

Committee on Nuclear Technology and Law
of
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THE RENEWAL OF NUCLEAR POWER PLANT
OPERATING LICENSES

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The National Energy Strategy recently released by the U.S. Department of Energy projects that between 190 and 275 gigawatts of generating capacity must be added by 2010 to serve the Nation's needs.^{1/} In this same period, the initial operating licenses for more than 30 nuclear power plants will expire.^{2/} The National Energy Strategy recommends extending the licenses of existing nuclear power plants -- in a safe and economical manner -- which DOE believes would replace the need for about 66 gigawatts of new capacity by 2030.^{3/}

This strategy is sure to kindle controversy, not only because of the opposition of some to nuclear power in this country, but also because the older plants whose licenses will soon expire may be perceived as less safe than newer plants. This report discusses this controversy, which is already manifest in the U.S. Nuclear Regulatory Commission's efforts to develop a license renewal program.

I. Introduction

The Nuclear Regulatory Commission (NRC) is currently engaging in a rulemaking proceeding to establish the procedures and standards that would govern the renewal of operating licenses for commercial nuclear power plants.^{4/} This rulemaking involves considerations that are of significant national interest. The NRC's license renewal process must reasonably assure the public health and safety. It is also important that barriers to license renewal not be imposed needlessly. Nuclear power provides about twenty percent of our domestic electrical energy requirements, and the loss of this generating capacity would have serious economic impacts.

In its proposed rule, the NRC has determined that the same requirements and conditions that governed operation during a plant's initial license term should be adequate reasonably to assure safe operation during the renewal term, provided age-related degradation of the nuclear plant's structures, systems, and components is managed in a manner that maintains the safety of the plant throughout the renewal term. Consequently, the

^{1/} U.S. Department of Energy, National Energy Strategy 108 (1st ed. 1991/1992).

^{2/} Id. at 114.

^{3/} Id.

^{4/} Nuclear Power Plant License Renewal, Proposed Rule, 55 Fed. Reg. 29,043 (1990).

proposed rule would focus a license renewal proceeding on managing the effects of aging.

The argument can be (and has been made) that license renewal should be predicated on a complete reevaluation of plant design and safety to the standards for a new plant. If this view prevails, license renewal may well be foreclosed, because it would likely be impossible (and certainly uneconomical) to redesign and rebuild existing plants.

It has also been suggested that the license renewal process should be expanded to include a mandatory antitrust review. Proponents of such review argue that further conditions on operation will be necessary to prevent situations inconsistent with the antitrust laws.

This report examines the merits of the NRC's proposal and some of the issues raised by the rule. To provide an understanding of the issues, the NRC's licensing process is first described. Next, the development of the proposed rule is briefly discussed. Last, the underlying philosophy and legality of the proposed rule are analyzed.

II. The Licensing Process

A. The Statutory Licensing Scheme

The NRC (the successor to the Atomic Energy Commission (AEC)) licenses nuclear power plants under the authority of the Atomic Energy Act of 1954, as amended.^{5/} Until nuclear power was demonstrated to be of practical value, nuclear plant licensing was governed by section 104(b) of the Act,^{6/} which instructed the Commission to impose only the minimum amount of regulation necessary to permit the Commission to fulfill its statutory obligations. After nuclear power was determined to be of practical

^{5/} 42 U.S.C. §§ 2011 et seq. (1988). Sections 101-111 of the Atomic Energy Act, 42 U.S.C. §§ 2131-2141 (1988), provide for the licensing of "production and utilization" facilities. A nuclear power plant is referred to in the Atomic Energy Act as a "utilization facility" because it utilizes "special nuclear material" (enriched uranium) as fuel. See 42 U.S.C. §§ 2014(cc).

^{6/} 42 U.S.C. § 2234(b) (1988).

value in 1970,^{7/} commercial licenses were issued under section 103.^{8/}

1. The Two-Step Initial Licensing Process

The Act prescribes a two-stage initial licensing process. A utility wishing to construct a nuclear plant must first apply for and obtain a construction permit under section 185 of the Act.^{9/} When construction is complete, the utility must amend its application and obtain a license to operate.^{10/}

The two-step initial licensing process was borrowed from the Communications Act of 1934. The Communications Act provided a two-step initial licensing process for broadcasting stations because it was important that a broadcasting station be built and tested to assure that it would operate without undue interference with other stations before the government extended its final approval in the form of a license.^{11/}

Applying this procedure to the initial licensing of nuclear plants made similar sense. When the Atomic Energy Act of 1954 was enacted, reactor designs for power production had not yet been developed. The initial construction permit stage allowed the Commission to review and approve a preliminary design before significant resources were expended. After construction, the operating license stage proceeding provided the Commission the opportunity to review and approve the safety of the final design, and to conduct inspections and tests to make sure the plant functioned as intended, before issuing a final license.

Section 189 of the Atomic Energy Act^{12/} establishes a hearing requirement in connection with licensing. It requires a mandatory hearing in connection with an application for a construction permit. It also requires a hearing in connection with an

^{7/} The "practical value" determination was made legislatively, Pub. L. 91-560, 84 Stat. 1472 (1970).

^{8/} 42 U.S.C. § 2233 (1988).

^{9/} 42 U.S.C. § 2235 (1988).

^{10/} Id. Plants whose construction permits were issued prior to 1970 received operating licenses under section 104(b); all other plants received operating licenses under section 103.

^{11/} H. Marks and G. Trowbridge, Framework for Atomic Industry 76 (1955).

^{12/} 42 U.S.C. § 2239 (1988).

application for an operating license (or in any proceeding for the granting, suspending, revoking, or amending of a license) upon request of a person whose interest may be affected.^{13/}

2. Findings Related To License Issuance

Statutorily prescribed considerations and findings in connection with the issuance of a license are scattered through several sections of the Atomic Energy Act. Sections 103 and 182, however, are the most important in defining the basic considerations pertaining to the issuance of a license.

Section 182^{14/} states:

Each application for a license . . . shall specifically state such information as the Commission, by rule or regulation, may determine to be necessary to decide such of the technical and financial qualifications of the applicant . . . or any other qualifications of the applicant as the Commission may deem appropriate for the license. In connection with licenses to operate . . . utilization facilities, the applicant shall state such technical specifications . . . and such other information as the Commission may, by rule or regulation, deem necessary in order to enable it to find that the utilization . . . of special nuclear material will be in accord with the common defense and security and will provide adequate protection to the health and safety of the public.

Section 103(b)^{15/} states:

the Commission shall issue . . . licenses on a nonexclusive basis to persons applying therefor (1) whose proposed activities will serve a useful purpose proportionate to the

^{13/} The NRC has the authority to set the threshold which a person seeking a hearing must meet to be entitled to a hearing. BPI v. AEC, 502 F.2d 424, 428-29 (D.C. Cir. 1974); Union of Concerned Scientists v. NRC, 920 F.2d 50, 55 (D.C. Cir. 1990).

^{14/} 42 U.S.C. § 2232 (1988).

^{15/} 42 U.S.C. § 2133(b) (1988).

quantities of special nuclear material to be utilized; (2) who are equipped to observe and who agree to observe such safety standards to protect the public health and to minimize danger to life or property as the Commission may by rule establish; and (3) who agree to make available to the Commission such technical information and data concerning activities under such licenses as the Commission may determine necessary to promote the common defense and security and to protect the health and safety of the public.

These sections indicate that there are two basic findings that must be made by the NRC in connection with the issuance of a license: that the license (1) adequately protects the public health and safety; and (2) accords with the common defense and security. The Commission may also consider the technical and financial qualifications of a license applicant, but these considerations are generally recognized as being ancillary to the health and safety finding. The findings and considerations in sections 103 and 182 apply to issuance of both a construction permit^{16/} and an operating license, although the findings supporting a construction permit need not be as definitive as those later made to support operation.^{17/}

Sections 103 and 182 give the Commission considerable latitude in determining what is necessary to satisfy these basic considerations. For example, section 182 gives the Commission the authority to determine, by rule or regulation, what information is necessary in an application to determine an applicant's technical and financial qualifications and to find that the public health and safety will be adequately protected. Similarly, section 103(b) requires the Commission to issue a license to persons equipped to observe such safety standards "as the Commission may by rule establish."

This latitude has been recognized by the judiciary on many occasions. In Siegel v. Atomic Energy Commission,^{18/} the U.S. Court of Appeals for the D.C. Circuit observed that in the Atomic Energy Act:

^{16/} A construction permit is considered a license. 42 U.S.C. § 2235 (1988).

^{17/} Power Reactor Development Co. v. Int'l Union of Elec., Radio and Machine Workers, 367 U.S. 396, 404-415 (1961).

^{18/} 400 F.2d 778 (D.C. Cir. 1968).

Congress . . . enact[ed] a regulatory scheme which is virtually unique in the degree to which broad responsibility is reposed to the administering agency, free of close prescription in its charter as to how it shall proceed in achieving the statutory objectives.^{19/}

Section 185^{20/} sets forth findings to be made when a construction permit is converted to an operating license. It provides that upon completion of a facility and the filing of any additional information needed to bring the application up to date, "and upon finding that the facility authorized has been constructed and will operate in conformity with the application as amended and in conformity with the provisions of this Act and of the rules and regulations of the Commission," the Commission will issue an operating license.^{21/}

The reason section 185 formulates the findings in this manner is not explained in the legislative history, but the language probably reflects two competing Congressional purposes. First, Congress did not want the conversion of a construction permit to an operating license to be automatic. Section 185 therefore instructed the Commission to make basic findings before converting a construction permit to an operating license. Second, while Congress did not want to guarantee that an operating license

^{19/} Id. at 783. See also North Anna Environmental Coalition v. NRC, 533 F.2d 655, 658-59 (D.C. Cir. 1976); Duke Power Co. v. NRC, 770 F.2d 386, 390 (4th Cir. 1985). The Commission may, for example, establish generalized presumptions and decide issues generically by rule. See Coalition for Environment v. NRC, 795 F.2d 168, 173-74 (D.C. Cir. 1986) (upholding an NRC rule eliminating financial qualifications review of electric utility applicants at the operating license stage based on the NRC's generic determination that the ratemaking process reasonably assures such financial qualification); Minnesota v. NRC, 602 F.2d 412, 416-19 (D.C. Cir. 1979) (upholding NRC waste-confidence determination). See also Baltimore Gas & Electric Co. v. Natural Resources Defense Council, 462 U.S. 87, 103 (1983) (recognizing the propriety of NRC rule generically determining fuel cycle impacts for NEPA purposes).

^{20/} 42 U.S.C. 2235 (1988).

^{21/} Id. See Nuclear Information Resource Service v. NRC, 918 F.2d 189, 193 (D.C. Cir. 1990), vacated and reh'g granted, 928 F.2d 465 (1991).

would be issued to any plant whose construction had been authorized by a construction permit, it nevertheless sought to provide assurances that an operating license would not be denied arbitrarily. Section 185 therefore signals Congress' intent that a completed plant would be licensed if it had been built in compliance with the application and the applicable regulations, and satisfies the statutory provisions such as section 103.

The Atomic Energy Act establishes one other consideration in connection with nuclear power plant licensing. Section 105,^{22/} as amended in 1970 when the Congress determined nuclear power to be of practical value,^{23/} requires the Commission, at the construction permit stage for a facility to be licensed under section 103, to consult with the Attorney General and make a finding as to whether the activities under the license would create or maintain a situation inconsistent with the antitrust laws. If so, the Commission is authorized to issue the license subject to preventive or remedial conditions.

The Act does not permit reconsideration of these antitrust matters at the operating license stage for a facility licensed under section 103 unless the Commission determines that there have been significant changes in the licensee's activities since the construction permit stage review.^{24/} The Act prohibits antitrust review of a facility licensed under section 104(b), except in one specific circumstance -- where a person who sought antitrust review at the construction permit stage requests such review in connection with the operating license.^{25/}

Section 102(2)(c) of the National Environmental Policy Act (NEPA)^{26/} creates additional licensing considerations, albeit of a procedural nature. It requires federal agencies to prepare a detailed environmental impact statement in connection with any major federal action significantly affecting the environment. The licensing of a nuclear plant has always been considered a major federal action.^{27/}

^{22/} 42 U.S.C. § 2135 (1988).

^{23/} Pub. L. 91-560, 84 Stat. 1472 (1970).

^{24/} 42 U.S.C. § 2135(c)(2) (1988).

^{25/} 42 U.S.C. § 2135(c)(3) (1988).

^{26/} 42 U.S.C. § 4332(2)(C) (1988).

^{27/} See Public Service Co. of New Hampshire v. NRC, 582 F.2d 77, 81 (1st Cir.), cert. denied, 439 U.S. 1046 (1978).

3. License Term and Renewal

Section 103(c)^{28/} of the Act provides that "Each such license [i.e., a license issued under section 103] shall be issued for a specified period, as determined by the Commission, depending upon the type of activity to be licensed, but not exceeding forty years, and may be renewed upon the expiration of such period."^{29/} The statute is silent concerning how renewal is to be accomplished and what procedures apply. There is no indication whether renewal constitutes an amendment of an existing license, or the issuance of a new license, or whether the licensing vehicle makes any difference; and there are no findings specified for renewal. The legislative history is similarly silent. Section 104(b) neither limits the terms of operating licenses issued pursuant to that section nor addresses renewal of those licenses.^{30/}

B. NRC Implementation of the Act

Reflecting the broad authority conferred in the Atomic Energy Act, the Commission has established a regulatory process designed to provide adequate protection to the public health and safety. The NRC's regulations and guidance documents establish an initial licensing procedure that comports with the statutory scheme,^{31/} a set of technical requirements forming the licensing

^{28/} 42 U.S.C. § 2133(c) (1988).

