U.S. NUCLEAR REGULATORY COMMISSION

DESIGN-SPECIFIC REVIEW STANDARD FOR mPOWER™ iPWR DESIGN

5.2.1.1 COMPLIANCE WITH THE CODES AND STANDARDS RULE, 10 CFR 50.55a

REVIEW RESPONSIBILITIES

Primary - Organization responsible for mechanical engineering reviews

Secondary - Organization responsible for component integrity reviews

I. AREAS OF REVIEW

The mPower™ integral pressurized water reactor (iPWR) designed by Babcock & Wilcox (B&W) incorporates the reactor core, control rod drive mechanisms, reactor coolant pumps, a single once through steam generator, and the pressurizer inside the reactor vessel. This limits the size of piping connected to the reactor vessel and the number of mechanical components outside the reactor vessel. Connections to the mPower™ reactor vessel include the steam system, the feedwater system, the reactor inventory control and purification system, safety relief valves, the passive emergency core cooling system, and the component cooling water system via the reactor support loop.

This Design-Specific Review Standard (DSRS) section is used to verify whether acceptable codes and standards (and their edition and addenda) required by Title 10 of *Code of Federal Regulations* (10 CFR) 50.55a are identified for construction of components to be used in the iPWR. The review under this section is coordinated closely with the review described in DSRS Section 3.2.2 for mPower™ iPWRs. More detailed review of compliance with ASME Code requirements for the component code class (e.g., component welds verified to meet requirements applicable for the Code Class) is addressed in other DSRS sections. The applicant's framework for compliance with 10 CFR 50.55a requirements for application of codes and standards during the inservice phase of the component life is also reviewed in other DSRS sections (e.g., 3.9.6, 5.2.4, 6.6, etc.).

The specific areas of review are as follows:

1. The NRC regulations in 10 CFR 50.55a(c) require that components which are part of the reactor coolant pressure boundary (RCPB) must meet the requirements for Class 1 components in Section III of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code*, Section III, Division 1 (hereafter the ASME B&PV Code)and be constructed[1] in accordance with the rules of that code, except for components which meet the exclusion requirements of 10 CFR 50.55a(c). The

[1] Constructed, as used herein, is an all-inclusive term comprising material certification, design, fabrication, examination, testing, inspection, and certification required in the manufacture and installation of components.

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regulations in 10 CFR 50.55a(d) and (e) require that components classified as Quality Group B or Quality Group C components, respectively, meet the requirements for Class 2 or Class 3 components in Section III of the ASME B&PV Code. Regulatory Guide (RG) 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants," provides guidance for the classification of Quality Group B and Quality Group C components.

Applicants will provide a table in their technical submittal identifying pressure vessels, piping, pumps and valves, and the component code class, code edition, and addenda (where applicable) for each component.

Components within the scope of 10 CFR 50.55a are subject to inservice inspection (ISI) and inservice testing (IST) in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME B&PV Code, and the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), respectively, as incorporated by reference in 10 CFR 50.55a.

Protection and safety systems are subject to the requirements specified in Institute of Electrical and Electronics Engineers (IEEE) Standards IEEE-279, "Criteria for Protection Systems for Nuclear Power Generating Stations," and IEEE-603, "Criteria for Safety Systems for Nuclear Power Generating Stations," as incorporated by reference in 10 CFR 50.55a.

For construction permit (CP) and operating license (OL) applications under 10 CFR Part 50, and for design certification (DC) and combined license (COL) applications under 10 CFR Part 52, the staff determines the acceptability of the technical submittal to provide assurance that the applicant complies with 10 CFR 50.55a.

2. The NRC regulations in 10 CFR 50.55a(f)(5)(iii) and (g)(5)(iii) require a nuclear power plant licensee to notify the NRC where it has determined that conformance with certain code requirements related to the IST and ISI programs, respectively, is impractical for its facility and to submit information to support its determination. The NRC regulations in 10 CFR 50.55a(f)(6)(i) and (g)(6)(i) state that the NRC will evaluate determinations that code requirements for IST and ISI programs, respectively, are impractical, and may grant relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The NRC staff will review instances where the iPWR applicant identifies that conformance with code requirements related to the IST and ISI programs is impractical.

