U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

14.2 INITIAL PLANT TEST PROGRAM - DESIGN CERTIFICATION AND NEW LICENSE APPLICANTS

REVIEW RESPONSIBILITIES

Primary - Organization responsible for the review of quality assurance

Secondary - Relevant technical organizations responsible for a portion of the review of the Initial Test Program

I. AREAS OF REVIEW

The quality assurance (QA) staff reviews and evaluates the initial test program (ITP) submitted by design certification (DC), combined license (COL), and operating license (OL) applicants.

The ITP addresses the applicant's plan for preoperational and initial startup testing. The test program consists of preoperational and initial startup tests, as described in Regulatory Guide (RG) 1.68. Preoperational tests consist of those tests conducted following completion of construction and construction-related inspections and tests, but before fuel loading. Such tests demonstrate, to the extent practicable, the capability of structures, systems, and components (SSCs) to meet performance requirements and design criteria. Initial startup tests include those test activities scheduled to be performed during and following fuel activities. Testing activities include fuel loading, precritical tests, initial criticality, low-power tests, and power ascension tests that confirm the design bases and demonstrate, to the extent practicable, that the plant will operate in accordance with its design and is capable of responding as designed to anticipated transients and postulated accidents.

Revision 3 - March 2007

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.

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The specific areas of review are as follows:

1. 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.

2. 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.

Review Interfaces

Other SRP sections interface with this section as follows:

1. For COL and OL applicants, the QA staff reviews the information provided by the applicant to ensure that the overall ITP is acceptable. The relevant technical reviewers ensure, for their particular areas of review, that specific test objectives, test methods, and acceptance criteria are acceptable and consistent with the design requirements for the facility in accordance with the technical reviewers' guidance. The QA staff also evaluates the nuclear steam supply system (NSSS) vendor involvement in the development of the plant ITP, including NSSS vendor review of test procedures.

2. For DC reviews, in addition to reviewing the ITP to ensure that the overall program is acceptable, the QA staff performs coordination activities, as requested by other reviewers, for testing issues related to Tier 1. However, the relevant technical reviewers are responsible for the review of the individual systems in Tier 1 in accordance with the technical reviewer guidance. For example, the relevant technical reviewers responsible for reviewing the design of a specific system and/or design feature will assess certain tests, such as (1) those for the reactor systems, containment systems, electrical power systems, emergency core cooling systems, security systems, and related features or (2) those identified for design-specific or unique (for example, first-of-a-kind) plant features. For those areas of review identified above, additional acceptance criteria and/or review methods beyond those described in this section are specified in other RGs (for example, RG 1.20). These acceptance criteria and/or review methods are also of use in the overall evaluation of issues related to the ITP, such as (1) the adequacy of testing proposed for specific SSCs and/or design features and (2) the design parameters, characteristics, and performance criteria that should be satisfactorily demonstrated by testing.

This SRP is organized into six areas of review. Section II discusses these areas of review in detail.

II. ACCEPTANCE CRITERIA

Requirements

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

1. 10 CFR 50.34(b)(6)(iii), which requires the applicant to provide plans for preoperational testing and initial operations.

2. 10 CFR 30.53(c), as it relates to testing radiation detection and monitoring instruments.

3. Section XI of Appendix B to 10 CFR Part 50, as it relates to test programs established to assure that SSCs will perform satisfactorily in service.

4. Section III.A.4 of Appendix J to 10 CFR Part 50, as it relates to the preoperational leakage rate testing of the primary reactor containment and related systems and components penetrating the primary containment pressure boundary.

5. 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;

6. 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;

7. 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.

1. Summary of Test Program and Objectives

This SRP section lists the general criteria of RG 1.68 that a DC, COL, or OL applicant or holder should address in its safety analysis report (SAR).

DC/COL/OL Applicants

A. The ITP should describe its objectives, including a description of the objectives for each of the major phases of the test program.

B. The ITP should describe the criteria for selection of plant features to be tested by the applicant.

C. Objectives and testing selection criteria should be consistent with the general guidelines and applicable regulatory positions in RG 1.68. Applicants should appropriately justify exceptions.

