



## U.S. NUCLEAR REGULATORY COMMISSION

# STANDARD REVIEW PLAN

### 6.2.6 CONTAINMENT LEAKAGE TESTING

#### REVIEW RESPONSIBILITIES

**Primary** - Organization responsible for the review of containment integrity.

**Secondary** - None

#### I. AREAS OF REVIEW

The description of the reactor containment leakage rate testing program is reviewed for conformance to 10 CFR Part 50, Appendix J, and General Design Criteria 52, 53, and 54.

Appendix J includes two options, A and B, either of which can be chosen by an applicant or licensee for meeting the requirements of the appendix. Option A is "Prescriptive Requirements" and Option B is "Performance-Based Requirements." In accordance with Option B, section V., an applicant or licensee may choose to comply with all of Option A, all of Option B, or one of the options for containment integrated leakage rate tests (CILRTs) and the other option for local leakage rate tests (LLRTs). If a mixed approach is used, experience indicates that it will likely be Option B for CILRTs and Option A for LLRTs, due to the much longer CILRT interval available under Option B. Further, the staff believes that applicants for new plants will choose Option B for all tests, due to its test interval advantages. Regardless of the choice made, a plant's Technical Specifications will indicate the choice, and a subsequent change in choice would be implemented through a Technical Specifications change.

Despite the differences between Option A and Option B, there are many similarities and the review guidance below will apply to either option, unless otherwise stated.

The specific areas of review are as follows:

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### USNRC STANDARD REVIEW PLAN

This Standard Review Plan, NUREG-0800, has been prepared to establish criteria that the U.S. Nuclear Regulatory Commission staff responsible for the review of applications to construct and operate nuclear power plants intends to use in evaluating whether an applicant/licensee meets the NRC's regulations. The Standard Review Plan is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide an acceptable method of complying with the NRC regulations.

The standard review plan sections are numbered in accordance with corresponding sections in Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)." Not all sections of Regulatory Guide 1.70 have a corresponding review plan section. The SRP sections applicable to a combined license application for a new light-water reactor (LWR) are based on Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

These documents are made available to the public as part of the NRC's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-0800 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments may be submitted electronically by email to [NRR\\_SRP@nrc.gov](mailto:NRR_SRP@nrc.gov).

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1. CILRTs (Type A tests as defined by Appendix J), including pretest requirements, general test methods, acceptance criteria for preoperational and periodic leakage rate tests, provisions for additional testing in the event of failure to meet acceptance criteria, and scheduling of tests.
2. Containment penetration leakage rate tests (Type B tests as defined by Appendix J), including identification of containment penetrations, general test methods, test pressures, acceptance criteria, and scheduling of tests.
3. Containment isolation valve leakage rate tests (Type C tests as defined by Appendix J), including identification of isolation valves, general test methods, test pressures, acceptance criteria, and scheduling of tests.
4. Technical specifications pertaining to containment leakage rate testing are reviewed at the operating license (OL) or combined license (COL) stage, or, in some cases, as part of the design certification review under 10 CFR Part 52.
5. In addition to the tests described above, Appendix J, Option A, discusses the special leakage testing programs that may be needed for the secondary containments for plants using the dual containment concept. Dual containments are proposed for some plants because of site limitations. The intent of the dual containment is to collect and process reactor containment leakage. Option A discusses the tests, but does not contain requirements for the tests, other than to state that secondary containments shall be subject to individual tests in accordance with the procedures specified in the Technical Specifications or associated bases. Option B does not discuss such tests at all. Testing programs to ensure that leakage will be contained as proposed by applicants using this kind of containment are reviewed under SRP Section 6.2.3
6. Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). For design certification (DC) and combined license (COL) reviews, the staff reviews the applicant's proposed ITAAC associated with the structures, systems, and components (SSCs) related to this SRP section in accordance with SRP Section 14.3, "Inspections, Tests, Analyses, and Acceptance Criteria." The staff recognizes that the review of ITAAC cannot be completed until after the rest of this portion of the application has been reviewed against acceptance criteria contained in this SRP section. Furthermore, the staff reviews the ITAAC to ensure that all SSCs in this area of review are identified and addressed as appropriate in accordance with SRP Section 14.3.
7. COL Action Items and Certification Requirements and Restrictions. For a DC application, the review will also address COL action items and requirements and restrictions (e.g., interface requirements and site parameters).

