UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
COMMISSIONER

June 9, 1981

MEMORANDUM FOR: Chairman Hendrie
Commissioner Gilinsky
Commissioner Bradford

FROM: John Ahearne

SUBJECT: OPERATOR QUALIFICATIONS AND LICENSING PROPOSED RULE (SECY-81-84)

I continue to believe that the overall qualifications of reactor operators can be improved in a significant and important way by requiring operators to have a Bachelor of Science (BS) or Bachelor of Engineering (BE) degree. A BS or BE degree is a strong indicator of the technical knowledge, general aptitude, sense of responsibility and commitment that I believe is important for reactor operators to have, particularly during an unanticipated emergency situation when written procedures may not apply. As a point of comparison, 97 percent of all 1980 new pilot hires of major airlines had 4-year degrees. A 4-year degree is required or preferred by 56 percent of the major airline carriers and an additional 34 percent require or prefer 2 years or more of college (source: Future Aviation Professionals of America).

I also support in concept the plan presented by Commissioner Gilinsky for accommodating the Reactor Operators (ROs), Senior Reactor Operators (SROs), and Shift Supervisors (SSs), currently in the system. This plan provides a reasonable approach to upgrade the technical expertise of nondegreed operator personnel while minimizing career impact on the individual.

I propose that Commissioner Gilinsky's approach be combined with a phased degree requirement in the following way:

1. Licensees would be required on a phased basis to eventually hire or reassign degreed personnel to fill at least 50 percent of new RO positions. To provide for transition, at least 25 percent of new ROs would have to be degreed during the third year after the effective date of the rule. Starting with year 4, at least 50 percent of new ROs would have to be degreed.

2. New nondegreed ROs, SROs, and SSs would have to meet the requirements specified in Commissioner Gilinsky's proposal.

3. There would be no specific percentage requirement for the total number or number per shift of ROs, SROs, and SSs with degrees. Once the basic new hire and reassignment criteria are met, normal licensee selection procedures would determine who would be promoted to SRO, SS, or other management positions.

4. Licensees would be encouraged to rotate engineers from support and maintenance staffs through operator positions as a method of meeting the degreed requirement for new operators and also for broadening the experience base of key engineering and management staff.

5. The long term objective would be to require all new reactor operators to hold a BS or BE degree. Prior to implementing this requirement, however, and at the end of a five year period after publication of the rule, NRC would assess the effectiveness and benefits of the revised criteria to determine if all new reactor operators should hold a BS or BE degree.

Assuming an average of approximately 50 reactor operator personnel per unit and 20 percent turnover per year, the net effect of my proposal would be that each unit would have to hire initially three and eventually five degreed operators per year. I think this is clearly achieveable with the proper commitment by licensees. Sufficient pay and advancement incentives can outweigh the disadvantage of shiftwork.

I suggest my proposal be incorporated into the rule as an alternative on which public comment be asked. Attached is such a version.

Attachment:
As stated

cc: EDO
NRR
RES

NOTE:
SEE PP 16, 17, 18, 43, & 44 FOR J.A. ADDITIONS.

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 50 and 55

OPERATOR QUALIFICATIONS AND LICENSING

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed Rule.

SUMMARY: The Nuclear Regulatory Commission is proposing to amend its regulations to improve and strengthen the criteria for issuing an operating license to operators and senior operators. The amendments focus on initial improvements in requirements for operator education, operator simulator training, operator understanding of the theory behind operation of a facility, maintaining operator proficiency, and NRC participation in requalification examinations. Also included are a proposed set of qualifdcation requirements for individuals designated by utility management to exercise control of unit shift operations (such as shift supervisors). The proposed amendments were initiated by an internal review of the operator licensing program by the Office of Nuclear Reactor Regulation following the accident at Three Mile Island Unit 2 and the recommendations and concerns of the various external review groups following the accident and are designed to improve operator performance to help minimine the possibility of accidents and strengthen the operator's ability to deal with the accident if one should occur. It

is emphasized that these proposals are important early-first steps in the process of upgrading the qualification of reactor operations personnel. Additional proposed amendments are being developed and will be the subject of separate Commission action.

Also, The proposed amendments are being coordinated with other efforts to upgrade the area of personnel qualification such as revision to Regulatory Guide 1.8, "Personnel Qualification and Training."

DATES: Comments received after (60 days after publication) will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments filed on or before (60 days after publication).