2. Test Program's Conformance with Regulatory Guides

DC/COL/OL Applicants

A. The applicant should commit to the revision of RG 1.68 and the RGs listed in RG 1.68, that are referenced in this SRP and are in effect six months prior to submittal. The applicant may propose exceptions or alternatives to the specific criteria in any of these RGs, and the staff may find them acceptable if the applicant provides adequate justification. The reviewer responsible for the RG evaluates any exceptions or alternatives. The safety evaluation report (SER) should also list such exceptions or alternatives.

3. Initial Test Program Administrative Procedures

DC Applicant

The applicant should provide a summary description of the following areas:

A. The applicant should provide general guidance to control ITP activities, including administrative controls that will be used to develop, review, and approve individual test procedures, coordination with organizations involved in the test program, participation of plant operating and technical staff, and review, evaluation, and approval of test results.

B. The applicant should include general guidance for the review of relevant operating and testing experiences at other facilities. This guidance should recognize reportable occurrences of repeatedly experienced safety concerns and other operating experiences that could potentially impact the performance of the test program.

C. The applicant should include general guidance about how, and to what extent, the test program will use and/or test plant operating, emergency, and surveillance procedures.

D. The applicant should provide test abstracts of SSCs and unique design features that will be tested to verify that system and component performance is in

accordance with the design. These test abstracts should include the objectives, tests, and acceptance criteria that will be included in the test procedures.

COL/OL Applicants

The applicant should provide a detailed description of the following areas:

A. Management Organizations

i. The applicant should provide organizational descriptions for principal management positions responsible for the planning, execution, and documentation of preoperational and startup testing activities.

ii. The applicant should provide (1) the organizational descriptions for any augmenting organizations or other personnel who will manage or execute any phase of the test program, and (2) the responsibilities, interfaces, and authorities of the principal participants.

B. Conduct of the Initial Test Program

i. The applicant should conduct the ITP using detailed procedures approved by designated managers in the applicant's organization.

ii. Administrative controls should be established to ensure that the designated construction-related inspections and tests are completed before preoperational testing begins. The applicant should also include in the ITP adequate controls for the evaluation and approval of preoperational test results before initial startup tests begin.

iii. Administrative controls should address adherence to approved test procedures during the conduct of the test program and the methods for effecting changes to approved test procedures.

iv. The controls that the applicant uses to ensure that the test prerequisites are met should include requirements for (1) inspections, checks, and similar controls, (2) identification of test personnel completing data forms or checksheets, and (3) identification of dates of completion. Each major phase of the test program as well as individual tests should satisfy these requirements.

v. The staff will find that the controls provided for plant modification and repairs, identified as a result of plant testing, are acceptable if the controls (1) are sufficient to ensure that the required repairs or modifications will be made, (2) will ensure retesting is conducted following such modifications or repairs, and (3) will ensure a review of any proposed facility modifications by the original design organization or other designated design organizations. The applicant's requirements for documentation associated with such controls should permit audits to be conducted to ensure its proper implementation.

C. Test Program Schedule and Sequence

i. The applicant should develop a schedule for conducting each major phase of the ITP.

ii. The schedule should establish that the safety of the plant will not depend on the performance of untested SSCs.

iii. Overlapping test program schedules (for multiunit sites) should not result in significant divisions of responsibilities or dilutions of the staff implementing the test program.

iv. The sequential schedule for individual startup tests should establish that test requirements will be completed in accordance with plant technical specification requirements for SSC operability before changing plant modes.

D. Staff Responsibilities, Authorities, and Qualifications

i. The applicant should describe the education, training, and experience requirements established for each management and operating staff member—including the NSSS vendor, architect-engineer, and other major contractors, subcontractors, and vendors, as appropriate—who will conduct the preoperational and startup tests and will develop testing, operating, and emergency procedures.

ii. The applicant should develop a training program for each functional group of employees in the organization relative to the schedule for preoperational testing and initial startup testing to ensure that the necessary plant staff are ready to begin the test program.

