U.S. NUCLEAR REGULATORY COMMISSION

DESIGN-SPECIFIC REVIEW STANDARD FOR mPOWER^{TM} iPWR DESIGN

6.2.6 CONTAINMENT LEAKAGE TESTING

REVIEW RESPONSIBILITIES

Primary – Organization responsible for the review of containment integrity.

Secondary – None

I. AREAS OF REVIEW

The Babcock & Wilcox Nuclear mPower^{TM} design is for a two reactor, two containment small, modular plant. It has an integral pressurized-water reactor (iPWR) design with the reactor, steam generator, pressurizer and control rod drives all located in a single pressure vessel. The reactor design has no large cold or hot leg piping and employs conventional balance-of-plant systems. Each reactor has its own containment. The containment is intended to be at atmospheric pressure and entirely below grade.

The description of the reactor containment leakage rate testing program is reviewed for conformance to Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix J, and General Design Criteria (GDCs) 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.

Regardless of the choice made, a plant's technical specifications (TS) will indicate the choice, and a subsequent change in choice would be implemented through a TS 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:

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.

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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. TS pertaining to containment leakage rate testing are reviewed at the combined license (COL) stage, or, in some cases, as part of the design certification (DC) review under 10 CFR Part 52.

5. Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). For DC and COL reviews, the staff reviews the applicant's proposed ITAAC associated with the structures, systems, and components (SSCs) related to this design-specific review standard (DSRS) section in accordance with Standard Review Plan (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 DSRS 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.

6. 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.

7. 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 DSRS section are the Containment leak Rate Testing program based on the requirements of 10 CFR Part 50, Appendix J.

Review Interfaces

Other SRP and DSRS sections interface with this section as follows:

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

2. The review of the probabilistic risk assessment is performed under SRP Section 19.3 for potential risk significance of SSCs.

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 Regulatory Guide (RG) 1.163, constitutes an acceptable basis for satisfying the requirements of the following GDCs applicable to containment leakage rate testing:

1. 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. 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. 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. GDC 5, as it relates to providing assurance that sharing of SSCs important to safety among nuclear power units will not significantly impair their ability to perform their safety functions.

5. 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.

6. The reactor containment leakage rate testing program, 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 Sections V.B.2 and V.B.3 of Option B, either complies with methods approved by the Commission and endorsed in a RG (RG 1.163) and includes a requirement to do so in the TS, 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 TS.

7. 10 CFR 52.47(b)(1), which requires that a DC application contain the proposed 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 facility that incorporates the DC has been constructed and will be operated in conformity with the DC, the provisions of the Atomic Energy Act (AEA), and the U.S. Nuclear Regulatory Commission's (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 COL, the provisions of the AEA, and the NRC's regulations.

<u>DSRS Acceptance Criteria</u>

Specific DSRS acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations identified above are set forth below. The DSRS is not a substitute for the NRC's regulations, and compliance with it is not required. Identifying the differences between this DSRS section and the design features, analytical techniques, and procedural measures proposed for the facility, and discussing how the proposed alternative provides an acceptable method of complying with the regulations that underlie the DSRS acceptance criteria, is sufficient to meet the intent of 10 CFR 52.47(a)(9), "Contents of applications; technical information." The same approach may be used to meet the requirements of 10 CFR 52.79(a)(41) for COL applications.

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 Nuclear Energy Institute (NEI) 94-01, Revision 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 TS.

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, Revision 0 (with certain exceptions), which provides similar guidance in Sections 8.0 and 10.0. At the standard DC 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 COL stage, that such testing will result in equivalent or more conservative results.

NEI 94-01, Revision 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.

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 TS. Periodic leakage rate testing, using the sealing liquid as the test medium, is then needed to ensure that the TS 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.

<u>Operational Programs</u>. 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 and 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 DSRS 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 DSRS 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 (1) periodic inspection of penetrations, (2) an appropriate surveillance program, and (3) periodic testing of the leak tightness of penetrations with resilient seals and expansion bellows.

   GDC 53 applies to this DSRS 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 DSRS 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 leak tightness of the reactor containment and penetrations.

   Appendix J applies to this DSRS section because it contains detailed requirements concerning the manner in which the reactor containment and its parts must be tested. These tests include (1) periodic CILRTs, (2) local testing of containment penetration leakage rates, and (3) 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 leak tightness of the containment will be within the values specified in the facility TS and that offsite radiation doses in excess of the reference valves specified in 10 CFR Part 100 will not occur.

5. Meeting the requirements of GDC 5 as it relates to providing assurance that sharing of structures, systems, and components important to safety among nuclear power units will not significantly impair their ability to perform their safety functions.

6. 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.

7. 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

These review procedures are based on the identified DSRS 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 DC 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 COL stage review, described below, as much as practical considering the detail provided by the applicant.

At the 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 TS are reviewed for completeness and for conformance to Appendix J.

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

1. Programmatic Requirements – In accordance with the guidance in NUREG-0800 "Introduction," Part 2 as applied to this DSRS section, the staff will review the programs proposed by the applicant to satisfy the following programmatic requirements. If any of the proposed programs satisfies the acceptance criteria described in Subsection II, it can be used to augment or replace some of the review procedures. It should be noted that the wording of "to augment or replace" applies to nonsafety-related risk-significant SSCs, but "to replace" applies to nonsafety-related nonrisk-significant SSCs according to the "graded approach" discussion in NUREG-0800 "Introduction," Part 2. Commission regulations and policy mandate programs applicable to SSCs that include:

   A. Maintenance rule, SRP Section 17.6 (DSRS Section 13.4, Table 13.4, Item 17, RG 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and RG 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants."