For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. Additionally, a COL applicant must address requirements and restrictions (e.g., interface requirements and site parameters) included in the referenced DC.

8. Operational Program Description and Implementation. For a COL application, the staff reviews the Containment Leak Rate Testing program description and the proposed implementation milestones. The staff also reviews final safety analysis report (FSAR) Table 13.x to ensure that the Containment leak Rate Testing program and associated milestones are included. Specific to this SRP section are the Containment leak Rate Testing program based on the requirements of 10 CFR Part 50, Appendix J.

## Review Interfaces

For COL reviews of operational programs, the review of the applicant's implementation plan is performed under SRP Section 13.4, "Operational Programs."

The specific acceptance criteria and review procedures are contained in the referenced SRP sections.

## II. ACCEPTANCE CRITERIA

### Requirements

Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations:

Conformance with the requirements of Option A of Appendix J, or the requirements of Option B of Appendix J and the provisions of RG 1.163, constitutes an acceptable basis for satisfying the requirements of the following General Design Criteria applicable to containment leakage rate testing:

1. General Design Criterion 52 (GDC 52), "Capability for Containment Leakage Rate Testing," as it relates to the reactor containment and exposed equipment being designed to accommodate the test conditions for the CILRT (up to the containment design pressure).
2. General Design Criterion 53 (GDC 53), "Provisions for Containment Testing and Inspection," as it relates to the reactor containment being designed to permit appropriate inspection of important areas (such as penetrations), an appropriate surveillance program, and leakage rate testing at the containment design pressure of penetrations having resilient seals and expansion bellows.
3. General Design Criterion 54 (GDC 54), "Piping System Penetrating Containment," as it relates to piping systems penetrating primary reactor containment being designed with a capability to determine if valve leakage rate is within acceptable limits.
4. 10 CFR 100.11 requires that, as an aid in evaluating a proposed nuclear power plant site, an applicant should assume the expected demonstrable leakage rate from the containment. Nuclear power plant leakage rate testing experience shows that a design leakage rate of 0.1% per day provides adequate margin above typically measured containment leakage rates and is compatible with current leakage rate test methods and test acceptance criteria. Therefore, the minimum acceptable design containment leakage rate should not be less than 0.1% per day.
5. 10 CFR 100.10 addresses factors to be considered when evaluating nuclear power plant sites and includes the safety features that are engineered into the facility. The secondary containment of dual-type containments, which provide for a controlled, filtered release to the environs of leakage from the primary reactor containment, is such an engineered safety feature, whose effectiveness should be periodically tested as stated in Appendix J, Option A, in Section IV.B.; Option B plants should also be tested in the same way. In so doing, the leakage limit of the secondary containment is acceptable if it is based on the limit used in the analysis of the secondary containment depressurization time. The test should be conducted at each refueling outage or at a comparable frequency. The test limit should be consistent with the limit used for direct leakage in the analysis of the radiological consequences by the organization responsible

for analysis of radiological consequences. Potential bypass leak paths (identified in accordance with Branch Technical Position CSB 6-3, "Determination of Bypass Leakage Paths in Dual Containment Plants") should be locally leakage rate tested in accordance with the requirements of Appendix J.

6. The reactor containment leakage rate testing program, as described in the safety analysis report (SAR) or design certification document (DCD), will be acceptable if:
  - A. Under Option A, it meets the requirements stated in Option A of Appendix J to 10 CFR Part 50. Appendix J, Option A, provides the test requirements and acceptance criteria for preoperational and periodic leakage rate testing of the reactor containment and of systems and components which penetrate the containment. Exemption from Appendix J requirements will be reviewed on a case-by-case basis.
  - B. Under Option B, it meets the requirements stated in Option B of Appendix J to 10 CFR Part 50 and, under section V.B.2 and V.B.3 of Option B, either complies with methods approved by the Commission and endorsed in a regulatory guide (RG 1.163) and includes a requirement to do so in the Technical Specifications, or complies with the provisions of some other implementation document which has been adequately justified to the staff, with supporting analyses, and is cited as a requirement in the Technical Specifications. As of the publication date of this SRP revision, virtually all applicants and licensees using Option B have chosen compliance with RG 1.163, so this Standard Review Plan (SRP) is written assuming that future applicants will do the same.
7. 10 CFR 52.47(b)(1), which requires that a DC application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations;
8. 10 CFR 52.80(a), which requires that a COL application contain the proposed inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will operate in conformity with the combined license, the provisions of the Atomic Energy Act, and the NRC's regulations.