E. Development, Review, and Approval of Test Procedures

i. The applicant is responsible for the preparation of preoperational and startup test procedures. This includes the methodology used for the generation, review, and approval of test procedures.

ii. The applicant should use the NSSS vendor, architect-engineer, and other major contractors, as appropriate, to provide the test objectives and acceptance criteria used in developing detailed test procedures.

iii. The applicant's administrative system for use in reviewing and approving individual test procedures should provide for appropriate levels of review before approval.

iv. Controls should be in place to ensure that test procedures include appropriate prerequisites, test objectives, safety precautions, testing of initial conditions, methods to direct and control test performance, and acceptance criteria for evaluating the test.

v. The applicant should include provisions to ensure that retesting that is required for modifications or maintenance remains in compliance with ITAAC commitments.

vi. The format for the test procedures should be similar to that in RG 1.68, or the reviewer should consider whether the justification provided by the applicant for exception is acceptable. The format should include checklists and signature blocks to control the sequencing of testing.

vii. Approved test procedures should be in a form suitable for review by regulatory inspectors at least 60 days before their intended use. Licensees should provide timely notification to NRC of changes in approved test procedures that have been made available for NRC review.

F. Review, Evaluation, and Approval of Test Results

i. The applicant should develop the procedures that will govern the review, evaluation, and approval of test results for each phase of the test program. Specific procedures should be implemented to ensure notification of responsible organizations, such as design organizations, when test acceptance criteria are not met and specific controls have been established to resolve such problems.

ii. Before proceeding with testing, the applicant should provide controls relating to (1) the methods and schedules for approval of test data for each major phase, and (2) the methods used for initial review of individual parts of multiple tests (e.g., hot functional testing).

iii. The controls that will govern the review, evaluation, and approval of test results should provide a technical evaluation of test results by qualified personnel and approval of such results by personnel in designated management positions in the applicant's organization.

iv. The applicant should include provisions to allow design organizations to participate in the resolution of design-related problems that result in, or contribute to, a failure to meet test acceptance criteria.

v. Provisions should be in place to retain test reports, including test procedures and results, as part of the plant historical records. Startup test reports should be prepared in accordance with RG 1.16, or the reviewer should consider whether the justification provided by the applicant for exception is acceptable.

G. Utilization of Reactor Operating and Testing Experiences in the Development of the Test Program

i. The applicant should provide a summary of the principal conclusions or findings from the review of operating and testing experiences at other reactor facilities and their effect on the test program. This review should recognize categories of reportable, repeatedly experienced occurrences and other operating experiences that could potentially impact the performance of the test program.

H. Trial Use of Plant Operating and Emergency Procedures

i. The applicant should incorporate, to the extent practicable, the plant operating, emergency, and surveillance procedures into the test program or otherwise verify these procedures through use during the test program.

ii. The applicant should provide additional operator training and participation based on the performance and evaluation of the test results of certain initial tests. An acceptable program will satisfy the criteria described in Three Mile Island (TMI) Action Plan Item I.G.1 of NUREG-0660 and NUREG-0737.

4. Initial Startup Tests

DC Applicant

The applicant should provide a summary description of the following areas:

A. Initial Fuel Loading/Initial Criticality/Low-Power/Power Ascension Testing

i. The applicant should include in the ITP a description of the general provisions and precautions for fuel loading, initial fuel loading, initial criticality, low-power testing, and power ascension phases. Precautions, prerequisites, and measures should be consistent with the guidelines and regulatory positions in RG 1.68. This includes guidance for (1) the completion of all ITAAC associated with preoperational tests before fuel load, (2) measures to review and evaluate the results of the completed preoperational tests, (3) appropriate remedial actions to take if acceptance criteria are not satisfied, (4) applicable technical specification requirements, and (5) actions to take if unanticipated errors or malfunctions occur.

COL/OL Applicants

The applicant should provide a detailed description of the following areas:

A. Initial Fuel Loading and Initial Criticality

i. The applicant should provide measures to ensure that preoperational tests are evaluated and approved before fuel loading begins.

ii. The procedures that will guide initial fuel loading and initial criticality should include precautions, prerequisites, and measures consistent with the guidelines and regulatory positions in RG 1.68. The staff will review exceptions to regulatory positions and their associated justification on a case-by-case basis.

iii. Technical specifications should be instituted to ensure the operability of systems required for fuel loading.

iv. The applicant should describe the minimum conditions for initial core loading, which may include, but are not limited to:

(1) The reactor containment structure should be complete, and containment integrity should be demonstrated according to technical specifications.

(2) Fuel handling tools and equipment should be available, and operators should be familiar with the use and operation of equipment.

