



U.S. NUCLEAR REGULATORY COMMISSION
STANDARD REVIEW PLAN
OFFICE OF NUCLEAR REACTOR REGULATION

14.3.10¹ INITIAL TEST PROGRAM AND D-RAP (Tier 1)

REVIEW RESPONSIBILITIES

Primary - Quality Assurance and Maintenance Branch (HQMB)

Secondary - None

I. AREAS OF REVIEW

HQMB reviews the Design Control Document (DCD) submitted by the applicant. HQMB has primary review responsibility for Tier 1 information related to the Initial Test Program (ITP) and the Design-Reliability Assurance Program (D-RAP).

Review Interfaces

SRP Section 14.3 provides general guidance on review interfaces. HQMB performs related reviews and coordination activities, as requested by other branches, for issues in Tier 1 related to testing issues and the reliability assurance program.

For testing issues, the reviewer is responsible for providing clear guidance to other branches regarding the utilization of the pre-operational test descriptions in DCD Tier 2 Chapter 14.2 for development of the individual system ITAAC. However, the technical branches are responsible for the review of the individual systems in Tier 1. In addition, HQMB is responsible for ensuring that new testing requirements identified by other branches in Tier 1 review are adequately treated in DCD Tier 2 Section 14.2. HQMB is responsible for ensuring that all initial plant tests are reviewed and will provide the coordination and supplementary review necessary to accomplish this review.

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USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

Some safety significant design requirements cannot be verified by ITAAC because they can only be performed after fuel loading. Examples of these might include the testing of main steam isolation valves at high flow/temp/pressure conditions, testing involving 100% load rejection by a turbine, and fuel and control rod performance verification. These requirements and supporting analyses for these tests should be identified in the applicable sections of Tier 2 and by the cognizant technical branch; HQMB is responsible for ensuring that the appropriate testing requirements are verified in the startup and power ascension test programs in DCD Tier 2 Section 14.2.

For D-RAP issues, the reviewer is responsible for coordinating with the Probabilistic Risk Assessment Branch (SPSB), so that risk-significant SSCs are identified in the DCD, and are treated appropriately in Tier 1. The acceptance criteria necessary for the review and their methods of application are contained in the applicable SRP sections related to the PRA review.

II. ACCEPTANCE CRITERIA

The acceptance criteria for ITAAC are based on meeting 10 CFR 52.97(b)(1), which sets forth the comprehensive requirements for ITAAC. For design certification reviews, the scope of ITAAC is limited to the scope of the certified design as required by 10 CFR 52.47(b).

Initial Test Program - The above acceptance criteria can be met for the ITP by the following:

A high level commitment in Tier 1 to an ITP and a general description of the preoperational and power ascension test programs and 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). Provisions should be included to ensure these test procedures and test specifications are made available to the NRC. Tier 2 Chapter 14.2 should contain a complete description of the ITP.

The reviewer should review Tier 1 to ensure it contains a high level commitment to an ITP as described in the acceptance criteria above and in Appendix A to SRP Section 14.3, regarding format of Tier 1/ITAAC. The staff should also review Tier 1 for consistency with the guidelines contained in the SRP Section 14.2 and RG 1.68, "Initial Test Program for Water-Cooled Nuclear Power Plants." RG 1.68 describes the general framework and controls for implementing the ITP.

The key facets of the ITP are described in Tier 1 Tier 1 to ensure that subsequent changes in the conduct of the ITP cannot be initiated unilaterally by the COL applicant. The ITP is described in Tier 1 because of the essential role of a test program in the verification that SSCs have been constructed and will perform satisfactorily in service. Tier 1 description requires that the ITP be 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 as-built facility is in accordance with the design certification and applicable regulations. Thus, the staff will have the confidence that the ITP will be implemented effectively, so that the appropriate testing methodologies, and associated programmatic controls

for testing plant systems will be ensured. A corresponding ITAAC for this design description is not required for several reasons:

- (1) Tier 1 certified design material consists of a high level commitment to an ITP, and a description of the program and major program documents that constitute an acceptable ITP (i.e., a site-specific startup administrative manual, test specifications, and test procedures). The specific testing necessary to verify design features and performance aspects of the design is delineated in the system-specific ITAAC.
- (2) The ITP covers a broader spectrum of time than the ITAAC. While ITP pre-operational testing shall be completed prior to fuel load, the ITP startup and power ascension testing will be conducted after fuel load. As the ITP involves testing post-fuel load, it is not appropriate to define associated ITAAC entries as Part 52 specifies that the ITAAC will be completed prior to fuel load.

