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PRESIDENT AND
CHIEF EXECUTIVE OFFICER

May 13, 1991

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Chairman Kenneth M. Carr
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Chairman Carr:

As promised in my April 26, 1991 letter, enclosed is a markup of the NRC draft Statement of Considerations (SOC) which accompanied the draft License Renewal rule. The enclosure contains a detailed markup with annotated footnotes explaining the suggested changes.

Our suggested changes are intended to assure that the SOC provides a firm foundation for a rule that focuses on age related degradation affecting the safety function of important systems, structures and components. The aim is to make it clear that the rule seeks to determine that programs for monitoring, maintenance, refurbishment and replacement of components assure that the plant can be safely operated in the renewal period. Our concern is that the present SOC is overly broad and unclear in intent. Language in it can be interpreted to support imposition of requirements beyond those currently imposed on new operating licensees. By tightening up the SOC in this way, the public and the prospective licensee applicants can better understand the focus on assurance of component performance during the renewal term and not on the collection, preservation, and production of a licensing basis.

The fundamental issue at hand appears to me to be the appropriate standard to be used to determine whether a renewal license should be issued. The standard that we would recommend is the "adequate protection" standard identified by Sec. 182 of the Atomic Energy Act. The NRC has already made, and continues to make, in the course of its inspection and enforcement processes, assessments of adequacy as well as numerous findings beyond that level. Thus, NRC can, and has, concluded that the safety level of existing plants is adequate.

Unfortunately, much of the discussion on the rule has focused on the peripheral issue of compilation of the current licensing basis. If the standard proposed above is used for the rule, the issue becomes moot and compilation becomes unnecessary. If the present standard as proposed in the NRC rule and SOC is used, namely, maintenance of the CLB vs. assurance of adequate protection, the compilation issue and the attendant impact become a fundamental question relating to the scope of review.

DSB

A fine distinction must be understood here. There is no dispute whatsoever that the current licensing basis should be carried forward into the renewal term. This means that a licensee must continue to satisfy, in the renewal term, every requirement that exists in the CLB and also must satisfy any additional requirements resulting from the renewal review. However, as crafted, the draft SOC indicates that the CLB would effectively be elevated to a license condition because of its use as the standard. This, we feel, is a misuse of the CLB and a point of unnecessary confusion.

Our suggestion is that the rule and SOC be modified to reflect the standard of adequate protection. Information extracted from the CLB will be used and identified as such when needed for the analysis of specific systems, structures and components. It is my belief that the changes necessary to implement this standard are relatively minor and more accurately reflect the fundamental intentions of the Commissioners as to what is required for a renewal license.

By focusing on the rule and SOC, the proper framework for subsequent regulatory guidance documents will be established to reflect this intent. By establishing a License Renewal Rule, we create a process of enhanced monitoring and detection which includes continuation of the refurbishment and replacement processes now in use. We should not leave the impression, whether intentional or not, that there will be no component failures in the future. Clearly, a component failure does not reflect a failure of the licensee's entire age management program. This does not reflect reality nor should it appear to be the intent of the Nuclear Regulatory Commission. We have to be practical and reasonable and not set expectations that go beyond high, but achievable, goals. By heavy reliance on frequency, probability analyses, and lifetime calculations to attempt to preclude failure events on paper, we foster this notion. As a practical matter, such analyses are not necessary to assure safety. Over the last thirty years, we have demonstrated that with adequate maintenance, testing and surveillance we can assure safety.

I appreciate the time and attention you have given this issue. Clearly, how the License Renewal rule and the Statement of Considerations is worded will significantly influence the final process and its effectiveness.

If you have any additional questions on this issue, please do not hesitate contacting me.

Sincerely yours,

Andrew C. Kadak

ACK/kg

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 2, 50, and 54

RIN 3150-AD04

Nuclear Power Plant License Renewal

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission is proposing to issue a rule that would establish the requirements that an applicant for renewal of a nuclear power plant operating license must meet, the information that must be submitted to the NRC for review so that the agency can determine whether those requirements have in fact been met, and the application procedures. This proposed rule will inform nuclear power plant licensees of necessary requirements for renewing operating licenses.

DATE: The comment period expires 90 days from the date of publication in the Federal Register. Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Comments may be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch, or may be hand-delivered to One White Flint North, 11555 Rockville Pike, Rockville, MD 20852, between 7:30 am and 4:15 pm Federal workdays. Copies of comments received may be examined at the Commission's Public Document Room at 2120 L St., NW (Lower Level), Washington, DC, between the hours of 7:45 am and 4:15 pm Federal workdays.

FOR FURTHER INFORMATION CONTACT: George Sage, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: (301) 492-3917.

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1. INTRODUCTION

The Atomic Energy Act of 1954 (AEA) limits the duration of most operating licenses for nuclear power plants to a maximum of 40 years, but permits their renewal. The Commission's regulations at 10 CFR 50.51 implement this authority by permitting renewal. However, § 50.51 provides no standards or procedures for determining renewal applications. The Department of Energy and the commercial nuclear utility industry has expressed considerable interest in operating existing nuclear power plants beyond their initial term of operation.¹ The industry has undertaken several initiatives in support of plant life extension. A Steering Committee on Nuclear Plant Life Extension (NUPLEX) has been formed under the direction of the Nuclear Management and Resources Council (NUMARC). The Electric Power Research Institute (EPRI), in cooperation with the U.S. Department of Energy (DOE), and two utilities have sponsored research on life extension, including pilot studies on two nuclear plants, Surry-1 and Monticello. This has culminated in DOE and EPRI funding of two lead applications for renewal of the operating licenses for the Yankee Rowe and Monticello facilities.²

1 NRC states that the nuclear industry:
 "... has expressed considerable interest in operating existing nuclear power plants beyond their initial term of operation ..."

and

"... The nuclear industry has urged the NRC to develop standards and procedures for license renewal ..."

While these statements are true, the point should be made that it is not only the nuclear industry that is in favor of license renewal, but others as well. For example, DOE also supports NRC's initiative in this area. The importance of license renewal should be portrayed as being more global in scope, not limited to the nuclear industry.

2 EPRI should be identified as a co-sponsor of the Lead Plant Projects.

The Department of Energy and the commercial nuclear industry have urged the NRC to develop standards and procedures for license renewal so that the utilities would know what will be required to obtain a renewed operating license (See footnote 1). The industry states that a license renewal rule is needed now because of the need for a significant number of plants to make decisions in the near future as to whether to seek license renewal. For the oldest nuclear power plants, the expiration of their original license term is approaching. If the 108 nuclear power plants licensed as of the end of 1989 were licensed for 40 years from the date of their operating license, the first eight plants will have their licenses expire during the years 2000 to 2009, with another 40 licenses expiring by 2014. Utilities contend that they will require 10 to 15 years to plan and build replacement power plants if the operating licenses for existing nuclear power plants are not renewed. They also contend that the NRC's technical requirements for license renewal must be established before utilities can reasonably determine whether renewal of their existing operating licenses is economically and technically justified. (For more information on the expiration of facility operating licenses, see Appendix A to the Regulatory Analysis for License Renewal, NUREG-1362.) To ensure a reasoned process for considering license renewal for those who may pursue it, the NRC has determined to proceed with license renewal rulemaking now in order to establish the requirements for renewal of nuclear power plant operating licenses in a timely fashion.

II. BACKGROUND

The NRC's research program on the degradation of nuclear power plant systems, structures, and components (SSCs) due to aging began in the early 1980s. In 1982, the NRC staff, recognizing the potential impact of plant aging phenomena on the continued safe operation of nuclear power plants, convened a "Workshop on Plant Aging" in Bethesda, Maryland. The purpose of the workshop was to focus attention on how to best proceed to identify and

resolve the various technical plant aging issues relevant to life extension. In 1985, the Division of Engineering of the Office of Nuclear Regulatory Research issued the first comprehensive program plan (NUREG-1144) for nuclear power plant aging research. By 1986, age-related degradation became a more important priority with the recognition that utilities were interested in extending the life of their existing power plants beyond the term of up to 40 years of their original operating licenses. In response, the NRC staff developed the "Plan to Accomplish Technical Integration for Plant Aging/Life Extension" (May 1987) and established a Technical Review Group for Aging and Life Extension (TIRGALEX). The objectives of TIRGALEX were to clearly define the technical safety and regulatory policy issues associated with plant aging and life extension and to develop a plan for resolving the issues in a timely, well-integrated manner. In May 1987, the TIRGALEX report was issued. It identified a broad spectrum of technical safety and regulatory policy issues. These included identification of systems, structures, and components that are susceptible to aging and could adversely affect safety; degradation processes; testing, surveillance, and maintenance requirements; and criteria for evaluating residual life. TIRGALEX concluded that many aging phenomena are readily managed and do not pose major technical issues that would preclude life extension, provided that necessary compensatory measures such as maintenance, surveillance, repair, and replacement are effectively implemented during the extended operation, and for a number of the measures during the existing license term as well.

Simultaneously, a request for comments on establishment of a policy statement on life extension was published in the Federal Register (51 FR 40334; November 6, 1986). Comments were requested on seven major policy, technical, and procedural issues (21 separate questions). The first and sixth policy areas focused on the timing of regulatory action on life extension, including the need for a policy statement, and timing of resolution of policy, technical, and procedural issues. The earliest and latest dates for filing a life extension application and the potential term of such an

extension were the subject of the second and a portion of the fourth policy area. The question of an appropriate licensing basis was the third policy issue, including the need for and role of a probabilistic risk assessment (PRA). The fourth and fifth areas focused on technical issues regarding the nature of aging degradation, its identification and mitigation, and the need for research and changes to industry codes and standards. The final policy area was the need for procedural changes in the Commission's regulations for handling life extension requests. A total of 58 written comments were received from the electric utility industry, public interest groups, private citizens, independent consultants, and government agencies. These comments were reviewed and a summary provided in SECY-87-179, "Status of Staff Activities to Develop a License Renewal Policy, Regulations and Licensing Guidance and to Report on Public Comments" (July 21, 1987).

Based on these comments, the staff began to specifically identify and resolve the wide variety of policy and technical issues relevant to life extension. In August 1988, the staff published an Advance Notice of Proposed Rulemaking (ANPRM) in the Federal Register (53 FR 32919; August 29, 1988) in which the Commission announced its intention to bypass a policy statement and go directly to preparing a proposed rule on license renewal. The ANPRM also announced the availability of NUREG-1317, "Regulatory Options for Nuclear Plant License Renewal," and requested comments on the issues discussed. First three alternative licensing bases for assessing the adequacy of a life extension application were presented and discussed: (a) the existing licensing basis for a facility, (b) supplementation of the existing licensing basis with reviews in safety significant areas, or (c) compliance with new plant standards at the time the application is submitted. Commenters were asked to identify whether any other major regulatory options for license renewal should be considered, and whether verification of the existing licensing basis at each plant should be required for license renewal. Second, two alternatives for handling uncertainties in age-related degradation were described and discussed: (a) emphasize maintenance, inspection, and reliability assurance,

or (b) emphasize defense-in-depth. The relative merit of the two alternatives was the second subject for comment. Third, the advisability of preparing a generic environmental impact statement (EIS) and whether Part 51 should be amended to permit the NRC the option of preparing an environmental assessment (EA) instead of an EIS were discussed. Finally, 12 procedural and policy issues were discussed. Comments on the environmental, procedural, and policy issues were invited.

Fifty-three written comments were received from nuclear industry groups and individual utilities, public interest groups, and Federal and State agencies in response to the ANPRM and commenting on NUREG-1317. An overview and summary analysis of the comments are contained in NUREG/CR5332, "Summary and Analysis of Public Comments on NUREG-1317: Regulatory Options for Nuclear Plant License Renewal" (March 1989).

Also in 1988 the NRC, in cooperation with the American Nuclear Society (ANS), the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), and the Institute of Electrical and Electronics Engineers (IEEE), sponsored an International Nuclear Power Plant Aging Symposium. The symposium, which was held in Bethesda, Maryland, from August 30 to September 1, 1988, was attended by more than 550 internationally prominent nuclear scientists and engineers from 16 countries. The symposium focused on the potential safety issues arising from progressive aging of nuclear power plants. These issues included aging of structures in austenitic steel, fatigue life of structural materials, aging of insulating materials, degradation of pumps and valves, reliability of safety system components, radiation and thermal embrittlement of metals, and erosion-corrosion of fluid-mechanical systems. Discussion addressed topics in the staff's report NUREG-1317, which had been published immediately preceding the symposium. The proceedings of the symposium were published as NUREG/CP-0100 in March 1989.