(3) The reactor vessel and associated components should be ready to receive fuel.

(4) Nuclear instrumentation should be tested and verified to be operable.

v. The applicant should include provisions to verify that core flux levels are within predicted or acceptable values.

vi. The applicant should provide measures to stop core loading operations if an unexpected or unanalyzed condition occurs.

vii. At the completion of fuel loading, the applicant should perform sufficient tests, as necessary, to ensure that the facility is in a final state of readiness to achieve initial criticality and to perform low-power tests.

B. Low-Power/Power Ascension Testing

i. The applicant should include procedures that will control low-power and power ascension testing. These procedures should include precautions, prerequisites, and measures consistent with the guidelines and regulatory positions in RG 1.68. The staff will review exceptions to regulatory positions and their associated justifications for acceptability on a case-by-case basis.

5. Individual Test Descriptions/Abstracts

<u>DC/COL/OL Applicants</u>

A. The applicant should provide abstracts of planned tests to demonstrate and verify the performance capabilities of SSCs and design features that serve the following functions:

i. Used for safe shutdown and cooldown of the reactor under normal plant conditions and for maintenance of the reactor in a safe condition for an extended shutdown period

ii. Used for safe shutdown and cooldown of the reactor under transient conditions (infrequently or moderately frequent events) and postulated accident conditions and for maintenance of the reactor in a safe condition for an extended shutdown period following such condition

iii. Used for establishing conformance with safety limits or limiting conditions for operation that will be included in the facility technical specifications

iv. Classified as engineered safety features or used to support or ensure the operations of engineered safety features within design limits

v. Assumed to function, or for which credit is taken, in the accident analysis for the facility, as described in the DCD or SAR (as applicable)

vi. Used to process, store, control, measure, or limit the release of radioactive materials

vii. Used in a special low-power testing program to be conducted at power levels no greater than 5 percent for the purpose of providing meaningful technical information beyond that obtained in the normal startup test program, as required for the resolution of TMI Action Item I.G.1

viii. Identified as risk significant in the design-specific probabilistic risk assessment

B. The abstracts should include test objectives, prerequisites, test methods, significant parameters and plant performance characteristics to be monitored, and acceptance criteria in sufficient detail to establish the functional adequacy of the SSCs and design features tested.

C. For new, unique, or first-of-a-kind design features used in the facility, the functional testing requirements and acceptance criteria necessary to verify their performance should be submitted for review and approval.

D. If the testing method will not subject the SSC to representative design operating conditions, the test abstract should contain sufficient information to justify the proposed test method.

6. Initial Test Program Acceptance Criteria

<u>DC Applicants</u>

A. The applicant should provide in Tier 1 a general description of the preoperational and power ascension test programs and the major program documents that define how the ITP will be conducted and controlled (i.e., a site-specific startup administrative manual, test specifications, and test procedures). Tier 2, Chapter 14.2, should contain a complete description of the ITP.

B. The applicant should describe the key elements of the ITP in Tier 1 to ensure that the COL applicant cannot unilaterally initiate subsequent changes in the conduct of the ITP.

C. The applicant should include provisions to ensure that test procedures and test specifications are made available to the NRC.

<u>COL/OL Applicants</u>

A. Applicants referencing a certified design should provide a clearly and sufficiently described ITP in terms of scope and level of detail in accordance with the rule certifying the design and the design control document.

B. An applicant which does not reference a certified design should provide a clearly and sufficiently described ITP in terms of scope and level of detail in accordance with RG 1.68.

C. Refer to SRP Section 14.3.10 for additional guidance.

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. 10 CFR 50.34(b)(6)(iii) requires that each application for a license to operate a facility include a final SAR (FSAR). The FSAR should include information that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the SSCs and of the facility as a whole, including plans for preoperational testing and initial operations. A major ITP objective (including preoperational testing and testing during initial operation) is to verify that SSCs are capable of performing their safety functions as specified in the design and as assumed/credited in safety analyses. Application of 10 CFR 50.34(b)(6)(iii) to the ITP ensures that the applicant submits adequate information, commitments, and plans to demonstrate that the capability will exist for initial operation within the bounds of the design and safety analyses and that initial testing activities will be conducted in a sequence and manner that minimizes operational reliance on untested SSCs/safety functions.