### SRP Acceptance Criteria

Specific SRP acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations identified above are as follows for the review described in this SRP section. The SRP is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

Appendix J, Option A, Section III.A.1(a), requires that no repairs or adjustments be made to the containment prior to the performance of the CILRT so that the containment can be tested in as close to the "as is" condition as practical. Under Option B, RG 1.163 endorses NEI 94-01,

Rev. 0 (with certain exceptions), which provides similar guidance in Sections 8.0 and 9.0. Instrumentation lines that penetrate containment, however, are sometimes isolated for the CILRT. To ensure that they are included in the test, the following should be done. Leakage rate testing of instrumentation lines that penetrate containment may be done in conjunction with either the LLRTs or the CILRT. Instrumentation lines that are not locally leakage rate tested should not be isolated from the containment atmosphere during the performance of the CILRT. The measured leakage rates from instrumentation lines that are locally leakage rate tested, and also isolated during CILRTs, should be added to the CILRT result. Provisions should be made to ensure that instrumentation lines isolated during the CILRT are restored to their operable status following the test.

All leakage rate tests, performed by either pneumatic or hydrostatic means, should have the capability to quantify the leakage rates either explicitly or by a conservative bounding method to satisfy test acceptance criteria in Appendix J and the Technical Specifications.

Appendix J, Option A, Section III.C.1, prescribes methods for conducting the containment isolation valve leakage rate tests. Under Option B, RG 1.163 endorses NEI 94-01, Rev. 0 (with certain exceptions), which provides similar guidance in Sections 8.0 and 10.0. At the construction permit (CP) or standard design certification stage, the applicant should identify all containment isolation valves that will be locally (Type C) leakage rate tested with the test pressure applied in a direction opposite to that which would occur under accident conditions and should commit to justify, at the OL or COL stage, that such testing will result in equivalent or more conservative results.

With regard to the application of Appendix J, Option A, Section III.C.1, and Option B, Section III.B., for leakage rate testing of main steam isolation valves (MSIVs) in boiling water reactor (BWR) plants, if a test pressure of less than Pa (calculated peak containment accident pressure) is necessary, the test pressure and the test acceptance criteria should be justified and included in the plant Technical Specifications. Further, this will require an exemption from the applicable Appendix J requirement and the applicant or licensee must request one, with appropriate justification. In addition, it is typical for BWR applicants or licensees to request that MSIV local leakage rates be excluded from the Type A test leakage rate and the sum of Type B and Type C leakage rates, which would require exemption from Option A, Sections III.A., III.B.3., and III.C.3, or Option B, Sections III.A. and III.B. Such exemptions must also be requested and justified, and may readily be combined with an exemption request regarding test pressure and acceptance criteria, mentioned above.

NEI 94-01, Rev. 0 (Section 6.0), and ANSI/ANS-56.8-1994 (Section 3.3.1) state that Type B or Type C tests are not required for the following cases:

1. Containment boundaries that do not constitute potential containment atmospheric leakage pathways during and following a design-basis loss-of-coolant accident (DB LOCA);
2. Containment boundaries sealed with a qualified seal system;
3. Test connections, vents, and drains between containment isolation valves which:
  - A. are one inch or less in size, and
  - B. administratively secured closed, and
  - C. consist of a double barrier (e.g., two valves in series, one valve with a nipple and cap, one valve and a blind flange).

This guidance may be applied to either Option A or Option B of Appendix J.

Examples of Case No. 1 are lines that terminate below the minimum post-accident water level of the suppression pool in a BWR or the recirculation sump in a PWR.