The NRC staff's views on specific license renewal issues, as evolved in early 1989, were presented to the public in an NRC panel discussion and question and answer session at the NRC's Regulatory Information Conference, held on April 18, 19, and 20, 1989. Among the issues discussed were the nature of a renewed license (renewed license versus amendment of existing license), the need for probability risk assessment (PRA), integration with the

Individual Plant Examination (IPE) process, and compliance with the National Environmental Policy Act (NEPA).

On October 13, 1989 (54 FR 41980), the Commission announced that a workshop would be held on November 13 and 14, 1989, to focus on specific technical issues, including identification of the significant technical issues bearing on safety, the nature and content of standards for issuance of a renewed license, and the appropriate role and scope of deterministic and probabilistic risk assessments. In addition, the schedule for rulemaking and alternatives for addressing compliance with NEPA were identified as issues for discussion. General questions to focus workshop discussions were provided in the Federal Register notice and later supplemented by a more detailed set of questions. In addition, the Federal Register notice included a "Preliminary Regulatory Philosophy and Approach for License Renewal Regulation" and an "outline of a Conceptual approach to a License Renewal Rule." Written comments on the questions posed, the statement of regulatory philosophy, and the conceptual rule outline were accepted by the agency up to December 1, 1989. Transcripts were made of the entire workshop. Two hundred and one individuals (not including NRC staff) representing 89 organizations registered for the workshop. A partial listing by category includes 62 individuals representing 28 electric utilities, 10 individuals representing 2 nuclear industry groups, 16 individuals representing 4 nuclear vendors, 5 individuals representing 2 architect-engineer firms, 36 industry consultants representing 26 firms, 5 individuals representing 4 State agencies, 2 journalists from 2 trade press organizations, and 1 individual from a public interest group. Comments provided during the workshop were from industry representatives and individuals affiliated with the nuclear industry. The Nuclear Management and Resources Council (NUMARC), Yankee Atomic Electric Company, and Northern States Power Company presented prepared comments at each session. In addition, written comments were received from 12 organizations, including substantial submissions by NUMARC, Yankee Atomic, Northern States Power, Westinghouse, the Illinois Department of Nuclear Safety, and an independent consultant. DOE was the only Federal agency submitting written comments. No comments were submitted by any public interest group.

III. PROPOSED ACTION

The Atomic Energy Act, which permits renewal of licenses, and the license renewal rule already in effect (10 CFR 50.51) do not contain specific procedures, criteria, and standards that must be satisfied in order to renew a license. The proposed rule would establish the procedures, criteria, and standards governing nuclear power plant license renewal.

The following are the principal elements of the proposed rule:

(1) The licensing basis for a nuclear power plant during the renewal term will consist of the current licensing basis for that plant together with any additional considerations related to possible degradation through aging of systems, structures, and components (SSCs) important to license renewal, necessary to ensure that the facility can continue to be operated without undue risk to the health and safety of the public. The "current licensing basis" includes all applicable NRC requirements and licensee commitments, as defined in the rule.

(2) Provisions are included requiring renewal applicants to perform and submit an integrated plant assessment, in which systems, structures, and components important to license renewal are identified and screened, to determine and describe the required age-related degradation management actions.

- (3) An application is required to contain specified information for NRC review, including a description of plans for aging management.
- (4) Opportunity for public hearings is provided.
- (5) Application may be made not more than 20 years before license expiration. It must be made not less than 3 years before license expiration for the timely renewal provision of 10 CFR 2.109 to apply.
- (6) A renewal license is effective upon its issuance.

- (7) A renewal term may be granted or approved as justified by the licensee, but not for more than 20 years beyond the original license expiration.

IV. PRINCIPAL ISSUES

a. Regulatory Philosophy and Approach

(i) Two Principles.

The regulation that the Commission proposes for license renewal is founded on two key principles. The first principle is that, ~~with the exception of age-related degradation,~~ the current licensing basis for each reactor provides ~~and maintains~~ an acceptable level of safety for operation during any renewal period. The second and equally important principle is that each plant's current licensing basis must be ~~maintained~~ retained during the renewal period. The continued performance of safety functions must be assured. This is done by continuation of existing programs and through an augmented ~~in part through a~~ program of age-related degradation management for systems, structures, and components ~~that are important in this connection~~ where deemed necessary. In establishing these two key principles for license renewal, the Commission makes special note of the fact that age-related degradation management is an integral part of the CLB for both initial licenses and license renewals.³

³ The purpose of the license renewal reviews is to identify additional measures necessary to supplement existing activities and programs under the current licensing basis to manage and mitigate age-related degradation right now. In many cases, particularly those involving relatively short-lived components, these activities will be adequate for the renewal term. In the case of other, longer-lived equipment, a specific evaluation is needed to determine if age-related degradation mechanisms will be adequately managed. As a consequence, the key principles have been restated to clarify that, instead of an apparent exception to the adequacy of the CLB, age-related degradation and the management thereof would be continued and augmented during the renewal period.

(ii) First Principle: Licensing Basis ~~Retention~~ Adequacy.⁴

The current licensing basis, as used above, means the Commission requirements and licensee commitments imposed on a nuclear power plant at the time of the initial license, as modified or supplemented by the many additional requirements that have been imposed on the licensee by the Commission subsequent to the initial license and by the additional commitments made by the licensee during the period of plant operation up to the filing of a renewal application. This principle is founded on the Commission's initial finding of adequate protection for the initial design and construction of a nuclear power plant, as well as the Commission's continuing oversight and regulatory actions with respect to nuclear power plants. The Commission may issue an operating license to a utility only if it can make the findings required by 10 CFR 50.57. More specifically, the Commission must conclude that the facility will operate in compliance with the application, as amended, and the rules and regulations of the Commission. Further, the Commission must conclude that the authorized activities can be conducted without endangering the health and safety of the public and that the issuance of an operating license will not be inimical to the common defense and security or the public health and safety. Thus, when the Commission issues an initial operating license, it has determined that the design, construction, and proposed operation of the facility satisfy the Commission's requirements and provide adequate protection of the public health and safety and common defense and security.

However, the licensing basis upon which the Commission determined that an acceptable level of safety existed does not remain fixed for the term of the operating license. Rather, the licensing basis continues to evolve during the term of operation, in part due to the continuing regulatory activities of the Commission. These include research, inspections, and the evaluation of operating experience. New requirements and guidance are promulgated by the

⁴ The title of the first key principle for license renewal does not accurately describe the principle.

Commission which may require plant modifications on a plant-specific basis; generic and unresolved safety issues are resolved and the resolution may require that licensees evaluate and modify their designs; and additional evaluations are routinely required as the Commission identifies areas of plant operation that require additional understanding.⁵

(iii) Review of Operating Events.

The Commission has a program for the review of operating events at nuclear power plants. As a requirement of the current licensing basis, and one which would continue during the renewal term, each licensee is required to notify the Commission promptly of any plant event that meets or exceeds the threshold defined in 10 CFR 50.72 and to file a written licensee event report for those events that meet or exceed the threshold defined in 10 CFR 50.73. This information is reviewed daily and follow-up efforts are carried out for events that appear to be potentially risk significant or are judged to be a possible precursor to a more severe event. Depending on the significance, further action may be taken to notify all licensees or to impose additional requirements. Information on operating events is disseminated by the NRC in the form of information notices, bulletins, and other reports; by individual licensees in the form of licensee event reports. The total process offers a high degree of assurance that events that are potentially risk significant or precursors to potentially significant events are being reviewed and resolved expeditiously.

(iv) Generic Safety Issues.

As described in SECY-89-148, the Commission also maintains an active program for evaluating and resolving generic issues that may impact public health and safety. A generic safety issue (GSI) involves a safety concern that may affect the design, construction, or operation of all, several, or a class of reactors or facilities. Its resolution may have a potential for

safety improvements and promulgation of new or revised requirements or guidance. It should be noted, however, that all unresolved GSIs generally address only enhancements of safety. This conclusion was determined during the initial evaluation of the generic concern which assessed whether any aspect of the generic concern might have a significant impact on the protection of the public health and safety or that immediate remedial action would be warranted. The licensing basis of individual plants includes changes that have resulted from resolution of generic issues determined to be applicable and will include applicable generic-issue-derived changes in the future.

A special group of 22 generic safety issues deemed to be of sufficient significance to warrant both a high-priority resolution effort and special attention in tracking was designated as unresolved safety issues (USIs). All USIs have been resolved. Most of the USI resolutions have been implemented; the remainder are being implemented on a schedule found satisfactory by the staff.

The USI and GSI resolution process is limited to issues that are not of such gravity that immediate action (remedy or shutdown) is required.

Cost-benefit analyses were employed as part of the basis of resolving GSIs involving safety enhancement above the adequate-safety level. In these tradeoffs between net safety benefit and net cost, the remaining plant operating term ordinarily enters the calculations. However, such calculations do not have a precision sufficient to make a significant distinction between plant operating terms with and without a 20-year renewal, given the fact that these decisions have been based on average plant ages in the first half of a 40-year license term. Accordingly, it is not necessary to reexamine in the license renewal context such cost-benefit calculations underlying decisions not to backfit. Should special circumstances in connection with a particular issue as applied to a particular plant warrant reassessment, such reassessment would be undertaken on a plant-specific basis.

(v) Systematic Evaluation Program.

In 1977 the NRC initiated the Systematic Evaluation Program (SEP) to review the designs of older operating nuclear power plants and thereby confirm and document their safety. The reviews were organized into approximately 90 review topics (reduced by consolidations from 137 originally identified). The review results were documented in a series of Integrated Plant Safety Assessment Reports. As a result of these reviews with respect to some of the issues, the licensees proposed and implemented procedural or hardware modifications or additional analyses to define corrective actions that would improve plant safety with respect to the differences from current requirements that were identified.

The SEP effort highlighted a smaller group of 27 regulatory topics for which corrective action was generally found to be necessary for all of the initial SEP plants and for which significant safety improvements for other operating plants of the same vintage could be expected. The topics on this smaller list are referred to as the SEP "lessons learned," and the staff expects that these topics would be generally applicable to operating plants that received their construction permits in the late 1960s or early 1970s.

As part of the current staff effort associated with documenting the regulatory processes that contribute to the continued adequacy of the current licensing bases at operating plants, the staff has under way a short-term effort to identify how specific "lessons learned" from the SEP effort have been factored into the licensing bases of all operating plants or into ongoing regulatory programs. Resolutions are matters for the current licensing terms.⁶ The staff program includes identification and definition of the lessons learned as generic safety issues and determination of the appropriate priority rankings for the resolution of these issues. The staff effort will take public comments on this issue into account.

⁶ The SEP program as with other generic issues identified in the CLBs requires resolution in today's licensing terms. They have no reason to be tied to license renewal for conclusion.

(vi) Consistency of Regulatory Philosophy.

The regulatory philosophy containing the two fundamental principles is also consistent with the Commission policy stated in the Policy Statement entitled "Severe Reactor Accidents Regarding Future Designs and Existing Plants (50 FR 23138; August 8, 1985)." In this Policy Statement, the Commission concluded that existing plants pose no undue risk to public health and safety. Moreover, the Commission stated that it has ongoing nuclear safety programs, described in NUREG-1070, that include the resolution of unresolved safety and generic safety issues, the Severe Accident Research Program, operating experience and data evaluation concerning equipment failures and human error, and scrutiny by NRC inspectors to monitor the quality of plant construction, operation, and maintenance. If new safety information were to become available, from any source, to question the conclusion of no undue risk, then the technical issue(s) so identified would be resolved by the NRC under its backfit policy and other existing procedures including the possibility of generic rulemaking.

(vii) Probabilistic Risk Assessment.

Although a plant-specific probabilistic risk assessment (PRA) or plant safety assessment (PSA) will not be a requirement for the renewal of plant operating licenses, the Commission recognizes that a plant-specific probabilistic assessment can be used as an effective tool that can provide integrated insights into the plant design and procedures and provide an additional measure of overall plant safety. ~~The Commission understands that all plants will have completed a plant specific PRA as part of the Individual Plant Examination program.~~⁷ Probabilistic assessment techniques could also be

7 This section states that PRA is not a requirement of the license renewal rule, but that the Commission "understands" that all plants will have completed a plant-specific PRA as part of the Individual Plant Examination (IPE) program. This statement is disturbing because it may lead the staff in the future to view the completion of the IPE process as a prerequisite to license renewal.