3. The NRC regulations in 10 CFR 50.55a allow alternatives to the requirements of 10 CFR 50.55a to be used if the applicant demonstrates that (1) the proposed alternative would provide an acceptable level of quality and safety, or (2) compliance with the specified requirements of 10 CFR 50.55a would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The technical submittal should identify differences between the specific portions of the code and code addenda to which each component has been constructed and that are required for compliance with 10 CFR 50.55a, and provide justification for proposed alternatives in accordance with 10 CFR 50.55a.

4. 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 DSRS section in accordance with NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition (hereinafter 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 and DSRS Sections 14.3, 14.3.2, 14.3.3, and 14.3.4.

5. 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.

6. The NRC regulations in 10 CFR 52.47(a)(27) and 52.79(a)(46) require DC and COL applicants, respectively, to submit a description of the plant-specific probabilistic risk assessment (PRA) and its results in their applications. Therefore, the NRC staff may incorporate risk insights into the review of DC and COL applications as described in this and other SRP and DSRS sections. When applying risk insights in its application review, the applicable technical branch will focus its application review on safety-related components categorized as having high risk significance. For safety-related components categorized as having low risk significance, the staff will rely on the applicant’s certification of component qualification and programmatic requirements to provide reasonable assurance that the components satisfy the requirements in the applicable codes and standards as incorporated by reference in 10 CFR 50.55a, with confirmation of compliance with those regulatory requirements through ITAAC verification and inspection activities. In addition, the staff will evaluate the quality standards specified by the applicant for the design, fabrication, erection, inspection, and testing of components outside the scope of the codes and standards incorporated by reference in 10 CFR 50.55a, but determined to have high risk significance, commensurate with the importance of the safety function to be performed.

Review Interfaces

Other technical staff interfaces with this DSRS section as follows:

1. The organization responsible for component integrity reviews verifies the compatibility of the materials of construction with service conditions and, as required, assists in establishing acceptability if an applicant proposes alternatives not in accordance with 10 CFR 50.55a.

2. The organization responsible for component integrity reviews verifies that the applicant has specified in its submittal that components within the scope of 10 CFR 50.55a are

subject to ISI and IST in accordance with Section XI of the ASME B&PV Code, and the ASME OM Code, respectively.

3. Determination of SSC risk significance is performed under SRP Section 19.0.

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

II. ACCEPTANCE CRITERIA

Requirements

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

1. 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1 as to the requirement that SSCs be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed;

2. 10 CFR 50.55a as to the establishment of minimum quality standards for the design, fabrication, erection, construction, testing, and inspection of Reactor Coolant Pressure Boundary (RCPB) components and components in other fluid systems connected to the reactor coolant system of mPower™ iPWRs by compliance with industry codes and standards incorporated by reference in 10 CFR 50.55a;

3. 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 design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Atomic Energy Act (AEA), and the U.S. Nuclear Regulatory Commission's (NRC's) regulations.

4. 10 CFR 52.79(a)(11), which requires a COL applicant to provide, in its final safety analysis report, a description of the programs and their implementation necessary to ensure that the systems and components meet the requirements of the ASME B&PV Code and ASME OM Code in accordance with 10 CFR 50.55a at a level sufficient to enable the NRC to reach a final conclusion on all safety matters that must be resolved before COL issuance; and

5. 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 AEA, and the NRC's regulations.

DSRS Acceptance Criteria

Specific DSRS acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations identified above are as follows for review described in this DSRS section. 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."

1. 10 CFR Part 50, Appendix A, GDC 1 requires that SSCs be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed. For those SSCs defined as safety-related, the NRC regulations specify special treatment requirements to provide reasonable assurance of the capability of those SSCs to perform their safety-related functions. One special treatment requirement is that applicable components meet the requirements in the ASME B&PV Code and OM Code as incorporated by reference in 10 CFR 50.55a. Where risk insights will be applied in the review of an iPWR application, the applicable NRO technical branch will evaluate whether the provisions in the applicant's submitted documentation are acceptable to provide reasonable assurance in the capability of SSCs that are not classified as safety-related, but are categorized as having high risk significance, to perform their intended functions.