2. 10 CFR 30.53(c), as it relates to this SRP section, requires that each licensee (defined as an entity licensed to receive and possess byproduct material in this context) perform, or permit the Commission to perform, tests of radiation detection and monitoring instruments. In nuclear power plants, radiation detection and monitoring instruments are used for ambient monitoring related to worker radiation protection, effluent monitoring, automatic initiation of features to mitigate accidental releases of radioactive materials, and automatic initiation of engineered safety features to minimize the consequences of design-basis accidents. Application of 10 CFR 30.53(c) to the ITP ensures that the capabilities to perform these functions are adequately verified initially and that deficiencies are identified and corrected. This provides increased assurance of reliable radiation detection/monitoring and instrument response to any detected adverse radiological conditions.

3. Section XI of Appendix B to 10 CFR 50 requires that a test program be established to ensure that all testing required to demonstrate that SSCs will perform satisfactorily in service is identified and performed in accordance with written test procedures that incorporate the requirements and acceptance limits in applicable design documents. The test program should include, as appropriate, proof tests before the installation, preoperational tests, and operational tests during plant operation of SSCs. Test procedures should include provisions for ensuring that all prerequisites for the given test have been met, adequate test instrumentation is available and used, and the test is performed under suitable environmental conditions. Test results should be documented and evaluated to ensure that test requirements have been satisfied.

   The SSCs that are subject to initial testing perform safety functions, including fission product containment and/or control, reactivity monitoring and control, reactor safe shutdown (including maintaining the safe shutdown), core cooling, accident prevention, and consequence mitigation, as specified in the design and as assumed/credited in safety analyses. The application of Section XI of Appendix B to 10 CFR Part 50 to the ITP ensures that DC, COL, and OL applicants provide all testing required to demonstrate that (1) SSC capabilities to perform specified/analyzed functions are initially verified with adequate precision and accuracy, (2) necessary SSC and plant baseline performance data are obtained, (3) deficiencies are identified and corrected, and (4) activities are conducted in a sequence and manner that minimizes operational reliance on untested SSCs/safety functions. This provides a high degree of assurance of SSC and overall

plant readiness for safe operation within the bounds of the design and safety analyses, protection against unexpected or unanalyzed SSC/plant behavior, and prevention of early SSC/safety function failures in service.

4. Appendix J to 10 CFR Part 50 requires, in part, that upon completion of construction of the primary reactor containment, including installation of all portions of mechanical, fluid, electrical, and instrumentation systems penetrating the primary reactor containment pressure boundary, and prior to any reactor operating period, preoperational leakage rate tests are conducted as specified (e.g., in Section III.A). The primary reactor containment provides a barrier against the release of fission products after accidents. The extent of overall containment leakage at pressures associated with accident conditions affects the public dose and environmental damage consequences of accidents. Application of Appendix J to the ITP ensures that the containment performs as a leakage barrier as specified in the design and as assumed/credited in safety analyses that evaluate the public dose and environmental consequences of design-basis accidents.

5. 10 CFR 52.47(b)(1) requires DC applicants to include in the application the proposed ITAAC that are sufficient to ensure that the SSCs in this area of review are built and will operate in accordance with the certification and the Commission's regulations. The ITP is described as Tier 1 information because of the essential role of a test program in verifying that SSCs have been constructed and will perform satisfactorily in service. The Tier 1 description directs that the ITP is performed under suitably controlled conditions and processes. The development of test procedures, conduct of the tests, and safe execution of the test program are important considerations in ensuring that the as-built facility is in accordance with the DC and applicable regulations. Thus, the staff will have reasonable assurance that the ITP will be implemented effectively by the COL or OL applicant who references the certified design.

6. 10 CFR 52.79 requires that each COL application contain a final SAR (FSAR) that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the SSCs and of the facility as a whole, including plans for preoperational testing and initial operations. A major ITP objective (including preoperational testing and testing during initial operation) is to verify that SSCs are capable of performing their safety functions as specified in the design and as assumed/credited in safety analyses. Application of 10 CFR 52.79 to the ITP ensures that the applicant submits adequate information, commitments, and plans to demonstrate that the capability will exist for initial operation within the bounds of the design and safety analyses and that initial testing activities will be conducted in a sequence and manner that minimizes operational reliance on untested SSCs/safety functions.