This possibility is not remote. In the January 30 briefing to the Commissioners, the staff stated, with respect to severe accident

used as a supplemental tool in the renewal applicant's integrated plant assessment that is to underlie the plant's age-related degradation management program as well as in monitoring the safety implications of a plant's performance during the renewal term. As part of the monitoring function, time trends in the frequency of events or in the rate of deterioration of equipment with significant safety implications could be identified. This monitoring process helps ensure that acceptable levels of safety are maintained during the lifetime of any reactor, including any renewal terms.

(viii) Ongoing Assurance.

Thus, the Commission-required changes to a plant's licensing basis provide ongoing assurance that the original Commission conclusion of adequate protection of the health and safety and common defense and security continues to remain valid throughout the remaining term of the facility's operating license.

closure, that it "expects" the IPE results to be either implemented or scheduled before an application is tendered, and intends to emphasize this expectation in the statement of considerations published with the license renewal rule. The staff explained "... I think the argument would be that if you don't have severe accidents closed, you don't know what your licensing basis is..." (Tr. 42)

These statements are inconsistent with the CLB concept. The performance of IPEs and the closure of severe accidents will proceed irrespective of license renewal; and, when changes are made in response to severe accident issues, those changes will become part of the CLB. The NRC staff has not explained why this normal course of consideration would not be acceptable for plants seeking license renewal. Moreover, attempting to link license renewal with the completion of an IPE (or the closure of severe accident issues) by announcing an "understand[ing]" in the explanatory statement accompanying the renewal rule may raise questions about what is, in fact, legally required, may lead to inconsistent NRC reviews of license renewal applications, and does create the possibility of severe accident issues being litigated in renewal proceedings.

- (ix) Second Principle: ~~Maintaining~~ Retaining the Licensing Basis During Renewal Term.⁸

The second principle for license renewal is that the Commission must ensure that the plant-specific licensing basis is ~~maintained~~ retained and carried forward during the renewal term.⁹ This principle is a necessary

8 Striking reference to age-related degradation in the second principle corrects the misimpression that age-degradation management is not part of the CLB and preserves the intent of the Commission to emphasize age-related degradation further. It is necessary to strike pertinent references in the second principle to avoid the possibility of interpretations which could present inconsistencies in the Commission position. In this regard, the second principle was described in the following phrase:

"... each plant's current licensing basis must be maintained during the renewal period. ..."

The problem here is in the use of the word "maintained". The maintenance of equipment performance must not be confused with a hypothetical "maintenance" of the CLB. To avoid this potential conclusion, the notion of maintenance has been removed.

Also, the CLB is dynamic and changes throughout both the initial operating term and throughout the renewal term. The NRC and licensee will change the CLB, when necessary, during the renewal term to ensure that an acceptable level of safety is always provided. Treatment of the CLB during the renewal term should be no different than during the initial operating term. It is "an acceptable level of safety" that must be maintained throughout the initial and renewed operating terms. As in the first principle, it is the level of safety that matters. Qualification of NRC's conclusion regarding adequate protection and adherence to the licensing basis implies that there is not sufficient proof to conclude in the affirmative. The fact is that, as a result of the NRC's initial OL review and subsequent review, reporting, and inspection activities, the NRC has more than enough information to conclude affirmatively that each operating plant's licensing basis does provide adequate protection of the public health and safety and the environment, and as is similarly the case in the initial license term, licensees will adhere to their licensing basis.

- 9 The second and equally important principle is that the CLB for each plant shall continue in effect through the period of renewal except for such changes as may be necessary to maintain an acceptable level of safety.

Striking reference to age-related degradation in the second principle corrects misimpression the problem in both principles and would preserve the intent of the Commission to point out the importance of addressing age-related degradation. It is necessary to strike some wording in the second principle to avoid the possibility of interpretations which could be inconsistent. In this regard, consider the second principle as provided in the Proposed Rulemaking.

"...each plant's current licensing basis must be maintained during the renewal period...."

The problem here is in the use of the word "maintained." This suggests that the CLB at the time of renewal is static. Such a position is inconsistent with the Commission's recognition of the changing nature of

complement to the first principle. As discussed above, the first principle is founded upon a generic determination that each nuclear power plant's licensing basis, if complied with, provides reasonable assurance of adequate protection throughout the renewal term. Therefore, it follows that each nuclear power plant that complies with its license throughout the renewal term will actually provide the adequate protection ~~thought to be provided~~ by the licensing basis.¹⁰ ~~The Commission believes that~~ adherence to the licensing basis can

the CLB. For instance, in the following examples from the Statement of Consideration, NRC describes a process of change that occurs today and will continue throughout the renewal term, resulting in changes to the licensing basis.

"... the licensing basis upon which the Commission determined that an acceptable level of safety existed does not remain fixed for the term of the operating license. Rather, the licensing basis continues to evolve during the term of operation, in part due to the continuing regulatory activities of the Commission." (Section IV.a(ii), First Principle: Licensing Basis Retention)

"As a requirement of the current licensing basis, and one which would continue during the renewal term, each licensee is required to notify the Commission promptly of any plant event that meets or exceeds the threshold defined in 10CFR50.72.... This information is reviewed daily and follow-up efforts are carried out... further action may be taken to notify all licensees or to impose additional requirements." (Section IV.a(iii), Review of Operating Events)

"The licensing basis of individual plants includes changes that have resulted from resolution of generic issues determined to be applicable and will include applicable generic-issue-derived changes in the future." (Section IV.a(iv), Generic Safety Issues)
 "...the licensing basis changes throughout the term of the original operating license and will also change throughout the term of the renewed license." (Section IV.a(X), Licensing Basis Changes)

As illustrated in the above examples, the CLB is dynamic and changes throughout both the initial operating term and throughout the renewal term. The NRC and licensee will change the CLB, when necessary, during the renewal term to ensure that an acceptable level of safety is always provided. Treatment of the CLB during the renewal term should be no different than during the initial operating term. It is "an acceptable level of safety" that must be maintained throughout the initial and renewed operating terms. As in the first principle, it is the level of safety that matters.

10 The NRC states that adequate protection is "thought to be" provided by the licensing basis. The NRC also states that it "believes" that adherence to the licensing basis can and will be provided by the Part 54

and will be ensured by: (a) § 54.33(d), which states the licensing basis for the renewed license shall include the plants' current licensing basis as defined in § 54.3(a), including those provisions addressing age-related degradation, and (b) continuing the NRC's regulatory oversight program throughout the term of a plant's renewed license. In this manner the current licensing basis will remain enforceable by the Commission throughout the term of the renewed license to the same extent as during the original licensing term.

The Commission intends to continue its regulatory oversight program throughout the term of renewed licenses. This program, which is discussed below in greater detail in Section b, "Current Licensing Basis," has been successful in the past in ensuring licensee compliance with applicable requirements and licensee commitments, as well as identifying important areas of noncompliance. NRC oversight, if continued throughout the term of the renewed license and modified as necessary to reflect new information and experience of extended operation, will also provide assurance that licensees will ~~comply with~~ implement their plants' licensing bases during the term of their renewed licenses.

(x) Licensing Basis Changes.

The principle of compliance with the licensing basis does not preclude changes to the licensing basis; as discussed above, the licensing basis changes throughout the term of the original operating license, and will also change throughout the term of the renewed license. However, changes to the

rule and continuing NRC oversight. Qualification of NRC's conclusion regarding adequate protection and adherence to the licensing basis implies that the NRC does not have the proof necessary to conclude in the affirmative. The fact is that as a result of the NRC's initial OL review and subsequent review, reporting, and inspection activities, the NRC has more than enough information to conclude affirmatively that each operating plant's licensing basis does provide adequate protection of the public health and safety and the environment, and as is similarly the case in the initial license term, licensees will adhere to their licensing bases. If that were not the case, the NRC would not allow the plant(s) to continue to operate.

plant's current licensing basis that are unrelated to age-related degradation will not be considered or proposed by the Commission in determining whether to grant the renewal application. Such changes to the licensing basis are inconsistent with the first key principle of license renewal, viz., that the current licensing basis for a plant is sufficient to ensure adequate protection. The proposed rule incorporates this principle by making a generic finding in § 54.29 that the plant-specific licensing bases for all nuclear power plants are sufficient to ensure adequate protection to the public health and safety. This finding will preclude reexamination of the adequacy of a plant's current licensing basis in individual license renewal proceedings.

To preclude the renewal proceeding from developing into a general reconsideration of a plant's current licensing basis, the proposed rule has been carefully structured to establish a regulatory process that is precisely directed at addressing only¹¹ age-related degradation during the renewed license term. Sections 54.19, 54.21, and 54.23, which specify the information that must be submitted in a renewal application, require only information regarding administrative matters, age-related degradation, and environmental impact. While the applicant must submit a list of documents describing that portions of the current licensing basis which ~~are relevant to~~ was actually used in¹² the system, structure, and component screening process. The rule does not require submission of information relating to the adequacy of a plant's current licensing basis. § 54.29, which defines the standard for

11 NRC states that to preclude the renewal proceeding from developing into a general reconsideration of a plant's CLB, the proposed rule has been carefully structured to establish a regulatory process that is precisely "directed at addressing age-related degradation" during the renewed term.

Except for the possibility of age-related degradation concerns, the CLB has been deemed adequate for the renewal term. Therefore, the above statement should be further clarified to support that concept.

12 Only information used from the CLB is relevant to staff review.

issuance of a renewed license, does not require a new¹³ finding that the plant's current licensing basis is sufficient to ensure adequate protection.

~~The only situation in which a plant's current licensing basis may be changed in a license renewal proceeding is when the licensee asserts that it is impossible or extremely impractical for it to comply with its current licensing basis due to age related degradation. Any changes in the current licensing basis proposed by the licensee to accommodate age related degradation must be thoroughly analyzed and justified by the licensee. The justification must show that the licensee proposed changes provide adequate protection to the public health and safety. Such licensee initiated changes in the current licensing basis would be subject to challenge in a hearing.~~

~~If the staff or the licensee seeks to make changes in a plant's licensing basis for reasons other than age related degradation, they should be pursued either in the existing operating license or the renewed license, once issued. Staff initiated changes would be evaluated in accordance with the backfit rule, 10 CFR 50.109.~~

"A plant's CLB may be changed while the license renewal application is being reviewed. The licensee can make changes in accordance with 10 CFR 50.59, and the NRC can make changes in accordance with 10 CFR 50.109. However, the applicant must inform the Director of Nuclear Reactor Regulation of any changes that affect the contents of the license renewal application while the license renewal application is under review. Notification will be in writing and as the changes occur."¹⁴

13 The word "new" should be added to better clarify the statement and make it consistent with Section IV.b(ii).

14 NRC states that:

"The only situation in which a plant's current licensing basis may be changed in a license renewal proceeding is when the licensee asserts that it is impossible or extremely impractical for it to comply with its current licensing basis due to age-related degradation."

This statement does not reflect the changing nature of the CLB during the initial license term. As NRC accurately points out on Page 14 of the Statements of Considerations, "The licensing basis upon which the Commission determined that an acceptable level of safety existed does

b. Current Licensing Basis

(i) Current Licensing Basis Explained.

As discussed earlier and as defined in this proposed rule, the current licensing basis (CLB) means the Commission requirements for the plant that are in effect at the time of the renewal application. Included are the requirements at the time that the initial license for the plant was granted together with requirements subsequently imposed. It includes the licensee's commitments for complying with those requirements at the time the initial license was granted, including those documented in the operating license application or Final Safety Analysis Report (FSAR). Further, the CLB includes those requirements and commitments as modified or supplemented by additional requirements imposed by the Commission and by commitments made by the licensee during the period of plant operation up to the filing of a renewal application that are part of the docket for the plant's license. More specifically this includes, but is not limited to, plant-specific compliance with the Commission regulations as prescribed in Parts 2, 19, 20, 21, 30, 40, 50, 55, 72, 73, and 100 and the appendices thereto of Title 10 of the Code of Federal Regulations; orders; license conditions; exemptions; and technical specifications. In addition, the current licensing basis includes written commitments made in docketed licensing correspondence, such as responses to NRC bulletins, generic

not remain fixed for the term of the operating license." During review of the license renewal application while undergoing review by NRC and/or during the hearing proceedings, a licensee will have a valid operating license that will require change. For example, Technical Specification amendments may be necessary for a new fuel cycle, or NRC may issue a new rule requiring licensee implementation.