^{29/} Id. The forty-year maximum term does not appear to be based on any Congressional determination of how long a nuclear power plant might operate safely, but instead on the general period of depreciation for an electric generating unit. Hearings before the Joint Committee on Atomic Energy on S. 3323 and H.R. 8862, 83d Cong., 2d Sess., Part I, 227-231 (1954).

^{30/} The NRC's regulations require all licenses, including those issued under section 104, to be issued for a fixed period of time not exceeding forty years, subject to renewal. 10 C.F.R. § 50.51 (1990).

^{31/} The initial licensing procedure described below is the two-step procedure governed by 10 C.F.R. Part 50. This procedure, which has been applied to all nuclear power plants to date, is described to provide an understanding of the basis for existing licenses. Recently, the NRC has also promulgated a combined licensing procedure for future plants, codified at 10 C.F.R. Part 52. The combined license procedure and judicial review thereof are discussed later in this article.

basis for nuclear plants, and extensive post-licensing oversight and enforcement programs.

1. The Licensing Procedure

Under the NRC's procedures, a utility wishing to construct a nuclear power plant must submit an application providing information specified in 10 C.F.R. §§ 50.33, 50.33a, and 50.34(a). Section 50.33 requires, inter alia, the applicant to identify itself, demonstrate that it is not owned or controlled by a foreign entity, and demonstrate that it is financially qualified to carry out the activities for which the permit is sought. Section 50.33a requires information for the construction permit stage antitrust review. Section 50.34(a) requires the preparation and submittal of a Preliminary Safety Analysis Report (PSAR).

In the PSAR, the applicant must describe the preliminary design of the proposed facility (including design criteria and design bases), analyze the design with the objective of assessing risk to the public health and safety, and show that the proposed site satisfies siting criteria specified in 10 C.F.R. Part 100. The applicant also must submit an environmental report addressing the environmental impact of the proposed plant to assist the NRC's consideration of NEPA matters.

The NRC Staff reviews this application and issues a Safety Evaluation Report (SER) documenting its technical conclusions, and an Environmental Impact Statement (EIS) addressing the NEPA matters. An Atomic Safety and Licensing Board,^{32/} using formal adjudicatory proceedings, then holds a hearing and conducts a de novo review. Persons with standing may intervene in this proceeding. If the Board finds in favor of the applicant at the conclusion of the hearing process, the Staff is authorized to issue the construction permit.

When the construction of the plant is nearly complete, the utility files an application for an operating license, providing the information in 10 C.F.R. § 50.33,^{33/} a Final Safety Analysis Report (FSAR) in accordance with 10 C.F.R. § 50.34(b), and a current Environmental Report. The FSAR provides the final description of the facility, its design basis, and the limits on its operation, and presents a safety analysis of the facility as a

^{32/} The Atomic Safety and Licensing Board consists of three Administrative Judges, one being a lawyer and the other two being scientists.

^{33/} An electric utility applicant is not required to provide information demonstrating financial qualifications at the operating license stage. 10 C.F.R. § 50.33(f) (1990).

whole. The applicant also submits proposed technical specifications to establish safety limits and conditions of operation,^{34/} describes its organizational structure and managerial and administrative controls, and provides an operational quality assurance program satisfying 10 C.F.R. Part 50, App. B. In addition, the applicant must provide emergency, physical security, and safeguards contingency plans.^{35/}

The NRC Staff's review of this information is again documented in an SER and in a supplement to its EIS. If a person with standing properly intervenes and requests a hearing, a hearing will be conducted by an Atomic Safety and Licensing Board to resolve contested issues ("contentions"). Apart from the financial qualifications of an electric utility applicant (and a few environmental issues),^{36/} an intervenor may raise matters even though such matters were previously addressed or adjudicated at the construction permit stage.^{37/}

If contested issues are resolved in the applicant's favor, the Atomic Safety and Licensing Board will authorize the Staff to issue the operating license. License issuance is based on findings set forth at 10 C.F.R. § 50.57(a).^{38/} The license may

^{34/} See 10 C.F.R. § 50.36 (1990).

^{35/} 10 C.F.R. § 50.33(b)(6)(v), 50.36(c), 50.36(d).

^{36/} The Commission's regulations implementing NEPA preclude consideration of certain alternatives that are no longer viable once construction of a nuclear plant has been completed. 10 C.F.R. §§ 51.53(a), 51.95(a) (1990).

^{37/} An intervenor in an operating license proceeding may be collaterally estopped from raising an issue previously decided in the construction permit stage hearing, but only if the intervenor was a party to that hearing. Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-673, 15 N.R.C. 688, 695 (1982).

^{38/} Tracking the various requirements of the Atomic Energy Act, the findings set forth at 10 C.F.R. § 50.57(a) are that:

(1) Construction of the facility has been substantially completed, in conformity with the construction permit and the application as amended, the provisions of the Act, and the rules and regulations of the Commission; and

contain conditions, and it will incorporate the approved technical specifications for the facility.

2. Technical Requirements

As indicated above, the PSAR and FSAR that an applicant must submit, in connection with a construction permit and operating license respectively, must demonstrate the acceptability of the facility siting, design, and operation. Over the years, the NRC, and the AEC before it, have promulgated regulations guiding or controlling these determinations.

Site acceptance criteria are established by 10 C.F.R. Part 100, which was promulgated in 1962. The regulations at 10 C.F.R. § 100.11 require a nuclear power plant to be located in an "exclusion area" (an area controlled by the licensee, so that public residence and activity in the vicinity may be excluded),^{39/} and the exclusion area must be sized so that the

Footnote continued from previous page.

(2) The facility will operate in conformity with the application as amended, the provisions of the Act, and the rules and regulations of the Commission; and

(3) There is reasonable assurance (i) that the activities authorized by the operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the regulations in this chapter; and

(4) The applicant is technically and financially qualified to engage in the activities authorized by the operating license in accordance with the regulations in this chapter. However, no finding of financial qualification is necessary for an electric utility applicant for an operating license for a utilization facility of the type described in § 50.21(b) or § 50.22.

(5) The applicable provisions of Part 140 of this chapter have been satisfied; and

(6) The issuance of the license will not be inimical to the common defense and security or to the health and safety of the public.

^{39/} 10 C.F.R. § 100.3(a) (1990).

maximum radiation dose that an individual located at its boundary could receive following certain postulated accidents would not exceed specified limits. Around the exclusion area, there must be a low population zone (LPZ). The LPZ need not meet any specific population density requirement, but it must be shown that appropriate protective measures could be taken in the event of an accident to keep radiation doses below established limits.^{40/} 10 C.F.R. Part 100 also establishes seismic and geologic criteria which are used to define the maximum earthquake which the facility must be designed to withstand.^{41/}

General Design Criteria for the nuclear plant are established by Appendix A to 10 C.F.R. Part 50, which was promulgated in 1971 to codify design practices and features that had been found acceptable on a case-by-case basis for previously licensed plants.^{42/} Appendix A reflects the Commission's "defense in depth" philosophy and requires that a reactor employ multiple barriers to the release of fission products. More specifically, Appendix A identifies systems that are important to safety and defines the capabilities that each should possess. Such systems must be redundant, so that the single failure of a component will not prevent the accomplishment of the necessary safety functions. Also, such systems must be designed to accommodate the environmental effects associated with normal operation and postulated accidents and be subject to adequate fire protection and mitigation measures.

The Commission has published Regulatory Guides (known in the early days of the AEC as Safety Guides) detailing ways in which license applicants can address the general design criteria and other regulations. A Regulatory Guide is not itself a regulation, but represents the Commission's guidance on a method which the Commission deems acceptable to satisfy some more general regulation such as the General Design Criteria.^{43/} A Regulatory Guide may, for example, endorse a particular computer code, analytical methodology, or industrial standard. These Regulatory Guides have been revised over the years as codes, analytical

^{40/} 10 C.F.R. § 100.3(b) (1990).

^{41/} 10 C.F.R. Part 100, Appendix A (1990).

^{42/} Draft versions of the General Design Criteria, which existed and were used for plants licensed in the late 1960's, differed in certain respects from the final criteria adopted in Appendix A in 1971.

^{43/} An applicant may use an alternative approach if it can demonstrate that method to be acceptable.

techniques, and standards have advanced. There are currently about 150 Regulatory Guides on reactor safety issues.^{44/}

In a number of cases, the Commission has codified some of its more detailed acceptance criteria by regulation. In 1971, the Commission promulgated 10 C.F.R. § 50.55a requiring that certain components meet the American Society of Mechanical Engineers Boiler and Pressure Vessel Code then in effect. In 1973, the Commission published Appendix G to 10 C.F.R. Part 50 establishing additional fracture toughness requirements for pressure-retaining components. In 1974, the Commission promulgated 10 C.F.R. § 50.46 and Appendix K establishing acceptance criteria for emergency core cooling systems. In 1978, the Commission promulgated 10 C.F.R. § 50.44, establishing standards for combustible gas control systems. In 1980, the Commission promulgated 10 C.F.R. § 50.48 and 10 C.F.R. Part 50, Appendix R, codifying detailed fire protection requirements. In 1982, the Commission promulgated 10 C.F.R. § 50.49 establishing more specific standards for qualifying electrical equipment to assure that such equipment remains functional in normal and accident environments. In 1985, the Commission promulgated 10 C.F.R. § 50.61 establishing further reactor vessel fracture toughness requirements. In 1988, the Commission promulgated 10 C.F.R. § 50.62 requiring the development of measures responsive to "anticipated transients without scram" (ATWS), and 10 C.F.R. § 50.63 establishing reliability requirements for nuclear plant emergency power supplies.

NRC regulations also establish requirements relating to such areas as the licensee's organization,^{45/} emergency and operating procedures,^{46/} Quality Assurance programs,^{47/} security and

^{44/} The NRC's "Standard Review Plan" (NUREG-0800), which guides the NRC Staff in its technical review of applications for construction permits and initial operating licenses, is also useful in providing guidance on methods acceptable to the NRC staff of complying with NRC regulations.

^{45/} 10 C.F.R. §§ 50.34(b)(6)(i), 50.54(k)-(m), and 10 C.F.R. Part 50, App. B, § I (1990).

^{46/} 10 C.F.R. § 50.34(b)(6)(iv) (1990).

^{47/} 10 C.F.R. § 50.34(b)(6) and 10 C.F.R. Part 50, App. B (1990).

safeguards,^{48/} emergency preparedness,^{49/} and training.^{50/} In addition, the NRC regulations establish certain financial requirements.^{51/}

3. The Licensing Basis

By necessity, a nuclear plant is licensed on the basis of the regulatory requirements and positions in effect at the time of licensing. The universe of applicable requirements, acceptance criteria, and methods adopted for satisfying the existing requirements is generally referred to as a plant's licensing basis.

While a plant is licensed on the basis of regulations and positions in effect at the time of licensing, it may be subject to new requirements that are imposed after initial licensing. Thus, a plant's licensing basis does not remain fixed, but evolves over time.

The regulations imposing specific design requirements illustrate this process. The regulations establishing acceptance criteria for emergency core cooling systems,^{52/} combustible gas control systems,^{53/} fire protection,^{54/} environmental qualification,^{55/} reactor vessel toughness,^{56/} and station blackout^{58/} were applied retroactively in varying degrees to existing plants as the NRC determined to be necessary.

^{48/} 10 C.F.R. §§ 50.34(c)-(d), 50.54(p), (v), 55.57, and 10 C.F.R. Part 73 (1990).

^{49/} 10 C.F.R. §§ 50.47, 50.54(a), and 10 C.F.R. Part 50, App. E (1990).

^{50/} 10 C.F.R. §§ 50.34(b)(8), 50.54(i) (1990).

^{51/} 10 C.F.R. §§ 50.54(w), 50.75; 10 C.F.R. Part 140 (1990).

^{52/} 10 C.F.R. § 50.46 and App. K (1990).

^{53/} 10 C.F.R. § 50.44 (1990).

^{54/} 10 C.F.R. § 50.48 and App. R (1990).

^{55/} 10 C.F.R. § 50.49 (1990).

^{56/} 10 C.F.R. § 50.61 (1990).

^{57/} 10 C.F.R. § 50.62 (1990).

^{58/} 10 C.F.R. § 50.63 (1990).

This process is referred to as "backfitting," and is controlled by 10 C.F.R. § 50.109. Under section 50.109, the NRC may impose on an existing plant, without regard to cost, any new requirement which it deems necessary to ensure adequate protection to the public health and safety or to bring the licensee into conformance with its license or existing regulations.^{59/} The NRC may also direct improvements beyond those necessary to provide adequate protection to the public health and safety, if such improvements will result in significant safety benefits and are justified on a cost-benefit basis. Therefore, when the NRC amends its regulations to revise or to add safety requirements, it must consider whether the changes should be applied to existing plants as well as to future plants. The revised regulation will be made applicable to existing plants if such application is necessary to ensure the public health and safety or effect compliance with preexisting requirements, or if it is justified on a cost-benefit basis.