2. The NRC regulations in 10 CFR 50.55a require that components of the RCPB be designed, fabricated, erected, and tested in accordance with the requirements for Class 1 components of Section III of the ASME B&PV Code as incorporated by reference in 10 CFR 50.55a. The Codes and Standards Rule also requires that pressure-retaining components of other fluid systems designated as ASME Code Class 2 or Class 3 components meet the applicable requirements of the ASME B&PV Code as incorporated by reference in 10 CFR 50.55a. Components within the scope of 10 CFR 50.55a are subject to ISI and IST in accordance with ASME B&PV Code, Section XI, and ASME OM Code, respectively, as incorporated by reference in 10 CFR 50.55a.

   The requirements of GDC 1 regarding quality standards are met by acceptable application of quality group classifications and quality standards. RG 1.26 describes a quality classification system that may be used to determine quality standards acceptable to the NRC staff for satisfying GDC 1 for ASME Code Class 2 and 3 components.

3. 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 design certification has been constructed and will be operated in conformity with the design certification, the provisions of the AEA, and the NRC's regulations. 10 CFR 52.80(a)requires that the COL identify the ITAAC necessary and sufficient to assure that the facility has been constructed and will be operated in conformity with the license. SRP Section 14.3 provides guidance for reviewing the ITAAC. The requirements of 10 CFR 52.47(b)(1) and 10 CFR 52.80(a) will be met, in part, by identifying ITAAC of the top-level design features to ensure compliance with 10 CFR 50.55a in the DC and COL applications, respectively.

4. 10 CFR 52.79(a)(11) requires that a COL applicant provide, in its safety analysis report, a description of the programs and their implementation necessary to ensure that the systems and components meet the requirements of the ASME B&PV Code and ASME OM Code in accordance with 10 CFR 50.55a at a level sufficient to enable the NRC to reach a final conclusion on all safety matters that must be resolved before COL issuance. RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," provides guidance for the content of COL applications for a description of the ISI and IST programs to meet 10 CFR 50.55a. The organization responsible for component integrity reviews the descriptions of these programs and documents its review in the applicable SER sections.

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 1 requires that SSCs be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed.

   The NRC regulations in 10 CFR 50.55a specify application of the ASME B&PV Code as incorporated by reference for the construction of ASME Code Class 1, 2 and 3 components. RG 1.26 provides quality group classifications for water-, steam-, and radioactive waste-containing components (pressure vessels, piping, pumps, valves, and storage tanks) commensurate with the importance of the safety functions they perform. For compliance with these quality group classifications, RCPB and other components within the scope of 10 CFR 50.55a meet the requirements of ASME B&PV Code, Section III. These components will perform acceptably, commensurate with their intended safety functions, when designed in accordance with ASME B&PV Code requirements as incorporated by reference in 10 CFR 50.55a.

   Where risk insights are applied in the iPWR application review, the applicable NRO technical branch will evaluate whether the provisions in the applicant's submitted documentation are acceptable to provide reasonable assurance in the capability of SSCs important to safety outside the scope of the ASME B&PV Code and OM Code, but categorized as having high risk significance, to perform their intended function commensurate with the importance of the safety function consistent with the requirements in GDC 1.

   The staff considers the requirements outlined in GDC 1 to be adequate for assurance that these SSCs will perform acceptably, commensurate with the importance of their safety functions.

2. 10 CFR 50.55a requires that components be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety functions to be performed.

   10 CFR 50.55a specifies that ASME Code Class 1, 2 and 3 components must be constructed to meet ASME B&PV Code, Section III as incorporated by reference in 10 CFR 50.55a. These components will perform acceptably, commensurate with their

intended safety functions, when designed in accordance with ASME Code requirements as incorporated by reference in 10 CFR 50.55a.

10 CFR 50.55a requires that components within the scope of the ASME B&PV Code and the ASME OM Code are subject to ISI and IST in accordance with Section XI of the ASME B&PV Code and the OM Code, respectively, as incorporated by reference in the rule.

10 CFR 50.55a requires that protection and safety systems are subject to the requirements specified in IEEE-279 and IEEE-603 as incorporated by reference in the rule.

Where risk insights are applied in the iPWR application review, the applicable Office of New Reactors (NRO) technical branch will evaluate whether provisions in the applicant's submitted documentation are acceptable to provide reasonable assurance in the capability of SSCs important to safety outside the scope of ASME B&PV Code and OM Code, but categorized as having high risk significance, to perform their intended functions consistent the requirement in 10 CFR 50.55a that components be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety functions to be performed.