Under a licensee's existing Part 50 license, a licensee who has filed a license renewal application is allowed to continue to make changes in accordance with 10 CFR 50.59. NRC can make changes to the CLB in accordance with 10 CFR 50.109. To ensure that such changes do not invalidate any conclusions that the NRC makes regarding a licensee's renewal application, applicants for renewal should be required to inform the NRC, in writing, of changes to the current licensing basis that affect in any way the contents of the license renewal application.

letters, and enforcement actions, that remain in effect at the time of the application.

~~The licensing basis for the plant at the time of application will form the basis for each licensee's compilation of those items that would be tested against the criteria used in the SSC screening process as acceptance or rejection criteria and, therefore, for determining the need for additional measures related to preventing, mitigating, or monitoring age related degradation.~~¹⁵

The Atomic Energy Act directs the Commission to ensure that nuclear power plant operation provides adequate protection to the health and safety of the public. However, adequate protection is not absolute protection or zero risk and therefore safety improvements beyond the minimum needed for adequate protection are possible. As new information is developed on technical subjects, the NRC identifies potential hazards and then may require that designs be able to cope with such hazards with sufficient safety margins and reliable systems. When this new information may reveal an unforeseen significant hazard or a substantially greater potential for I a known hazard, or insufficient margins and backup capability, the Commission may, in light of the information, conclude that assurance of an acceptable level of safety requires changes in the existing regulations. Therefore, as the Commission identifies new issues or concerns, reasoned engineering decisions occur within the Commission concerning whether any additional measures must be taken at plants to resolve the issues. When specific actions are identified, the Commission, through its regulatory programs, can modify the licensing bases at operating plants at any time to resolve the new

15 There is no need to compile the CLB as there is no real use proposed to be made of this information. The compilation of this information is not necessary for review of the integrated plant assessment, since proposed § 54.21 (a)(4) requires the applicant to describe and provide the basis for resolving issues presented by the age-related degradation of SSCs. The Updated Safety Analysis Report that each plant is required to maintain by 10 CFR 50.71 should provide the NRC with an ample general-reference tool in support of review of renewal applications.

Compilation is not at all necessary for LR.

concern. This process of determinations concerning backfitting of evolving requirements to plants already licensed is currently guided by the provisions of the backfit rule (10 CFR 50.109). Before promulgation of the backfit rule, similar considerations were applied, though the backfit rule enhanced the discipline of the process.

In view of the regulatory programs and processes just described, it is evident that the licensing basis differs among plants. These differences arise from differences in license date as well as differences in such factors as site, plant design, and plant operating experience. The paragraphs above have described, in general terms, the processes employed by the Commission to provide continued assurance that the licensing basis at an operating plant provides an acceptable level of safety at any point in time of its operating life and that the current licensing bases, the CLB of all ~~of older~~ plants remain acceptable through backfit of newly evolving requirements and guidance when that is necessary for adequate safety or warranted as worthwhile safety enhancements. These regulatory processes also ensure that the licensing bases of any plant ~~exempted older plants excused~~ from complying with specific new requirements remain acceptable.¹⁶

16 NRC states the following:

"The paragraphs above have described, in general terms, the processes employed by the Commission to provide continued assurance that the licensing basis at an operating plant provides an acceptable level of safety at any point in time of its operating life and that the current licensing basis of older plants remain acceptable through backfit of newly evolving requirements.... These regulatory processes also ensure that the licensing bases of older plants excused from complying with specific new requirements remain acceptable...."

These statements infer that "old" plants are excused from having to maintain an acceptable level of safety. This mischaracterization should be corrected. All plants undergo review for backfit of new and/or changed requirements promulgated by the NRC. There is no "old" or "new" with regard to the regulations. There is only a difference in how new or changed regulations are applied to "already licensed" and "yet to be licensed" plants.

Licensees, whose plants have already been licensed (which is the majority of plants in this country), review each new requirement for application to their plant(s). Because every requirement does not impact a plant in the same way, there will be, as noted by the NRC, differences among plant CLBs. Such differences are acceptable; what matters is not the differences, but whether each plant through its CLB

(ii) Foundation for the Adequacy of the Licensing Bases.

In order to limit the Commission's license renewal decision to consideration of whether age-related degradation has been adequately addressed, the Part 54 rulemaking must make a generic finding for all nuclear power plants that the reasonable assurance findings for issuance of an operating license continue to be true at the time of the renewal application and accordingly need not be made anew at the time of license renewal. The technical and policy bases for this generic finding are set forth in a document entitled "Foundation for the Adequacy of the Licensing Bases" (NUREG-1412), which is a separate supplement to this statement of considerations. This document describes how the licensing process has evolved in major safety issue areas, under processes that have ensured continued adequacy of older plants. The document thus details the Commission's reasons for considering it unnecessary to re-review an operating plant's licensing basis, except for age-related degradation concerns, at the time of license renewal. The document does this in generic terms. Plant-specific details can be found in the docket files containing the records of individual plant license applications and licenses. The document also illustrates how the regulatory process will continue to ensure that an operating reactor's licensing basis will continue to provide an acceptable level of safety during any renewal term.

~~In view of the differences in the licensing bases among plants, each licensee will be required to compile its plant's licensing basis for use in the screening process to identify SSCs requiring action to manage age related degradation. Since portions of this compilation constitute acceptance criteria for determining the adequacy of the screening methodology and will be carried forward in the renewed term, a list of documents identifying these~~

maintains an acceptable level of safety. The licensing basis for each currently operating nuclear power plant provides an acceptable level of safety. If that were not the case, the NRC would not allow the plant(s) to continue to operate. Therefore, we recommend that in Section IV.b(i) the word "older" be removed.

~~portions of the current licensing basis should be submitted as part of the application. All documents describing the current licensing basis should be maintained in an auditable and retrievable form.~~¹⁷

(iii) Compliance with the Licensing Bases.

The Commission has determined that a finding of compliance by a plant with its current licensing basis is not required for issuance of a renewed license. When a plant's original operating license was issued, the Commission made a finding, pursuant to 10 CFR 50.57(a)(1), that construction of the plant had been substantially completed and was "in conformity with" the construction permit, the operating license application, the requirements of the Atomic Energy Act, and the NRC's rules and regulations. That finding was essentially equivalent to a finding that the plant was in compliance with its licensing basis as it existed at the time of issuance of the operating license.

Once the operating license is issued, the licensee must continue to comply with its licensing basis, unless the licensing basis is properly changed or the licensee is excused by the NRC from compliance. Assurance of continued licensee compliance during the license term rests on two factors: (a) licensee programs required by the NRC's rules and regulations to ensure continued safe operation of the plant, and (b) the NRC's regulatory oversight program.

The licensee programs include self-inspection, maintenance, and surveillance programs that monitor and test the physical condition of plant equipment as the plant operates, as well as review of systems, structures, and components to ensure that plant life can be extended beyond the originally planned 40 years. Through these programs, licensees identify the degradation

¹⁷ There is no need to compile the CLB as there is no real use proposed to be made of this information. The compilation of this information is not necessary for review of the integrated plant assessment, since proposed § 54.21 (a)(4) requires the applicant to describe and provide the basis for resolving issues presented by the age-related degradation of SSCs. The Updated Safety Analysis Report that each plant is required to maintain by 10 CFR 50.71 should provide the NRC with an ample general-reference tool in support of review of renewal applications.

of components due to a number of different environmental stressors and are, in general, able to replace or refurbish their equipment so that the ~~frequency and severity of challenges to~~ performance of plant structures, and components remain within acceptable limits and the necessary safety features would work when actually called upon under transient accident conditions.¹⁸

The Commission's regulatory oversight programs are established to ensure that the plant's licensing basis is modified as appropriate to reflect new information on technical topics affecting the design, construction, or operation of the licensed plant so that the licensing bases at operating plants continue to provide an acceptable level. These continuing activities in place during the initial license continue during the renewal term as well. Examples of these include its inspection, operating events assessment, and generic issues programs and are discussed in greater detail in the paragraphs below. In the cases where the Commission finds that additional protection is necessary to ensure the public health and safety or where significant additional protection at a reasonable cost substantially enhances plant safety, the Commission may require the backfit of a licensed plant, i.e., the addition, elimination, or modification of the systems, structures, or components of the plant.

Historically, the Commission's inspection program has been constructed around a series of inspection procedures that provide for the routine examination of activities at an operating nuclear facility on a periodic basis. Once licensed, a nuclear facility remains under NRC surveillance and undergoes periodic safety inspection during its operating term. The inspection program is designed to obtain sufficient information on licensee performance, through direct observation and verification of licensee activities, to determine whether the facility is being operated safely and whether the licensee management control program is effective, and to ascertain whether there is reasonable assurance that the licensee is in compliance with

¹⁸ The notion that frequency and severity of challenges goes up is false.

the NRC regulatory requirements. The program includes inspection of the licensee's performance in technical disciplines such as operations, radiological controls and protection, maintenance, surveillance, emergency preparedness, physical security, and engineering. In summary, the policy contained in NRC Inspection Manual Chapters (IMC) 2500, Reactor Inspection Program, and IMC-2515, Light-Water Reactor Inspection Program -- Operations Phase, is designed to provide for reasonable assurance that the licensee is in compliance with the NRC regulatory requirements, to ensure that the plant is operated and maintained in a safe condition and that conditions adverse to quality and safe operation are identified and corrected.

In sum, the licensee's programs and actions to ensure continued compliance with its evolving licensing basis, together with the Commission's activities to ensure continuing licensee compliance with its licensing basis, provide reasonable assurance that a licensee continues to be in compliance with its current licensing basis at the time of issuance of the renewed license. Therefore, the proposed rule's standard for issuance of a renewed operating license does not require a new¹⁹ finding that a nuclear power plant is in compliance with the regulations. ~~its current licensing basis.~~

c. Aging Management

The proposed rule requires that the applicants for license renewal take necessary actions to ensure that the plant will continue to meet an acceptable level of safety during the renewal term. Required actions would include those

20 NRC also states in Section IV.b(iii) that:

"... the proposed rule's standard for issuance of a renewed operating license does not require a finding that a nuclear power plant is in compliance with its current licensing basis."

The word "new" should be added to make it consistent with Section IV.b(ii).

Also, the appropriate standard for compliance is the regulations themselves.

necessary for the effective management of age-related degradation of systems, structures, and components (SSCs) important to license renewal.

Aging can affect all SSCs to some degree. Generally, the changes due to the aging mechanisms involved are gradual. Where necessary, nuclear power plant licensees are and have been required to establish programs for managing age-related degradation during the original license term. Age-related degradation becomes a subject of regulatory concern in the context of license renewal if the SSCs involved have a role in ensuring plant safety and the degradation of SSCs can progress to a point of impairing safety performance during the renewal term, but the SSCs involved are not yet subject to an established effective program of aging management.

Continued safe operation of a commercial nuclear power plant requires that SSCs that perform or support safety functions continue to perform in accordance with the applicable requirements in the current licensing basis of the plant ~~and that other plant SSCs do not substantially increase the frequency of challenges to plant safety systems.~~²⁰ As a plant ages, a variety of aging mechanisms are operative. They include erosion, corrosion, thermal and radiation embrittlement, creep, oxidation, wear, and fatigue, ~~and vibration.~~²¹

Existing regulatory requirements, ongoing licensee programs, and national consensus codes and standards address the aforementioned aging mechanisms and the means of mitigating age-related degradation. However, the Commission believes that not all age-related degradation that may be important in the renewal term will be adequately addressed by existing regulatory or

20 These words are inconsistent with the other definitions provided for systems and structures important to license renewal contained in the rule. These words introduce into the scope of license renewal systems which are second tier initiators which are being addressed by other industry programs under current activities and are not appropriate under the scope of license renewal.

21 Vibration is not an aging mechanism; rather it is a stressor driving the mechanism.

licensee programs and, for some SSCs, age-related degradation, if unmitigated, could affect the operability and reliability of SSCs important to license renewal and could lead to loss of safety functions or to unacceptable reduction in safety margins during the renewal term.