ADDRESSES: Written comments should be submitted to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

FOR FURTHER INFORMATION CONTACT: S. D. Richardson, Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone 301-443-5913.

SUPPLEMENTARY INFORMATION: In the aftermath of the Three Mile Island nuclear plant accident, the Nuclear Regulatory Commission and others have conducted a number of studies and

investigations, and, as a result of their findings, have concluded that changes are necessary in the qualifications of nuclear power plant personnel. All of these recommended changes have not been fully evaluated; however, a number of major interim amendments are under consideration by the Commission to its regulations in 10 CFR Part 55, "Operators' Licenses," and in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." It is emphasized that these amendments are important only first steps in the process of upgrading the qualification of nuclear power plant personnel, and that additional amendments are expected. Additional requirements under development by the Commission staff will provide mechanisms to screen license candidates relative to their ability to perform under stress and evaluation of prior commercial and/or military experience to assure that the experience satisfies the applicable experience requirements of the regulation. The purpose of these amendments is to specify requirements designed to improve operator performance in order to help minimize the possibility of accidents induced by operator error and to improve the operator's ability to deal with the accident if one should occur.

Paragraph 50.54(w) of 10 CFR Part 50 would be added to include, as a condition of the facility license, a requirement that administrative procedures be developed to ensure that

an operator is proficient in and is familiar with current plant conditions before being allowed to manipulate the controls; ~~or~~ in the case of senior operators, to supervise the manipulation of the controls of the facility; in the case of shift supervisors, to supervise shift activities involving licensed duties. This change is proposed in order to help ensure that licensed individuals ~~both operators~~ currently performing licensed duties and those returning to licensed duties after a period of inactivity are competent to perform licensed activities.

A new paragraph 55.3(c) would be added to require Commission licensing of individuals assigned to the position of shift supervisor. This new category of licensed individual is created in recognition of the important responsibilities borne by individuals in overall charge of directing licensed activities. Individuals currently designated as shift supervisors would remain in their positions without a license until the first renewal date of their senior reactor operator license after the effective date of the rule.

Paragraph 55.4(c) of 10 CFR Part 55 would be amended to include in the definition of "facility", the concept that more than one facility may be included in an operator's license, since a number of operators are licensed on more than one facility.

A new paragraph 55.4(h) would be added to include the definition of "nuclear power plants." The term "nuclear power plants" is used in the proposed regulation to distinguish these plants from research reactors, test reactors and production facilities, since the revised qualification requirements have been specifically developed for nuclear power plant personnel and requirements for operators of other reactor types have not been considered at this time.

A new paragraph 55.4(i) would be added to include the definition of "shift supervisors", the senior operator in charge of licensed activities during a shift.

Paragraph 55.10(a) would be amended to require an applicant for a nuclear power plant operator or senior operator license to meet the minimum requirements of a new Appendix B to 10 CFR Part 55. This appendix includes specific proposed education, experience and certification requirements for applicants. The specific proposed requirements that are included in Appendix B are based on consideration of a number of specific documents including NUREG-0585,* "TMI-2 Lessons Learned Task Force Final Report" and the draft standard ANS 3.1, "Standard for Qualification and Training of Personnel for Nuclear Power Plants" dated December 6, 1979.

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*Available from GPO Sales Program, U.S. Nuclear Regulatory Commission.

A new paragraph 55.10(e) would be added to require an applicant for a shift supervisor license to meet the minimum requirements of a new Appendix B to 10 CFR Part 55. The specific proposed requirements for shift supervisors are based on a recognition of the substantial responsibilities of the person in charge of licensed activities during a shift, including direction of control room actions and direction of the balance of plant activities that have a direct bearing on the health and safety of the public and of the individuals employed at the plant.

Paragraph 55.11(c) would be amended to eliminate the possibility of an operator, or senior operator or shift supervisor receiving a license on one facility and then being allowed to operate another facility unless that licensee operator is licensed on both facilities. In the case of ~~facilities~~ that are similar, the Commission may issue a license that covers two or more facilities.

Section 55.20 would be amended to include in the scope of license examinations the testing of the applicant's understanding of the theory of operation of the facility. The inclusion of this item is intended to help ensure that

the operator understands the physical processes enough to deal with the consequences of an accident should one occur.

