17 EPRI developed an abbreviated methodology that was used to assess plant risk
18 impact associated with containment leakage rate testing alternatives currently being
19 proposed by this guideline. The overall approach involved an examination of the risk
20 spectra from accidents reported in PWR and BWR IPEs. Plant risk was quantified for a
21 PWR and a BWR representative plants. Quantification of the risk considered the
22 consequences from containment leakage in more detail than reported in IPEs. The impact
23 associated with alternative Type A, Type B, and Type C test intervals, measured as a
24 change in risk contribution to baseline risk, is presented in Table 1. The risk values
25 compare well with the analysis in NUREG-1493.

26

27 The risk model was specifically quantified by using a "failure to seal" probability
28 (as opposed to failure to close considered in IPEs). This required failure rates to be
29 developed for this failure mode. Type B and Type C test data obtained by NEI allowed
30 determination of failure rates where failure is defined as the measured leakage exceeding
31 allowable administrative limits for a specific Type B or Type C component. The failure
32 rate values were used in the containment isolation system fault tree, and used to calculate
33 a failure-to-seal probability. Characterization of baseline risk (in terms of accident
34 sequences that are influenced by containment isolation valve or containment penetration
35 leakage rate) allowed the plant models to calculate the risk impact associated with
36 changes in test intervals.

37

38 As indicated above, historical industry failure rate data was used to develop the
39 component failure to seal probabilities used in the analysis. This approach is quite
40 conservative because these guidelines require demonstration of performance prior to
41 extending the component leakage rate testing interval. The performance demonstration

1 consists of successful completion of two consecutive leak rate tests to increase the
2 interval from 24 to 60 months, and three consecutive leakage rate tests to increase the
3 interval to over 60 months. This takes advantage of the findings of NUREG-1493,
4 Appendix A, which suggests that "If the component does not fail within two operating
5 cycles, further failures appear to be governed by the random failure rate of the
6 component," and "Any test scheme considered should require a failed component pass at
7 least two consecutive tests before allowing an extended test interval." In addition, the
8 penetration failure analysis considered components which exceeded the administrative
9 limits as failures. The containment leakage rate computation conservatively used
10 maximum pathway leak rates derived from the upper bounds of the NEI data. Therefore,
11 the analysis is very conservative, and the component performance trending provides the
12 necessary confidence demonstration that component leakage is being managed at a low
13 level.

14
15 For Type C test, a bounding analysis was performed that assumed all valves have
16 test intervals that were extended to 48, 60, 72 and 120 months. For Type B tests, it was
17 assumed that electrical penetrations were tested at a nominal 120 months frequency. In
18 addition, it was assumed that some portion of the penetrations was tested periodically
19 during the 120 months. Airlock tests were assumed to be conducted every 24 months.
20 Blind flanges were assumed to be tested after each opening, or at 48-month intervals.

21
22 There are many points of similarity between the NUREG-1493 report and the
23 EPRI study, both in methodology and assumptions, reflecting close agreement on
24 elements important to safety for containment leakage rate testing. The similarity also
25 extends to the results. The EPRI study confirms the low risk significance associated with
26 Type A testing intervals of 10 years. Similarly, extending the Type B and Type C test
27 intervals to 120 months was found acceptable provided the Type B or Type C
28 components have successfully passed two consecutive tests, and provided that certain
29 controls were imposed on the leakage rate testing program.

30
31 Changing Appendix J test intervals from those presently allowed to those in this
32 guideline slightly increases the risk associated with Type A and Type B and Type C-
33 specific accident sequences as discussed in Table 1. The data suggests that increasing the
34 Type C test interval can slightly increase the associated risk, but this ignores the risk
35 reduction benefits associated with increased test intervals. In addition, when considering
36 the total integrated risk (representing all accident sequences analyzed in the IPE), the risk
37 impact associated with increasing test intervals is negligible (less than 0.1 percent of total
38 risk). This finding is further reinforced by the conservative assumptions used in the
39 analysis. The EPRI study reaffirms the conclusion in NUREG-1493 that changes to
40 leakage testing frequencies are "feasible without significant risk impact."