For Case No. 2, a qualified seal system is defined in ANSI/ANS-56.8-1994 as a system that is capable of sealing the leakage with a liquid at a pressure no less than 1.1 Pa, for at least 30 days following the DB LOCA. The staff's position is that the analysis of the sealing capability includes the assumption of the most limiting single failure of any active component. Also, unless there is a virtually unlimited supply of sealing liquid (such as from a suppression pool or recirculation sump), limits for liquid leakage rate should be assigned to these valves based on analysis and included in the plant technical specifications. Periodic leakage rate testing, using the sealing liquid as the test medium, is then needed to ensure that the technical specification limits are maintained.

For Case No. 3, to ensure that containment integrity is restored following testing, the test, vent, and drain connections that are used to facilitate local leakage rate testing and the performance of the CILRT should be under administrative control and should be subject to periodic surveillance, to ensure their integrity and to verify the effectiveness of administrative controls.

The testing requirements for BWR drywell steam bypass are discussed in SRP Section 6.2.1.1.C.

Operational Programs. For COL reviews, the description of the operational program and proposed implementation milestones for the Containment Leak Rate Testing Program are reviewed in accordance with 10 CFR Part 50, Appendix J. The implementation milestones are as follows:

- A. Appendix J, Option A, Section III:  
Type A, B and C test: prior to any reactor operating period.
- B. Appendix J, Option B, Section III.A:  
Type A test: after the containment has been completed and is ready for operation.  
  
Type B & C test: prior to initial criticality

#### Technical Rationale

The technical rationale for application of these acceptance criteria to the areas of review addressed by this SRP section is discussed in the following paragraphs:

1. Compliance with GDC 52 requires that the reactor containment and associated equipment be designed so that periodic integrated leakage rate testing can be conducted at containment design pressure.

GDC 52 applies to SRP Section 6.2.6 because the review focuses on containment leakage rate testing, which includes the integrated leakage rate testing specified in GDC 52. The requirement for integrated leakage rate testing of the reactor containment is imposed to ensure that it will function as designed in the event of an accident.

Meeting the requirements of GDC 52 provides assurance that the reactor containment will function as designed and that releases of fission products to the environment will not result in offsite radiation doses in excess of the reference values specified in 10 CFR Part 100.

2. Compliance with GDC 53 requires that the reactor containment be designed to permit (a) periodic inspection of penetrations, (b) an appropriate surveillance program, and (c) periodic testing of the leaktightness of penetrations with resilient seals and expansion bellows.

GDC 53 applies to this SRP section because the review broadly covers containment testing. The requirement for inspection, surveillance, and periodic testing of reactor containment penetrations, particularly those with resilient seals and expansion bellows, is imposed because these penetrations are among the containment vessel components most likely to be the source of leakage.

Meeting the requirements of GDC 53 provides assurance that containment penetrations will function as designed in terms of leakage and will not contribute unduly to offsite radiation doses.

3. Compliance with GDC 54 requires that piping systems penetrating primary reactor containment be provided with leak detection, isolation, and performance testing capabilities.

GDC 54 applies to this SRP section because the review broadly covers containment testing. The requirements of GDC 54 are imposed so that unanticipated leakage from piping systems penetrating the reactor containment will not occur during the recovery period that follows a LOCA. Such leakage would compromise the ability of the system to limit the release of fission products to the environment.

Meeting this requirement provides assurance that piping systems penetrating the reactor containment will not be an additional source of leaking fission products and, hence, that releases of fission products off site will not result in radiation doses in excess of the reference values specified in 10 CFR Part 100.

4. Appendix J to 10 CFR Part 50 specifies requirements and acceptance criteria for preoperational and periodic testing of the leaktightness of the reactor containment and penetrations.

Appendix J applies to this SRP section because it contains detailed requirements concerning the manner in which the reactor containment and its parts must be tested. These tests include (a) periodic CILRTs, (b) local testing of containment penetration leakage rates, and (c) local testing of isolation valve leakage rates. Appendix J includes pertinent information on the frequency of testing, pressures at which tests will be conducted, recording of test results, and acceptance criteria for testing.

Meeting the requirements of Appendix J to 10 CFR Part 50 provides assurance that the leaktightness of the containment will be within the values specified in the facility technical specifications and that offsite radiation doses in excess of the reference values specified in 10 CFR Part 100 will not occur.

5. 10 CFR 100.10 focuses on factors to be considered when evaluating potential sites for nuclear power plants. Safety features engineered into the nuclear reactor plant constitute one such factor.