Sections 55.21 and 55.22 would be amended to include in the contents of the examinations, the items resulting from the amended scope in Sec. 55.21. The format of these sections has also been revised to make them directly applicable to the categories included in the examinations. NUREG-0094,** "NRC Operator Licensing Guide" published in July 1976, lists and describes the categories. Concerning 10 CFR Part 55, NUREG-0094 states, "Although it is desirable to separate the written examination into categories in order to determine relative strengths and weaknesses of the applicant, some of the 12 topics listed in the regulation are so closely interrelated that division into 12 separate examination categories is impractical. Therefore, the topics listed in Sec. 55.21 of Part 55 have been regrouped, for examination purposes, into seven categories....". Since the method of regrouping in NUREG-0094 has been proven through use, the proposed amendment lists the seven categories with the addition of a category on theory to meet the needs of the amended scope. The proposed amendment also lists six additional categories in Sec. 55.22 of 10 CFR Part 55 for senior operator examinations. Five of the categories are consistent with the categories for senior operator examinations listed in NUREG-0094 and one has been added to meet the needs of the amended scope of

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** Available from National Technical Information Service, Springfield, Virginia 22161.

Sec. 55.20. In addition, Sec. 55.11 has been revised to include the topic of the use of all available structures systems and components that can control or mitigate degraded core accidents. Requirements for degraded core training are also included in the proposed rule entitled "Interim Requirements Related to Hydrogen Control and Certain Degraded Core Consideration" which was published for comment on October 2, 1980 in the Federal Register. (45 FR 65466).

Section 55.23 would be amended to require the use of a simulator for applicable parts of the operating test in order to ensure that operator proficiency is demonstrated for a much broader range of control manipulations (such as emergency conditions) that cannot be practically demonstrated on the actual plant. The use of simulators is currently optional.

Paragraph 55.31(e) would be amended to require recertification on a simulator as a demonstration of an operator's capabilities after 4 months of inactivity with respect to licensed duties in order to ensure that operator proficiency is demonstrated prior to resumption of licensed duties.

Paragraph 55.31(f) would be added to ensure that all licensees participate in a requalification program and satisfactorily complete annual examinations as a condition of a license. Currently, participation in a requalification program is not mandatory.

Paragraph 55.31 would be amended to stipulate that the term of a shift supervisor license is two years. This provision is consistent with the term of operator and senior operator licenses. The two year expiration date for shift supervisor licenses is judged necessary to ensure periodic reviews of the licensee's performance in carrying out the substantial responsibilities in directing shift operations.

Paragraph 55.33(a)(4) would be amended to delete the portion that applied only until two years after September 17, 1973, and to include proposed requirements concerning information to be submitted with respect to any incomplete portion of the requalification program for all applicants who have not satisfactorily completed all requalification program requirements by the time the renewal application is submitted.

Paragraph 55.33(b) would be amended to require both the timely submittal of the renewal application and the satisfactory completion of at least one requalification examination as conditions to extending the operator's or senior operator's license past the expiration date while the application is under Commission review. This amendment is consistent with the proposed requirements for mandatory requalification program participation and is proposed to provide additional verification of licensee capabilities prior to the Commission allowing the licensee to continue licensed duties during Commission review of the renewal application.

Paragraph 55.33 c (2) would be amended to clarify the conditions for license renewal and the action to be taken if these conditions are not met. These changes make participation in the requalification program mandatory and note that the Commission may require additional training as well as examinations for those applicants who have not completed the requalification program.

Paragraph 55.33(c)(2)(i) would be amended to indicate that the Commission would renew, upon application, a shift supervisor license if the individual has been actively and extensively engaged as a shift supervisor under his existing license, has discharged his responsibilities competently and safely, and, is capable of continuing to do so.

A new paragraph 55.33(c)(4) would be added to require that nuclear power plant senior operator and shift supervisor license renewal applicants meet the applicable educational requirements of Appendix B to 10 CFR Part 55 ~~for operator license renewal applications received after December 31, 1981~~ and for senior operator license renewal applications received after January 1, 1985 ~~December 31, 1984~~. This These specific date dates is are proposed based on the length of time required for senior operators and shift supervisors at the time these amendments would become effective ~~to senior operator applicants~~ to obtain the college level educational elements required by Appendix B. It is proposed that the remaining requirements of Appendix B (except as noted) would be made effective within several months after publication of the final regulation on a date specified in the final rule.

