

THIS PRELIMINARY RULE LANGUAGE AND ACCOMPANYING DISCUSSION IS BEING RELEASED TO SUPPORT INTERACTIONS WITH STAKEHOLDERS AND THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS). THIS LANGUAGE HAS NOT BEEN SUBJECT TO COMPLETE NRC MANAGEMENT OR LEGAL REVIEW, AND ITS CONTENTS SHOULD NOT BE INTERPRETED AS OFFICIAL AGENCY POSITIONS. THE NRC STAFF PLANS TO CONTINUE WORKING ON THE CONCEPTS AND DETAILS PROVIDED IN THIS DOCUMENT AND WILL CONTINUE TO PROVIDE OPPORTUNITIES FOR PUBLIC PARTICIPATION AS PART OF THE RULEMAKING ACTIVITIES.

<p>Subpart F – Requirements for Operation</p>	<p>Subpart F is part of the Part 53 structure and format described in previous public meetings. Subpart F defines the requirements during the operation phase of an advanced nuclear plant to ensure the safety criteria (Subpart B) and other areas of Part 53 (e.g., design & analysis (Subpart C)) continue to be satisfied throughout the plant's lifetime.</p>
<p>§ 53.700 Operational objectives. Each licensee shall define, implement, and maintain controls for plant SSCs, responsibilities of plant personnel, and plant programs during the operating life of each advanced nuclear plant such that the first and second tier safety criteria defined in §§ 53.210 and 53.220 are satisfied. Each licensee shall maintain the capabilities and reliabilities of facility structures, systems, and components to ensure that the safety functions identified in § 53.230 will be performed if called upon during normal operations and licensing basis events. Each licensee shall ensure that plant personnel have adequate knowledge and skills to perform their assigned duties that support the performance of the safety functions identified in § 53.230. Each licensee shall implement plant programs during operations sufficient to ensure that the safety functions identified in § 53.230 will be performed if called upon during normal operations and licensing basis events.</p>	<p>This section provides the overall objectives and general organization of Subpart F, which is to define requirements on:</p> <ol style="list-style-type: none"> 1) Plant SSCs (e.g., configuration control, testing) (§ 53.700 – 53.740) 2) Plant personnel (e.g., licensing, training) (§ 53.XXX) and 3) Plant programs (e.g., radiation protection, security) (§ 53.800 – 53.900). <p>These requirements are needed to ensure that the advanced nuclear plant is maintained and operated such that the first and second tier safety criteria are met during all modes of normal operation.</p>
<p>§ 53.710 Transition from construction/manufacturing to operation. The applicant or licensee shall prepare a transition plan from construction to operations for each advanced nuclear plant. The plan must identify all testing or verifications required to:</p>	<p>This section requires a transition plan from construction to operations. This paragraph may be revised once the remainder of Part 53 is complete to account for ITAAC-related issues.</p> <p>A possible discussion topic is whether these requirements would be more logically addressed as a startup testing program in the programs-related sections of this Subpart, rather than</p>

<p>(a) Before plant operation, demonstrate that the SR and NSRSS SSCs have been appropriately constructed or manufactured to further ensure those SSCs have the capabilities needed to perform or support the safety functions of § 53.230 and satisfy the first and second tier safety criteria defined in §§ 53.210 and 53.220;</p> <p>(b) Demonstrate that plant personnel are appropriately licensed, trained, and otherwise capable and available to support the safety functions of § 53.230 and satisfy the first and second tier safety criteria defined in §§ 53.210 and 53.220;</p> <p>(c) Demonstrate that all programs, procedures, and controls have been prepared and implemented to support the safety functions of § 53.230 and satisfy the first and second tier safety criteria defined in §§ 53.210 and 53.220.</p>	<p>addressed separately as illustrated in the preliminary proposed rule language in this section.</p>
<p>§ 53.720 Maintaining capabilities and availability of structures, systems, and components.</p> <p>Controls must be provided for each advanced nuclear plant such that the capabilities and reliability of SSCs, when combined with associated programmatic controls and human actions, provide reasonable assurance that the safety criteria defined in §§ 53.210(b) and 53.220(b) will be met.</p> <p>(a) Technical Specifications must be developed and implemented that define conditions or limitations on plant operations that are necessary to provide reasonable assurance that SR SSCs fulfill the safety functions identified in § 53.230 and that satisfy the first tier safety criteria of § 53.210(b). The technical specifications must describe the following requirements:</p> <p>(1) Limits on the inventory of radioactive materials within the reactor system and supporting systems with the potential, individually or collectively, to cause a release exceeding the safety criteria in § 53.210(b) as a result of a</p>	<p>This section provides the requirements for maintaining capabilities, availability, and reliability of SSCs to support meeting the first and second tier safety criteria for unplanned events that are described in Subpart B. The basic structure of this section is that controls for safety-related (SR) SSCs are provided by technical specifications (paragraph (a)) and controls for non-safety related but safety significant (NSRSS) SSCs are required to be addressed with licensee-controlled documents and procedures (paragraph (b)).</p> <p>This paragraph defines the required limits to be included in Technical Specifications (TS). The submittal and control of TS as a key licensing document will be addressed in Subparts H, “Licenses, Certifications and Approvals,” and I, “Maintaining and Revising Licensing Basis Information.” The general content and control of TS under Part 53 will be similar to the requirements in Parts 50 and 52. The requirements for TS include limits on the inventories of radioactive materials, plant operating limits, and specific requirements for each SR SSC, including limiting conditions for operation and required surveillances. The proposed requirements for TS also include sections on</p>