Backfitting may also be effected by the NRC through means other than rulemaking. The NRC may impose a new requirement on a particular plant, or group of plants, by order. The NRC may also issue a variety of generic communications to alert licensees to some situation and recommend or request responsive action.^{60/} This will occur, for example, when the NRC decides that a methodology previously endorsed by a Regulatory Guide is no longer an acceptable method of demonstrating compliance with an underlying regulation. In revising the Regulatory Guide to endorse some new methodology, the NRC may advise existing licensees of the new approach to demonstrate regulatory compliance. The backfit rule again defines the circumstances under which a backfit may be directed.

The NRC is active in its efforts to identify changes that should be required. The NRC analyzes plant operational performance through reviews of plant-submitted data to identify current and emerging problems. The NRC's Division of Operational Events Assessment systematically screens and assesses reactor events reported by licensees or NRC personnel, identifies those that

^{59/} A backfit rule to this effect has existed since 1970. See C.F.R. § 50.109 (1971) as promulgated at 35 Fed. Reg. 5,318 (1970). See also Union of Concerned Scientists v. NRC, 824 F.2d 108 (D.C. Cir. 1987); Union of Concerned Scientists v. NRC, 880 F.2d 552 (D.C. Cir. 1989).

^{60/} The NRC uses "Information Notices," "Bulletins," and "Generic Letters," depending on the nature of the matter and its importance. The NRC may also require specific licensees to submit information to the NRC to determine if further regulatory action is necessary. 10 C.F.R. § 50.54(f).

require further investigation or have generic safety implications, and develops guidance and guidelines for corrective action. The Division informs licensees of generic issues and appropriate actions by issuing Information Notices, Bulletins, and Generic Letters.

A similar function is performed by the NRC's Office of Analysis and Evaluation of Operational Data (AEOD). AEOD reviews all Licensee Event Reports (LER's), several thousand per year, performs in-depth evaluations of selected issues, and publishes case studies, engineering evaluations, and technical review reports. The most significant issues are addressed in AEOD Power Reactor Event Reports. AEOD also performs trend and pattern analysis of operational data.

The NRC has resolved many generic safety issues over the years through research and development, and when deemed necessary by the NRC, through the imposition of additional requirements. These new requirements have been imposed on existing reactors to varying degrees based on the backfitting criteria. All such new requirements become components of a plant's licensing basis.

Changes in a plant's licensing basis may also result from a licensee's initiative, but such changes are subject to regulatory controls to ensure that they are properly evaluated and documented, and do not diminish the safety of the plant. An NRC rule at 10 C.F.R. § 50.59 requires a licensee to obtain NRC approval in the form of a license amendment before making any change in the facility or procedures as described in the safety analysis report if such change involves an unreviewed safety question.^{61/} This provision has the effect (and purpose) of preserving the validity of the licensing basis of the facility, so that the NRC's safety assessment of the plant is not negated. If changes are authorized, they must be reflected in an updated safety analysis report that each licensee must maintain.^{62/}

Finally, changes in a plant's licensing basis may be the result of a petition by an interested party. The Commission's

^{61/} A change involves an unreviewed safety question if the probability of occurrence or consequence of an accident or malfunction important to safety previously evaluated in the safety analysis report may be increased, if a possibility of an accident or malfunction or a type of accident or malfunction of a different type from any evaluated previously in the safety analysis may be created, or if the margin of safety as defined in the basis for any technical specification is reduced. 10 C.F.R. § 50.59(a)(2) (1990).

^{62/} 10 C.F.R. § 50.71(e) (1990).

regulations allow any person to request that the NRC institute a proceeding to modify, suspend, or revoke a license.^{63/} If the NRC agrees that there is a problem (i.e., that some action may be necessary to provide reasonable protection to the public health and safety), it will issue an order requiring the licensee to show cause why its license should not be modified, suspended, or revoked.^{64/}

4. NRC Oversight

Establishing appropriate regulatory requirements only partially fulfills the NRC's role in regulating nuclear power plants. The NRC must also ensure that its requirements are met. The NRC performs this function by oversight and enforcement.

One method consists of imposing extensive reporting requirements on each nuclear plant licensee. The licensee is required to provide immediate notification of specified types of events.^{65/} The NRC also requires a licensee to submit a written "Licensee Event Report" within 30 days of specified events.^{66/} The reportable situations include any event which puts a plant outside its design basis or which could have prevented a system important to safety from fulfilling its safety function. 10 C.F.R. Part 21 is another broad regulation requiring a licensee to report any defect in basic components.^{67/} In addition, a licensee is generally required to report any information that has a significant implication for the public health and safety.^{68/}

Another method of NRC oversight is inspection. The NRC assigns to each nuclear plant resident inspectors who have access

^{63/} 10 C.F.R. § 2.206 (1990).

^{64/} 10 C.F.R. § 2.202 (1990). If the public health and safety so require, the NRC may order that the proposed action be immediately effective, pending further order. 10 C.F.R. § 2.202(f) (1990).

^{65/} See, e.g., 10 C.F.R. §§ 20.205, 20.403, 50.36, 50.72, 73.71 (1990). Additional reporting requirements may be imposed in a plant's license.

^{66/} 10 C.F.R. § 50.73 (1990).

^{67/} 10 C.F.R. Part 21 implements section 206 of the Energy Reorganization Act of 1974, 42 U.S.C. § 5846 (1988). See Natural Resources Defense Council, Inc. v. NRC, 666 F.2d 595 (D.C. Cir. 1981).

^{68/} 10 C.F.R. § 50.9 (1990).

to and monitor the daily functioning of all activities that affect the safety of plant operations. In addition, there are frequent special inspections by NRC individuals or teams.

III. The Current Rulemaking

Current NRC regulations are essentially silent on the subject of license renewal.^{69/} The existing regulations were promulgated to govern initial licensing, often codifying practices and standards that had been developed in individual, initial licensing proceedings. Because commercial power reactor licenses were issued for no longer than a forty-year term (with the first such license issued in 1957), the NRC has had no occasion yet to consider an application for the renewal of such a license.

Attention to license renewal commenced in the early 1980's, with the recognition that energy reliability planning would necessitate that the first license renewal proceedings be conducted in the 1990's. In 1982, the Electric Power Research Institute (EPRI) published an economic and technological review of the feasibility of extending nuclear plant operations,^{70/} and in conjunction with the U.S. Department of Energy, funded studies at the Monticello and Surry Unit 1 nuclear plants. Shortly thereafter, the National Environmental Studies Project of the Atomic Industrial Forum sponsored a study of the regulatory considerations for extending the life of nuclear power plants.^{71/}

The Commission also began considering the development of a regulatory policy on extending nuclear power plant licenses. In November 1986, the NRC requested public comments on a number of issues, such as the appropriate scope of a license extension application, technical considerations, and applicable procedures.^{72/}

^{69/} 10 C.F.R. § 50.51 does provide that licenses may be renewed, but provides no specifics on the procedures or standards.

^{70/} EPRI-NP-2418, "Extended Life Operation of Light Water Reactors: Economic and Technological Review" (June 1982).

^{71/} Atomic Industrial Forum, "Regulatory Considerations for Extending the Life of Nuclear Power Plants," AIF/NESP-040 (Dec. 1986).

^{72/} 51 Fed. Reg. 40,334 (1986). The NRC already had underway a technical research effort to consider plant aging. In May, 1987, the NRC's "Technical Review Group for Aging and Life Extension" issued a report concluding that plant aging would

Footnote continued on next page.

After assessing comments,^{73/} the NRC published a report on the regulatory options,^{74/} and solicited further public comment in an advance notice of rulemaking.^{75/} The central regulatory question was whether a plant's existing licensing basis would be adequate for renewal, or whether license renewal should be based on compliance with the requirements that would apply to a new plant or some other basis.

The public comments were again analyzed.^{76/} The prevalent view of commenters was that license renewal should be a continuation of a plant's existing licensing basis.^{77/} Several private groups asserted that compliance with the requirements applicable to a new plant was appropriate.^{78/}

After considering these comments, the NRC prepared a conceptual rule and a document entitled "Preliminary Regulatory Philosophy and Approach for License Renewal." The conceptual rule adopted the approach that a plant's current licensing basis would adequately ensure safe operation during a renewal term. The NRC

Footnote continued from previous page.

not pose major technical issues precluding plant life extension, provided compensatory measures are effectively implemented.

^{73/} In addition to comments provided by members of the nuclear industry, two citizen groups responded to the NRC's request for comments. One stated its absolute opposition to renewal. The other stated general support for the concept of license renewal, but urged caution in formulating the criteria.

^{74/} U.S. NRC, "Regulatory Options for Nuclear Plant License Renewal," NUREG-1317 (June 1988).

^{75/} 53 Fed. Reg. 32,919 (1988).

^{76/} The MITRE Corp., "Summary and Analysis of Public Comments on NUREG-1317: Regulatory Options for Nuclear Plant License Renewal," NUREG/CR-5332 (March 1989).

^{77/} See *id.* at 3-3 to 3-8. Forty-four utilities, several industry groups and law firms involved in nuclear power matters, and the U.S. Department of Energy supported this approach.

^{78/} See *id.* at 3-8 to 3-9.

published these documents in the Federal Register and held a public workshop for their discussion.^{79/}

Finally, in July 1990, the NRC published its proposed rule. The rule explained the current licensing basis approach and was supported by four additional reports.^{80/} In all, over 400 pages of technical and regulatory analysis were provided in support of the proposed rule.

A. Provisions of the Proposed Rule

As described in the supplementary information published in the Federal Register,^{81/} the proposed rule has the following principal features. The licensing basis for renewal will consist of a plant's current licensing basis, together with any additional considerations related to the aging of important systems, structures, and components. The "current licensing basis" of a plant is defined in the rule to include all "applicable" NRC requirements and commitments by the licensee. The rule will include a generic finding that the current licensing bases of existing plants are sufficient to ensure adequate protection to the public health and safety, thereby eliminating any need to make further findings under 10 C.F.R. § 50.57(a) in support of a license renewal.^{82/}

The proposed rule would create a new Part 54 to 10 C.F.R. to establish the procedure for license renewal. As proposed, an applicant will be required to submit an integrated plant assessment to supplement the plant's FSAR. This assessment must apply a screening process to identify systems, structures, and

^{79/} 54 Fed. Reg. 41,980 (1989).

^{80/} NUREG-1411, "Response to Public Comments Resulting from the Public Workshop on Nuclear Power Plant License Renewal" (June 1990); NUREG-1412, "Foundation for the Adequacy of the Licensing Bases, Draft Report for Comment" (June 1990); NUREG-1398, "Environmental Assessment for Proposed Rule on Nuclear Power Plant License Renewal, Draft for Comment" (June 1990); NUREG-1362, "Regulatory Analysis for Proposed Rule on Nuclear Power Plant License Renewal, Draft for Comment" (June 1990).

^{81/} 55 Fed. Reg. at 29,045.

^{82/} See 55 Fed. Reg. at 29,047, 29,061 (1990). Note that certain findings included in 10 C.F.R. § 50.57(a), specifically findings (1) and (2) relating to conformity with NRC regulations, are derived from section 185, which only applies when a construction permit is converted to an operating license.

components "important to license renewal" (a defined term) and demonstrate for each that aging either is not significant or can be adequately managed.

Because a utility may require twelve years or longer to plan, site, design, license, construct, and test new baseload capacity if a license cannot be renewed, a utility needs enough lead time to pursue license renewal and still be able to put replacement capacity into service if the application is denied. In order to accommodate utility planning, the proposed rule allows an application for license renewal to be submitted up to twenty years before an existing license expires.

While a license renewal application may be submitted up to twenty years before the license expiration date, it must be submitted no less than three years before license expiration in order for the "timely renewal provision" of the Administrative Procedure Act to apply. That statute, which is applicable to NRC actions,^{83/} provides that "[w]hen the licensee has made timely and sufficient application for renewal or a new license in accordance with agency rules, a license with reference to an activity of a continuing nature does not expire until the application has been finally determined by the agency."^{84/}

If the application is granted, the renewal license will immediately supersede the existing license. The term of the renewal license will run through the remainder of the period that had been authorized by the previous license, plus an additional period of up to 20 years beyond the previous license expiration date, as sought and justified by the licensee.

The effect of the proposed rule, and particularly of the generic findings to be embodied in the rule, is to limit the NRC Staff's review to plant aging issues. This same limitation would also apply to any public evidentiary hearing conducted in connection with a license renewal application. In both cases, the limitation reflects the NRC's policy judgments that license renewal should not invalidate the many prior technical reviews and determination of plant adequacy and accordingly that the license renewal process should be a focused inquiry.

One might suggest that perhaps evidentiary hearings should be more far ranging in order to allow the public a fuller opportunity to air any concerns. As a practical matter, establishing one scope for the NRC staff's review and a different scope for the evidentiary hearing would be chaotic. The desire to allow

^{83/} 42 U.S.C. § 2231 (1988).

^{84/} 5 U.S.C. § 558(c) (1988).

members of the public to express their views fully is better accommodated by the "limited appearance" sessions^{85/} (non-evidentiary public meetings) conducted by the Licensing Boards in conjunction with any evidentiary proceeding. If a significant safety issue is identified at a limited appearance session, the Licensing Board may refer the issue to the Commission.^{86/}

B. Philosophy Underlying the Proposed Rule

The proposed rule is based on two conclusions. The first is that each plant's current licensing basis represents a set of requirements and commitments that continuously provide adequate protection to the public health and safety. The second is that the NRC regulatory system provides reasonable assurance that a licensee will remain in compliance with its current licensing basis during an extended term of operation, provided the effects of aging are adequately addressed.