A new paragraph 55.[illegible]c would be added to allow for revocation or suspension of a license in accordance with Subpart B of 10 CFR Part 2 for failure to satisfactorily complete annual examinations as required by Appendix A to 10 CFR Part 55.

Paragraph 4 in the Introduction of Appendix A to 10 CFR Part 55 would be amended to delete the list of requalification program lecture subjects and instead refer to the list of areas and topics in Sec. 55.21 and Sec. 55.22.

Paragraph 3.a of Appendix A to 10 CFR Part 55 would be amended to expand the 10 required reactivity control manipulations. The proposal requires that a variety of control manipulations be performed to demonstrate skill or familiarity with the facility. These control manipulations are not specified in order to allow flexibility in complying with the regulation. A set of specific control manipulations, which is acceptable to the Commission staff for meeting the intent of the regulation, is being developed for proposed revision 2 to Regulatory Guide 1.8, "Personnel Qualification and Training" which was issued for comment on October 2, 1980.*

Paragraph 3.e of Appendix A to 10 CFR Part 55 would be amended to require the use of a simulator for abnormal, infrequent and emergency training of nuclear power plant licensed operators and senior operators as part of the

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* Available from U.S. Nuclear Regulatory Commission, Division of Technical Information and Document Control.

requalification program. The last paragraph of the Introduction to Appendix A would be deleted to remove the statement that the use of a simulator is optional.

Paragraph 4.a of Appendix A to 10 CFR Part 55 would be amended to change the primary purpose of the annual examinations from that of determining areas in which retraining is needed to that of verifying that the operator can operate the controls, or supervise the operation of the controls in the case of a senior operator, in a competent and safe manner. The annual examination will include an oral and simulator test as well as the written examination. The annual examinations will be given by the Commission staff or Commission accredited contractor staff unless the Commission directs that they be given by the facility staff. The provisions for the facility administering such examination are being proposed in response to consideration of Commission resources required to administer these examinations.

Appendix B to 10 CFR Part 55 is proposed to be added to establish requirements for the education, experience, training, and certification of applicants for nuclear power plant operator, and senior operator and shift supervisor licenses. ~~Appendix B also includes a section on requirements for qualifications of individuals designated by management to exercise control of unit shift operations.~~ Although specific proposals are included in the proposed rule in some cases, a number of alternative proposals are still under consideration by the Commission. Advantages of using the high school diploma as the educational requirement, as proposed, include the fact that in addition to skills, the high school diploma

documents an individual's motivation and self-discipline necessary to complete a comprehensive educational program and not just to pass a single examination. However, the Commission realizes that colleges and some parts of the military accept high school equivalency exams as an indication of an individual's high school level knowledge.* The Commission seeks public comment on the use of equivalency exams in meeting the high school completion requirement for operators.

The educational requirements proposed in Appendix B have been formulated with three thoughts in mind. First, nuclear power plants are complex machines whose design and operation involve a large number of scientific and engineering disciplines. While operators need not necessarily have the training for or ability to perform engineering analyses of complex transients or accidents, some degree of theoretical understanding of underlying principles by shift supervisors and senior operators is necessary if they are to be able to diagnose abnormal plant behavior and to take corrective actions. Moreover, in meeting the technical demands of nuclear generating stations we cannot rely on the standards and practices that have evolved at fossil generating stations. The nuclear navy has suited its personnel requirements to the special demands of nuclear technology. For the same reasons, the Commission proposes to require substantial college level education in technical subjects related to nuclear power plants and their

* Commissioner Ahearne believes the Department of Defense preferred policy is not to [redacted] equivalency exams.

operation as a condition for receiving a shift supervisor and senior operator license after January 1, 1981. More would be required of a shift supervisor -- the individual in charge -- than for a senior operator.

This proposed requirement does not call into question the abilities of individuals now operating or supervising the operation of nuclear power plants and who lack formal technical education. The Commission recognizes the substantial value of practical experience. The Commission has formulated educational requirements that would allow individuals who now have shift supervisor and senior operator responsibilities to remain in those positions while at the same time allowing them, where necessary, an opportunity to obtain formal technical education at a pace consistent with full-time employment. Such individuals with considerable experience but with little or no formal education in technical subjects would be required to take roughly a course a semester for about the next three years.