design basis accident analyzed in accordance with § 53.450(e).

(2) Operating limits for the facility that if exceeded could lead to a failure to perform a required safety function necessary to meet the safety criteria in § 53.210(b).

(3) For each SSC classified as SR in accordance with § 53.460, technical specifications must define:

(i) *Limiting conditions for operation.* Limiting conditions for operation are the lowest functional capability or performance levels of SR SSCs required to provide reasonable assurance that the design basis accidents analyzed in accordance with § 53.450(e) would not give rise to an immediate threat to the public health and safety as represented by the first tier safety criteria of § 53.210(b). When a limiting condition for operation is not met, the licensee must shut down the plant or follow any remedial action permitted by the technical specifications until the condition will be met.

(ii) *Surveillance requirements.* Surveillance requirements relate to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained and that the limiting conditions for operation will be met.

(4) *Design attributes.* Design attributes to be included are those attributes of the facility such as materials of construction and geometric arrangements, which, if altered or modified, would have a significant effect on safety and are not covered in categories described in paragraphs (a)(1)-(3) of this section.

(5) *Administrative controls.* Administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner. Each licensee must submit any reports to the Commission pursuant to approved technical specifications as specified in § 53.40.

important “design attributes” (similar to “design features” in § 50.36 but different term may be needed if design feature becomes a defined term within Part 53 to mean something different than in Part 50), administrative controls, and decommissioning (when applicable).

This first iteration of preliminary language for this section of Part 53 does not include the concept of safety limits or associated limiting safety system settings from 10 CFR 50.36. As discussed in SECY-18-0096, systematic assessments and more mechanistic approaches to evaluating source terms support an alternative approach to establishing barrier-based safety limits. An example provided in that paper is a comparison of (1) the traditional specified acceptable fuel design limits (SAFDLs) that are generally used as performance measures or safety limits for reactor protection systems in LWRs to protect a specific barrier from potential failure mechanisms (e.g., departure from nucleate boiling) and (2) the specified acceptable radionuclide release design limit (SARRDL) concept, which establishes limits on the possible increase in circulating radionuclide inventory during normal operations or an anticipated operational occurrence as part of an integrated or “functional containment” approach. The SARRDL could be addressed under subparagraph (2) as an operating limit within this preliminary construct of requirements for TS.

This first iteration of preliminary language for this section of Part 53 does not include the criteria for identifying limiting conditions for operation (LCOs) from 10 CFR 50.36. Instead, the staff proposes to maintain the concepts from Subparts B and C and define TS LCOs as providing limits on safety-related SSCs, which are those associated with protecting against an immediate threat to public health and safety and the first tier safety criteria in § 53.210(b). 10 CFR 50.36(c)(2)(ii) provides the criteria for limiting conditions for operation and includes criterion (D) A structure, system, or component which operating

(6) *Decommissioning*. This paragraph applies only to advanced nuclear plants that have submitted the certifications required by subpart G of this part. Technical specifications involving limiting conditions for operation; surveillance requirements; design features; and administrative controls will be developed on a case-by-case basis.