The staff considers these requirements adequate for assurance that these components will perform acceptably, commensurate with the importance of their safety functions.

3. 10 CFR 52.47(b)(1) requires that a DC application contain proposed ITAAC necessary and sufficient to assure the plant is built and will operate in accordance with the design certification. 10 CFR 52.80(a) requires that the COL identify the ITAAC necessary and sufficient to assure that the facility has been constructed and will be operated in conformity with the license. SRP Section 14.3 provides guidance for reviewing the ITAAC. The staff considers these requirements in 10 CFR 52.47(b)(1) and 10 CFR 52.80(a) to be sufficient to provide confidence in compliance with 10 CFR 50.55a in iPWR DC and COL applications.

4. 10 CFR 52.79(a)(11) requires that a COL applicant provide, in its safety analysis report, a description of the programs and their implementation necessary to ensure that the systems and components meet the requirements of the ASME B&PV Code and ASME OM Code in accordance with 10 CFR 50.55a at a level sufficient to enable the NRC to reach a final conclusion on all safety matters that must be resolved before COL issuance. RG 1.206 provides guidance for the content of COL applications for a description of the ISI and IST programs to meet 10 CFR 50.55a. The staff considers the requirements in 10 CFR 52.79(a)(11) and the guidance in RG 1.206 to be sufficient to provide confidence in compliance with 10 CFR 50.55a in the COL application.

5. Where risk insights are applied in the iPWR application review, the programmatic requirements listed in the acceptance criteria provide confidence that SSCs in the iPWR will perform their intended functions commensurate with their importance to safety. For example, Appendix A to 10 CFR Part 50 requires that SSCs be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed. 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," requires that a quality assurance program be established for SSCs classified as safety-related to provide reasonable

assurance that those SSCs are available to perform their safety-related functions. The availability controls for Regulatory Treatment of Non-Safety Systems equipment as discussed in RG 1.206 apply to nonsafety-related systems that are categorized as having high risk significance. The staff will apply these and other requirements to provide assurance that SSCs in the iPWR will perform their intended functions commensurate with their importance to safety.

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 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.

1. Programmatic Requirements and Guidance - 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. Examples of those programs and associated guidance follows:

    - 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants"
    - 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants"
    - 10 CFR 50.55a, "Codes and Standards"
    - Maintenance Rule, SRP Section 17.6 (SRP 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".)
    - Quality Assurance Program, 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants", SRP Sections 17.3 and 17.5 (DSRS Section 13.4, Table 13.4, Item 16).
    - 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.
    - Reliability Assurance Program (SRP Section 17.4).

- Regulatory Treatment of Non-safety Systems (SRP Section 19.3)

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

- ITAAC (SRP/DSRS Chapter 14).

2. In accordance with 10 CFR 52.47(a)(8),(21), and (22), and 10 CFR 52.79(a)(17) and (20), 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 which are identified in the version of NUREG-0933 current on the date up to 6 months before the docket date of the application and which 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. For reviews of OL and CP applications under 10 CFR Part 50, and DC and COL applications under 10 CFR Part 52, the NRC staff verifies that Section 5.2.1.1 of the applicant's submitted documentation specifies the use of an acceptable edition and addenda of the ASME B&PV Code, Section III and Section XI, and the ASME OM Code incorporated by reference in 10 CFR 50.55a. The staff also checks the applicant's table identifying pressure vessel components, piping, pumps and valves, and the corresponding component code, code edition, and applicable addenda of each ASME Code, Section III, Class 1, 2, and 3 component for compliance with 10 CFR 50.55a. The ASME Code Class requirements applied for non-RCPB components are based on the acceptable component Quality Group classifications verified under DSRS Section 3.2.2.

4. For components not in compliance with 10 CFR 50.55a, the staff identifies specific component Code sections of the Code, Code Addenda, and technical submittal with which they do not comply.