Design Reliability Assurance Program - The above acceptance criteria can be met for the D-RAP by the following:

Tier 1 should contain a high level commitment to a D-RAP for use in the detailed design and equipment specification of risk-significant SSCs prior to fuel load, and as described in Appendix C to SRP Section 14.3. An ITAAC should be provided to verify the commitments in Tier 1. Tier 2 Section 17.4 contains a more detailed description of the D-RAP. The D-RAP is described in Tier 1 because of the essential role of a reliability assurance program in assuring that the final as-built facility performs satisfactorily in service. The following items were found to be acceptable for the evolutionary standard designs, but are not meant to constitute the only acceptable discussion appropriate in Tier 1. Items should be added or deleted as appropriate for a specific design. Particular attention should be paid to additional commitments that should be made on a design-specific basis, particularly for new or unusual aspects of standard designs.

The Design Description in Tier 1 should describe the scope, purpose, objectives and essential elements of the D-RAP. It should provide a commitment for a process to evaluate and prioritize SSCs, and list the SSCs based on their risk-significance. It should include a commitment that the process used to determine dominant failure modes considered industry experience, analytical models, and applicable requirements. Also, for those SSCs designated as risk-significant, the key assumptions and risk insights should consider operations, maintenance, and monitoring activities.

The scope of the D-RAP program should include risk-significant SSCs as determined by probabilistic, deterministic, or other methods used for design certification to identify and prioritize risk-significant SSCs. The purpose should include ensuring that the detailed facility design remains consistent with the original design bases.

The D-RAP program objectives should include that the program provides a reasonable assurance that the plant is designed such that: (1) It is consistent with the assumptions and risk insights for these risk-significant SSCs, (2) the risk-significant SSCs will not degrade to an unacceptable level during their design life, (3) the frequency of transients that challenge these SSCs will be acceptably low, and (4) these SSCs will function reliably when challenged.

III. REVIEW PROCEDURES

1. Follow the general procedures for review of Tier 1 contained in the Review Procedures section of SRP Section 14.3. Ensure that the DCD is consistent with Appendix A to SRP Section 14.3. Review responsibilities may be consistent with those in Appendix B to SRP Section 14.3.
2. Ensure that all Tier 1 information is consistent with Tier 2 information regarding ITP and D-RAP descriptions.
3. The reviewer should ensure that appropriate guidance is provided to other branches such that testing and D-RAP issues in Tier 1 are treated in a consistent manner among branches.

IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided to satisfy the requirements of this Standard Review Plan section, and concludes that Tier 1 is acceptable. The findings should support the following type of conclusive statement to be included in the staff's safety evaluation report:

"Based on the staff's review of the material in the (standard design) Tier 1, and a review of the selection methodology and criteria for the development of Tier 1 contained in DCD Tier 2 Section 14.3, the staff concludes that the ITP (or D-RAP) is appropriately described in Tier 1, and Tier 1 is acceptable."

V. IMPLEMENTATION

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

This SRP section will be used by the staff when performing safety evaluations of design certification and combined license applications submitted by applicants pursuant to 10 CFR 52. Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of 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.

VI. REFERENCES

1. 10 CFR Part 52, §52.47 "Contents of Applications."
2. 10 CFR Part 52, §52.97 "Issuance of Combined Licenses."
3. Regulatory Guide 1.68, "Initial Test Program for Water-Cooled Nuclear Power Plants."

4. NUREG-1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor", Volumes 1 and 2, July 1994.
5. NUREG-1462, "Final Safety Evaluation Report Related to the Certification of the System 80+ Design," Volumes 1 and 2, August 1994.
6. SECY-95-132, "Policy and Technical Issues Associated With the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs (SECY-94-084)," May 22, 1995.

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SRP Draft Section 14.3.101
Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	Integrated Impact 1543	The scope and content of this proposed SRP section is derived from the requirements of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants," as well as the guidance in staff SECY papers related to design certification and combined license reviews, and the staff positions established in the Final Safety Evaluation Reports (FSERs) for the evolutionary reactor designs. SRP Section 14.3.10 provides guidance specific to the review of the initial test program and D-RAP information and related inspections, tests, analyses, and acceptance criteria (ITAAC) provided in applications submitted in accordance with the requirements of 10 CFR 52.

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SRP Draft Section 14.3.101
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
1543	Develop Acceptance Criteria and Review Procedures for review of Certified Design Material (CDM) including associated inspections, tests, analyses and acceptance criteria (ITAAC) for the initial test program and D-RAP.	All