The reactor containment is an engineered safety feature that, as specified by 10 CFR Part 100, must be considered when evaluating potential sites for nuclear power plants. Thus, the potential for leakage from the containment vessel must be considered as an integral aspect of determining the acceptability of the site.

Addressing engineering safety features collectively (including reactor containment) provides assurance that the reference values specified in 10 CFR Part 100 will not be exceeded should an accident occur.

6. 10 CFR 100.11 specifies the manner in which exclusion area distance, low population zone distance, and population center distance are determined for a proposed nuclear plant site.

The containment leakage rate is one of the factors considered when calculating radiation doses associated with accidents. Radiation doses thus calculated determine the acceptability of the exclusion area distance, low population zone distance, and population center distance.

Verifying the containment leakage rate by means of periodic testing provides assurance that the leakage rate will remain below values assumed in the accident analysis conducted to determine the acceptability of the nuclear power plant site and that offsite radiation doses will be within the reference values specified in 10 CFR Part 100.

### III. REVIEW PROCEDURES

The reviewer will select material from the procedures described below, as may be appropriate for a particular case.

These review procedures are based on the identified SRP acceptance criteria. For deviations from these acceptance criteria, the staff should review the applicant's evaluation of how the proposed alternatives provide an acceptable method of complying with the relevant NRC requirements identified in Subsection II.

At the CP or design certification stage, the preliminary design provisions that will permit containment leakage rate testing to be done in accordance with the requirements of Appendix J are reviewed. In some instances, however, the applicant may not be able to address specific aspects of the leakage rate testing program because of incomplete designs. Under these circumstances, the design criteria, and other commitments, that will ensure compliance with the requirements of Appendix J are reviewed. In addition, the applicant's rationale for concluding that the requirements of Appendix J will be met is reviewed. If, on the other hand, the applicant is able to address specific aspects of the leakage rate testing program, the review will be akin to the OL or COL stage review, described below, as much as practical considering the detail provided by the applicant.

At the OL or COL stage, the containment final design is reviewed and it is verified that the containment leakage rate testing program meets the requirements of Appendix J. In addition, the plant technical specifications are reviewed for completeness and for conformance to Appendix J.

The review of the reactor containment leakage rate test program at the OL or COL stage specifically includes the following:

1. CILRT (Type A Test)

Those systems not vented or drained should be identified and the reason for not venting or draining should be stated. Piping and instrumentation diagrams and process flow drawings are used by the reviewer to confirm that, in the vented and drained condition, the isolation valves are exposed to the test air pressure and differential pressure, i.e., the systems are vented and drained both upstream and downstream of the containment isolation valves. For Option B, guidance on venting and draining is available in Section 8.0 of NEI 94-01, Rev. 0.

2. Containment Penetration Leakage Rate Test (Type B Test)

All containment penetrations should be listed in the test program. By reference to piping and instrumentation diagrams, the reviewer confirms that all penetrations have been listed. The program should identify any penetration not requiring leakage rate testing and the reason for not requiring a test should be stated. The reviewer confirms that those penetrations not requiring testing cannot result in leakage to the atmosphere during a LOCA.

Test pressures for containment penetrations should be stated in the test program and in the Technical Specifications. The test pressure is acceptable if it is the calculated peak containment internal pressure related to the DB LOCA.

3. Containment Isolation Valve Leakage Rate Test (Type C Test)

All containment isolation valves requiring a Type C test should be listed in the test program. By reference to the piping and instrumentation diagrams, the reviewer confirms that all isolation valves to be tested have been listed.

Test pressures for isolation valve Type C tests should be included in the test program and technical specifications.

Special testing procedures for dual-type containments should be identified.

The reviewer ensures that the applicant has provided a leakage rate testing program and has specified the maximum leakage rate which may occur from bypass (or dilution) leakage for dual-type containments. Potential leakage paths which bypass the annulus or the auxiliary building areas or may leak directly to atmosphere must be identified. The total amount of containment bypass leakage to the environment must be specified and included in the technical specifications. The reviewer determines that the test provisions are adequate to confirm the bypass leakage rate specified.

Preoperational and periodic tests are reviewed by the appropriate NRC Regional Office.