1. The First Conclusion

The first conclusion, that a plant's current licensing basis represents a set of requirements and commitments that reasonably assure the public health and safety, follows primarily from the structure of the NRC's licensing and oversight programs. As discussed above, the NRC initially licenses a plant upon a determination that the plant complies with the existing regulations and reasonably assures the public health and safety. As new regulatory positions and requirements are formulated, the NRC considers whether they should be applied retroactively to existing plants, and imposes a backfit, without regard to cost, whenever it deems it necessary to protect the public health and safety. Thus, each plant's current licensing basis is an evolutionary set of requirements deemed sufficient for continued operation. If the current licensing basis were not adequate, the NRC would order the plant to cease operations.

The conclusion that the current licensing bases for existing power reactors are sufficient to reasonably assure the public health and safety is also supported by a succession of programs that the NRC has conducted over the years to evaluate and reevaluate the overall design and safety of individual plants. One of the earliest of these programs was the NRC's Systematic

^{85/} 10 C.F.R. § 2.715(a) (1980).

^{86/} The Commission could either waive the limitations in the renewal rule to allow the Licensing Board to adjudicate the issue (10 C.F.R. § 2.758) or institute a separate proceeding to consider the issue (10 C.F.R. § 2.202).

Evaluation Program (SEP), which the NRC conducted from 1977 into the 1980's to review the design and operating experience of ten of the older plants. The NRC undertook the SEP specifically to address the evolutionary nature of licensing requirements and developments in plant technology and safety, and to examine differences in the design basis of the earliest plants as compared to the design basis of more recently licensed plants.

The results of the SEP reviews showed that where there were differences between the design basis and current regulatory requirements, the vast majority of the earlier plants met the intent of current criteria or had design features that performed safety functions equivalent to those currently required. The relatively few differences warranting further consideration (known as the SEP "lessons learned")^{87/} were identified so that they could be factored into subsequent generic and plant-specific reviews.

After the Three Mile Island (TMI) accident in 1979 and as part of the TMI Action Plan, the NRC Staff undertook what it called the Interim Reliability Program (IREP), in which plant-specific Probabilistic Risk Assessments (PRAs) were performed for several operating reactors (Arkansas Nuclear 1, Browns Ferry 1, Crystal River 3, and Millstone 1) to provide data to supplement WASH-1400.^{88/} The NRC also undertook (through Sandia National Laboratories) a Reactor Safety Study Methodology Applications Program, which evaluated Calvert Cliffs Unit 1, Grand Gulf 1, Oconee 3, and Sequoyah 1.^{89/} Further, the NRC created a special task force to evaluate Indian Point 2 and 3 and Zion 1 and 2, because of the population density around those units.

Based on the SEP and IREP experience, the Commission determined that the safety of operating reactors could be effectively and efficiently reassessed in an integrated plant-specific review.^{90/} In 1984, the NRC initiated a pilot Integrated Safety Assessment Program (ISAP). The ISAP included plant-specific PRA,

^{87/} Letter from N. Palladino, Chairman, NRC, to Rep. T. Beville, House Subcomm. on Energy and Water Development (May 18, 1984) (providing a report on the findings of the SEP).

^{88/} WASH-1400 is the report on 1975 Reactor Safety Study (RSS), which was based on a probabilistic risk assessment of Surry 1 and Peach Bottom 2.

^{89/} U.S. NRC, Reactor Safety Study Methodology Applications Program, NUREG/CR-1659 (1981).

^{90/} See Commission Policy Statement on the Systematic Evaluation of Operating Nuclear Reactors, 49 Fed. Reg. 45,112 (1984).

deterministic evaluations (including consideration of a set of SEP lessons learned), and an evaluation of operating experience, all of which were intended to be as comprehensive as practical. Millstone Unit 1 and Haddam Neck were volunteered as pilot plants under this program.

During the same time frame, the NRC pursued a Severe Accident Research Program, which included an Accident Sequence Evaluation Program and a Severe Accident Risk Reduction Program.^{91/} In August 1985, the NRC issued a "Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants," in which the Commission concluded that:

On the basis of currently available information, . . . existing plants pose no undue risk to public health and safety and [the Commission] sees no present basis for immediate action on generic rulemaking or other regulatory changes for these plants because of severe accident risk.^{92/}

These conclusions are further supported by NUREG-1150, the NRC's 1987 Reactor Risk Reference Document, which was based on further probabilistic evaluations of the Surry, Zion, Sequoyah, Peach Bottom, and Grand Gulf reactors. The study found that each of the plants met NRC safety goals, with the probability of a core damage accident being very small (in the neighborhood of one in 10,000 to one in 100,000 reactor years of operation).

In summary, both the structure of the licensing process and the succession of safety evaluations described above support the

^{91/} The Industry Degraded Core Rulemaking study, and other research performed by the U.S. Department of Energy, the Electric Power Research Institute's Nuclear Safety Analysis Center, and the Institute for Nuclear Power Operations, provided important contributions to the Severe Accident Research Program.

^{92/} 50 Fed. Reg. 32,138, 32,143-44 (1985). The NRC's evaluation of severe accident risk continues. Generic Letter 88-20, dated November 23, 1988, announced that each nuclear power plant now operating or under construction will be examined, on an individual basis, for plant-specific instances of vulnerability to severe accidents. A systematic evaluation of plant design, operation, maintenance and emergency operation, called an "Individual Plant Examination," is to be conducted for each operating plant.

conclusion that the licensing bases of existing plants adequately protect the public health and safety. Further support for this conclusion could be garnered from the record of nuclear plant operation in this country. Over 100 plants have accrued about 1400 years of reactor operating experience without any physical injury to the public, even in the case of the Three Mile Island accident.

2. The Second Conclusion

The second conclusion, that there is reasonable assurance that a licensee will remain in compliance with its current licensing basis over an extended term of operation, provided the effects of aging are adequately addressed, follows from the nature of the NRC's requirements and oversight program. With respect to certain categories of requirements, continued compliance is reasonably assured because there is no time-dependence per se. With respect to other categories, compliance is reasonably assured by the regular inspection and review activities of the NRC and licensees.

As an illustration, the NRC's requirements are divided into five categories for analysis below. The categories are: (a) requirements pertaining to plant configuration; (b) requirements pertaining to operability or functionality of systems, structures, and components; (c) requirements pertaining to operational programs; (d) requirements pertaining to siting; and (e) financial requirements.

a. Plant Configuration

The NRC's requirements pertaining to plant configuration dictate the inclusion in the plant of specified engineered safety features, the redundancy and separation of systems important to safety, and other physical plant layout features. Compliance with these requirements is not time-dependent. As long as the licensee does not physically alter its facility, physical plant configuration will remain the same. The NRC's regulations impose controls to prevent a licensee from altering its plant without proper review. A licensee may not alter the configuration of its plant without evaluation and documentation showing that the licensing basis is preserved.^{23/} Further assurance that a licensee does not improperly alter its plant is provided by NRC inspections, including not only the day-to-day oversight of the resident NRC inspectors but also special NRC team inspections, such as the so-called Safety System Function Inspections (SSFIs), which scrutinize representative systems (in effect, a "vertical

^{23/} 10 C.F.R. § 50.59 (1990).

slice" of the plant) to audit the plant's compliance with design and licensing requirements.

Because the NRC determined the adequacy of plant configuration during each plant's initial licensing, revises those requirements when deemed necessary, and implements regulatory mechanisms to prevent alteration of plant configuration in a manner that would invalidate the safety assessment of the plant, the NRC does not need to conduct a watershed review of a plant's configuration in connection with license renewal. Given the existing NRC regulatory controls, a plant's configuration will be no less adequate in the forty-first year of operation than in the thirty-ninth.

b. Operability/Functionality

The NRC's requirements pertaining to operability/functionality dictate that systems, structures and components important to safety remain capable of performing their intended functions. This type of requirement contains a time-independent aspect and a time-dependent aspect.

The time-independent aspect consists of the criteria that define the function that a system, structure, or component must perform. For example, a load-bearing structure must be capable of carrying a specified load. A pump must be capable of injecting water at a certain rate. These "performance" or "acceptance" criteria (*i.e.*, the capabilities that a system, structure, or component must possess) are invariant. They will remain equally appropriate in the forty-first year of plant operation as in the thirty-ninth.

The time-dependent aspect of operability/functionality consists of the demonstrated ability of a system, structure, or component to meet its performance or acceptance criteria. This is usually demonstrated by showing compliance with codes, performing cyclic stress analyses, or by performing environmental qualification tests to ensure that a component can function in its end-of-life condition, which may have been predicated on a forty-year life. Since aging may adversely affect this ability, the NRC's proposed rule requires a demonstration either that aging will not be significant or can and will be adequately managed.

c. Operational Programs

The NRC's operational requirements dictate that a licensee conduct training, health physics, environmental monitoring, quality assurance, security, emergency preparedness, and other operational programs. Each of these programs at each operating plant has been reviewed and found adequate by the NRC, either during the initial licensing of the plant or when the operational

requirement was first imposed. Once approved, the quality assurance, safeguards, and emergency planning programs, and other operational procedures affecting safety may not be changed without prior NRC approval if the change would reduce commitments or create an unreviewed safety issue.^{94/} Further, each of the major programs is subject to periodic audits, exercises, and inspections by both the licensee and NRC to provide assurance that they remain adequate at any point in time.

d. Siting

Nuclear plant siting is evaluated from three perspectives: (1) radiological dose to the public during normal operations; (2) accident considerations; and (3) external hazards. As discussed in turn below, each of these issues is revisited regularly or as the need arises during a nuclear plant's operating life.

Radiological dose to the public during normal operations is evaluated against the "ALARA" principle ("As Low As Reasonably Achievable"), which keeps off-site doses substantially below the radiation protection standards in 10 C.F.R. Part 20. Appendix I to 10 C.F.R. Part 50 establishes numerical dose limits that are considered ALARA; and each licensee is required to demonstrate that doses to the public remain below these limits by measuring its plant's releases and using an approved computer model to calculate the dose to a hypothetical maximally exposed individual assumed to be located at the site boundary. Further, license technical specifications require the licensee's radiological monitoring program to include periodic land use censuses so that the modeling remains valid. This regular activity ensures that plant siting remains acceptable vis-a-vis radiological doses to the public from normal operations.

With respect to accident considerations, the adequacy of a site is judged both by dose calculations as part of the defense in depth concept, and by emergency planning. The accident dose limits are established by 10 C.F.R. § 100.11(a) and (b) and are calculated for hypothetical individuals at any point in an exclusion area or low population zone. Because the dose limits are individual (*i.e.*, are not population doses), they are not time dependent. They will change only if source terms determined by the NRC are modified, or zone boundaries are changed.

Both the exclusion area and LPZ are established in the license technical specifications and cannot change without license amendment. The exclusion area is set based on the

^{94/} 10 C.F.R. § 50.54(a), (p), (q) (1990). See generally 10 C.F.R. § 50.59 (1990).

property physically controlled by the licensee, which is highly unlikely to be reduced in size.

The LPZ is established as the area where protective measures can be reasonably implemented in the event of a serious accident. The NRC regulations do not specify a specific population density or population limit for the low population zone. The adequacy of the LPZ therefore relates to the sufficiency of emergency planning. Here, too, changes in site characteristics are regularly considered. Emergency plans must be updated and exercised regularly, and changes in demography, land use, roadways, and facilities are therefore regularly accommodated.^{95/} As a result, the adequacy of emergency response (including the ability to implement protective action guidelines) is continually revalidated.

Finally, changes in site-related hazards are also addressed as new situations arise at particular plants. Site seismicity is a prime example. Where new information indicates the possible existence of a capable fault in closer proximity to a plant than was previously determined, or some other information affecting the Operating Basis Earthquake or Safe Shutdown Earthquake at a particular plant, the licensee has been required to perform new seismic analyses and to improve seismic design where warranted.^{96/}

Other off-site hazards have resulted in similar activity. For example, licensees have been required to perform revised aircraft hazard analyses when new airports have been constructed near a nuclear power plant and could potentially affect the plant's external events evaluation. Similarly, additional hazards evaluations have been required when new chemical facilities (such as a liquid natural gas facility) have been constructed in the vicinity of a nuclear plant. Such analyses become part of the licensing basis for the plant and reflect the changes in site characteristics.

^{95/} See 10 C.F.R. § 50.47(b)(14); 10 C.F.R. Part 50, App. E § 4.F (1990).

^{96/} See e.g., Southern California Edison Co. (San Onofre Nuclear Generating Station, Unit 1), DD-81-19, 14 N.R.C. 1041 (1981). See also Portland General Electric Co. (Trojan Nuclear Plant), DD-80-26, 12 N.R.C. 241 (1980); Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant), DD-88-10, 27 N.R.C. 657 (1988).

e. Financial Requirements

The NRC's regulations require that a licensee maintain over \$1 billion in property insurance,^{97/} maintain the maximum liability insurance available,^{98/} and establish a decommissioning funding mechanism satisfactory to the NRC.^{99/} Maintenance of the property insurance coverage must be demonstrated annually.^{100/} Maintenance of the liability coverage is ensured by policy provisions which prevent the insurer from cancelling the policy without advance notification to the NRC.^{101/} Compliance with these financial requirements will not be affected by continued operation beyond the initial license term.