41

1 **11.3 Plant-Specific Testing Program Factors**

2
3 A licensee may adopt specific surveillance frequencies from Section 10.0 provided
4 that plant-specific test performance history is acceptable as discussed in Section 10.0, and
5 certain performance factors and controls are reviewed and applied as appropriate in the
6 determination of test intervals. Each licensee should demonstrate by quantitative or
7 qualitative review that plant-specific performance is adequate to support the extended test
8 interval.

9
10 In all cases where test intervals are extended using the provisions of this guideline,
11 test intervals should not exceed 120 months. However, an extension of up to 25 percent
12 of the test interval (not to exceed 12 months) may be allowed on a limited basis for
13 scheduling purposes only. Otherwise, an exemption will be required.
14

1
2
3
4

Table 1

Risk Results for Type A, Type B, and Type C Test Intervals

<i>Test Type</i>	<i>Risk-Impact Current Test Intervals</i>	<i>Risk-Impact Extended Test Intervals</i>	<i>Comment</i>
<i>PWR Representative Plant Summary</i>			
Type A	0.0032% incremental risk contribution, based on 2×10^{-4} leakage	0.035% incremental risk contribution, based on test interval 1 in 10 years	Compares well with Surry risk contribution of 0.07%. A range of 0.002 to 0.14 percent is reported for other plants in NUREG-1493.
Type B	<0.001% incremental risk contribution 6.9E-05 person-rem/yr rebaselined risk	<0.001% incremental risk contribution, 1.3E-04 person-rem/yr rebaselined risk. Based on testing with some components tested periodically during time interval months. In addition, blind flanges and penetrations would be removed and retested during every refueling outage. Airlocks to be tested every 24 months.	A range of 0.2 to 4.4 percent is provided for other plants for both Type B and Type C penetrations in NUREG-1493.
Type C	0.022% of total risk 4.9E-03 person-rem/yr	0.04% incremental risk contribution, 8.8E-03 person-rem/yr rebaselined risk, based on 48 month test intervals. 1E-2, 1.2E-2, and 1.64E-2 person-rem/yr risk, based on 60, 72, and 120 month test intervals	A range of 0.2 to 4.4 percent of total risk is provided for other plants for both Type B and Type C penetrations in NUREG-1493.
<i>BWR Representative Plant Summary</i>			
Type A	0.026% incremental risk contribution, based on 2×10^{-4} leakage	0.029% incremental risk contribution, based on test interval 1 in 10 years	Compares well with the Peach Bottom estimated value of 0.038%. A range of 0.02 to 0.14 percent is reported for other plants in NUREG-1493.
Type B	<0.001% of total risk 8.0E-06 person-rem/yr	0.001%, 1.85E-05 person-rem/yr Based on testing with some components tested periodically during time interval months. In addition, blind flanges and penetrations would be removed and retested during every refueling outage. Airlocks to be tested every 24 months.	A range of 0.2 to 4.4 percent is provided for other plants for both B and C penetration types in NUREG-1493.
Type C	0.002% of total risk 4.5E-06 person-rem/yr	0.006% of total risk, 1.1E-04 person-rem/yr, based on 48 months test intervals. 1.8E-4, 2.3E-4, and 5.01E-4 person-rem/yr risk, based on 60, 72, and 120 month test intervals.	A range of 0.2 to 4.4 percent is provided for other plants for both B and C penetration types in NUREG-1493.