Thirdly, the Commission recognizes the need for a reasonable and equitable transition period and recognizes further that it would not be practicable to apply the new standards in full for all currently licensed individuals. Therefore, the Commission is proposing a formula for reaching

the goal of substantial college level education for shift supervisors and senior operators that would allow substitution of licensed operator and senior operator experience for the college level course requirements, at the rate of 6 semester hours per year of experience, above a minimum number of course hours. This substitution of experience for course credit would not be allowed for experience after January 1, 1985.

Proposed Appendix B would also require that, on January 1, 1982 and thereafter, individuals occupying the position of shift supervisor must have at least five years of responsible nuclear power plant experience, including two years of control room experience as a licensed senior operator. This proposed minimum requirement is based on the need to ensure that the individuals in charge of shift operations involving licensed activities have extensive practical experience in plant operations. This requirement would be applied to facilities that have not yet operated since, in the first few years, there is a premium on having experienced personnel in the control room. The Commission is particularly seeking comments on any impacts this requirement would have on the manning of currently operating reactors. Recognizing the wide variation in plant designs, layouts and performance in this country, the Commission also proposes in Appendix B that at least one of the years of experience be as a senior operator on the unit

for which the shift supervisor license is sought. This last requirement could be waived, with case-by-case substituted requirements, for plants that have yet to be operated. The Commission seeks comments on what substitutions may be appropriate.

These proposed amendments and additions to 10 CFR Part 55 contain requirements for training and for college level courses which are specified independent of each other. If the required training program is sufficiently rigorous, and especially if accredited by a recognized educational body, the Commission may allow substitution of elements of the training program for the proposed college level course requirements. However, the Commission has not yet developed standards for such substitution and seeks public comment on this point.

In addition to the above, the Commission seeks public comment on an alternative which would require college degrees for some operators. A Bachelor of Science (BS) or Bachelor of Engineering (BE) degree that includes at least 60 semester hours of specific technical subjects would be proposed as the education requirement for at least 50 percent of new reactor operators. This would be implemented in a phased approach to allow reasonable time for compliance.

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A BS or BE degree serves as a measure of the individual's initiative to complete a comprehensive training program and is a general indicator of knowledge of the physical sciences, mental aptitude and sense of responsibility. Such qualities are consistent with the strengthening of the cadre of highly trained and highly dedicated professional reactor operations personnel.

Related to the requirement for 50 percent of the new reactor operators to have BS or BE degrees is the expectation that utility management will look for individuals with degrees and experience as reactor operators as candidates for more senior positions in the nuclear portion of the company. Such opportunities for advancement for individuals with degrees should serve as enticement to serve on shift work. A corollary to this principle is the option of rotating engineers in technical support and maintenance staffs into reactor operator positions. Such reassigns would credit toward the percentage goal for degreed new reactor operators and at the same time would broaden the experience and perspective of these support functions.

This alternative does not envision that specific requirements will be set for the percentage of degreed reactor operations staff in total or on a given shift. Once the basic new hire or reassignment goals are met, normal personnel selection procedures would determine who would be promoted to SRO, SS, or other management or staff positions.

The long term objective under this alternative would be to have 100 percent of all new reactor operators possess a BS or BE degree. Prior to implementing this requirement however, and at the end of a five-year period after publication of this rule, NRC would assess the effectiveness, benefits and problems of the revised criteria. Based on this evaluation, a determination would be made regarding the desirability of all or part of the reactor operators having Bachelor of Science degrees.

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Guidance on the type of instruction which is acceptable to the Commission staff for meeting the requirements of "college level education" has been included in proposed revision 2 to Regulatory Guide 1.8.

The type of simulator required to be used to conduct training would also be specified. Provisions have been included in the proposed amendments for the Commission to approve alternative types of simulators, potentially for older one-of-a-kind plants where procurement of a simulator in accordance with the similarity requirements of the proposed rule may be impractical.

Appendix B also states that for applicants for plants which have not yet commenced operation, other experience requirements may be substituted. Such requirements, which would be developed case-by-case, could include additional training or experience at another operational facility, or both. Specific public comments are requested on what factors should be included in these case-by-case determinations.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and section 553 of title 5 of the United States Code, notice is hereby given that adoption of the following amendments to 10 CFR Part 50 and 10 CFR Part 55 is contemplated.

PART 50 - DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

1. Paragraphs 50.54(v) and (w) are added to read as follows:[1] Sec. 50.54 Conditions of licenses.

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(v) [Reserved]

(w) Administrative procedures shall be developed by the licensee to assure that:

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[1] Reserved for other proposed rulemakings in progress.