IV. Legality of the Current Licensing Basis Approach

The legality of the proposed rule must be judged by its consistency with the requirements of the Atomic Energy Act. More specifically, one must consider whether the proposed license renewal process allows the Commission to make the findings called for by the Act.

Clearly, the most important issue is whether the renewal process allows a finding that the public health and safety will be adequately protected. Another issue is whether the Commission may make statutorily required findings generically by rule, thereby limiting the scope of inquiry in a contested proceeding. Finally, one could question whether the NRC should consider anti-trust issues in connection with license renewal. Each of these potential issues is examined in turn below.

^{97/} 10 C.F.R. § 50.54(w) (1990).

^{98/} 10 C.F.R. Part 140 (1990). This coverage presently includes \$200 million under a primary insurance policy and approximately \$6.5 billion under a secondary retrospective premium plan.

^{99/} 10 C.F.R. §§ 50.75, 50.82 (1990).

^{100/} 10 C.F.R. § 50.54(w)(3) (1990).

^{101/} See 10 C.F.R. § 140.91, Appendix A (1990) (Form of nuclear energy liability policy for facilities).

A. Adequate Protection to the Public Health and Safety

As discussed earlier, sections 103^{102/} and 182^{103/} indicate that the NRC should, before issuing a license, make a finding that the activity to be licensed will provide adequate protection to the public health and safety. Although neither of these sections specifically mentions renewal, it is reasonable to apply the same standard to license renewals. Adequate protection to the public health and safety is the touchstone of the Atomic Energy Act, and license renewal should not be based on anything less.

Because the Atomic Energy Act does not define what constitutes "adequate" protection, it might be argued that the current licensing basis approach does not satisfy the statutory requirement. The argument would be that a plant for which license renewal is sought does not provide adequate protection unless it is as safe as possible or at least as safe as a new plant.^{104/}

As a fundamental matter, absolute or perfect assurances of safety are not required by the Atomic Energy Act, "and neither present technology nor public policy admit of such a standard."^{105/} Instead, the use of the term "adequate protection" in the Atomic Energy Act (as opposed to stricter statutory phrases such as "best available technology") and the discretion afforded to the Commission to define the term dictate a more practical standard.

In Nader v. NRC, the Court explained:^{106/}

The Commission has long interpreted this provision [to afford adequate protection to the health and safety of the public] as a demand for "reasonable assurance" of that

^{102/} 42 U.S.C. § 2133 (1988).

^{103/} 42 U.S.C. § 2232 (1988).

^{104/} To a certain extent, these arguments are already presaged by opponents' comments on the proposed rule. See, e.g., Proposed Rule on Nuclear Power Plant License Renewal, Comments of the Union of Concerned Scientists and the New England Coalition on Nuclear Pollution 3, 5 (Oct. 15, 1990).

^{105/} Citizens for Safe Power v. NRC, 524 F.2d 1291, 1297 (D.C. Cir. 1975). See also Crowther v. Seaborg, 312 F. Supp. 1205, 1234 (D. Col. 1970).

^{106/} 513 F.2d 1045 (D.C. Cir. 1975).

protection, and the Supreme Court, in its Power Reactor decision has squarely maintained that administrative construction.^{107/}

As discussed above, the Atomic Energy Act confers on the NRC broad latitude to determine what constitutes "adequate protection." This determination involves the Commission's scientific expertise and engineering judgment, which the courts have held are entitled to substantial deference.^{108/}

Nor does the "adequate protection" standard mean that each plant be as "safe" as any other. The Atomic Energy Act does not require that all plants have an equivalent level of safety. Even if the level of safety could be measured for each plant, such requirement would be improvident, because it would result in every advancement in technology rendering all previous designs inadequate. This would in turn deter designers and suppliers of reactor technology from improving their designs or from developing alternative designs. The Atomic Energy Act did not contemplate such an approach. Quite to the contrary, it was intended that the Atomic Energy Commission would encourage the development of different power reactor technologies.^{109/}

As a result, there are several distinct types of nuclear power plants in operation today, each employing different design features. The degree of protection that each affords to the public health and safety may be quantitatively different, but is nonetheless deemed adequate because of the combination features designed to prevent accidents.

In sum, the Atomic Energy Act does not require an existing nuclear power plant to be as the same, or as "safe," as a new plant. Allowing existing plants to continue to operate without redesign and reconstruction is acceptable if the existing design is deemed adequate as a matter of engineering judgment.

^{107/} Id. at 1052 (omitting footnote), citing Power Reactor Dev. Co. v. Electrical Workers Int'l, 367 U.S. 396, 406-16 (1961).

^{108/} Baltimore Gas & Electric Co. v. Natural Resources Defense Council, 462 U.S. 87, 103 (1983); Union of Concerned Scientists v. NRC, 880 F.2d 552, 558 (D.C. Cir. 1989).

^{109/} See, e.g., S. Rep. No. 1699, 83d Cong., 2d Sess. 20 (1954); To Amend the Atomic Energy Act of 1946, Hearings On S. 3323 and H.R. 8862 Before the Joint Comm. on Atomic Energy, 83rd Cong., 2d Sess. Part II at 565 (1954).

B. Compliance With Regulations

While it is unreasonable to construe the "adequate protection" standard as requiring each nuclear plant to be as safe as every other plant, it might be claimed that section 185 provides support for such a standard. Section 185 requires the NRC, before converting a construction permit to an operating license, to make a finding that a plant has been constructed and will be operated in conformity with the NRC's regulations. It could be argued, by extension, that the license for an existing plant may not be renewed unless the plant conforms with all current regulations applicable to a new plant.^{110/}

As discussed below, section 185 does not dictate such an inflexible result. The Atomic Energy Act does not prohibit the Commission from establishing different requirements for different plants or from granting exemptions from specific requirements for different plants.

1. The Implications of Section 185

At the outset, it should be observed that section 185 does not apply to license renewals. Section 185 controls the conversion of a construction permit to an initial operating licensing.^{111/} It requires, before a construction permit may be converted to an operating license, a finding that the plant has been constructed and will be operated in conformity with the Commission's regulations.

For a plant seeking license renewal, the conversion of the construction permit to an operating license (and the finding of regulatory compliance called for by section 185 in connection with the conversion) will already have occurred. There is no provision in the Atomic Energy Act, either in section 185 or elsewhere, that mandates another finding of regulatory compliance when an operating license is renewed.

Even if one assumes, arguendo, that section 185 does apply to license renewals, it would not require a finding of conformity with all current regulations applicable to a new plant. Section 185 does not contain such an explicit requirement, nor is it sensible to interpret the section in so sweeping a manner.

^{110/} Again, this type of argument has already been suggested in comments during the rulemaking. See UCS Comments, supra note 104, at 3.

^{111/} See text at note 20 supra.

Instead, section 185 should be interpreted in pari materia with the licensing considerations identified in sections 103 and 182. Sections 103 and 182 require an applicant to provide such information "as the Commission may, by rule or regulation, deem necessary" to determine that the plant will adequately protect the public health and safety, and call for issuance of a license to persons who will observe "such safety standards as the Commission may by rule establish." Therefore, "conformity with the regulations" in section 185 should be construed as a requirement that an applicant comply with that set of regulations the NRC has determined is necessary adequately to protect the public health and safety.

The set of regulations that provides adequate protection to the public health and safety is not, by definition, "all current regulations." Several reasons support this conclusion. First, as evidenced by the NRC's backfitting regulation,^{112/} the NRC establishes certain requirements for new plants that may go beyond what is necessary to provide adequate protection to the public health and safety. Second, the NRC may grant an exemption from a regulatory requirement if there is adequate justification in a particular factual setting and the public health and safety remains adequately protected.^{113/}

Under its backfitting procedures, if the NRC determines that a new regulatory requirement is necessary to provide adequate protection to the public health and safety, that requirement is made applicable to existing plants. If the Commission determines that some advancement or additional safety feature under consideration goes beyond what is necessary for adequate protection and its imposition on existing plants is not otherwise justified, the new requirements will be made explicitly applicable only to new plants (where the advancement or additional safety feature can often be incorporated into the initial design with little or no extra expense).

The Commission's rule at 10 C.F.R. § 50.55a provides an apt illustration. In section 50.55a, the Commission has required that pressure retaining components be constructed in accordance with the edition of the ASME Boiler and Pressure Vessel Code in effect at the time of the issuance of the construction permit. This regulation reflects the Commission's judgment that compliance with previous versions of the ASME Code continues to provide adequate protection to the public health and safety. As long as an existing plant complies with the edition of the ASME Code in

^{112/} 10 C.F.R. § 50.109 (1990).

^{113/} 10 C.F.R. §§ 50.11, 50.12 (1990). See note 122 infra, and accompanying text.

effect when the plant was built, it not only would continue to comply with the NRC's regulations (as literally worded) but also would continue to provide adequate protection to the public health and safety, notwithstanding the fact that newer plants are required to be built to more recent Code editions.

The Commission's ATWS rule^{114/} provides another example. The rule requires all boiling water reactors to have a standby liquid control system.^{115/} The Commission's rule requires that such a system be automated in new plants, because the NRC determined that automated initiation was desirable and easily incorporated in new plant designs. The Commission decided not to require older plants to automate such existing systems in their plants, reflecting the judgment that automation was neither necessary to provide adequate protection nor justifiable on a cost-benefit basis.^{116/}

In Union of Concerned Scientists v. NRC,^{117/} which reviewed the NRC's 1985 revision to the backfit rule,^{118/} the U.S. Court of Appeals for the D.C. Circuit recognized the Commission's authority to impose safety measures on licenses and applicants over and above those necessary to provide the requisite "adequate protection." The Court stated that "[t]he exercise of this authority is entirely discretionary."^{119/} If the imposition of requirements that go beyond those necessary to provide adequate protection is "entirely discretionary," the Atomic Energy Act

^{114/} 10 C.F.R. § 50.62 (1990).

^{115/} 10 C.F.R. § 50.62(c)(4) (1990).

^{116/} See Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 and 2), LBP-84-40, 20 N.R.C. 1181 (1984), aff'd ALAB-841, 24 N.R.C. 64, 87-89 (1986).

^{117/} 824 F.2d 108 (D.C. Cir. 1987).

^{118/} The Court remanded the 1985 rule because, under the Court's interpretation of the regulatory intent, economic costs might conceivably be considered in establishing of requirements deemed necessary to provide "adequate protection." In response, the Commission again revised its rule to make clear that economic costs were a consideration only with respect to requirements that were in excess of those necessary to provide adequate protection. 53 Fed. Reg. 20,604 (1988). This revised rule was affirmed by Union of Concerned Scientists v. NRC, 880 F.2d 552 (D.C. Cir. 1989).

^{119/} 824 F.2d at 118.

cannot reasonably be construed as demanding unequivocal compliance with such requirements.

Compliance with "all current regulations" is also not required to provide adequate protection, because the NRC may grant an exemption pursuant to 10 C.F.R. § 50.12 if the exemption will not present an undue risk to the public health and safety and is justified by particular circumstances. The NRC might grant such an exemption because a licensee's proposed approach to accomplish some safety function is better than the approach called for by a regulation.

The position that renewal licensees must comply with "all current regulations" is tantamount to arguing that the NRC has no authority to grant exemptions. This argument has already been made and rejected. In connection with 1985 amendments to section 50.12,^{120/} it was argued that the Commission had no statutory authority to grant an exemption, and in any event could not grant an exemption because the NRC regulations establish the minimum requirements for providing adequate protection to the public health and safety.^{121/}

The Commission disagreed, observing that general rulemaking authority carries with it the authority to provide exemptions to allow for special circumstances.^{122/} The Commission further stated:

[W]hile it is true that compliance with all NRC regulations provides reasonable assurance of adequate protection of the public health and safety, the converse is not correct, that failure to comply with one regulation or another is an indication of the absence of adequate protection, at least in a situation where the Commission has reviewed the noncompliance and found that it does not pose an

^{120/} Section 50.12 was originally promulgated in 1956, when the first Part 50 regulations were issued. 21 Fed. Reg. 355 (1956).

^{121/} See 50 Fed. Reg. 50,764, 50,767-68 (1985).

^{122/} Id. at 50,766, citing United States v. Allegheny-Ludlum Steel, 406 U.S. 742, 755 (1972). See also WAIT Radio v. FCC, 418 F.2d 1153, 1157 (D.C. Cir. 1969), cert. denied, 409 U.S. 1027 (1972). Indeed, due process may require an agency with general rulemaking power to entertain exemption requests. Southwest Pennsylvania Cable TV v. FCC, 514 F.2d 1343, 1347 n.7 (D.C. Cir. 1975).

"undue risk" to the public health and safety.^{123/}

In sum, even if section 185 did require a finding of conformity with NRC regulations in connection with license renewal, it would require no more than a determination that the plant complies with whatever set of regulations the Commission deems should be applicable. For the most part, each of the NRC's regulations itself defines its applicability to a particular plant (by specifically stating the type or vintage of plant covered). For example, some regulations apply to boiling water reactors but not to pressurized water reactors (see, e.g., 10 C.F.R. § 50.62(c)(4)); others apply only to pressurized water reactors and not to boiling water reactors (see, e.g., 10 C.F.R. § 50.61). In other cases, a regulation may be inapplicable because of a specific exemption. In neither case is it reasonable to read section 185 as precluding license renewal.