(b) Controls on plant operations, including availability controls, must be developed and implemented to provide reasonable confidence that the configurations and special treatments for NSRSS SSCs provide the capabilities and reliabilities required to satisfy the second tier safety criteria of § 53.220(b). The controls must:

- (1)(i) Identify who within the advanced nuclear plant has authority to make configuration changes;
 - (ii) Establish processes to make configuration changes to the advanced nuclear plant's system; and
 - (iii) Establish processes to ensure that all departments of the advanced nuclear plant affected by the configuration changes are formally notified and approve of the change; and
- (2) Describe the means by which the special treatments for each NSRSS SSC will be provided and maintained over the operating life of the advanced nuclear plant. [examples would include appropriate surveillances, reliability assurance programs, etc.]

experience or probabilistic risk assessment has shown to be significant to public health and safety. In this preliminary construct for Part 53, risk significant SSCs are addressed through a combination of TS for the safety-related SSCs and the introduction of paragraph (b) of this section for NSRSS SSCs.

Note that guidance, Part 53 rule language, or addressing some designs within a revised Part 50 are being explored as possible ways to accommodate deterministic approaches for performing the design and analysis described in Subpart C. Developing approaches within this rulemaking for different design philosophies is a continuing topic of discussion.

Paragraph (b) defines the required controls to be developed and implemented for NSRSS SSCs. Configuration management and other special treatments provide reasonable confidence that the capabilities and reliabilities of SSCs are maintained consistent with the underlying risk assessments. The staff notes that these or similar controls are needed to implement a performance-based approach and to gain operational flexibilities in areas such as replacing the single-failure criterion with a probabilistic (reliability) approach, clarifying the appropriate classification and controls over SR SSCs and NSRSS SSCs, and supporting the staffing and program topics in this Subpart.

As mentioned in the paragraph (a) discussion, guidance or other changes may be needed to address deterministic approaches with different supporting analysis, safety classification schemes, and design approaches (e.g., inclusion of the single failure criterion). This topic also carries through other configuration control and program requirements that differentiate between SR and NSRSS SSCs based on risk-informed, performance-based concepts.

<p>§ 53.730 Maintenance, repair and inspection programs.</p> <p>(a) A program to control maintenance activities and monitor the performance or condition of SR and SS SSCs must be developed and implemented to provide reasonable assurance that the safety criteria defined in §§ 53.210(b) and 53.220(b) of this part will be met.</p> <p>(b) Whenever a licensee determines through activities related to maintenance, repair, and inspection of SSCs, the activities under § 53.720, or otherwise that the performance or condition of a NSRSS SSC does not meet established special treatment requirements or performance goals related to capabilities or reliabilities, the licensee must take appropriate corrective action.</p> <p>(c) Performance and condition monitoring activities and associated goals and preventive maintenance activities must be evaluated at least every 24 months. The evaluations must take into account, where practical, industry-wide operating experience. Adjustments must be made where necessary to ensure that the objective of preventing failures of SSCs through maintenance is appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventive maintenance.</p> <p>(d) Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee must assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to SSCs that a risk-informed evaluation process determines are necessary to provide reasonable assurance that the performance measures defined in §§ 53.210(b) and 53.220(b) of this part will be met.</p>	<p>This section provides the requirements for developing and implementing a program to: (a) control maintenance activities; (b) take corrective action when performance issues are identified; (c) conduct routine evaluations of effectiveness; and (d) assess and manage risks resulting from maintenance activities. These requirements are similar to those included in 10 CFR 50.65 (“maintenance rule”) with the scope revised to remain consistent with the safety criteria in Subpart B.</p>
<p>§ 53.740 Design control.</p> <p>The potential for adverse effects on safety, security, EP, operations, or other items related to plant safety must be assessed during the design process and before implementing</p>	<p>This section provides the requirements for assessing design or procedural changes during the operation phase of a facility to ensure safety functions continue to be satisfied and the</p>

design or operational changes. This includes planned and emergent changes, such as physical modifications, procedural changes, changes to operator actions or security assignments, maintenance activities, system reconfigurations, access modifications or restrictions, and changes to the emergency plan and security plan or their implementation. Accordingly, measures must be established for the identification and control of interfaces among plant activities. These measures must include procedures for the review, approval, release, distribution, and revision of documents involving design interfaces such that design decisions are made in an integrated fashion considering all aspects of the facility impacted by the design or operational change prior to its implementation.

interfaces between various design features, programs, and procedures are appropriately considered.