(1) Operators are proficient at manipulating the controls,

(2) Senior operators are proficient at supervising the manipulation of controls, ~~and~~

(3) Shift supervisors are proficient at supervising shift activities involving licensed duties, and

(4) Operators, ~~and~~ senior operators, and shift supervisors are knowledgeable of plant conditions before performing licensed duties.**[2]

PART 55 - OPERATORS' LICENSES

1. A new paragraph (c) is added to Sec. 55.3 to read as follows: Sec. 55.3 License Requirements.

* * * *

(c) No person may perform the function of shift supervisor as defined in this part except as authorized by a license issued by the Commission. An individual occupying ~~the~~ positions on the effective date of this regulation need not possess such a license until the first renewal date of his senior reactor operator license after January 1, 1982. After that date, they must possess a shift supervisor license in order to continue in that function.

2. Paragraph 55.4(c) is amended to read as follows: Sec. 55.4 Definitions.

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(c) "Facility" means any production or utilization facility as defined in Part 50 of this chapter. Where an

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[2] Add requirements to ensure operator proficiency. Also see Enclosure "B", Item 2, Recommendation 7.

**Comparative text based on existing regulations. Deletions are lined through and additions are underscored.

operator license is issued for operation of two or more facilities, "facility" shall mean all facilities identified in the license.[3]

3. A new paragraphs (h) and i are to added to Sec. 55.4 to read as follows:

Sec. 55.4 Definitions.

* * * * *

(h) "Nuclear Power Plant" means any utilization facility as described by Sec. 50.21 and Sec. 50.22 of this chapter except for the facilities described by paragraphs Sec. 50.21(a) and Sec. 50.21(c) of this chapter.[4]

(i) "Shift Supervisor" is any individual designated by a facility licensee under Part 50 of this chapter to exercise control of unit shift operations. An individual is deemed a shift supervisor if he directs the licensed activities of licensed operators and other senior operators.

4. Paragraph Sec. 55.10(a) is amended to read as follows:

Sec. 55.10 Contents of applications.

(a) Applications for licenses should be filed in triplicate, except for the report of medical examination, with the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, U.S. Nuclear Regulatory Commission, Washington,

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[3] Adds the concept that an operator may be licensed on more than one facility. Also see Enclosure "B", Item 7.

[4] Adds a definition for "Nuclear Power Plant" because it is used in the proposed regulation.

D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C. or at 7920 Norfolk Avenue, Bethesda, MD. Applications for nuclear power plant operator and senior operator licenses shall contain evidence that the applicant meets the minimum acceptable qualifications listed in Appendix B to this part.[5] Each application for a license shall contain the following information:

* * *

5. A new paragraph (e) is added to Sec. 55.10 to read as follows:

Sec. 55.10 Contents of Applications.

(e) Applications for shift supervisor licenses shall contain evidence that the applicant meets the minimum acceptable qualifications listed in Appendix B to this part. In addition, the application must contain a signed statement by a responsible officer with executive authority over nuclear activities at the facility for which the shift supervisor license is sought that certifies the applicant's personal characteristics, previous experiences, training, and education are deemed acceptable to assume the broad responsibilities of a shift supervisor.

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6. Paragraph 55.11(c) is revised to read as follows:

Sec. 55.11 Requirements for the approval of applications.

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[5] References Appendix B for experience, training, education, and certification requirements for nuclear power plant operators. Also see Enclosure "B", Item 1.

(c The applicant's services as a licensed operator, or senior operator, or shift supervisor will be utilized on the facility for which the license is sought.[6]

7. Section 55.20 is amended to read as follows:

Sec. 55.20 Scope of examinations.

The written examination and operating test for a license as an operator or a senior operator are designed to test the applicant's understanding of the facility design, the theory of operation,[7] and familiarity with the controls and operating procedures of the facility. The written examination is based, in part, on information in the final safety analysis report, operating manuals, and license for the facility.

8. Section 55.21 is amended to read as follows:

Sec. 55.21 Content of operator written examination.

The operator written examination, to the extent applicable to a facility, will include questions on topics in paragraphs (a) through (h) of this section. (Relevant examples are also included).[8,9]

(a) Principles of Reactor Plant Operation.

(1) Hydraulics and fluid flow fundamentals.

(2) Heat transfer and heat generation fundamentals.