The approach reflected in the proposed rule is to require each renewal applicant to address age-related degradation in an integrated plant assessment which demonstrates that age-related degradation of the facility's systems, structures, and components have been identified, evaluated, and accounted for as needed to ensure that the facility's licensing basis will be maintained throughout the term of the renewed license. The required assessment consists of a screening process to select SSCs important to license renewal, based on their intended safety functions ~~or contribution to challenging safety systems~~²²; an evaluation and demonstration of the effectiveness of the already ongoing licensee actions under existing regulatory requirements and plant-specific programs to address aging concerns; and the implementation, as necessary, of supplemental programs to prevent or mitigate age-related degradation during the renewed license term. Where such supplemental programs are not needed at the inception of the renewal term, the plan may provide for a deferred start.

Screening of SSCs will identify those that, by virtue of safety roles, are important to license renewal and, accordingly, could require additional attention. In the screening, it is recognized that there are many SSCs that are either covered by the existing ongoing NRC requirements and licensee-established programs or are not subject to age-related degradation. The screening process and methods for the selection of SSCs important to license renewal are expected to take such factors into account and will allow

22 The licensing basis of plants is based on a defense in depth approach. Because of this approach initiators of transients which result in challenges to safety systems were within the scope of review on the original license and should not be made part of the scope of license renewal at this time.

programs for understanding and managing age-related degradation to be properly scoped and focused.

The renewal applicant is required to identify and propose acceptable methods to be employed for the SSC selection process. The methods are expected to be primarily deterministic. Consistent with requirements for compliance with the current licensing basis, the selection process is expected to employ a deterministic basis for identifying SSCs with known important-to-safety functions.

The screening methods -- as well as aging management approaches -- selected by the license renewal applicants may also include use of probabilistic risk assessment (PRA) techniques as a supplement to the primarily deterministic methods. The public comments at the November 1989 License Renewal Workshop and those submitted in writing following the workshop reflected the view that the use of PRA should be permitted, but not required, in the screening process for systems, structures, and components. Appropriate aging data and models have not been developed for many SSCs for inclusion in the PRAs, and uniform criteria do not exist for evaluating the PRA results. However, as aging research progresses, it may become appropriate to use PRA to a greater extent in license renewal applications.

Many components in operating reactors are replaced on a cycle such as to assure successful functioning of the system. Other components are included in programs which otherwise successfully manage age-related degradation. Some components do not suffer significant age-related degradation. Other components will require additional aging management actions which are not being accomplished during the current initial licensing term. The development of an aging management program is described below.²³

23 Many components in operating reactors are replaced on a cycle such as to assure successful functioning of the system, or, are allowed to fail as long as limits set by technical specifications are not exceeded. This section assumes that for all components which are important to license renewal, some sort of active aging management or age-related degradation mitigation program is required. This is clearly not the case.

The planning for the management of age-related degradation reflects the knowledge that materials, stressors, the operating environment, and their interactions contribute to age-related degradation in SSCs. When these interactions cause degradation of reliability and may impact safety, then age-related degradation effects must be mitigated to ensure that the aged SSCs will adequately perform their design safety functions.

To gain the necessary understanding of aging mechanisms, the renewal applicants will need to ~~review~~ consider the system, structure, or component design, ~~fabrication, installation, testing, inservice inspection~~²⁴, operation and maintenance cycles to the extent required in performing the integrated plant analysis by implementation of the screening methods.

The recognized elements for timely mitigation of age-related degradation effects are inspection, surveillance, condition monitoring, maintenance, trending, record keeping, replacement, refurbishment, and appropriate adjustments in operating environment of the equipment in which the degradation occurs.

Adequate record keeping is needed on such items as transients, component failures, and root causes, and repair and replacement of components. Records being generated now will be useful in providing the technical bases for continued safe operation of nuclear power plants.

Maintenance, refurbishment, replacement of parts and components, residual life assessment, and changes in operating environment are other elements useful for mitigating age-related degradation effects. Timely

24 This paragraph says that "to gain the necessary understanding of aging mechanisms" applicants will need to "review" design, fabrication, installation, operation and maintenance. This requirement goes far beyond what is appropriate for license renewal. It is true that component design, operation, and maintenance need to be considered to examine their adequacy and effectiveness for managing aging during the license renewal period. However, this will be done as an inherent part of the screening method and need not be called out explicitly by this paragraph. It is incorrect to say that fabrication and installation need to be reviewed to understand aging mechanisms. Adequate fabrication and installation in the design sense have been assured by the CLB. The CLB also assures that any errors made during fabrication and installation will not compromise plant safety beyond an acceptable level.

mitigation of degradation through servicing, repair, refurbishment, or replacement of components is the prime function of an effective maintenance program. Mitigation of age-related degradation can be construed as the collection of activities that to a large extent relate directly to physical maintenance of components.

Operating practices that reduce stresses on the equipment by adjustment of the operating environment are also important considerations to mitigating degradation effects. For example, if warranted, operations could be required in an environment with lower temperatures, reduced flux, or controlled humidity. However, in taking such actions, the potential ill consequences need to be evaluated and considered in order to guard against inadvertent adverse side effects on some other aspect of safety.

d. Nature of License

An issue that the Commission identified early in the rulemaking is the legal nature of the license authorizing operation beyond that approved in the original operating license. Industry commenters suggested that extended operation could be accomplished through amendment of the expiration date in the existing operating license. After reviewing the Atomic Energy Act (AEA), as amended, and the relevant legislative history, the Commission concludes that extended operation of nuclear power plants licensed under Section 103 of the AEA should be accomplished by issuance of renewed operating licenses. The Commission proposes that extended operation of nuclear power plants licensed under Section 104b of the AEA also be accomplished through issuance of renewed operating licenses.

* Until 1970, nuclear power plants were licensed as "research and development facilities" under Section 104b of the AEA, since the Atomic Energy Commission (AEC) did not make a "practical value" finding for any power plant design, which was a necessary prerequisite for issuing an operating license under Section 103. In 1970, the AEA was amended so that all commercial nuclear power plants whose construction permits were filed after 1970 must be given Section 103 operating licenses.

Section 103c of the AEA limits the term of licenses for commercial nuclear power plants issued under Section 103 to 40 years, but provides that they may be renewed upon expiration. Based on the AEA's explicit prohibition of license terms in excess of 40 years, together with the statutory provision for renewal, the Commission concludes that the term of a Section 103 operating license may not be extended beyond 40 years by amending the expiration date in the existing operating license. While the record does not show any safety basis for the Congress's decision to set the 40-year limitation, the Commission is not free to ignore the statutory mandate.

Section 104b does not contain any limit on the term of operating licenses for nuclear power plants licensed as research and development facilities,² although the Commission has as a matter of practice limited Section 104b operating licenses to 40 years. Nonetheless, the Commission believes that life extension for nuclear power plants licensed under Section 104b should also be accomplished through issuance of renewed licenses.

* Research and test reactors, which are licensed under Section 104c of the AEA, are also not limited by statute to any particular term. However, the Commission has, as a matter of practice, issued operating licenses for such facilities for short terms, e.g., 10 years.

From the point of view of regulatory complexity, stability, and consistency, it is simpler to have one process and one set of regulations governing license renewal for all nuclear power plants. For all practical purposes, there is no technical distinction between the class of nuclear power plants licensed under Section 103 and the class licensed under Section 104b. Only the 1970 change in the AEA mandated by Congress separates these two classes of plants. Accordingly, the proposed rule makes no distinction between Section 103 and Section 104b power reactor licenses. Non-power reactors, including research and test reactors, on the other hand, differ as a class from nuclear power plants; they are not covered by this rulemaking.

In sum, the Commission has concluded that life extension for facilities with both Section 103 and Section 104b operating licenses shall be achieved through issuance of renewed operating licenses, rather than through amendment of the existing operating license. The Commission does not regard the legal form of a license authorizing extended operation as having any substantial effect on the technical aspects of life extension. Indeed, as discussed in the following section, the licensee-applicant for a renewed license is entitled to favorable treatment under the Timely Renewal Doctrine of the Administrative Procedure Act and 10 CFR 2.109. This treatment is not available to an applicant for a license amendment.

e. Latest Date for Filing Renewal Application, the Timely Renewal Doctrine, and Sufficiency of Renewal Application

Section 9(b) of the Administrative Procedure Act (APA), referred to as the "timely renewal doctrine," provides that if a licensee of an activity of a continuing nature makes a "timely and sufficient" application for renewal in accordance with agency rules, the existing license does not expire until the application has been finally determined by the agency. The timely renewal doctrine is embodied in the Commission's regulations at 10 CFR 2.109:

"If, at least thirty (30) days prior to the expiration of an existing license authorizing any activity of a continuing nature, a licensee files an application for a renewal or for a new license for the activity so authorized, the existing license will not be deemed to have expired until the application has been finally determined."

The 30-day deadline for timely renewal contained in § 2.109 would not provide the NRC a reasonable time to review an application for a renewed operating license for a nuclear power plant. Staff review of a technically complete and sufficient renewal application is projected to require approximately 2 years. Any necessary hearing would likely add an additional year. Therefore, the Commission proposes that § 2.109 be modified to require that nuclear power plant operating license renewal applications be submitted at least 3 years prior to their expiration in order to take advantage of the timely renewal doctrine.

Renewal applications should be essentially complete and sufficient when filed. Section 9(b) of the APA confers the benefit of "timely renewal" to those who make a timely filing of a "sufficient application," although the current wording of the Commission's parallel rule in § 2.109 only refers to the timely filing of an "application for a renewal or for a new license..." and does not include the proviso for a "sufficient" application. The

Commission proposes to modify § 2.109 to parallel the APA's provision for a "sufficient" application. Other considerations lead the Commission to incorporate the requirement for a sufficient application into § 2.109. First, the proposed 3-year deadline for timely submission of renewal applications is based upon a projected 3-year period for completing staff review of a renewal application and any necessary hearing, which in turn is premised on renewal applications that are reasonably complete and sufficient when filed. In addition, the Commission does not wish to encourage the filing of pro-forma renewal applications which are filed simply for the sake of meeting the 10 CFR 2.109 deadline. For these reasons, the proposed revision to § 2.109 requires a "sufficient" renewal application. By making this change the Commission does not contemplate litigation over the "sufficiency" of the application in order for a license to continue in force under timely renewal. Sufficiency is essentially a matter for the staff to determine based on the required contents of an application under § 54.19 and 54.20. It is enough that the licensee submits the required reports, analyses, and other documents required in such application. That such documents may require further supplementation or review is of no consequence to continued operation under timely renewal.

The NRC staff plans to issue a regulatory guide on the content of nuclear power plant license renewal applications that will present one acceptable way of preparing a renewal application that would meet the criterion of a "sufficient" application.

f. Earliest Date for Filing Applications

Neither the AEA nor the Commission's current regulations contain a limit on how long before the expiration of the operating license a renewal application may be filed. However, the Commission has decided to impose such a limit to ensure that substantial operating experience for the nuclear power plant is accumulated before consideration of the renewal application for that plant. The 20-year limit established allows the licensee ample time to plan for license renewal or alternative actions.

g. Renewal Term

Although the AEA permits the Commission to issue operating licenses, including renewed licenses, with terms of up to 40 years, the Commission has decided to limit the maximum term of a renewed license to 20 years beyond the expiration of the existing (previous) operating license. The Commission believes that there is now sufficient technical understanding of age-related degradation to justify permitting extended operation for an additional 20 years beyond expiration of existing licenses. However, a 20-year limit on extended operation will, in the Commission's judgment, provide a useful opportunity to validate and reassess, if necessary, the current understanding of age-related degradation effects.

The proposed rule does not include a minimum term for a renewed license that may be requested by an applicant. The primary reason for such a limitation would be to discourage repetitive renewal applications for relatively short periods, which may consume an unwarranted amount of staff resources to review, as well as the potential for abuse. Upon consideration, the Commission believes that the renewal applicant's need for longer-term planning of its electric power generating capacity will ordinarily motivate him to seek a longer renewal term and that setting of a minimum term would be an unnecessary constraint on flexibility.

h. Effective Date of Renewed License

Two alternatives were identified early by the Commission with respect to the effective date of a renewed license: (a) a "tack-on" license which takes effect at the expiration of the current operating license, and (b) a "supersession" license which takes effect immediately upon NRC approval of the renewal application. The tack-on approach is initially attractive, since, in general, renewals of licenses take effect upon expiration of the pre-existing license. Moreover, it may be argued that "tack-on" licensing was contemplated

by Congress, since Section 103c of the AFA states that licenses "may be renewed upon the expiration of [the specified license term]." However, nuclear power plant licensing renewal is unique in that a potentially long period may occur between the agency decision to approve a renewal application and the expiration date of the original operating license (in some cases as much as 20 years), since utilities need ample time to develop alternative sources of power if the license is not renewed. If issuance of the renewed license were kept in abeyance for such an extended period, there would be a great deal of uncertainty in terms of the administrative finality of the renewal decision. As for the "upon expiration" language of Section 103c, the Commission does not believe that Congress intended by that language to preclude supersession licenses. Since Section 103c provides for licenses to be Issued for a "specified period," it would be natural to speak of renewal following the "expiration of such period." On balance, the Commission has determined that a renewed license should be in the form of a supersession of the pre-existing operating license.

i. Content of Application -- Technical Information

The proposed renewal rule identifies specific requirements for the content of a renewal application.