2. Most Variation in Licensing Bases Is Not Related to Differences in Regulatory Requirements

The argument that the proposed rule fails to require compliance with "all current regulations" would also incorrectly imply that there are many "regulations" which an older plant may ignore. There are not.^{124/} Most Part 50 regulations are in fact applicable to all plants. Instead, the variation in the licensing basis among plants of different vintages is in large measure attributable to the NRC's regulatory guidance implementing regulatory requirements.

The NRC's Standard Review Plan and Regulatory Guides are not regulations, but merely identify approaches that may be used by licensees to demonstrate compliance with the regulations.^{125/} A licensee may use alternative methods if they are acceptable to the NRC Staff.

As technology and analytical methodology have developed, and as industrial codes have been updated, the NRC has revised its Regulatory Guides and Standard Review Plan to incorporate state-of-the-art methods of complying with the basic requirements in

^{123/} 50 Fed. Reg. at 50,768.

^{124/} See text at notes 52-58 *supra*.

^{125/} *Porter County Chapter of Izaak Walton League v. AEC*, 533 F.2d 1011, 1016 (7th Cir.), cert. denied, 429 U.S. 945 (1976).

the regulations. Though the Regulatory Guides and other guidance documents are not regulations, the NRC applies its backfit rule to changes in those documents. When the NRC revises a Regulatory Guide to endorse a newer method of demonstrating compliance with a basic requirement, its Committee for Review of Generic Requirements considers what plants, or groups of plants, should be affected.^{126/}

Because of this process, a newly licensed plant following the NRC guidance may have used newer codes and methodologies than were used in an older plant, but that does not mean that older plants are not in compliance with the same basic regulations or that they are unsafe. Unless the Staff has pursuant to the backfitting rule invalidated some earlier methodology used by licensees, it is still an acceptable method of demonstrating regulatory compliance and of reasonably assuring the public health and safety.

C. Resolution of Licensing Considerations
By Rulemaking

The NRC's proposed rule recognizes that there are certain statutorily derived findings that should be made to support license renewal -- in particular, that the public health and safety will be adequately protected. The NRC proposes to make such findings generically in the rulemaking, thereby reducing the number of issues that might otherwise be considered in individual proceedings.^{127/}

More specifically, the NRC proposed to find generically (1) that the current licensing bases for existing plants provide adequate protection to the public health and safety, and (2) that if age-related degradation is adequately managed, existing plants should remain in compliance with their licensing bases. In making these findings, the NRC is not purporting to have re-reviewed and revalidated the licensing basis of every plant in this rule-making proceeding. Rather, the NRC is creating a generalized presumption which is based on the licensing process that is applied to every plant. The NRC has already determined that existing plants when initially licensed provided adequate protection. After initial licensing, new requirements are imposed on existing plants when deemed necessary to provide adequate protection to the public health and safety. Regulatory compliance mechanisms and oversight are applied not only to police compliance with existing requirements but also to identify any areas

^{126/} See U.S. NRC, NRC Manual, Part 0500, Appendix 0514, at 2.

^{127/} See 55 Fed. Reg. at 29,047, 29,061 (1990).

warranting further backfitting. Accordingly, a generalized presumption that existing plants may continue to operate under their current licensing bases is rational.

The generic findings would not be irrebuttable. The limitations on the scope of the renewal proceeding would be subject to waiver under the NRC's existing regulations.^{128/} Those regulations provide for the waiver of any regulation in an NRC proceeding upon a showing that, as a result of special circumstances, the application of the regulation would not serve its underlying purpose.^{129/}

There is precedent for the NRC's use of generalized presumptions established by rulemaking to eliminate matters from consideration in licensing proceedings. 10 C.F.R. § 50.33(f) eliminates the NRC's consideration of the financial qualifications of an applicant for a nuclear plant operating license if the applicant is an electric utility. The NRC determined that the ratemaking process provided reasonable assurance that funds would be available for the safe operation of a plant. In Coalition for the Environment v. NRC,^{130/} the U.S. Court of Appeals for the D.C. Circuit sustained the rule. The court found nothing in the Atomic Energy Act or its legislative history that would preclude the NRC from relying on generalized criteria in judging a category of license applicants to be financially qualified.^{131/}

Further, the court specifically rejected the argument that the rule was unsupported because financial assurances were not guaranteed by the ratemaking process. The court recognized that "reasonable assurance" was not absolute certainty, and observed:

^{128/} 10 C.F.R. § 2.758 (1990).

^{129/} Id.

^{130/} 795 F.2d 168 (D.C. Cir. 1986).

^{131/} Id. at 173-74. In an earlier, related case, the Court observed:

[E]ven if a statutory mandate for review of financial qualifications exists . . . , it does not preclude the adoption of appropriate generalized criteria that would render some case-by-case evaluations unnecessary.

New England Coalition on Nuclear Pollution v. NRC, 727 F.2d 1127, 1129 (D.C. Cir. 1984).

The Commission has determined that the ratemaking process provides that reasonable assurance. . . . The Commission noted in promulgating this rule that it retained the authority to require additional information in individual cases when the presumption of financial qualification seemed unreliable because, for example, "a threshold showing is made that, in a particular case, the local public utility commission will not allow the total cost of operating the facility to be recovered through the rates."^{132/}

This precedent is precisely on point. The NRC's proposed license renewal rule is creating a generalized presumption concerning statutory licensing considerations. This presumption is not based on a "guarantee" that no safety issue exists at any plant, but rather on the Commission's rational conclusion that the licensing process already applied to the plant provides "reasonable assurance" that the public health and safety are adequately protected. If that presumption is rebutted by a sufficient showing under the NRC's waiver rule, additional safety issues could be litigated.

D. The NIRS Case

Subsequent to the close of the comment period on the proposed rule, the U.S. Court of Appeals for the D.C. Circuit issued an opinion in Nuclear Information Resource Service v. NRC,^{133/} (hereinafter "NIRS") which considered section 185 in relation to the NRC's recent rule creating a combined licensing process for future plants. Because of the potential implications of the NIRS decision the NRC's proposed rule, the context and holding of NIRS are examined below, although the decision has been vacated upon a grant of rehearing. This examination shows that the Court's reasoning in NIRS is inapposite to the license renewal rulemaking.

1. The Context of the NIRS Decision

In 1989, the NRC promulgated regulations at 10 C.F.R. Part 52 which, among other things, would allow persons who propose in the future to build a new nuclear plant to obtain a "combined

^{132/} 795 F.2d at 175.

^{133/} 918 F.2d 189 (D.C. Cir. 1990), vacated and reh'g granted, 928 F.2d 465 (1991).

license."^{134/} This combined license would consist of a construction permit with a conditional operating license.^{135/} More specifically, the combined license would authorize construction and would specify the acceptance criteria which, if met, are sufficient to provide reasonable assurance that the facility has been constructed and will operate in conformity with the license, the Act, and the NRC's regulations.

The new Part 52 rules require a mandatory hearing before a combined license may be issued. The rules also allow an opportunity for a second hearing, held after construction is completed but before operation is authorized.^{136/} The subject matter of this second hearing is limited to issues relating to whether the plant has met the acceptance criteria specified in the combined license. A person may, however, challenge the necessity and the sufficiency of the acceptance criteria by filing a petition to modify the combined license. Such a petition would be processed in the same manner as petitions submitted under 10 C.F.R. § 2.206 for an order to show cause why a license should not be modified, suspended or revoked.

Upon judicial review of this rule, the Court in NIRS held that the limited scope of the operating stage hearing was contrary to the plain meaning of section 185.^{137/} The Court reasoned that section 185 required the Commission to make specific findings after construction, including a finding that the plant will operate in conformity with the Act.^{138/} The Court further reasoned that the post-construction "authorization to operate" would be a "granting of a license" subject to the hearing rights established by section 189 of the Atomic Energy Act.^{139/} Such a hearing, the Court stated, must generally provide an opportunity for submission and challenge of evidence as to any and all issues of material fact.^{140/} The Court therefore concluded that the

^{134/} 54 Fed. Reg. 15,372 (1989).

^{135/} 10 C.F.R. § 52.97 (1990).

^{136/} 10 C.F.R. § 52.103 (1990).

^{137/} NIRS, 918 F.2d at 196.

^{138/} Id. at 192, 193, 196.

^{139/} Id. at 193-94.

^{140/} Id. at 194, citing Union of Concerned Scientists v. NRC, 735 F.2d 1437, 1444-45 (D.C. Cir.), cert. denied, 469 U.S. 1132

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Commission was obligated to consider in the post-construction hearing any significant new information material as to whether the plant would operate in conformity with the Act.^{141/}

The Court also considered whether the availability of the 10 C.F.R. § 2.206 procedure might satisfy the hearing requirement. The Court held that it would not because there is no right to a hearing upon request in connection with a petition filed under section 2.206.^{142/}

This decision, even if it had not been vacated, would not have affected the validity of the proposed license renewal rule for three reasons. First, as discussed earlier, license renewals are not governed by section 185. Second, the NIRS holding would not have precluded the Commission from establishing generalized presumptions by rulemaking. Third, the limitations on the scope of a license renewal proceeding are subject to a waiver mechanism in the adjudicatory proceeding. These three interrelated points are discussed in detail below.

As already discussed, section 185 applies to the issuance of a construction permit and to the conversion of a construction permit to an operating license. This two-step licensing process was created with the instruction in section 185 that the Commission make specific findings before converting the construction

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(1984). The Court's reasoning is questionable. The Court did not, for example, consider the Commission's authority to define what is material to licensing, and to limit the scope of a proceeding to that set of issues. Cf. Bellotti v. NRC, 725 F.2d 1380, 1382 (D.C. Cir. 1983). Relatedly, the Court did not consider the Commission's authority to decide issues generically, obviating consideration in individual proceedings. Minnesota v. NRC, 602 F.2d 412 (D.C. Cir. 1979). See also Baltimore Gas & Electric Co. v. Natural Resources Defense Council, 462 U.S. 87, 103 (1983) (upholding Commission's authority to decide NEPA issues generically).

^{141/} Id. at 195.

^{142/} Id. at 195-96. The Court appears to have assumed that 10 C.F.R. § 2.206 was the only procedure by which a person could challenge matters previously decided before combined license issuance. It is unclear, however, whether 10 C.F.R. § 2.758, which allows the waiver of any rule in an adjudicatory proceeding upon a sufficient showing, would be unavailable at the operating-stage hearing of a combined-license proceeding.

permit to an operating license, so that the government could have an opportunity before issuing a final license to observe whether a constructed plant would operate as intended.

Section 185 does not apply to a license renewal. In a license renewal proceeding, there is no construction permit being converted to an operating license. In each case, such conversion will already have occurred, long ago, after the requisite findings.

Further, the policy considerations underlying section 185 are inapplicable in the context of license renewal. Unlike the initial licensing, a plant seeking license renewal will already have operational experience; it will have been operating for between twenty to forty years subject to Commission inspection and oversight. The entire concept of post-construction review is inapplicable.

Thus, the specific regime of section 185, upon which the NIRS decision rested, has no bearing on license renewal. The Atomic Energy Act contains no similar strictures for license renewal. There is no requirement that the NRC, before renewing a license, reconsider every issue which the Commission reviewed at the time that the construction permit for a nuclear power plant was converted to an operating license. Quite to the contrary, section 103(c), which authorizes the Commission to renew licenses, specifies no particular findings that the Commission may make.^{143/}

It might be argued that the statutory considerations in section 103(b) dictate that the same findings be made in connection with license renewal as section 185 requires when a construction permit is converted to an operating license. But section 103(b) applies to the "issuance" of a license, not to the renewal of a license. Section 103(c), which provides that a license shall be "issued" for a specified period and may be "renewed," shows that Congress understood a difference between these terms. Issuance refers to the initial granting of a license, and renewal refers to the extension of that license's term.^{144/}

^{143/} As discussed above, for those plants licensed under section 104(b) of the Act, the NRC has even greater discretion concerning renewal since that section fixes no maximum license term and calls for the minimum regulation necessary.

^{144/} The NRC has proposed to effectuate a license renewal by preparing a new license document superseding the old. The NRC has proposed this approach because it has read section

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In any event, section 103(b) does not call for a broad finding of conformity with the Act. Instead, it calls for the Commission to issue licenses to persons who will observe such safety standards "as the Commission may by rule establish." Section 103(b) therefore confers on the Commission the authority and discretion to establish licensing prerequisites by rulemaking, which the NRC's proposed rule does.

In this respect, the proposed license renewal rule is establishing a generalized presumption. The propriety of establishing such a presumption was confirmed by Coalition for the Environment and the New England Coalition cases, supra, which approved the Commission's rule obviating consideration of the financial qualifications of a license applicant at the operating license stage.^{145/}

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103(c) as "an explicit prohibition of license terms in excess of forty years." 55 Fed. Reg. at 29,050.

However, section 103(c) states, "Each such license shall be issued for a specified term . . . not exceeding forty years, and may be renewed." 42 U.S.C. § 2133(c) (1988). Obviously renewal may therefore extend the term of authorized operation beyond forty years.