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[6] Deletes the portion which allows a licensed operator or senior operator, licensed on a facility, to operate a similar facility. Also see Enclosure "B", Item 7.

[7] Expands the scope of license examinations to include related theory of operation. Also see Enclosure "B", Item 5, Recommendation 10 of SECY-79-330E.

[8] Revised to include examples of topics in the areas listed.

[9] Revised to include the change in scope and to group the areas in a practical manner. Also see Enclosure "B", Item 5, Recommendation 10 of SECY-79-330E.

(3) Fundamentals of thermodynamics.

(4) Simple calculational problems showing understanding in this area.

(b) Principles of Reactor Core Operation.

(1) Fundamentals of reactor theory including fission process, neutron multiplication, source effects, control rod effects, and criticality indications.

(2) Simple calculations showing understanding of the principle involved in this area.

(3) Reactivity and the effects of poisons.

(c) Features of Facility Design.

(1) General design features of the core, including core structure, fuel elements, control rods, and coolant flow.

(2) Mechanical design of features of the reactor primary coolant system and auxiliary systems.

(3) Shielding design.

(4) Overall design perspective of systems important to safety.

(5) Electric power distribution including normal, alternate, and emergency power supplies for plant use.

(6) Design limits (e.g., maximum flow, minimum vacuum, maximum pressure, allowable load) or fixed numerical values for fabrication (e.g., enrichment, dimensions).

(7) Design features for normal and decay heat removal.

(d) General Operating Characteristics.

(1) Causes and effects of temperature, pressure, flow, and reactivity changes.

(2) Effects of load changes.

(3) Secondary system transients that induce reactor transients.

(4) Operating limitations and reasons.

(5) Primary coolant subcooling, boiling and superheat detection.

(e) Instruments and Controls.

(1) Design, components, and function of reactivity and process control mechanisms and interlocks.

(2) Nuclear and process instrumentation.

(3) Incore instrumentation system.

(4) Purpose, principles, and failure modes of control room instrumentation, alarms, and annunciators.

(5) Accident monitoring instrumentation.

(6) Fundamentals of electricity as it pertains to instrumentation and controls.

(f) Safety and Emergency Systems.

(1) Design, components, and function of systems designed to prevent or mitigate accidents, including instrumentation, interlocks, and automatic and manual control features.

(2) Setpoints for automatic features.

(3) Components, capacity, and functions of reserve and emergency systems.

(4) Isolation and containment design features.

(5) Locations and controls of emergency shutdown panels.

(6) Use of all available structures, systems, and components that can control or mitigate degraded core accidents.

(g) Standard and Emergency Operating Procedures.

(1) Immediate actions for emergency procedures.

(2) Major steps of standard procedures.

(h) Radiation Control and Safety.

(1) Purpose and operation of radiation monitoring system, including alarm and survey equipment.

(2) Radiological safety principles and procedures.

(3) Radiological limits.

(4) Types of radiation.

(5) Shielding and distance effects of radiation.

9. Section 55.22 is amended to read as follows:

§55.22 Content of senior operator written examination.

The senior operator written examination, to the extent applicable to the facility, will include questions on the topics listed in paragraphs (a) through (h) of §55.21 (Relevant examples are also included), and the following:[8,9]

(a) Theory of Reactor Plant Operation.

(1) Hydraulics and fluid flow theory.

(2) Heat transfer theory.

(3) Thermodynamics.

(4) Calculational problems showing understanding in this area.

(b) Reactor Theory.

(1) Theory of fission process, neutron multiplication, source effects, control rod effects, and criticality indications.

(2) Calculations showing understanding in this area.

(c) Radioactive Material Handling, Disposal, and Hazards.

(1) Radiation hazards that may arise during the performance of experiments, shielding alterations, maintenance activities, and various contamination conditions.

(2) Procedures and equipment available for handling and disposal of radioactive materials and effluents, including discharge limitations.

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[8]See page 28.
[9]See page 28.

(3) Shielding effects on radiation and related calculational problems.

(c) Specific Operating Characteristics

(1) Coolant chemistry.

(2) Reactivity calculations for criticality and charging power.

(3) Specific operating characteristics of reactor and auxiliary systems.

(e) Fuel handling and core parameters.

(1) Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity.

(2) Procedures and equipment used in fuel handling.

(3) Fuel element characteristics and limitations.

(f) Administrative Procedures, Conditions and Limitations

(1) Conditions and limitations in the facility license.

