INTRODUCTION

Purpose of the Standard Review Plan

The Standard Review Plan (SRP) is prepared for the guidance of staff reviewers in the Office of Nuclear Reactor Regulation in performing safety reviews of applications to construct or operate nuclear power plants and the review of applications to approve standard designs and sites for nuclear power plants. The principal purpose of the SRP is to assure the quality and uniformity of staff safety reviews. It is also the intent of this plan to make information about regulatory matters widely available and to improve communication between the NRC, interested members of the public, and the nuclear power industry, thereby increasing understanding of the review process.

Background

The SRP was first issued in 1975 as NUREG-75/087. It evolved from many years of NRC staff experience in establishing safety requirements and applying them in safety evaluations of nuclear facilities. Use of the SRP as a routine tool for the NRC staff in the safety evaluation of nuclear power plants was established by NRR Office Letter No. 2, dated August 12, 1975, which described the SRP as representing "the integrated result of the hundreds of conscious choices made by the staff and by the nuclear industry in developing design criteria and design requirements for nuclear power plants" and "the most definitive basis available for specifying the NRC's interpretation of an acceptable level of safety for light water reactor facilities."

An extensive revision program was conducted and the SRP was issued in July 1981 as NUREG-0800. The revision program had three major objectives: (1) to more completely identify the NRC requirements that were relevant to each review topic, (2) to more fully describe how the review determined that safety requirements had been met, and (3) to incorporate a number of newly established regulatory positions, including those related to the Three Mile Island Action Plan.

In 1991, the Standard Review Plan Update and Development Program (SRP-UDP) was established to update NUREG-0800 for use in reviewing future reactor design applications. An “Implementing Procedures Document (IPD)”, NUREG-1447, was issued in May 1992 to describe the SRP-UDP and establish the procedures for updating the SRP. The principal objectives of the SRP-UDP were to update the SRP to reflect the substantial changes in regulatory guidance that occurred since the 1981 revision of the SRP, to incorporate industry operating experience since 1981, and to reflect the experience of the safety reviews conducted on design certification applications for evolutionary nuclear power plant designs.

Review of License Applications

The safety review of license applications is based primarily on information submitted by an applicant for a license. Applications may be submitted under the licensing processes of either 10 CFR Part 50 or Part 52. Existing nuclear plants have been licensed under 10 CFR Part 50. It is expected that future nuclear power plants will be licensed under 10 CFR Part 52. The SRP provides an acceptable format for submittal of applications.

Applications Submitted Pursuant to 10 CFR Part 50:

For construction permit or operating license applications submitted pursuant to 10 CFR Part 50, the safety review is primarily based on the information provided by an applicant in a Safety Analysis Report (SAR). Section 50.34 of 10 CFR Part 50 (10 CFR 50.34) requires that each application for a construction permit to build a nuclear facility shall include a Preliminary Safety Analysis Report (PSAR) and each application for a license to operate such a facility shall include a Final Safety Analysis Report (FSAR).

In general terms, 10 CFR 50.34 specifies the information to be supplied in a PSAR or FSAR. The SAR must be sufficiently detailed to permit the staff to determine whether the plant can be built and operated without undue risk to the health and safety of the public. Prior to submission of a SAR, an applicant should have designed and analyzed the plant in sufficient detail to conclude that it can be built and operated safely. The SAR is the principal document by which the applicant provides the information needed to understand the basis upon which this conclusion has been reached.

Applications Submitted Pursuant to 10 CFR Part 52:

Part 52 governs the issuance of early site permits, design certifications, combined licenses, manufacturing licenses, duplicate design licenses, standard design approvals, and pre-application reviews of site suitability issues. As in Part 50, applications for these issuances must contain the applicable information required by 10 CFR 50.34, either wholly or partially, and any other information required in the respective sections of Part 52.

For design certifications, the information to be supplied in an application is set forth in 10 CFR 52.47. This Section also establishes requirements related to the level of design detail to be provided in the application for design certification. The application must contain a level of design information sufficient to enable the Commission to reach a final conclusion on all safety questions associated with the design. In general terms, a design certification application should provide an essentially complete nuclear plant design, with the exception of site specific design features such as intake structures and the ultimate heat sink. The unique aspects of design certification applications, such as inspections, tests, analyses, and acceptance criteria, are described in Section 14.3 of the SRP.

Revisions to the SRP

The SRP is intended to provide complete comprehensive guidance for staff review of applicant submittals within its scope. The SRP is the result of many years of experience by the staff in establishing and using regulatory requirements to evaluate the safety of nuclear power plants and the review of Safety Analysis Reports. This SRP may be considered part of a continuing regulatory standards development activity that not only documents current methods of review but also provides a basis for orderly modifications of the review process in the future. The Commission disseminates information regarding current safety issues and proposed solutions though various means such as generic communications, proposed rules, proposed NRC regulatory guides, and generic safety issues. A data base is maintained of these issues and documents related to the scope of reviews currently addressed in the SRP. As these safety issues are resolved and regulations and guidance are finalized and promulgated, the SRP will be revised as necessary. The safety review of information provided by applicants will also include consideration of these issues in addition to the criteria contained in the SRP. The SRP will be maintained current by periodic updating to reflect new NRC requirements and guidance relevant to licensing reviews. The need for SRP text revisions will be evaluated periodically and a determination will be made based on the extent and the nature of the required changes. Until a revision to the SRP section is published, the NRC will maintain and publish annually a list of the additional issues that will be considered in the review of license applications. The SRP revision in effect at any time consists of the published SRP text plus the additional issues.