Section 103(c) does not prohibit accomplishing renewal by amendment, and there is in fact every indication that issuing a new license was not intended. Simply using the term "renewal" connotes the extension of the existing license. An existing license, not a new license, is "renewed." Further, Congress appears to have been well aware of the distinction between license issuance and license renewal. First, the use of the two differing terms suggests an intended distinction. Second, the Administrative Procedure Act, which Congress made applicable to all agency actions under the Atomic Energy Act (42 U.S.C. § 2231), recognizes a distinction; the timely renewal provision applies to an "application for renewal or a new license." 5 U.S.C. § 558(c) (1988). Finally, in explaining the application of the antitrust review provision, conducted at license issuance, the Joint Committee on Atomic Energy stated that license "issuance" refers to issuance of the initial license. H.R. Rep. No. 1470, 91st Cong., 2d Sess. 29 (1970).

^{145/} See also Minnesota v. NRC, 602 F.2d 412, 416-19 (D.C. Cir. 1979).

NIRS did not overrule these earlier precedents, and they are readily reconciled. The Commission's Part 52 rule, at issue in NIRS, appeared to preclude any possibility of design issues being adjudicated in the post-construction hearing. The rule established the non-adjudicatory 2.206 petition^{146/} as the only means by which a design feature could be challenged after issuance of the combined license, no matter how significant or material new information might be. In contrast, the financial qualifications rule at issue in Coalition for the Environment created no more than a presumption, which the court recognized could be overcome by a threshold showing in the operating license adjudication.

The Commission's proposed license renewal rule takes this latter approach. Unlike the Part 52 regulations, the proposed license renewal rule does not make the 10 C.F.R. § 2.206 procedure the exclusive vehicle for challenging the adequacy of a plant's current licensing basis. As a result, the proposed rule's limitations on the scope of the renewal proceeding are subject to the waiver under the NRC's regulations^{147/} and therefore rebuttable.

For this reason, even if section 185 were to be applied to license renewal, or some other statutory provision required findings equivalent to those specified in section 185, the proposed license renewal rule would comport with the statutory mandate. The proposed rule provides a rational basis for the presumption of reasonable assurance of adequate protection to the public health, but this presumption may be overcome, in the hearing on the renewal application, upon a showing that, as a result of special circumstances in the case, the application of the rule would not serve its underlying purpose.

V. Antitrust Review

The NRC's proposed rule does not require antitrust review by the Attorney General in connection with a license renewal application. The Commission explains,

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

^{146/} See text at note 63 supra.

^{147/} 10 C.F.R. § 2.758 (1990). See text at notes 128 and 129 supra.

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).^{148/}

This aspect of the NRC's proposed rule raises a number of questions. Certain comments submitted during the rulemaking ^{149/} presage arguments that (1) antitrust review is statutorily compelled for plants originally licensed under section 103;^{150/} (2) plants originally licensed under section 104 cannot be exempted;^{151/} and (3) antitrust review is necessary to effectuate the policies underlying the Atomic Energy Act.^{152/}

As discussed below, and as the NRC correctly discerned, the Atomic Energy Act requires antitrust review only in connection with the initial application for a license under section 103. Further, none of the considerations that prompted Congress to include an antitrust review procedure in connection with initial licensing would support the imposition of such a review procedure in connection with license renewals today. Finally, but very importantly, the antitrust laws continue to apply to licensees; and the availability of both private and government enforcement.

^{148/} 55 Fed. Reg. at 29,055.

^{149/} Comments of the American Public Power Association, the National Rural Electric Cooperative Association, and the Public Systems on Proposed NRC Rulemaking on Plant License Renewal (Oct. 26, 1990) (hereinafter cited as "Comments of the American Public Power Association *et al.*")

^{150/} *Id.* at 4.

^{151/} *Id.* at 10.

^{152/} *Id.* at 28.

outside of the NRC licensing arena, should provide adequate competitive protection to consumers and competitors, just as it does in other industries.

A. The Inapplicability of the Antitrust
Review Provision to the Renewal of
103 Licenses

As a matter of logic, the argument that antitrust review is "statutorily compelled" for plants licensed under section 103 requires two premises. The major premise is that section 105(c) applies to license renewals in the same manner in which it applies to the issuance of initial operating licenses (i.e., an antitrust review would be appropriate if the Commission determined that "such review is advisable on the ground that significant changes in the licensee's activities or proposed activities have occurred subsequent to the previous review by the Attorney General and the Commission . . . in connection with the construction permit for the facility"). The minor premise is that significant changes will necessarily have occurred.

This syllogism does not withstand scrutiny. First, "an application for a license to . . . operate a utilization facility," as used in section 105(c)(2), was not intended to include an application for license renewal. In the Congressional report accompanying the 1970 amendments to section 105 (which created the current antitrust review scheme), the Joint Committee on Atomic Energy explicitly stated:

The committee recognizes that applications may be amended from time to time, that there may be applications to extend or review (sic) [should be "renew"] a license, and also that the form of an application for a construction permit may be such that, from the applicant's standpoint, it ultimately ripens into the application for an operating license. The phrases "any license application," "an application for a license," and "any application" as used in the clarified and revised subsection 105c. refer to the initial application for a construction permit, the initial application for an operating license, or the initial application for a modification which would constitute a new or substantially different facility, as the case may be, as determined by the Commission. The phrases do not include, for purposes of triggering

subsection 105c., other applications which may be filed during the licensing process.^{153/}

Second, even if one assumed arguendo that an application for license renewal were an application for an operating license within the meaning of section 105(c), there would be no basis to conclude that significant changes have occurred.^{154/} The mere possibility that some members of the utility industry have changed their operations does not constitute "significant changes" within the meaning of section 105(c).

The term "significant changes" refers to the licensee's activities or proposed activities; the committee considers that it would be unfair to penalize a licensee for significant changes not caused by the licensee or for which the licensee could not reasonably be held responsible or answerable.^{155/}

^{153/} H. R. Rep. 1470, 91st Cong., 2d Sess. 29 (1970).

^{154/} Antitrust review in connection with an application for an operating license is the exception, and not the rule. Section 105(c)(2) states that the antitrust review provision "shall not apply to an application for a license to operate a utilization . . . facility unless the Commission determines such review is advisable on the ground that significant changes in the licensee's activities or proposed activities have occurred subsequent . . . to the review . . . in connection with the construction permit." The statute therefore creates a presumption against antitrust review. Unless the Commission makes an affirmative determination that significant changes have occurred, there is no review in connection with an application for a license to operate a utilization facility.

^{155/} H.R. Rep. No. 1470, 91st Cong., 2d Sess. 29 (1970).

Comments on the proposed license renewal rule have suggested that significant "industry-wide" changes have occurred and refer specifically to "the establishment of many utility-owned or utility-affiliated generation companies that provide bulk power to their utility affiliates and other distributors at market based (rather than cost-based) wholesale rates." Comments of the American Public Power Association

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B. The Exemption of Section 104 Licenses

Section 105(c)(3)^{156/} provides,

With respect to any Commission permit for the construction of a utilization or production facility issued pursuant to subsection (b) of section 2134 [Section 104b] of this title prior to December 19, 1970, any person who intervened or who sought by timely written notice to the Commission to intervene in the construction permit proceeding for the facility to obtain a determination of antitrust considerations or to advance a jurisdictional basis for such determination shall have the right, upon a written request to the Commission, to obtain an antitrust review under this section of the application for an operating license.

The Congressional report that accompanied the 1970 amendments to the Atomic Energy Act did not explain why section 105(c)(3) exempted 104(b) licensees from the antitrust review process except in the one circumstance identified above. It

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et al., at 12. (Such a generation company is called an Independent Power Producer.) According to the comments, "In some cases, existing nuclear and non-nuclear generation facilities have been or will be transferred to utility-owned or associated generation companies." Id.

There are no Independent Power Producers operating nuclear facilities in this country. The Palisades plant, to which the comments refer (id. at 11 n.32), is under contract for sale to a consortium; but if that transaction is approved, the power from the plant will be sold at cost-based, not market-based, rates. See Michigan Public Power Agency v. FERC, Docket No. 90-1580, (D.C. Cir.), Joint Reply of Palisades Generating Co. and Consumers Power Co. to Michigan Municipal/Cooperative Group's Response to Joint Motion to Dismiss Petition for Review (Jan. 16, 1991). The only other reference in the comments is to a proposal by Arkansas Power & Light to transfer its interest in two units, neither of which is a nuclear plant. See Entergy Services, Inc., 51 FERC ¶61,376 n.2 (1990).

^{156/} 42 U.S.C. § 2135(c)(3) (1988).

appears, however, that Congress thought it would be unfair if those companies that had undertaken the financial risk to pioneer nuclear power under the pre-1970 licensing regime, which did not include antitrust review, were to be subjected to such review and license conditions after the fact. This sentiment was expressed during the legislative hearings preceding the 1970 amendments. For example, Representative Hosmer stated,

With all the other woes suffered by these people who have followed the inducement of the Atomic Energy Commission to build plants to demonstrate the practical value of nuclear energy, I am wondering why, in good discretion, they ought not be left to proceed on the same basis they started as a matter of fairness, equity, and any of the other virtues that you might surmise.^{157/}

Section 105(c)(3), which allows antitrust review of an application for an operating license issued under section 104(b) only if timely requested by a person who had sought such review at the construction permit stage, is the only statutory authority for antitrust review in connection with section 104 licenses. Congress' identification of a single circumstance in which section 104(b) licenses would be subjected to antitrust review belies the existence of any other occasion for such review.

The Nuclear Regulatory Commission has long held such a view.

We find the specificity and completeness of Section 105 striking. The section is comprehensive; it addresses each occasion on which allegations of anticompetitive behavior in the commercial nuclear power industry may be raised, and provides a procedure to be followed in each instance.^{158/}

Consequently, the Commission concluded that it had no broader antitrust power than that set forth in section 105. "We conclude

^{157/} Prelicensing Antitrust Review of Nuclear Powerplants, Hearings Before the Joint Comm. on Atomic Energy, 91st Cong., 1st and 2d Sess. 40 (1969-70). See also Fort Pierce Utilities Auth. v. United States, 606 F.2d 986, 997-98 (D.C. Cir.), cert. denied, 444 U.S. 842 (1979).

^{158/} Houston Lighting & Power Co. (South Texas Project), CLI-77-13, 5 N.R.C. 1303, 1312 (1977).

that Congress had no intention of giving this Commission authority which could place utilities under a continuing risk of antitrust review."^{159/}

The same result was reached by the Commission in connection with the licensing of the St. Lucie and Turkey Point plants.^{160/} In Fort Pierce, supra, the U.S. Court of Appeals affirmed the Commission's interpretation of its antitrust authority. The Court observed, "It is our view . . . that section 105(c), which exempts the operating licenses at issue here, is the Commission's exclusive grant of prelicensing antitrust authority over section 104(b) operating licenses."^{161/}

The legislative history of the grandfather clause suggests to us that Congress, by creating an exemption from the general requirement of prelicensing antitrust review, deliberately chose to single out section 104(b) licensees . . . for special treatment in obtaining operating licenses. . . . [W]e think it would be anomalous to interpret section 186(a) as authorizing postlicensing antitrust review under section 103 standards of the section 104(b) licenses at issue here, which, when reviewed as original license applications, were accorded by congressional mandate a special exemption from antitrust review.^{162/}

These limitations cannot be skirted by arguing that the renewal of a section 104(b) license must be considered a new section 103 license. Section 102(b)^{163/} of the Atomic Energy Act states:

Any license hereafter issued for a utilization or production facility for

^{159/} Id. at 1317.

^{160/} See Florida Power & Light Co. (St. Lucie Plant, Units Nos. 1 and 2) (Turkey Point, Units Nos. 3 and 4), ALAB-428, 6 N.R.C. 221 (1977), review declined, CLI-77-26, 6 N.R.C. 538 (1977).

^{161/} Fort Pierce, 606 F.2d at 998 n.14.

^{162/} Id. at 997-98.

^{163/} 42 U.S.C. § 2132(b) (1988).

industrial or commercial purposes, the construction or operation of which was licensed pursuant to subsection 104b prior to enactment into law of this subsection, shall be issued under subsection 104b.

Further, Congress expressly declared that "it would impose an unnecessary hardship on subsection 104b licensees to compel them to convert their permits to section 103 licenses."^{164/} In sum, Congress has expressly commanded that facilities originally licensed under section 104 shall remain licensed under section 104.

Nor can the Congressional limitations in section 102 and 105 be sidestepped by arguing that today's facilities are substantially different from the originally licensed facilities and must be treated as new facilities to be relicensed under section 103.^{165/} The NRC has rejected this argument in the past. In the case of the proposed transfer of the Palisades plant, the NRC indicated that changes in a plant do not constitute a modification that would constitute a new or substantially different facility unless they constituted the type of "material alteration" that would necessitate issuance of a construction permit.^{166/}

^{164/} H.R. Rep. No. 1470, 91st Cong., 2d Sess. 26-27 (1970).

^{165/} See, e.g., Comments of the American Public Power Association *et al.* at 19-20. The public power systems cite to a Congressional Report accompanying the 1970 amendments to the Atomic Energy Act, in which Congress stated,

The Committee here visualizes that amendments, as such, to an existing subsection 104b license will not affect the exception to section 103 licensing. If, however, the facility is to be modified to such a degree as to constitute a new or substantially different facility, as provided in a regulation or order issued by the Commission, the exception to section 103 licensing is not intended to be applicable to the necessary license amendment.