In SECY 93-087 (Reference 9) the staff recommended that the interval for Type C testing be changed from 24 months, as specified in Appendix J, Option A, to 30 months. The Commission approved this recommendation in its SRM dated July 21, 1993. Since no applicable revision to Option A has been issued for this position, a partial exemption from Appendix J, Option A, would be required for an applicant to utilize a 30 month interval for Type C testing. Under Option B of Appendix J, RG 1.163 allows Type B and Type C test intervals of 30 months or, under certain circumstances, more.

4. Operational Programs. The reviewer verifies that the Containment Leak Rate Testing is fully described and that implementation milestones have been identified. The reviewer verifies that the program and implementation milestones are included in FSAR Table 13.x.

Implementation of this program will be inspected in accordance with NRC Inspection Manual Chapter IMC-2504, "Construction Inspection Program - Non-ITAAC Inspections."

5. For review of a DC application, the reviewer should follow the above procedures to verify that the design, including requirements and restrictions (e.g., interface requirements and site parameters), set forth in the final safety analysis report (FSAR) meets the acceptance criteria. DCs have referred to the FSAR as the design control document (DCD). The reviewer should also consider the appropriateness of identified COL action items. The reviewer may identify additional COL action items; however, to ensure these COL action items are addressed during a COL application, they should be added to the DC FSAR.

For review of a COL application, the scope of the review is dependent on whether the COL applicant references a DC, an early site permit (ESP) or other NRC approvals (e.g., manufacturing license, site suitability report or topical report).

For review of both DC and COL applications, SRP Section 14.3 should be followed for the review of ITAAC. The review of ITAAC cannot be completed until after the completion of this section.

#### IV. EVALUATION FINDINGS

The reviewer verifies that the applicant has provided sufficient information and that the review and calculations (if applicable) support conclusions of the following type to be included in the staff's safety evaluation report. The reviewer also states the bases for those conclusions.

The staff concludes that the containment leakage rate testing program is acceptable and meets the requirements of General Design Criteria 52, 53, and 54; Appendix J to 10 CFR Part 50; and 10 CFR Part 100. This conclusion is based on the following: [The reviewer should discuss each item of the regulations or related set of regulations as indicated.]

1. The applicant has met the requirements of (cite regulation) with respect to (state limits of review in relation to regulation) by (for each item that is applicable to the review, state how it was met and why it is acceptable with respect to the regulation being discussed):
  - A. Meeting the regulatory positions in Regulatory Guide(s);
  - B. Providing and meeting an alternative method to regulatory positions in Regulatory Guide, that the staff has reviewed and found to be acceptable;
  - C. Meeting the regulatory position in BTP \_\_\_\_;
  - D. Using calculational methods for (state what evaluated) that have been previously reviewed by the staff and found acceptable; the staff has reviewed the impact parameters in this case and found them to be suitably conservative or performed independent calculations to verify acceptability of their analysis; and/or

- E. Meeting the provisions of (industry standard number and title) that have been reviewed by the staff and determined to be appropriate for this application.
2. Repeat discussion for each regulation cited above.

For DC and COL reviews, the findings will also summarize the staff's evaluation of requirements and restrictions (e.g., interface requirements and site parameters) and COL action items relevant to this SRP section.

In addition, to the extent that the review is not discussed in other SER sections, the findings will summarize the staff's evaluation of the ITAAC, including design acceptance criteria, as applicable.

3. The applicant described the Containment Leak Rate Testing and its implementation in conformance with 10 CFR Part 50 Appendix J.

The applicant described the [specify applicable operational program] and its implementation in conformance with [specify applicable regulation]. [For program implementation not specified by regulation, add a statement indicating that the program and its implementation milestones are included within the license condition on operational program implementation.]

4. For DC and COL reviews, the findings will also summarize the staff's evaluation of requirements and restrictions (e.g., interface requirements and site parameters) and COL action items relevant to this SRP section.
5. In addition, to the extent that the review is not discussed in other SER sections, the findings will summarize the staff's evaluation of the ITAAC, including design acceptance criteria, as applicable.

## V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of DC applications and license applications submitted by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52. Except when the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the staff will use the method described herein to evaluate conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed six months or more after the date of issuance of this SRP section, unless superseded by a later revision.

The following is intended to provide guidance to applicants and licensees regarding NRC staff plans for using this SRP section.