Content of the SRP

The SRP is written to cover a variety of site conditions and plant designs. Each section is written to provide the complete procedure and all acceptance criteria for all of the areas of review pertinent to that section. However, for any given application, the staff reviewers may select and emphasize particular aspects of each SRP section as is appropriate for the application. In some cases, the major portion of the review of a plant feature may be done on a generic basis with the designer of that feature rather than in the context of reviews of particular applications from utilities. In other cases a plant feature may be sufficiently similar to that of a previous plant so that a new and detailed review of the feature is not needed. For these and other similar reasons, the staff may not carry out in detail all of the review steps listed in each SRP section in the review of every application.

The individual SRP sections address, in detail, the NRR organizational elements that perform the review, the matters that are reviewed, the basis for review, how the review is accomplished, and the conclusions that are sought. One of the objectives of the SRP is to assign the review responsibilities to the various NRR technical branches and to define the sometimes complex interfaces between them. Each SRP section identifies the NRR technical branch that has the primary review responsibility for that section. In some review areas the primary branch may require support, and the branches that are assigned these secondary review responsibilities are also identified for each SRP section.

The SRP is directed toward light-water-cooled nuclear power plants. Staff reviewers will adapt the SRP for use in the reviews of other reactor types where applicable.

Each SRP section is organized into six subsections as follows:

I. Areas of Review

This subsection describes the scope of the review for which that SRP section provides guidance: that is, it specifies what is being reviewed by the NRR branch having primary review responsibility (primary review branch). This subsection contains a description of the systems, components, analyses, data, or other information on which the review will be based. It also identifies inputs to be provided by other NRR branches (secondary review branches), or review interfaces with other SRP sections, necessary for the primary review branch to complete its review.

II. Acceptance Criteria

This subsection contains a statement of the purpose of the review, an identification of which NRC requirements are applicable, and the specific criteria for determining the acceptability of the design or the programs within the scope of the area of review of the SRP section. A technical rationale discussion is provided to describe the safety rationale associated with selecting and applying specific regulatory requirements to the area being reviewed in the SRP section.

Over time, regulatory guidance provided by the NRC has evolved to become much more detailed and comprehensive. This evolution is consistent with the increase in safety information resulting from the analysis of nuclear plant operating experience, regulatory research activities, and further development of design codes and standards.

Specific criteria identified in Acceptance Criteria consist of detailed interpretations of the regulations used by the NRC in carrying out the safety review of nuclear plants. Specific criteria may be contained in documents such as NRC Regulatory Guides, Codes and Standards, Branch Technical Positions, and other documents cited in Acceptance Criteria. This specific criteria typically sets forth the solutions and approaches determined to be acceptable in the past by the staff in dealing with a specific safety concern or safety related design area. These solutions and approaches are established in this form so that staff reviewers can take uniform and well understood positions as the same safety issues arise in future cases.

The specific criteria identify solutions and approaches that are acceptable to the staff, but they are not required as the only possible solutions and approaches. However, applicants should recognize that substantial time and effort on the part of the staff has gone into the development of the specific criteria and that a corresponding amount of time and effort may be required to review and accept new or different solutions and approaches. Thus, applicants proposing solutions and approaches to safety problems or safety related design areas other than those described in the specific criteria must expect longer review times and more extensive questioning in these areas. The staff will consider proposals for other solutions and approaches

on a generic basis, apart from a specific license application, to avoid the impact of the additional review time on individual cases.

III. Review Procedures

This subsection discusses how the review is accomplished. The section is generally a step-by-step procedure that the reviewer goes through to provide reasonable verification that the applicable safety criteria have been met.

IV. Evaluation Findings

This subsection presents the type of conclusion that is sought for the particular review area. For each section, a conclusion of this type is included in the staff's Safety Evaluation Report (SER) in which the staff publishes the results of its review. The SER also contains a description of the review including such subjects as which aspects of the review were selected or emphasized; which matters were modified by the applicant, require additional information, will be resolved in the future, or remain unresolved; where the plant's design or the applicant's programs deviate from the criteria stated in the SRP; and the bases for any deviations from the SRP or exemptions from the regulations.

V. Implementation

This subsection provides guidance to applicants and licensees regarding the staff's plans for use of the SRP section and its applicability.

VI. References

This subsection lists the references used in the review process.

The SRP will be revised and updated periodically as the need arises to clarify the content or correct errors and to incorporate modifications approved by the Director of the Office of Nuclear Reactor Regulation. A revision number and publication date are printed at a lower corner of each page of each SRP section. Since individual sections have been, and will continue to be, revised as needed, the revision numbers and dates will not be the same for all sections. As necessary, corresponding changes to the Standard Format will also be made. Comments and suggestions for improvement will be considered and should be sent to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Notices of errors or omissions should also be sent to the same address.