Unless updated, the information submitted in the previous operating license docket continues to apply and is incorporated into both the renewal license application and the renewed license docket under the provisions of § 54.19 and 54.33.

In addition, the proposed rule requires the submittal of specific information related to the integrated plant assessment for age-related degradation.

In general, the proposed rule requires that renewal applicants submit, for staff review and approval, a methodology for assessing plant systems, structures, and components for age-related degradation and to provide the

results at specific steps within the assessment. It also requires that the applicant describe specific mitigative actions and the bases for the actions to be taken for each system, structure, and component for which present programs were not judged to be effective in preventing or mitigating deleterious age-related²⁵ degradation.

j. Environmental Information

As part of a separate rulemaking, the NRC is undertaking a generic environmental study with the purpose of defining the scope and focus of environmental effects that need to be considered in individual relicensing actions. To the extent this study is successful, reductions in the scope and focus will be codified through changes to 10 CFF Part 51. The programmatic findings in the environmental assessment (EA) supporting the present proposed rulemaking, 10 CFR Part 54, indicate that the generic environmental study will achieve some degree of success. This study will assess the full range of NEPA issues that will need to be reviewed in individual relicensing actions. The proposed action would be relicensing under Part 54. NEPA issues include need for the proposed action, alternatives to the proposed action, environmental effects of the proposed action, and alternative actions. The study will attempt to bound the full range of plants and sites in order that any issues eliminated or bounded by 10 CFR Part 51 will be applicable to as large a number of plants as possible. The study will attempt to build from the foundation provided by the EA for the 10 CFR Part 54 rule.

25 The words "deleterious degradation" are not used in any other sections of the regulatory documentation. The term "age-related degradation" is defined in the rule and accepted as a standardized term.

k. Backfit Considerations

The nuclear industry proposes that a new section be added to the proposed renewal rule that explicitly imposes backfit requirements during the license renewal application review in order to: (a) control the NRC's reconsideration of the adequacy of the current licensing basis ((LB); (b) require the NRC to use the "substantial increase in safety" and value/impact tests required by 10 CFR 50.109(a)(3) when evaluating the acceptability of the renewal application's proposals for addressing age-related degradation; and (c) make clear that the backfit rule applies throughout the term of the renewed license. ~~The Commission does not agree that a new backfit provision or a change to the backfit rule is required.~~²⁶

The Commission believes that it would be useful to explain how, in its view, the current backfit rule would apply to the review of individual license renewal applications, should the license renewal rule be adopted. All age-related requirements that the staff believes are necessary to ensure adequate protection during the ~~extended life~~ renewal term would be imposed without regard to cost. ~~This is the same as the "adequate protection exemption" in 10 CFR 50.109(a)(4)(ii).~~ Second, ~~any age-related~~ the requirements to address an identified age-degradation mechanism in order to maintain the CLB is not subject to cost-benefit considerations but the licensee/applicant may take cost into consideration when selecting options to

26 While the industry agrees with the philosophy presented in the supplementary information (pages 42-44), there are two aspects which deserve special note. The staff should not be encumbered by additional justification requirements on matters truly relating to adequate protection or compliance. However, it is reasonable, that staff imposed requirements which can be addressed in several different but equivalent ways, should allow the choice of the most cost-effective option. It also appears very reasonable that proposed new requirements which go beyond matters of adequate protection or compliance with the licensing basis must be fully justified under § 50.109 (3 (a) and (c)). Also, since provisions of § 50.109 apply more to the staff than licensees, the statement of § 54.35 should be augmented by a specific acknowledgement that § 50.109 applies in full measure to the renewal period. These refinements should be incorporated into rule language to ensure consistency at approach over time.

satisfy the requirement, ~~necessary to ensure that the plant will operate in conformance with the current licensing basis may be imposed without regard to cost. This category of actions is the same as the "compliance exemption" in 10 CFR 50.109(a)(4)(i).~~ In either case, the staff need not prepare a separate document explaining the basis for this conclusion. Instead, the bases for such a conclusion will be explicitly documented by the staff in a safety evaluation report that presents the results of the staff's license renewal application review. Language to implement this has been provided in a new § 54.22(a) (1) and (2) which picks up the specific paragraphs of the present backfit rule, § 50.109(a)(4), which apply.²⁷

However, if a proposed requirement to address age-related degradation goes beyond what is necessary to ensure adequate protection or compliance with the ~~current licensing basis~~ NRC's rules and regulations, the staff must prepare a backfit analysis that addresses the factors ~~in Section 50.109(c)~~, as provided for in a new § 54.22(a)(3), and show that the direct and indirect costs of implementing the proposed requirement are justified in view of the increase in the overall protection of the public health and safety or the common defense and security to be derived from the proposed requirement.

27 See justification provided above.

1. Hearings

Section 189a(1) of the AEA provides an Interested person the opportunity to request a hearing for the "granting, suspending, revoking or amending of any license..." Although "renewal" of a license is not explicitly mentioned as an action where an opportunity for hearing must be provided, the Commission concludes that a hearing opportunity should be provided. Renewal of an operating license is essentially the granting of a license and therefore would fall under Section 189a(1)'s requirement for a hearing opportunity for "issuance of a license." A contrary reading of Section 189a(1) would produce the anomalous result that an opportunity for hearing is provided for less significant license amendments, but a hearing opportunity is not provided for license renewal. Accordingly, the proposed rule will provide an opportunity for an interested person to request a hearing. If a request for hearing in connection with a renewal application is granted, the Commission proposes that they be hearings conducted in accordance with Subpart G of 10 CFR Part 2 as is customary for nuclear power plant licensing proceedings. However, the need for certainty in the case of renewal licenses is compelling enough for the Commission to indicate as a matter of policy that the following schedule be adopted by a hearing board to the greatest extent possible.

License Renewal Hearing MilestonesBased onSubpart G to 10 CFR Part 2

Day 0:	File Date: Utility licensee files license renewal application, which consists of a supplement to the facility FSAK and an environmental report.
Day 30:	NRC publishes a notice of opportunity for hearing in the Federal Register, which would provide interested members of the public to file, within 30 days, petitions to intervene pursuant to 10CFR § 2.714.
Day 60:	Deadline for petitions to intervene to be filed by the public
Day 75:	Deadline for filing answers to petitions to intervene. NRC establishes an Atomic Safety & Licensing Board (ASLB).

- Day 95: ASLB decides if intervening members of the public have established interest under 10 CFR § 2.714. If decision affirmative, ASLB schedules prehearing conference for 60 days hence.
- Day 115: Deadline for filing supplements to petitions to intervene, which list proposed contentions for litigation.
- Day 125: Deadline for filing answers to petition supplements.
- Day 155: ASLB hold prehearing conference in accordance with 10 CFR Part 2, which includes oral argument on proposed contentions.
- Day 185: ASLB decides admissibility of contentions pursuant to 10 CFR § 2.714. If decision affirmative, ASLB commences discovery on admitted contentions.
- Discovery consists of:
- (i) document production;
 - (ii) written interrogatories, not to exceed 35 served on any one party by any other party;
 - (iii) depositions upon good cause shown; and
 - (iv) requests for admissions.
- (Discovery may continue, if necessary, for the next 180 days while the parties are waiting for the NRC Staff to issue the documents referenced in the next milestone.)
- Day 730: NRC Staff issues its Safety Evaluation Report and Environmental Assessment and finding of No Significant Impact, based on the GEIS.
- SER Issuance Date + 60 Days: ASLB holds second prehearing conference in accordance with 10 CFR Part 2; ASLB decides admissibility of any amended or late-filed contentions based on NRC Staff documents, and discovery thereon commences.
- SER + 90 Days: Discovery, as described above, on amended contentions completed.
- SER + 120 Days: Deadline for filing final motions for summary disposition under 10 CFR § 2.749.
- SER + 140 Days: Deadline for answers to final motions for summary disposition.

- SER + 170 Days: ASLB issues order deciding motions for summary disposition. If order favors one party completely, ASLB dismisses the proceeding. If motions denied for denied in part, ASLB schedules hearing for 30 days hence.
- SER + 200 Days: Hearing commences before ASLB.
- SER + 245 Days: Hearing ends.
- SER + 300 Days: Deadline of the submission of findings of fact and conclusions of law completed under 10 CFR § 2.754.
- SER + 345 Days: ASLB issues initial decision.^{27A}

At the license renewal workshop and in written comments, Yankee Atomic Electric Co. and several other utility commenters urged that special hearing procedures be established for license renewal. Three procedural proposals were made: (a) a limit on the number of interrogatories that may be filed by an intervenor; (b) in lieu of the provision in 10 CFR 2.749 for summary disposition, a requirement that a party wishing to go forward to hearing demonstrate by affidavit that there is a genuine issue of fact which, if resolved in the party's favor, would result in the application being denied or substantially conditioned; and (c) a requirement that the hearing be conducted in accordance with a schedule incorporated as an appendix to a license renewal rule.

27A Given the importance of license renewal to our nation's energy security, it is imperative that license renewal hearings be conducted with a focus on the rendering of a decision. In order to assure full public participation and still provide some certainty that the hearing process will conclude, a schedule of milestones is imperative. Utilities should be informed as to whether renewal will be granted well before the expiration of their initial licenses so that in the case of denial, sufficient time remains to implement alternatives for replacement capacity. Furthermore, although the plant may be permitted to operate under timely renewal, important decisions about the plant must not be held in suspension until a final judgement is rendered on the license application. This problem can be easily avoided by requiring that the hearing boards utilize the hearing schedule and hold all parties to that schedule.

The Commission is disinclined to develop special procedures for hearings in license renewal proceedings. The timely renewal doctrine of the Administrative Procedure Act allows the licensee to continue operating its facility until final determination of its renewal application, even though its original license has expired. Therefore, a licensee seeking a renewed license whose application is yet to be acted upon because of an incomplete hearing is not as substantially and directly affected as an applicant for an initial operating license (OL), though the renewal applicant's need for timely contingency planning in view of possible denial of renewal could be impacted.

The staff also points out that the Commission has recently adopted changes to Part 2 (54 FR 33168; August 11, 1989), which raise the threshold for admission of contentions, reduce discovery against the staff, and explicitly authorize the presiding officer to require the filing of cross-examination plans (the Union of Concerned Scientists has filed a suit in the D.C. Circuit challenging the validity of the changes to Part 2). These procedural changes are likely to be more effective in focusing and expediting any necessary hearing than the industry-proposed changes.

With regard to the Industry's scheduling proposal, the Commission points out that it has plenary authority to impose a hearing schedule. The Commission has exercised that power several times in licensing proceedings in the past. Moreover, the Atomic Safety and Licensing Board or presiding officer also possesses the authority, in the absence of any specific Commission directive on scheduling, to adopt a schedule for conducting the hearing.

Finally, the Commission believes that the scope of litigatable issues in a license renewal proceeding are much narrower than in construction permit and initial operating license proceedings. Technical findings for issuance of a renewed license will focus primarily on age-related degradation concerns (see § 54.23 of the proposed rule) and therefore are much narrower than the 10 CFR 50.57 findings for issuance of an initial OL. The scope of litigable environmental issues in a license renewal proceeding is also expected to be limited by virtue of proposed 10 CFR Part 51 rulemaking and the generic

environmental document. In view of these factors, the proposed rule does not include any special hearing procedures for license renewal.

m. Report of the Advisory Committee on Reactor Safeguards

Section 182b of the AEA states:

"The ACRS shall review each application under section 103 or section 104b. for a construction permit or an operating I license for a facility, any application under section 104c. for a construction permit or an operating license for a testing facility, any application under section 104a. or c. specifically referred to it by the Commission, and any application for an amendment to a construction permit or an amendment to an operating license under Section 103 or 104a., b., or c. specifically referred to it by the Commission...."