## VI. REFERENCES

1. 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors."
2. 10 CFR Part 50, Appendix A, General Design Criterion 52, "Capability for Containment Leakage Rate Testing."
3. 10 CFR Part 50, Appendix A, General Design Criterion 53, "Provisions for Containment Testing and Inspection."

4. 10 CFR Part 50, Appendix A, General Design Criterion 54, "Piping Systems Penetrating Containment."
5. 10 CFR Part 52, "Early Site Permits; Standard Design Certifications and Combined Licenses for Nuclear Power Plants."
6. 10 CFR Part 100, "Reactor Site Criteria."
7. Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995.
8. NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," Nuclear Energy Institute, dated July 26, 1995.
9. American National Standard ANSI/ANS-56.8-1994, "Containment System Leakage Testing Requirements," American Nuclear Society, dated August 4, 1994.
10. SECY 93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs," April 2, 1993, and corresponding Staff Requirements Memorandum dated July 21, 1993.
11. NRC Inspection Manual Chapter IMC-2504, "Construction Inspection Program - Non-ITAAC Inspections," issued April 25, 2006.

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**PAPERWORK REDUCTION ACT STATEMENT**

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Part 50 and 10 CFR Part 52, and were approved by the Office of Management and Budget, approval number 3150-0011 and 3150-0151.

**PUBLIC PROTECTION NOTIFICATION**

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

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## **SRP Section 6.2.6** Description of Changes

This SRP section affirms the technical accuracy and adequacy of the guidance previously provided in (Draft) Revision 3, dated June 1996 of this SRP. See ADAMS accession number ML052070464. The following exception, as applicable is:

1. A major revision of the governing regulation (10 CFR Part 50, Appendix J) in 1995 added a performance-based option (Option B) to the existing prescriptive prescriptive requirements (Option A), so considerable guidance has been added to cover Option B.

In addition this SRP section was administratively updated in accordance with NRR Office Instruction, LIC-200, Revision 1, "Standard Review Plan (SRP) Process." The revision also adds standard paragraphs to extend application of the updated SRP section to prospective submittals by applicants pursuant to 10 CFR Part 52.

The technical changes are incorporated in Revision 3, dated March 2007:

Review Responsibilities - Reflects changes in review branches resulting from reorganization and branch consolidation. Change is reflected throughout the SRP.

### I. AREAS OF REVIEW

1. Reformatted the section with new numbering system. Incorporated reference to 10 CFR Part 52 from draft revision 3 - June 1996. Incorporated generic paragraphs relating to certified designs, ESPs, and COLs.
2. Added new introduction to the section to explain the two Appendix J options (Option A and Option B) that applicants can use in COLs or OL applications.
3. Added clarification of the requirements for secondary containment testing under the two Options.

### II. ACCEPTANCE CRITERIA

1. Reformatted the section with new numbering system. Incorporated reference to 10 CFR Part 52 from draft revision 3 - June 1996. Incorporated generic paragraphs relating to certified designs, ESPs, and COLs.
2. Added words for acceptance criteria for Options A and B in item throughout the section.
3. Under "Specific Acceptance Criteria" added language for acceptance under Option A and B, included guidance of RG 1.163.
4. Added specific guidance for applicants who require exemption from Appendix J for MSIV testing.
5. Added specific language for applicants regarding containment penetrations which do not require Type B or C tests (NEI 94-01 and ANSI/ANS-56.8-1994).
6. Details of the Operational Program and implementation miles stones added.
7. Removed guidance on leakage rate testing of hydrogen recombiners, because a 2003 revision of 10 CFR 50.44 eliminated the requirement to have hydrogen recombiners installed in plants.

III. REVIEW PROCEDURES

1. Guidance and clarifications with respect to Option B applicants provided throughout the section.
2. Deleted obsolete guidance on Type A testing procedure.

IV. EVALUATION FINDINGS

1. Reformatted the section with new numbering system. Incorporated reference to 10 CFR Part 52 from draft revision 3 - June 1996. Incorporated generic paragraphs relating to certified designs, ESPs, and COLs.

V. IMPLEMENTATION

None.

VI. REFERENCES

Added references to 3 documents which were created for the 1995 revision of 10 CFR Part 50, Appendix J.