NUREG-0800
(Formerly NUREG-75/087)

U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

9.2.4 POTABLE AND SANITARY WATER SYSTEMS

REVIEW RESPONSIBILITIES

Primary - ~~Auxiliary~~Plant[1] Systems Branch ~~(ASB)~~(SPLB)[2]

Secondary - None

I. AREAS OF REVIEW

At the construction permit (CP) stage of review, ~~ASB~~SPLB[3] reviews the information in the applicant's safety analysis report (SAR) in the specific areas that follow. At the operating license (OL) stage, ~~ASB~~the SPLB[4] review consists of confirming the design accepted at the CP stage. For design certification, SPLB reviews the design in the standard SAR against the acceptance criteria set forth in subsection II below.[5]

1. The system descriptions for the potable and sanitary water systems (PSWS) are reviewed. The piping and instrumentation drawings (P&IDs) are reviewed at the OL stage.

2. System design criteria to prevent connection to systems having the potential for containing radioactive material are reviewed.

3. The applicant's evaluation of potential radiological contamination, including accidental, and safety implications of sharing (for multi-unit facilities) is to be reviewed and accepted.[6]

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.

II. ACCEPTANCE CRITERIA

~~ASB~~SPLB[7] accepts the design of the PSWS if the requirements of General Design Criterion 60 (GDC 60)[8] are met as it relates to design provisions provided to control the release of liquid effluents containing radioactive material from contaminating the PSWS. Compliance with GDC 60 is established if the following are met:

1. There are no interconnections between the PSWS and systems having the potential for containing radioactive material.

2. The potable water system is protected by an air gap, where necessary.

3. An evaluation of potential radiological contamination, including accidental, and safety implications of sharing (for multi-unit facilities) indicates that the system will not result in contamination beyond acceptable limits.[9]

Technical Rationale

The technical rationale for application of the acceptance criterion for the reviewing the PSWS is discussed in the following paragraphs:[10]

Compliance with GDC 60 requires that the nuclear power unit design include, among other things, a suitable means to control the release of radioactive materials in liquid effluents.

GDC 60 applies to this Standard Review Plan (SRP) section because potable and sanitary water systems have liquid effluents that must be suitably controlled to prevent the release of radioactive materials.

Meeting the requirements of GDC 60 provides assurance that design provisions are in place to prevent liquid effluents containing radioactive materials from contaminating the PSWS and being released to the environment therefrom.[11]

III. REVIEW PROCEDURES

The reviewer selects and emphasizes material from this SRP section, as may be appropriate for a particular case.

In the review of the PSWS, ~~ASB~~SPLB[12] considers the design criteria to prevent cross connections, as described in the SAR. The P&IDs are reviewed at the OL stage to verify the absence of the potential for contamination of the PSWS with radioactive materials.

The applicant's evaluation of potential radiological contamination, including accidental, and safety implications of sharing (for multi-unit facilities) is to be reviewed.[13]

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (proposed), to verify that the

design set forth in the standard safety analysis report, including inspections, tests, analysis, and acceptance criteria (ITAAC), site interface requirements and combined license action items, meet the acceptance criteria given in subsection II. SRP Section 14.3 (proposed) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.[14]

IV. EVALUATION FINDINGS

~~ASB~~SPLB[15] determines that sufficient information has been provided and that the review supports conclusions of the following type, to be included in the staff's safety evaluation report (SER):[16]

> The potable and sanitary water systems (PSWS) include all components and piping from the supply connection to the municipal or other water source to all points of discharge to sewage facilities or other plant systems.
>
> Based on our review of the applicant's design criteria and design bases for the potable and sanitary water systems, we conclude that acceptable design provisions have been made to prevent the inadvertent contamination of the systems with radioactive material, and therefore find the proposed design of the potable and sanitary water system meets the requirement of GDC 60 and therefore is acceptable.
>
> An evaluation of potential radiological contamination, including accidental, and safety implications of sharing (for multi-unit facilities) was conducted by the applicant and the results are acceptable.[17]

For design certification reviews, the findings will also summarize, to the extent that the review is not discussed in other safety evaluation report sections, the staff’s evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and combined license action items that are relevant to this SRP section.[18]

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 license applications submitted by applicants pursuant to 10 CFR 50 or 10 CFR 52.[9] 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.[20]

VI. REFERENCES

1. 10 CFR Part 50, Appendix A, General Design Criterion 60, "Control of Releases of Radioactive Materials to the Environment."

SRP Draft Section 9.2.4
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.	Current primary review branch name and abbreviation	Changed PRB to Plant Systems Branch (SPLB).
2.	Current primary review branch abbreviation	Changed SRB to SPLB.
3.	Current primary review branch abbreviation	Changed PRB to SPLB.
4.	Current primary review branch abbreviation	Changed PRB to SPLB.
5.	SRP-UDP format item	Changed to add the possibility that the review might be conducted as a standard design certification under 10 CFR Part 52.
6.	Integrated Impact No. 1400	Added subsection I.3 to the areas of review to incorporate the provisions of the last sentence in subsection 9.2.4 of Regulatory Guide 1.70.
7.	Current primary review branch abbreviation	Changed PRB to SPLB.
8.	Editorial	Introduced "GDC 60" as initialism for "General Design Criterion 60."
9.	Integrated Impact No. 1400	Added acceptance criteria to incorporate the provisions of the last sentence in subsection 9.2.4 of Regulatory Guide 1.70.
10.	SRP-UDP format item	Added "Technical Rationale" and introductory paragraph to ACCEPTANCE CRITERION.
11.	SRP-UDP format item	Added technical rationale for GDC 60.
12.	Current primary review branch abbreviation	Changed PRB to SPLB.
13.	Integrated Impact No. 1400	Added review procedure to incorporate the provisions of the last sentence in subsection 9.2.4 of Regulatory Guide 1.70.
14.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
15.	Current primary review branch abbreviation	Changed PRB to SPLB.
16.	Editorial	Provided "SER" as initialism for "safety evaluation report."

Item	Source	Description
17.	Integrated Impact No. 1400	Added evaluation finding to incorporate the provisions of the last sentence in subsection 9.2.4 of Regulatory Guide 1.70.
18.	SRP-UDP format item	Added paragraph at the end of EVALUATION FINDINGS that references design certification reviews.
19.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard sentence to address application of the SRP section to reviews of applications filed under 10 CFR Part 52, as well as Part 50.
20.	SRP-UDP Guidance	Added standard paragraph to indicate applicability of this section to reviews of future applications.

SRP Draft Section 9.2.4
Attachment B - Cross Reference of Integrated Impacts

Integrated Impact No.	Issue	SRP Subsections Affected
1400	Incorporate provisions of the last sentence in subsection 9.2.4 of Regulatory Guide 1.70 in SRP Section 9.2.4. The sentence is: "An evaluation of radiological contamination, including accidental, and safety implications of sharing (for multi-unit facilities) should be described."	AREAS OF REVIEW Added subsection I.3 ACCEPTANCE CRITERIA Added subsection II.3 REVIEW PROCEDURES Added new second paragraph to Section III EVALUATION FINDINGS Added 4th (indented) paragraph to Section IV