Section 182b does not explicitly refer to applications for renewal of an operating license as requiring ACRS review. However, a renewed operating license is an operating license, an application for which is explicitly required by Section 182b to be reviewed by the ACRS. Accordingly, § 54.25 of the proposed rule requires ACRS review of a license renewal application.

n. Emergency Planning Considerations

Section 50.47 and Appendix E to Part 50 establish requirements and performance objectives to protect the public health and safety by ensuring the existence, implementation, revision, and maintenance of emergency preparedness programs for licensed nuclear power plants. These requirements apply to all nuclear power plant licensees and require the specified levels of protection from each licensee regardless of plant design or construction. Section 50.54(q) requires that the emergency plans be maintained until the Commission

terminates the license. The requirements of § 50.47 and Appendix E are independent of the duration or renewal of the operating license, and they will continue to apply during the license renewal term.

To ensure that a licensee's plan remains adequate to protect the health and safety of the public, NRC requires a detailed annual review of the facility's emergency preparedness plan by persons who have no direct responsibility for its implementation. Included within the review is an evaluation of the continued adequacy of applicable and appropriate communication and working relationships with State and local governments. Licensees must also perform an annual exercise or drill of their emergency preparedness plan and have the drill evaluated by the NRC against definitive performance criteria. These drills, performance criteria, and independent evaluations serve to ensure continued adequacy of emergency preparedness in light of changes in site characteristic, such as transportation systems and demographics. Changes occurring during the term of any renewed license will be addressed just as changes are addressed during the original license term.

The NRC has determined that the current requirements, including continuing update requirements for emergency planning, provide reasonable assurance that an acceptable level of emergency preparedness exists at any operating reactor at any time in its operating lifetime. For this reason, the Commission has determined that no new finding relative to the adequacy of the emergency plans for license renewal need be made. The Commission is proposing changes to 10 CFR 50.47 to clarify that no new finding on emergency preparedness will be made as part of license renewal.

The licensee programs, the annual exercises, and the NRC inspection activities provide continued assurance that the facilities and equipment needed for the proper functioning of the licensee's emergency preparedness program (as defined in 10 CFR Part 50, Appendix E, Section IV.E, Items 1 through 9) remain in a state of operational readiness, without significant performance impairment due to age-related degradation. Accordingly, the

additional aging management provisions of the proposed 10 CFR Part 54 rule are not needed for those facilities and equipment.

o. Plant Physical Security Considerations

Licensees must establish and maintain a system for the physical protection of plants and materials, in accordance with 10 CFR Part 73, to protect the plant from acts of radiological sabotage and prevent the theft of special nuclear material.

The NRC reviews the status of physical security measures at each individual plant during the Systematic Assessment of Licensee Performance (SALP). The NRC has also used Regulatory Effectiveness Reviews (RERs) to determine site compliance with 10 CFR 73.55 and ensure that the level of protection required by Part 73 is maintained. The RER teams use NRC security personnel and members of the U.S. Army Special Forces to test plant security systems and personnel.

The requirements of 10 CFR Part 73, notably the testing and maintenance requirements of 10 CFR 73.55(g), include provisions for keeping up the performance of security equipment against impairment due to age-related degradation or other causes.

Once a licensee establishes an acceptable physical protection system, changes that would decrease the effectiveness of the system cannot be made without filing an application for license amendment in accordance with 10 CFR 50.54(p)(1).

Application for a renewed license will not affect the standards for physical protection required by the NRC. The level of protection will be maintained during the renewal term in the same manner as during the original license term. The requirements of 10 CFR Part 73 will continue to be reviewed and changed to incorporate new information, as necessary. The NRC will

continue to ensure compliance of all licensees, whether operating under an original license or a renewed one, through ongoing inspections and reviews.

The NRC has reviewed current requirements for physical protection and determined that they provide reasonable assurance that an adequate level of physical protection will exist at any reactor at any time in its operating lifetime. Based on the above, the Commission has determined that the adequacy of a renewal applicant's physical protection program will not be readdressed during review of individual license renewal applications.

p. Operator Licensing Considerations

Individuals who manipulate the controls of nuclear power facilities licensed under 10 CFR Part 50, and individuals who direct activities of those individuals, must be licensed by the NRC. Specific criteria for obtaining a license are set forth in 10 CFR Part 55, which establishes the procedures and criteria for issuing operator licenses and defines the terms and conditions under which the NRC grants, modifies, and renews these licenses. The licensing process for individual plant operators is independent of the facility licensing process, and no change to 10 CFR Part 55 is necessary.

License renewals of the facility could affect operators, however. In that additional maintenance, surveillance, or equipment replacement may be necessary at some plants. Plant personnel would be informed of and trained to handle these activities through training programs. Operators are currently required to participate in periodic training programs, which cover important changes to the facility or supporting programs and procedures, and to requalify for their licenses, demonstrating this knowledge on a periodic basis. The requirements for operator knowledge set forth in 10 CFR Part 55, Subpart E, "Written Examinations and Operating Tests," as well as normal NRC review of plant operations, are adequate to ensure that operators are aware of any license renewal developments that may affect their duties. In addition,

the use of approved plant simulators for testing individual plant operators is required of all licensees by May 26, 1991, and will not be affected by license renewal.

Ongoing NRC Inspection and licensing efforts will verify that important license renewal developments are adequately addressed in the training of plant operators.

q. Financial Qualification Considerations

In 1984, the NRC adopted changes to § 50.57 and 2.104 concerning the need to perform financial qualification reviews of applicants for commercial nuclear power plant licenses (49 FR 35747; September 12, 1984).

Under the revised rule, electric utilities that apply for or possess an operating license are excluded from review of their financial qualifications by the NRC during an operating license proceeding. In publishing the final rule, the Commission stated:

"The Commission believes that the record of this rulemaking demonstrates generically that the rate process assures that funds needed for safe operation will be made available to regulated electric utilities. Since obtaining such assurance was the sole objective of the financial qualification rule, the Commission concludes that, other than in exceptional cases, no case-by-case litigation of the financial qualification of such applicants is warranted." (49 FR 35750)

This finding was based on a national survey submitted by the nuclear industry and the National Association of Regulatory Utility Commissioners regarding the provision of operating funds for nuclear power plants through the rate-making process of State commissions. The study concluded, inter alia, that rate-making authorities had various mechanisms to ensure the availability of utility revenues sufficient to meet the costs of NRC safety requirements. More specifically, most rate-making bodies indicated that while

no specific provision was made for NRC safety requirements, rates are generally estimated to produce sufficient overall revenues to ensure sound functioning of electrical power systems, including nuclear plants. Some public utility commissions indicated that their orders specifically allocate funds to meet NRC safety requirements (49 FR 35750).

The Commission believes that this finding is also true for renewed operating licenses for nuclear power plants. Therefore, the exclusions in § 50.57(a)(4) and 2.104(c)(4) with respect to the need for financial reviews of applications for operating licenses will be extended to applicants for renewal of operating licenses. The Commission concluded that the rate-making process generally provides assurance that funds needed for safe operation will be made available to regulated electric utilities. It further concluded that case-by-case litigation of the financial qualification of applicants for operating licenses is not warranted, except in exceptional cases (49 FR 35750). The Commission also stated that the process contained in the rule satisfies the statutory requirements of the Atomic Energy Act concerning the need for financial qualification reviews (49 FR 35762).

r. Decommissioning Considerations

The Commission's current requirements with respect to decommissioning assume that decommissioning is the only option following the expiration of the nuclear power plant's operating license. Five years before an operating license is to expire, the licensee is required by 10 CFR 50.54(bb) to submit written notification to the Commission for review and approval of a program for funding of the costs of management of spent fuel during the time between expiration of the operating license until the spent fuel is transferred to the U.S. Department of Energy for disposal in a spent fuel repository. Also five years prior to the "projected end of operation," the licensee is required, pursuant to 10 CFR 50.75(f), to provide a preliminary decommissioning plan, a cost estimate for implementing the plan, and any changes in funding necessary

to ensure that there will be sufficient funds for decommissioning. One year before the license is to expire, the licensee must file an application to terminate its operating license, together with a detailed plan for decommissioning. In accordance with 10 CFR 50.82.

If an operating license is renewed, decommissioning is postponed until expiration of the renewed license. The Commission does not believe that licensees who file their license renewal applications should also be required to proceed as if their facility will be decommissioned at the expiration of the current operating license. Submission of the funding reports required by § 50.75 and 50.82, as well as application for termination of the operating license and decommissioning plan in accordance with § 50.82, will require substantial licensee resources that will be wasted if the renewal application were approved.* The proposed rule addresses these concerns by amending § 50.54(bb) and 50.82 in such a way that licensees who filed sufficient renewal applications, but have not yet received a final determination on their application, would not need to file either the interim spent fuel funding plan or the application for termination and accompanying detailed decommissioning report. The Commission does not believe that any change to § 50.75(f) is necessary, since the current wording may be interpreted to exclude licensees who have filed renewal applications from the requirements for submission of the interim funding reports.

It is expected that, in consideration of their planning needs, licensees will ordinarily elect to apply for license renewal well before the 5-year lead time of the decommissioning planning requirements of § 50.54(bb) and 50.82.

* It is unlikely that a detailed decommissioning plan prepared at the time that a renewed license is requested would be considered technically sufficient so that it could be resubmitted at the termination of operation. As much as 35 years could have passed between the plan's preparation and submittal; and it is inevitable that technical information and regulatory requirements on decommissioning would render the decommissioning report obsolete.

Thus, timing problems with respect to contingency preparations for decommissioning, in case renewal is denied, would ordinarily not be expected to arise. The requirement for submittal of a proposed decommissioning plan is retained, with a proposed new provision, § 50.82(a)(1)(ii), to allow delay to within 1 year after disapproval of an application for a renewed license.

s. Antitrust Review

The proposed rule does not require antitrust review by the Attorney General of the renewed license application. The legislative history of Section 105c(2) of the AEA, which is the statutory basis for antitrust review of commercial nuclear power plants licensed under Section 103 of the AEA, makes clear that such review is required only for the initial application for construction permit (CP), or the initial application for operating license (if an antitrust review was not done for the CP), unless there are changes in licensee activities or modifications that would constitute a new or substantially different facility. [Joint Committee On Atomic Energy, Amending the Atomic Energy Act, H. Rep. No. 1470, 91st Cong., 2d Sess. 29 (1970); S. Rep. No. 1247, 91st Cong., 2d Sess. 29 (1970).] License renewal will not require modifications to commercial nuclear power plants such that they will constitute a "new or different facility"; therefore, an antitrust review by the Attorney General would not be necessary. Nuclear power plants licensed under Section 104b of the AEA are exempt from antitrust review under Section 105c(3).

t. Compliance with 10 CFR Part 140

Section 170 of the AEA (commonly referred to as the Price-Anderson Act) establishes financial protection and indemnification requirements for NRC licensees. 10 CFR Part 140 codifies the requirements of the Price Anderson Act. The Part 140 requirements with respect to nuclear power plants apply to

all licensees regardless of the plant's design or construction date. Furthermore, licensees are required to comply with any revisions in Part 140 that are required as a result of changes in the Price-Anderson Act.

In accordance with 10 CFR 50.57(a)(5), each licensee was found to comply with the requirements of Part 140 when the original operating license was issued. Subsequently, the NRC reviews the indemnity provisions and makes required adjustments as a result of further licensing action. In addition, the nuclear power plant insurance pools that form the basis for compliance with the financial protection requirements for 10 CFR Part 140 inform the NRC each year regarding any changes in insurance or potential cancellations.

Because all licensees are required to comply with 10 CFR Part 140, and because the NRC continues to ensure compliance with those requirements, the Commission concludes that the finding of compliance with Part 140 need not be made in any individual nuclear power plant operating license renewal under 10 CFR Part 54.

V. QUESTIONS

The Commission invites public comment on all aspects of this proposed rulemaking. In addition, the Commission specifically solicits views concerning the following questions:

(1) Are there any specific equipment items, equipment categories, or topics that should by rule be excluded from review under the age-related degradation management program requirements of the proposed rule? If so, what equipment or topics should be excluded, and what would be the justification for such exclusion?

(2) Should any equipment items, equipment categories, or topics (including topics related to the site, such as nearby hazards or demography) that may involve changes over time be added to the review requirements under the proposed rule? If so, what equipment items, equipment categories, or topics should be added, and what would be the justification for such addition?