1 **11.3.1 Performance Factors**

2
3 Prior to determining and implementing extended test intervals for Type B and
4 Type C components, an assessment of the plant's containment penetration and valve
5 performance should be performed and documented. The following are some factors that
6 have been identified as important and should be considered in establishing testing
7 intervals:

- 8
- 9 • *Past Component Performance* — Based on a survey sample of industry data
10 from approximately 1987 to 1993, 97.5% of the industry's containment
11 penetrations have not failed a Type B test, and 90% of the isolation valves have
12 never failed a Type C test in over 500 reactor-years of commercial operation.
13 Of the 10% of the Type C tests that have failed, only 22% of those have failed
14 more than once. A licensee should ensure that leakage rate testing intervals are
15 not extended until plant-specific component performance of two successful
16 consecutive As-found tests are performed.

 - 17
18 • *Service* — The environment and use of components are important in
19 determining its likelihood of failure. For example, a plant may have
20 experienced high leakage in valves in a high-flow steam environment due to
21 effects of valve seat erosion. Certain valves that open and close frequently
22 during normal plant operations may have experienced higher leakage. The
23 licensees' existing testing program should identify these types of components
24 to establish their testing intervals based on their performance history.

 - 25
26 • *Design* — Valve type and penetration design may contribute to leakage. For
27 example, motor operated valves in a plant may be found to leak less frequently
28 than check valves, and may support a longer test interval. Vendor
29 recommendations for valve or penetration subcomponent service life may be a
30 factor in determining test intervals. Certain passive penetrations, such as
31 electrical penetrations, may have had excellent performance history. Test
32 intervals for these penetrations may be relatively longer.

1 **11.3.2 Programmatic Controls**

2
3 If a licensee selects an extended test interval greater than 60 months for a Type B
4 or Type C tested component, the review to establish surveillance test intervals should
5 include the additional considerations:

- 6
7 • *As-found Tests* — In order to provide additional assurance that the increased
8 probability of component leakage is kept to a minimum, and is reasonably
9 within the envelope of industry data, a licensee should consider requiring three
10 successive periodic As-found tests to determine adequate performance.
- 11
12 • *Schedule* — To minimize any adverse effects of unanticipated random failures,
13 and to increase the likelihood unexpected common-mode failure mechanisms
14 will be identified in a timely manner, a licensee should implement a testing
15 program that ensures components are tested at approximate evenly-distributed
16 intervals across the extended testing interval for valves or groups of valves. A
17 licensee should schedule a portion of the tests during each regularly scheduled
18 outage or on some regular periodic basis, such that some percentage of the
19 components are tested periodically, and all components are tested at the new
20 extended test interval of greater than 60 months.
- 21
22 • *Cause Determination* — For failures identified during an extended test interval,
23 a cause determination should be conducted and appropriate corrective actions
24 identified. Part of a corrective action process should be to identify and address
25 common-mode failure mechanisms.
- 26
27 • *Review* — A review of the entire process should be performed prior to
28 establishing alternate test intervals under Option B to 10 CFR 50, including
29 plant-specific performance history, data analysis, establishment of surveillance
30 frequencies, and, if available and applicable, any risk-impact assessment. This
31 review should include adjustments to the program as required, based on expert
32 insight or engineering judgment. Results of the review should be documented.
- 33
34 • *Safety Impact* — The relative importance of penetrations can be judge in terms
35 of the potential impact of failure in limiting releases from containment under
36 accident conditions. Due to size or system inter-connections, some
37 components or penetrations may be more important than others in ensuring the
38 safety function of a containment penetration is achieved. This relative
39 importance should be considered in determining the test interval.
- 40

1 **12.0 RECORDKEEPING**

2
3 **12.1 Report Requirements**

4
5 A post-outage report shall be prepared presenting results of the previous cycle's
6 Type B and Type C tests, and Type A, Type B, and Type C tests, if performed during that
7 outage. The technical contents of the report are generally described in ANSI/ANS 56.8-
8 1993, and will be available on-site for NRC review. The report shall also show that the
9 applicable performance criteria are met, and serves as a record that continuing
10 performance is acceptable.

11
12 **12.2 Records**

13
14 Documentation developed for implementation of Option B to Appendix J should
15 be done in accordance with licensee established procedures. This documentation shall be
16 available for internal and external review, but is not required to be submitted to the NRC.