Id. at 19, citing "Joint Committee Report" (H.R. Rep. No. 1470) at 26-27.

^{166/} Letter from B. Holian, NRC, to R. Jablon, NRC Docket No. 50-255 (Aug. 22, 1990) (re Palisades Plant -- Transfer of Palisades Plant Ownership).

The NRC has ruled that a modification is a material alteration only if it changes the nature or function of the plant.^{167/} No changes that have occurred at any currently licensed commercial nuclear plant have been deemed a material alteration necessitating a construction permit. Further, if an existing facility were substantially modified in such a manner as to constitute an entirely new and different facility, the time for license conversion and for antitrust review would be when the application for facility modification was filed, not later when license renewal is sought.^{168/}

C. Antitrust Review Is Not Necessary to Effectuate
The Purposes of The Atomic Energy Act

An argument that antitrust review is necessary to effectuate the purposes of the Atomic Energy Act would imply that the Commission possesses and should exercise a general police power over the competitive practices of its licensees. This view is not supported by the provisions of the Atomic Energy Act or its legislative history. Indeed, the specificity with which section 105 identifies the occasions in which the Commission may consider antitrust matters belies any far-ranging authority. Even in

^{167/} Virginia Electric and Power Co. (Surry Power Station, Units 1 and 2), DD-79-19, 10 N.R.C. 625 (1979). In one instance where the NRC issued a construction permit in connection with a modification to a reactor, the modification was extensive, consisting of the complete removal of control rods, rod drive mechanisms, core instrumentation, and control room equipment and replacement with a new design. See id. at 656. On another occasion where the Staff required a construction permit for the alteration of a fuel reprocessing facility, the changes involved the construction of new buildings and equipment substantially changing and expanding the capacity of the facility. See id.

^{168/} See H.R. Rep. No. 1470, 91st Cong., 2nd Sess. 26-27, 29 (1970). At pages 26-27, Congress states that if a facility licensed under section 104(b) is "to be" modified to such a degree as to constitute a new or substantially different facility, the exception to section 103 licensing is not intended to be applicable "to the necessary amendment." At page 29, Congress states that the term "license application" as used in section 105 refers to the initial application for a construction permit, the initial application for an operating license, or "the initial application for a modification which would constitute a new or substantially different facility, as the case may be, as determined by the Commission." (Emphasis added).

those specified occasions where the Commission may conduct an antitrust review, its authority is limited to the narrow issue whether "the activities under the license would create or maintain a situation inconsistent with the antitrust laws."^{169/}

The limited antitrust review in connection with the initial licensing of a commercial nuclear plant was required because it was anticipated that such plants would have extremely low operating costs that might significantly increase a utility's competitive advantage. This explanation is found throughout the legislative history of section 105(c). For example, a representative of the Antitrust Division of the Department of Justice explained:

With regard to the establishment of a large-scale nuclear power plant, it is necessary to first determine the extent to which such plants might afford the participants therein decisive competitive advantage over their competitors. The economies of scale associated with such large plants are truly substantial, and access to this low-cost power may well be decisive in any competitive race between electric power companies. Access may well be required for the continued operation of a given company or sector of the industry.^{170/}

Similarly, in a colloquy among Joint Committee Chairman Holifield, Congressman Hosmer, and AEC General Counsel Hennessey, the low cost of nuclear power was identified as the critical factor mandating a need for an antitrust provision in the Atomic Energy Act, notwithstanding the absence of a parallel requirement that would be applicable to fossil plants:

REPRESENTATIVE HOSMER. . . . Is there any more vice in a plant that is to be constructed, including some monopolistic or other anticompetitive tendencies, if it is fired by nuclear fuel than if it is fired by coal or oil?

^{169/} 42 U.S.C. § 2135(c)(5) (1988).

^{170/} Prelicensing Antitrust Review of Nuclear Powerplants, Hearings Before the Joint Comm. on Atomic Energy, Part 1, 91st Cong., 1st Sess. 9 (1969).

MR. HENNESSEY. I see no distinction between the types of fuel so far as the antitrust implications are concerned.

REPRESENTATIVE HOSMER. . . . Yet there is no provision for plants fueled by conventional fuel to be subjected to this kind of review. Is that correct?

MR. HENNESSEY. That is correct. The problem centers on the very large plants that do provide the most economical source of energy, whether they be nuclear fuel or fossil fuel, and an opportunity for the small publicly owned utilities to have access to that newly available cheap source of power.^{171/}

The anticipation that nuclear power would be "too cheap to meter" has proven incorrect. The production costs of nuclear power plants are today somewhat higher than coal-fired plants.^{172/} Accordingly, the concern that prompted an antitrust review in connection with the initial licensing of nuclear plants no longer exists.

One might hypothesize that the costs of nuclear power might be substantially reduced in a plant's renewal term. Comments submitted during the rulemaking suggest that a nuclear plant will, after license renewal, be transformed into a low capital cost plant with only post-renewal capital additions to amortize over the renewal period.^{173/}

^{171/} Id. at 75. See also id. at 106 (Statement of S. David Freeman, Director of the Energy Policy Staff of the United States Office of Science and Technology), 128 (Statement of Walker B. Comegys, Acting Assistant Attorney General, Antitrust Division of the Department of Justice).

^{172/} Utility Data Institute, Inc., 1989 Production Costs: Operating Steam-Electric Plants, Table 4.

^{173/} See Comments of the American Public Power Association et al. at 13.

. . . [B]y the time that the applications for relicensing are filed the plants which are the subject of the applications will be almost fully depreciated and anticipated

Footnote continued on next page.

Such a suggestion is not well-founded. Because of both regulatory demands and plant reliability considerations, the capital additions at nuclear plants have outpaced depreciation. A Department of Energy study determined that capital additions have increased at an annual rate of about 17 percent per year above inflation.^{174/} The DOE study found that by the end of 1984, capital additions averaged about \$42 per kilowatt (electrical) per year,^{175/} which is equivalent to over \$30 million per year for an average size (800 MW) nuclear plant.

The Utility Data Institute's data base, which tabulates data annually reported by utilities to the Federal Energy Regulatory Commission, shows that the average amount of "plant in service" (i.e., undepreciated capital) at the end of 1989 for nuclear plants licensed from 1961 through 1971 was on the order of \$600 million per unit,^{176/} which in every case is considerably more than the initial cost of the plant. Because license renewal applications should be submitted at least twelve years before license expiration because of energy reliability planning considerations, and may under the renewal rule be submitted up to twenty years before license expiration, this sample of plants, which have been operating from between twenty and thirty years, shows the relative order of magnitude of the undepreciated capital that will exist for a plant seeking license renewal.

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costs will have been almost fully collected. With only post-renewal capital additions to amortize over the renewal period, nuclear power plants will be transformed from plants with a high capital cost to plants with a low capital cost. As a result, the holder of the renewal license will be granted access to extraordinarily inexpensive energy for a twenty-year term. This will exacerbate any existing competitive advantage and create significant new competitive advantage.

Id.

^{174/} U.S. Department of Energy, Energy Information Administration, "An Analysis of Nuclear Power Plant Operating Costs" 29 (1988).

^{175/} Id.

^{176/} Utility Data Institute, Inc., U.S. Nuclear Plant Statistics - 1989 (Table 7).

In addition, preparing for license renewal itself may entail substantial capital investment. Studies by the Department of Energy and the Electrical Power Research Institute suggest that the equipment replacement and refurbishment costs in connection with license renewal could cost several hundred million dollars.^{177/} Accordingly, a typical plant seeking license renewal could have on the order of \$1 billion in capital investment after the license renewal process.

Public utility commissions will not allow utilities to depreciate this capital cost over the remainder of the original license term when a twenty-year license extension has been granted. Accordingly, utilities will be required to revise their depreciation schedules in order to amortize the plant in service over the entire license life.

The suggestion that these plants will be "fully depreciated" with "only post renewal capital additions to amortize over the renewal period" is therefore unsupported. Nuclear plants that obtain license renewals will still represent a significant investments.

Even if a utility's capital costs were substantially reduced because of nuclear plant depreciation, it would be inappropriate as a matter of public policy to initiate a proceeding to provide competitors shared access to the depreciated nuclear plant. Depreciating an asset is not an anticompetitive evil practice, but a legitimate way of spreading an asset's expense over its useful life. That an asset is fully depreciated does not mean that its owner has unfairly received something for free, but rather that the owner has fully expensed the asset's cost. The argument that an owner of a fully depreciated asset must then give the asset away to competitors to negate any benefit received from having paid for the asset must be rejected. Such a policy would be confiscatory rather than promotive of competitive enterprise. Further, in this respect, a nuclear plant is no different than a fossil-fuel plant. Taken to its logical conclusion, the argument implies that any competitor has a right to share in any utility asset whose cost is below the market average, which is clearly wrong.

As a final note, there are many other means by which a competitor may protect its interests, making the NRC's involvement unnecessary. The Commission's limited involvement in the economic regulation of nuclear power does not preempt the many other bodies charged with enforcing the antitrust laws. This is

^{177/} See, e.g., EPRI-NP-2418, "Extended Life Operation of Light Water Reactors: Economic and Technological Review" (June 1982).

evident from the language of section 105, which states that "[n]othing contained in this Act shall relieve any person from the operation of the [antitrust laws]."^{178/}

VI. Conclusion

In culmination of its five-year rulemaking effort, the NRC has proposed a license renewal rule that satisfies statutory considerations and is rationally based. The NRC's proposed rule is designed to provide reasonable assurance that the public health and safety remain adequately protected. The NRC has identified the specific issues which, from an engineering and nuclear safety perspective, must be examined in order to provide this assurance, and has made these issues the focus of the license renewal proceeding.

Although the NRC has not based its rule on economic considerations, the focus it has included in the renewal process will make the process more manageable and predictable. In the same vein, the NRC's decision not to require complete redesign and reconstruction when existing designs are adequate to protect the public health and safety eliminates unnecessary capital barriers and reduces the possibility that valuable generating capacity will be needlessly lost. It will not, of course, end the public debate on the merits of nuclear power and related issues, such as the disposal of nuclear waste.

The license renewal rule's contribution, both to utility planning and to energy security, is vitally important. Over the last twenty years, the growth of the gross national product has been closely correlated to growth in electricity consumption.^{179/} Unfortunately, the addition of new electrical generating capacity has slowed for a number of reasons. As a result, the trend of reserve margins has been down and may soon fall below the 20% reliability benchmark.^{180/}

^{178/} 42 U.S.C. § 2135(a) (1988). Accord Ft. Pierce Utilities Authority v. United States, 606 F.2d 986, 1001 (D.C. Cir.), cert. denied, 444 U.S. 842 (1979).

^{179/} See J. Siegel, "The Future of Power Generation in North America" (1990). See also U.S. Department of Energy, National Energy Strategy 30 (1st ed. 1991/1992).

^{180/} North American Electric Reliability Council, 1989 Electricity Supply and Demand 24 (Oct. 1989). See also U.S. Council on Energy Awareness, "Outlook for U.S. Electricity Supply and Demand" (June 1989); J. Siegel, "The Future of Power Generation in North America" (1990).

To reverse this trend and accommodate reasonable growth, it is estimated that 100 to 150 gigawatts of generating capacity beyond that already planned must be installed by 2000, with an additional 100 gigawatts or more needed by 2010.^{181/} Long-term projections by EPRI in 1987 revealed that, owing to increasing demand and the projected retirement of both coal and nuclear facilities, about 810 GW of additional installed electric capacity will be needed through the year 2030. In light of these projections, and the long lead-times required to establish new base-load generating capacity (as much as twelve years), electric system reliability is at serious risk.

By the early 1990's, nuclear generation is projected to provide on the order of 20% of our domestic electrical energy requirements. If nuclear plants are shut down when their initial operating licenses expire, this generating capacity will be lost. Replacing the lost capacity by building new generating facilities or by demand management strategies would likely be extremely costly. Further, even the temporary loss of the available capacity would likely have severe consequences on the economy.

Accordingly, in those cases where operation could continue with adequate protection to the public health and safety and the environment, license renewal is of paramount public interest. The U.S. Department of Energy's National Energy Strategy (Interim Report, April 1990) indicates that extending the operating lifetimes of existing units from the current 40 years to 60 years or more could add 1,400 GW-years of capacity to the nation's energy supply.

But for the continuation of these valuable resources to be practical, utilities must be able to base plans of continued nuclear capacity on a known licensing process and on defined and reasonable requirements. Decisions on license renewal must be attainable sufficiently in advance of license expiration, so that if a renewed license is not granted, the utility will have the time necessary to plan, site, design, license, construct, and test new base-load replacement capacity, or to implement methods to reduce demand. And the licensing requirements applicable to renewal should be no more than what is reasonably necessary to protect the public health and safety so that unnecessary economic

^{181/} U.S. Department of Energy, Annual Energy Outlook 28-29 (1990); U.S. Department of Energy, National Energy Strategy 108 (1st ed. 1991/1992). See also J. Siegel, "The Future of Power Generation in North America" (1990) (estimating that an additional 180 GW must be installed by 2000, and about 250 GW must be ordered in the same period); U.S. Council on Energy Awareness, "Outlook for U.S. Electricity Supply and Demand" (June 1989) at 5.

disincentives are not created. The NRC's proposed rule satisfies all these concerns.

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