   B. Quality Assurance Program, SRP Sections 17.3 and 17.5 (DSRS Section 13.4, Table 13.4, Item 16).

   C. Technical Specifications (DSRS Section 16.0 and SRP Section 16.1) – including brackets value for DC and COL. Brackets are used to identify information or characteristics that are plant specific or are based on preliminary design information.

D. Reliability Assurance Program (SRP Section 17.4).

E. Initial Plant Test Program (RG 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants," DSRS Section 14.2, and DSRS Section 13.4, Table 13.4, Item 19).

F. ITAAC (DSRS Chapter 14).

2. In accordance with 10 CFR 52.47(a)(8),(21), and (22), for new reactor license applications submitted under Part 52, the applicant is required to (1) address the proposed technical resolution of unresolved safety issues and medium- and high-priority generic safety issues) that are identified in the version of NUREG-0933 current on the date 6 months before application and that are technically relevant to the design; (2) demonstrate how the operating experience insights have been incorporated into the plant design; and, (3) provide information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v). These cross-cutting review areas should be addressed by the reviewer for each technical subsection and relevant conclusions documented in the corresponding safety evaluation report (SER) section.

3. <u>CILRT (Type A Test)</u>. Those systems not vented or drained should be identified and the reason for not venting or draining should be stated. System description and schematics 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, Revision 0.

4. <u>Containment Penetration Leakage Rate Test (Type B Test)</u>. 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 TS. The test pressure is acceptable if it is the calculated peak containment internal pressure related to the DB LOCA.

5. <u>Containment Isolation Valve Leakage Rate Test (Type C Test)</u>. All containment isolation valves requiring a Type C test should be listed in the test program. By reference to the system description and schematics, 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 TS.

Special testing procedures for mPower^{TM} iPWR 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 mPower^{TM} iPWR 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 TS. 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 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 staff requirements memorandum (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.

6. 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 the DCD 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.”

7. 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 DCD, meets the acceptance criteria. 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 DCD.

   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 SER. 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 GDCs 5, 52, 53, and 54; Appendix J to 10 CFR Part 50; and 10 CFR Part 100. This conclusion is based on the following:

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 RG(s);

   B. Providing and meeting an alternative method to regulatory positions in RG, that the staff has reviewed and found to be acceptable;

   C. Using calculational methods for (state what was 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

   D. 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 DSRS 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.

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 DSRS 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 DSRS section in performing safety evaluations of mPower™-specific DC, or COL, applications submitted by applicants pursuant to 10 CFR Part 52. The staff will use the method described herein to evaluate conformance with Commission regulations.

Because of the numerous design differences between the mPower™ and large light-water nuclear reactor power plants, and in accordance with the direction given by the Commission in SRM-COMGBJ-10-0004/COMGEA-10-0001, "Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews," dated August 31, 2010 (Agencywide Documents Access and Management System Accession No. ML102510405), to develop risk-informed licensing review plans for each of the small modular reactor reviews, including the associated pre-application activities, the staff has developed the content of this DSRS section as an alternative method for mPower™ -specific DC, or COL submitted pursuant to 10 CFR Part 52 to comply with 10 CFR 52.47(a)(9), "Contents of applications; technical information."

This regulation states, in part, that the application must contain "an evaluation of the standard plant design against the Standard Review Plan (SRP) revision in effect 6 months before the docket date of the application." The content of this DSRS section has been accepted as an alternative method for complying with 10 CFR 52.47(a)(9), as long as the mPower™ DCD FSAR does not deviate significantly from the design assumptions made by the NRC staff while preparing this DSRS section. The application must identify and describe all differences between the standard plant design and this DSRS section, and discuss how the proposed alternative provides an acceptable method of complying with the regulations that underlie the DSRS acceptance criteria. If the design assumptions in the DC application deviate significantly from the DSRS, the staff will use the SRP as specified in 10 CFR 52.47(a)(9). Alternatively, the staff may supplement the DSRS section by adding appropriate criteria in order to address new design assumptions. The same approach may be used to meet the requirements of 10 CFR 52.79(a)(41) for COL applications.

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, GDC 52, "Capability for Containment Leakage Rate Testing."

3. 10 CFR Part 50, Appendix A, GDC 53, "Provisions for Containment Testing and Inspection."

4. 10 CFR Part 50, Appendix A, GDC 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. RG 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," NEI, 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 SRM dated July 21, 1993.

11. NRC IMC-2504, “Construction Inspection Program—Non-ITAAC Inspections,” issued April 25, 2006.

12. RG 1.68, “Initial Test Programs for Water-Cooled Nuclear Power Plants.”

13. RG 1.160, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.”

14. RG 1.182, “Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants.”

15. RG 1.206, “Combined License Applications for Nuclear Power Plants (LWR Edition).”

16. 10 CFR Part 50, Appendix A, GDC 5, “Sharing of Structures, Systems and Components.”