   The NRC staff will evaluate determinations by the applicant that code requirements for IST and ISI programs are impractical as indicated in 10 CFR 50.55a(f)(5)(iii) and (g)(5)(iii). The staff may grant relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

   The applicant may propose alternatives to the requirements of 10 CFR 50.55a(c), (d), (e), (f), (g), and (h) that will be reviewed by the staff. Where an alternative is proposed by the applicant under 10 CFR 50.55a, the staff evaluates whether the applicant demonstrates one of the following:

   A. The proposed alternatives would provide an acceptable level of quality and safety, or

B. Compliance with the specified requirements of 10 CFR 50.55a would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

If its concerns are not resolved satisfactorily, the staff takes a position in conformance with 10 CFR 50.55a.

5. Where risk insights are applied in the iPWR application review, the applicable NRO technical branch will evaluate whether the provisions in the applicant's submitted documentation are acceptable to provide reasonable assurance in the capability of SSCs important to safety outside the scope of the ASME B&PV Code or OM Code, but categorized as having high risk significance, to perform their intended functions consistent with the requirements in 10 CFR 50.55a that components be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety functions to be performed.

For 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 technical submittal meets the acceptance criteria. DCs have referred to the technical submittal as the DCD or final safety analysis report (FSAR). The reviewer should also consider the appropriateness of identified COL action items. The reviewer may identify additional COL action items that should be added to the DC applicant's DCD or 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 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 staff's technical review and analysis, as augmented by the application of programmatic requirements in accordance with the staff's review approach in the SRP Introduction, 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 NRC staff concludes that system components are in compliance with 10 CFR 50.55a and meet the requirements of GDC 1. This conclusion is based on the following findings:

1. The staff finds that the applicant has met the requirements of 10 CFR 50.55a and GDC 1 for the construction of SSCs important to safety to acceptable quality standards by ensuring that RCPB components, as defined by 10 CFR 50.55a, are classified properly in the technical submittal as ASME B&PV Code, Section III, Class 1 (Quality Group A) components, except for those which meet 10 CFR 50.55a(c) exclusion requirements. The applicant's technical submittal properly identifies the component Code, Code Edition, and Addenda for each ASME Code Class 1 component.

2. The staff finds that the applicant has met the 10 CFR 50.55a requirements by properly classifying components within the scope of the ASME B&PV Code but not ASME Code Class 1 components in its technical submittal as ASME B&PV Code, Section III, Class 2 (Quality Group B) or Class 3 (Quality Group C). These remaining components are classified as Quality Group B or C based upon the staff's guidance for component quality group classification described in DSRS Section 3.2.2 and are constructed as ASME B&PV Code, Section III, Class 2 or 3 components. The applicant's technical submittal identifies the Component Code, Code Edition, and Addenda for each Quality Group B and C components.

   The staff reviewed the Component Code, Code Edition, and Addenda as applied to each of these components and finds them to be constructed in accordance with the requirements of the applicable Codes and standards specified by 10 CFR 50.55a. The staff's review of quality group classifications for components of other fluid systems is described in Section 3.2.2 of the SER.

3. The staff finds that the applicant has specified that components within the scope of the ASME B&PV Code, Section XI, and the ASME OM Code are subject to ISI and IST in accordance with ASME B&PV Code and OM Code, respectively, as incorporated by reference in 10 CFR 50.55a.

4. The staff finds that relief from or alternatives to the ASME B&PV Code and ASME OM Code as identified and justified in the DC or COL applicant's technical submittal are granted or authorized, respectively, in accordance with 10 CFR 50.55a.

5. Where risk insights are applied in the iPWR application review, the staff describes in the applicable sections of the SER its review of the controls provided by the applicant to provide reasonable assurance that components important to safety outside the scope of the ASME B&PV Code or OM Code, but categorized as having high risk significance, will perform their intended functions consistent the requirements in 10 CFR 50.55a that components be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety functions to be performed.

6. As discussed above, the staff finds that the applicant has met the requirements in 10 CFR 50.55a for establishment of acceptable quality standards for the design, fabrication, erection, construction, testing, and inspection of ASME Code Class 1, 2, and 3 components to be used in the iPWR nuclear power plant.

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.

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 (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 50.55a, "Codes and Standards."

2. 10 CFR Part 50, Appendix A, GDC 1, "Quality Standards and Records."

3. RG 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants."

4. RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

5. ASME *Boiler and Pressure Vessel Code*, "Nuclear Power Plant Components," American Society of Mechanical Engineers.

6. ASME *Code for Operation and Maintenance of Nuclear Power Plants*, American Society of Mechanical Engineers.