THE USNRC LICENSE RENEWAL PROCESS
SYNOPSIS
BY
PAO-TSIN KUO, PhD, PE
LICENSE RENEWAL AND ENVIRONMENTAL IMPACTS PROGRAM
DIVISION OF REGULATORY IMPROVEMENT PROGRAMS
OFFICE OF NUCLEAR REACTOR REGULATION
U. S. NUCLEAR REGULATORY COMMISSION

Background

The U.S. Congress promulgated a law in 1954, entitled "Atomic Energy Act." This Act states that operating licenses for commercial nuclear power plants are limited to a fixed term of 40 years, but they may be renewed for a period not to exceed 20 years. The terms were established mainly for economic considerations, not based on technical limitations.

The U.S. Nuclear Regulatory Commission (USNRC) published the license renewal rule, Title 10 of the Code of Federal Regulations, Part 54 (10 CFR Part 54), in December 1991. The rule has since been amended in May, 1995. The underlying principle of the rule is that the regulatory process is adequate for ensuring safety of operating plants. The regulatory process includes NRC's issuance of Orders, Bulletins, Generic Letters, and Information Notices, as well as a number of special inspections in addition to the continuous oversight and routine inspection activities performed by on-site inspectors. Because of this comprehensive regulatory process, compilation of the current license basis or re-verification of the current licensing basis is not considered necessary for a license renewal review. The USNRC also determined on the basis of the findings of its research programs that active structures and components are well maintained by the existing programs. Therefore, the focus of the license renewal review is on passive, long-lived structures and components and on time-limited aging analyses. The time-limited aging analyses are for those structures and components which were originally designed to a 40-year service life.

The License Renewal Rule, 10 CFR Part 54

The USNRC license renewal rule rests on the determination that current operating plants continue to maintain adequate level of safety, and over the plants' life, this level has been enhanced through maintenance of the current licensing basis, with appropriate adjustments to address new information from industry's operating experience. Additionally, the regulatory activities have provided ongoing assurance that the current licensing basis will continue to provide an acceptable level of safety. Based on this determination, the USNRC has established two fundamental principles for license renewal:

Attachment

1. With the possible exception of the detrimental effects of aging on the functionality of certain plant systems, structures, and components in the period of extended operation and possibly a few other issues related to safety only during extended operation, the regulatory process is adequate to ensure that the licensing basis of all currently operating plants provides and maintains an acceptable level of safety so that operation will not be inimical to public health and safety or common defense and security; and

2. The plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term.

Consistent with these two principles, the rule defines a process for evaluating the effects of aging on system, structure, and component performance, and developing a license renewal application. The process has three major steps: 1) perform a scoping assessment, 2) do an integrated plant assessment (IPA), and 3) demonstrate that aging effects will be adequately managed in the period of extended operation. In addition, the rule includes provisions for evaluating time-limited aging analyses and specifies the technical information required in a license renewal application. Additional particulars are contained in the rule governing, among other things, the requirement for a Final Safety Analysis Report (FSAR) Supplement, the treatment of changes to the current licensing basis during the NRC's review of the application, the referral of applications to the Advisory Committee on Reactor Safeguards, the environmental report requirement (not discussed in this paper), and standards for the issuance of a renewed operating license.

The Review Guidance Documents

The USNRC has renewed eight operating licenses contained in four license renewal applications to date. Six license renewal applications for 15 operating licenses are currently under review. There is a growing list of utilities who have announced their intention to submit license renewal applications. To facilitate the review of these current and future license renewal applications, the USNRC has established a streamlined process for reviewing applications consistently and expeditiously by developing three improved guidance documents, namely, Generic Aging Lessons Learned (GALL) report, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR), and Regulatory Guide for Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses (RG-1.188). These guidance documents were developed to incorporate the lessons learned from the development and the USNRC's review of the initial license renewal applications; to provide information on the license renewal process to the public; and to provide guidance to potential license renewal applicants and staff reviewers.

During the review of the first four applications, the USNRC and the industry recognized that most of the existing programs at the plants could adequately manage aging effects for license renewal without change. Therefore, the USNRC staff undertook a generic review and a technical evaluation of existing plant programs to determine which programs would adequately manage aging effects without change and which programs would need to be augmented. The technical evaluation is documented in the GALL report which is the technical basis for the SRP-LR. The Nuclear Energy Institute (NEI), an industry organization, has also developed a guidance

document, NEI 95-10, entitled “Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule,” for the industry on developing a license renewal application. RG-1.188 endorses Revision 3 of NEI 95-10.

These guidance documents were developed to be used collectively and to provide consistent guidance to staff reviewers and license renewal applicants. While the GALL report, the SRP-LR, and RG-1.188 are not mandatory USNRC requirements, they represent an acceptable method to meeting the license renewal rule. Together, they provide a complete, stable and efficient regulatory framework for ensuring continued plant safety in the period of extended operation.