7. 10 CFR 52.80(a) requires COL applicants to include in the application the proposed ITAAC that are sufficient to assure that the SSCs in this area of review have been constructed and will be operated in conformity with the combined license, the provisions of the Atomic Energy Act, and the NRC's regulations. Refer to SRP Section 14.3.10 for additional guidance.

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 specific acceptance criteria, the staff should review the applicant's evaluation of how the proposed alternatives to the SRP criteria provide an acceptable method of complying with the relevant NRC requirements identified in Subsection II.

The designated reviewer will review ITPs submitted by DC or COL applicants, comparing them to the criteria described in Subsection II. When necessary, the reviewer will prepare one or more requests for additional information for the applicant or holder and will review the responses for acceptability.

The reviewer is responsible for the review and evaluation of all subsequent amendments to the SAR until the ITP is completed to ensure that any changes in design or commitments that affect the ITP will continue to satisfy the acceptance criteria described in Subsection II.

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.

The reviewer's determination of the adequacy of the ITP commitments, description of methods for meeting the commitments, organizational arrangements, and capabilities to fulfill the test program should lead to the conclusion of acceptability, as described in Subsection IV.

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 concluded that the initial plant test program meets the following requirements:

1. 10 CFR 50.34(b)(6)(iii), which requires inclusion of plans for preoperational testing and initial operations in the SAR (where applicable).

2. 10 CFR 30.53(c), with regard to initial testing of radiation detection and monitoring instruments.

3. Section XI of Appendix B to 10 CFR Part 50, which requires the establishment of a test program to ensure that all testing required to demonstrate that SSCs will perform satisfactorily in service and that the test program is conducted in accordance with written test procedures that incorporate the requirements and acceptance limits in applicable design documents.

4. Section III.A.4 of Appendix J to 10 CFR Part 50, which requires a preoperational measurement of the overall integrated leak-tightness of the primary reactor containment under specified pressure conditions.

5. 10 CFR 52.47(b)(1), which requires DC applicants to include in the application the proposed ITAAC that are sufficient to ensure that the SSCs in this area of review will operate in accordance with the certification and the Commission's regulations (where applicable).
6. 10 CFR 52.79(a)(28), which requires COL applicants to provide plans for preoperational testing and initial operations (where applicable).

7. 10 CFR 52.80(a), which requires COL applicants to include in the application the proposed ITAAC that are sufficient to ensure that the SSCs in this area of review have been constructed and will be operated in conformity with the combined license, the provisions of the Atomic Energy Act, and the NRC's regulations (where applicable).

The staff has reviewed the information provided in the FSAR on the applicant's test program in accordance with SRP Section 14.2. This review included an evaluation of the applicant's administrative measures to control (1) the conduct of the ITP, (2) the schedule for conducting the test program, (3) the sequence of startup testing to be performed, (4) the methods for conducting individual tests and the acceptance criteria to be used in evaluating the test results for plant SSCs, (5) the test programs' conformance with applicable regulations, (6) responsibilities, authorities, and qualifications, and (7) the conformance with RGs applicable to the ITP. The review also included an evaluation of the results of the applicant's review of operating and testing experiences at other reactor facilities and their effect on the ITP, and the incorporation and trial use of plant operating and emergency procedures during the test program. The staff has concluded that the information provided in the application meets the acceptance criteria in this SRP and describes an acceptable ITP that, when successfully completed, will demonstrate the functional adequacy of plant SSCs.

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.

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.

VI. REFERENCES

1. Regulatory Guide 1.16, “Reporting of Operating Information—Appendix A Technical Specifications.”

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4. Regulatory Guide 1.68.1, “Preoperational and Initial Startup Testing of Feedwater and Condensate Systems for Boiling Water Reactor Power Plants.”

5. Regulatory Guide 1.68.2, “Initial Startup Test Program To Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants.”

6. Regulatory Guide 1.68.3, “Preoperational Testing of Instrument and Control Air Systems.”

7. Regulatory Guide 1.20, “Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing.”

8. Regulatory Guide 1.30, “Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment (Safety Guide 30).”

9. Regulatory Guide 1.37, “Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants.”

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26. NUREG-0660, “NRC Action Plan Developed as a Result of the TMI-2 Accident.”

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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.

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