

Standard Review Plan for the Safety Analysis Report

U.S. Practices

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NUREG-1537 Part 2 (Standard Review Plan: SRP)

- Safety Guide on Safety Assessment of Research Reactors and Preparation of the Safety Analysis Report 35-G1-1993
 - ◆ Each member state should prepare acceptance criteria
- Guidelines for preparing and reviewing applications for the licensing of non-power reactors NUREG-1537 Part 2 (about 220 pages plus Appendixes)
 - ◆ Acceptance criteria for each topic in U.S. guidance

Regulatory Body Responsibilities

- Acquire an understanding of design, safety concept, QA program, operating principles
- Perform an assessment of the operators submissions
- Require modification of above if necessary
- Determine no undue radiological risk to site personnel or public

Regulatory Body Responsibilities - 2

- Safety Analysis Report Review
 - ◆ Adequate information provided
 - ◆ Information in compliance with applicable rules
 - ◆ Information is accurate
 - ◆ Engineering solutions are feasible

IAEA 35-G1 Acceptance Criteria

- Each member state to develop its own acceptance criteria
- Acceptance criteria must demonstrate application of principles for safe design and operation, for example:
 - ◆ dose limits for operating staff, experimenters and public
 - ◆ fuel clad damage limits

NRC SRP Topics

- NUREG-1537 Part 2 (Standard review plan) follows same topic format as Part 1 (Standard format and content)
- Not all guidance applicable to all non-power reactors
 - ◆ Power level
 - ◆ Uses

NRC SRP Objectives

- Discuss NRC requirements germane to each review topic
- Describe how the NRC reviewer determines that requirements are satisfied
- Document NRC practices developed in previous non-power reactor reviews

NRC SRP Document Structure

- Area of review
- Acceptance criteria
 - ◆ applicable requirements
 - ◆ technical bases for acceptability (may include conformance with guides, standards, technical positions)

NRC SRP Document Structure - 2

- Review procedures
 - ◆ summarize applicant proposal and modifications as a result of review
 - ◆ summarize staff findings
 - ◆ note areas of review that were emphasized
 - ◆ note areas that deviated from acceptance criteria and bases for acceptance
- Evaluation findings
 - ◆ provides model conclusions for each topic

Example for SRP Section 8.2 Emergency Power Systems

- NRC SRP example topics for emergency power
 - ◆ radiation monitors and recorders
 - ◆ lighting, communication
 - ◆ reactor shutdown monitors and recorders
 - ◆ placing experiments in safe condition

Example for SRP Section 8.2 Emergency Power Systems -2

Areas of Review

- Required if SAR analyses show backup power source is needed for:
 - ◆ safe shutdown (chapter 4)
 - ◆ ESF operation (chapters 6, 13)
 - ◆ prevention or monitoring of effluent releases (chapters 11, 13)
 - ◆ avoidance of experiment damage (chapter 10)

Example for SRP Section 8.2 Emergency Power Systems - 3

- Not required if other SAR sections demonstrate acceptable performance or consequences if primary power source is lost
- Also consider security and emergency plan needs (lighting, communications, locks)
- Candidate backup power sources
 - ◆ generator
 - ◆ batteries

Example for SRP Section 8.2 Emergency Power Systems - 4

Acceptance criteria

- Characteristics of emergency power system satisfy design needs of other SAR chapters
- Capable of supplying power for duration specified
- Manual or automatic actuation justified

Example for SRP Section 8.2 Emergency Power Systems - 5

Acceptance criteria - continued

- Malfunctions during normal or emergency operation do not interfere with safe shutdown
- Non-safety uses of emergency power do not interfere with emergency uses
- Technical specifications are proposed
 - ◆ based on accident analyses
 - ◆ include surveillance and testing
 - ◆ provide assurance of operability

Example for SRP Section 8.2 Emergency Power Systems - 6

Review procedures

- Compare design bases with requirements of Chapters 4, 5, 7, 9, 10, 11, 13 and security and emergency plans
- Compare functional characteristics with the design bases
- Verify no emergency power system is required if not proposed
- Consider methods of isolation from normal power services

Example for SRP Section 8.2 Emergency Power Systems - 7

Evaluation findings

- Emergency power is capable of providing the necessary range of safety-related services
- Source of emergency power is reliable
- System malfunctions during normal operation will not interfere with safe shutdown
- TS provide assurance of system operability and availability