(3) For certain limited technical issues with respect to which requirements have been established, some work on implementation and compliance remains to be completed. Unimplemented USIs, such as Station Blackout and Anticipated Transients Without Scram, GSIs, and the "lessons learned" issues of the Systematic Evaluation Program are examples. Is there a basis for removal of such issues at this time from the provision of § 54.29 of the proposed rule that the findings under 10 CFR 50.57(a) need not be made in order to issue a renewed license? If so, what would that basis be?

VI. AVAILABILITY OF DOCUMENTS

The principal supporting documents of this supplementary information are as follows:

- (1) NUREG-1412, "Foundation for the Adequacy of the Licensing Bases, Draft for Comment, U.S. Nuclear Regulatory Commission (USNRC), July 1990.
- (2) NUREG-1411, "Response to Public Comments Resulting from the Public Workshop on Nuclear Power Plant License Renewal," USNRC, July 1990.
- (3) NUREG-1398, "Environmental Assessment for Proposed Rule on Nuclear Power Plant License Renewal," Draft for Comment, USNRC, July 1990.
- (4) NUREG-1362, "Regulatory Analysis for Proposed Rule on Nuclear Power Plant License Renewal," Draft for Comment, USNRC, July 1990.

A free single copy of Documents (1), (3), and (4) above, to the extent of supply, may be requested by those considering providing comment by writing to the U.S. Nuclear Regulatory Commission, ATTN: Distribution Section, Washington, DC 20555.

Copies of all documents cited in this Supplementary Information are available for inspection, and/or for copying for a fee, in the NRC Public Document Room, 2120 L Street, NW (Lower Level), Washington, DC.

In addition, copies of NUREGs cited in this document may be purchased from the Superintendent of Documents, U.S. Government Printing Office, PLO, Box 37082, Washington, DC 20013-7082. Copies are also available for purchase

from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

VII. ENVIRONMENTAL IMPACT

A draft environmental assessment of this rule has been prepared pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality Regulations, 40 CFR 1500-1508, and NRC's regulations in 10 CFR Part 51. Under NEPA and 10 CFR Part 51, the NRC must consider, as an integral part of its decision-making process on the proposed action, the expected environmental impacts of promulgating the rule and reasonable alternatives to the action. The NRC concludes that promulgation of the rule would not significantly affect the environment, and, therefore, a full environmental impact statement is not required, and a finding of No Significant Impact can be made. The environmental assessment and finding of No Significant Impact are issued as a draft, and public comments are being solicited.

Implementing the proposed action would produce essentially the same effects as would result from implementation of the existing license renewal rule, since the proposed rule is distinguished from the existing rule in that it would establish the specific criteria and standards for renewal, whereas the existing rule is silent about criteria and standards. However, the proposed rule would add discipline to the license renewal process, tending in the directions of effective control of risk and environmental consequences and favorable benefit-cost relationships. Renewal under either the existing rule or the proposed rule would result in repair, replacement, or refurbishment of selected nuclear plant components and structures that are subject to aging. The scope of such activities would be specific to each plant, based on an assessment of plant safety and operation. Depending on the specific changes required in each case, the plants would make these changes at least partly during normal refueling shutdowns, but some plants may require additional shutdown ~~for as much as~~ ¹

~~to 2 years prior~~²⁸ to expiration of the initial license to accomplish the changes. A work force of from 300 to 950 could be on site during this period, regardless of whether renewal is under the existing rule or the proposed rule.

The environmental impacts associated with repair, replacement, or refurbishment would be of the same magnitude as those experienced during other maintenance or replacement activities conducted during the previous operation of the plant. Occupational exposures resulting from these activities are expected to range from 270 to 1930 person-remS based on exposure data from previous major maintenance activities. These impacts would not vary significantly whether renewal is accomplished under the current or the proposed rule.

The modifications, repairs, and replacements undertaken in each plant would not entail changes to the overall design of the plant. Thus, basic plant operating parameters, such as thermal performance, power output, and fuel utilization would not, in general, be expected to change during any renewal term under either the current rule or the proposed action. Further, occupational exposure and both radiological and non-radiological releases from the plant would be essentially the same whether renewal is done under the current or the proposed rule and are not expected to differ in magnitude from those experienced during operation prior to license renewal. The current average occupational radiation dose per plant of 425 person-remS per year (based on 1987 data) is expected to continue at about that level through a 20-year license renewal term.

Under the proposed license renewal rule, each licensee will be required at the time of application to identify ~~safety significant~~ systems, structures and components important to license renewal ~~and structures of the plant~~ that are subject to significant aging and, to assess and demonstrate ~~during the~~

28 There is no basis for stating that an additional one to two years prior to expiration of the initial license may be required to accomplish plant changes required for license renewal. Plant-specific life extension pilot studies at Surry-1 and Monticello do not support this finding.

~~renewal term, to assess and management of that the aging degradation of those components.~~²⁹ These activities will ensure that a reactor would not continue to operate if the probability of radiological release events increases significantly during the renewal term because of degradation of plant systems. Though similar objectives would be required to be met under the current rule, the current rule does not specify the procedures and standards that would be involved.

In either case, annual radioactive waste production is not expected to change significantly from rates during the original license term. A 20-year addition to a 40-year term of operation for a plant would, under either the existing or the proposed license renewal rule, result in about a 50 percent increase in the requirement for high-level waste repository storage, some increase in the spent fuel storage capability at each individual plant, and about a 50 percent increase in low-level waste storage capacity.

In sum, the environmental impact of no new rulemaking (i.e., not establishing specific criteria and standards for renewal) would be similar to those for license renewal with the proposed rule; however, there would be an undesirable level of uncertainty and lack of predictability in the plant relicensing process.

VIII. PAPERWORK REDUCTION ACT STATEMENT

The proposed rule amends Information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This proposed rule has been submitted to the Office of Management and Budget for review and approval under the paperwork requirements. Public reporting burden for this collection of Information is estimated to average approximately 130,000 person-hours per response, including time for reviewing Instructions.

²⁹ The current wording is not consistent with the process presented in § 54.21 (a) Integrated Plant Assessment.

searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch (MNBB7714), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the Paperwork Reduction Project (3150-0136, 0011, and 0021), Office of Management and Budget, Washington, DC 20503.

IX. REGULATORY ANALYSIS

The NRC has prepared a regulatory analysis of the benefits and costs of the proposed rule and of a set of significant alternatives. The analysis is reported in NUREG-1362. Some highlights are presented below.

The specific objectives of the revised license renewal rule are to establish the standards that must be met by license renewal applicants, to define the scope of information required for reviewing the applications, and to specify the procedures for submitting the applications. In order to determine the specific content of the rule consistent with these objectives, the staff has defined and evaluated a set of specific alternatives that cover the range of alternatives that would meet these objectives, as summarized below. (Also considered and covered in the cited full report, but not included in the summary below, are alternative regulatory positions on issues related to the environmental review and procedural requirements.) The alternative sets of safety criteria and standards, reflecting differing approaches and stringencies, that were evaluated and compared in the regulatory analysis are as follows:

Alternative A: Current licensing basis (original licensing basis, as amended to the date of the renewal application); no additional requirements.

This alternative is based on the proposition that risk-significant changes in the plant's materials and equipment generally occur as a gradual, progressive process. Knowledge of plant condition, maintenance actions to keep up an adequately safe condition, and aging management are all required during the original licensing term as well as after renewal. The current licensing basis, together with such future changes in requirements as may become applicable to particular plants, could thus be viewed as adequately accommodating the evolving technical issues of plant aging past the renewal date.

This alternative would require the lowest renewal expenditures but would be least intensive in addressing the advancing age-degradation issues.

Alternative B would involve greater renewal expenditures than Alternative A, but less than Alternatives C and D.

Alternative C: Extension of Alternative B to require assessment of design differences against selected new-plant standards.

The selection of applicable new-plant standards would be based on potential risk importance and the practicality of overcoming obstacles to the modifications involved. Applicants would be required to demonstrate, through PRA-aided analyses, that their specific plants' differences from the selected new-plant standards are not risk-significant or that the plant and procedural changes are adequate. The objective of Alternative C would be to upgrade the safety of renewed-license plants above the degree of safety that had been deemed acceptable for the original license term by seeking to attain the improvements envisaged for new plants in the more promising and less difficult areas.

Alternative C seeks safety enhancements over Alternative B, but its renewal expenditures would be higher.

Alternative D: Extension of Alternative B to require compliance with all new-plant standards.

Some limited compromises would necessarily be involved, both in new-plant requirements that it may not be possible or practical to comply with and in the fact that much retained equipment would not be free of all aging effects. Without some tolerance for near-equivalents or specific I; exemptions, this alternative may assimilate to the no-renewal option.

The objective of this alternative would be to seek the closest possible safety equivalence of renewal-license plants with new plants, in recognition of the historic gradual tightening of safety requirements over the years and increasing evolution of more conservative, more risk-averse public attitudes toward safety objectives of technological enterprises, notably nuclear power plants.

Alternative D would be the most ambitious in its safety objectives and highest in renewal expenditures.

Alternative B was chosen as the preferred alternative. Its intensive aging management requirement, absent from Alternative A, is warranted by the importance of equipment aging as the key safety issue in nuclear plant life extension and license renewal and is well justified on a cost-benefit basis. The enhancement over Alternative B offered by the selective or full introduction of new-plant standards, as would be the case with Alternatives C and D, are neither necessary for adequate safety nor worthwhile on a cost-benefit basis.

X. REGULATORY FLEXIBILITY ACT CERTIFICATION

The proposed rule will not have a significant impact on a substantial number of small entities. The proposed rule sets forth application procedures and technical requirements for renewed operating licenses for nuclear power plants. Nuclear power plant licensees do not fall within the definition of small businesses as defined in Section 3 of the Small Business Act, 15 U.S.C. 632, the Small Business Size Standards of the Small Business Administrator (13 CFR Part 121), or the Commission's Size Standards (50 FR 50241; December 9, 1985).

XI. NON-APPLICABILITY OF BACKFIT RULE

The proposed rule addresses the procedural and technical requirements for obtaining a renewed operating license for nuclear power plants. The Commission has not previously addressed the policy, technical, and procedural issues unique to renewal of nuclear power plant operating licenses in a rulemaking. Accordingly, the proposed rule, if adopted, would not constitute a "backfit" as defined in 10 CFR 50.109(a)(1) and a backfit analysis need not be prepared. The primary impetus for the backfit rule was "regulatory

ty," viz., that once the Commission decides to issue a license, the conditions for operating under that license would not be arbitrarily post hoc. Regulatory stability is not a relevant issue with respect to the proposed license renewal rule. The rule, if adopted, would have a retroactive effect only. There are no licensees currently holding renewed power plant operating licenses; consequently, there are no valid conditions that may be changed regarding the terms and conditions for obtaining a renewed operating license. As the Commission has previously stated in the Statement of Considerations for 10 CFR Part 52, which retroactively changed the requirements for receiving design certifications, the backfit rule:

was not intended to apply to every regulatory action which changes settled expectations. Clearly, the backfit rule would not apply to a rule which imposed more stringent requirements on all future applicants for construction permits, even though such a rule might arguably have an adverse impact on a person who was considering applying for a permit but had not done so yet. In this latter case, the backfit rule protects the construction permit holder, but not the prospective applicant, or even the present applicant." See 54 FR 15385-86; April 18, 1989.

At the November 1989 workshop and in written comments, the industry stated that a backfit analysis for the license renewal rule is desirable to ensure that the NRC engages in "disciplined decision-making" when determining what additional actions should be required by the rule to address age-related deterioration. The Commission believes that the industry concerns in this regard will be achieved by proper implementation of the regulatory analysis process, including the internal reviews by the Committee to Review Generic Requirements, the review of the license renewal rule by the ACRS, the analyses that are required by the paperwork Reduction Act, the high degree of public interaction and comment which the NRC staff has sought to date with respect to license renewal (e.g., public workshops, advance notices of rulemakings), and the

public interaction which the staff will continue to seek on the proposed license renewal rule, as part of its Obligation to comply with the rulemaking provisions of the APA.

In sum, because the proposed rule does not constitute a backfit under 10 CFR 50.109(a)(1), because the reasons underlying the Commission's adoption of the backfit rule are inapplicable to the kind of rulemaking being undertaken here, and because the proposed rule would not adversely affect licenseeS with respect to backfit considerationS, the Commission has determined that a backfit analysis need not be prepared for the proposed rule.