(2) Design and operating limitations in the technical specifications for the facility and their basis.

(3) Facility licensee procedures required to obtain authority for design and operating changes in the facility.

(4) Facility licensee procedures for the review and approval of experiments and tests.

(5) Emergency procedures including site and offsite notifications.

10. The first paragraph of §55.23 is amended to read as follows:

§55.23 Scope of operator and senior operator operating tests.

The operating tests administered to applicants for operator and senior operator licenses are generally similar in scope. For the listed

items that lend themselves to use of a simulator, the operating test for applicants for operator and senior operator licenses of nuclear power plants shall be administered using the same type of simulator as required by Appendix B to this part for training the applicant.[10] The operating test, to the extent applicable to the facility, requires the applicant to demonstrate an understanding of:

* * *

11. Paragraph 55.31(e) is amended to read as follows:

§55.31 Conditions of licenses.

* * * * *

(e)(1) If a licensee has not been actively performing the functions of an operator or senior operator for a period of four months or longer, the operator or senior operator shall, prior to resuming activities licensed pursuant to this part, demonstrate to the Commission that the knowledge and understanding of facility operation and administration are satisfactory. For nuclear power plant licensees, this demonstration shall include recertification on a simulator of the same type as required by Appendix B to this part.[11]

(2) The Commission may accept as evidence, a certification by an authorized representative of the facility licensee by which the licensee has been employed.

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[10] Requires the use of a simulator for conducting the operating test. Also see Enclosure "B", Item 2, Recommendation 11 of SECY-79-330E.

[11] Requires recertification of nuclear power plant licensees on a simulator prior to returning to licensed duties following a period of 4 months of licensed duty inactivity. Also see Enclosure "B", Item 2, Recommendation 7 of SECY-79-330E.

12. Paragraph 55.31(f) is renumbered 55.31(g). A new paragraph 55.31(f) is added to read as follows:

§55.31 Conditions of licenses.

* * * * *

(f) The operator shall participate in a requalification program pursuant to Appendix A to this part and shall satisfactorily complete annual examinations as required by Appendix A to this Part.[12]

13. Paragraph 55.32 is amended to read as follows:

Section 55.32 Expiration.

Each operator, senior operator and shift supervisor license shall expire two years after the date of issuance.

14. Paragraph 55.33(a)(4) is amended to read as follows:

Sec. 55.33 Renewal of licenses.

(a) * * *

(4) A statement that, during the effective term of the current license, the operator or senior operator applicant has satisfactorily completed the requalification program for the facility for which operator or senior operator license renewal is sought. If an applicant has not satisfactorily completed all of the requalification program, the applicant must specify in the application for renewal (i) the area(s) in which program participation was incomplete, (ii) when the program will be completed, and (iii) the special factors, or other justification, bearing on the renewal which the applicant wishes the Commission to consider in relation to the incomplete requalification program.[13]

* * *

[12] Requires participation in a requalification program as a condition of license. Also see Enclosure "B", Item 4, Recommendation 9 of SECY-79-330E.

[13] Allows for cases in which a renewal applicant has not fully completed a requalification program. Also requires information to be included to allow the Commission to determine additional training needed pursuant to paragraph 55.33(c)(2)(iii).

15. Paragraph 55.33(b) is amended to read as follows:

§ 55.33 Renewal of licenses.

* * * * *

(b) In any case in which a licensee not less than thirty days prior to the expiration of his existing license has filed an application in proper form for renewal or for a new license and the licensee has satisfactorily completed at least one annual examination under a requalification program pursuant to Appendix A to this part, the existing license shall not expire until the application for renewal or for a new license has been finally determined by the Commission.

* * * * *

16. Paragraph 55.33(c)(2) is amended to read as follows:

§55.33 Renewal of licenses.

(c) * * *

(2)(i) The licensee has been actively and extensively engaged as an operator, or as a senior operator or as a shift supervisor under the existing license, has discharged responsibilities competently and safely, and is capable of continuing to do so.

(ii) The licensee has completed a requalification program pursuant to Appendix A to this part.

(iii) If the requirements of paragraph (c)(2)(i) and (ii) of this section are not met, the Commission may require the applicant for renewal to satisfactorily complete additional training or examinations, or both.[1]

* * *

[1] An applicant who does not meet the requirements for license renewal may be required to take additional training or examinations or both to ensure he is properly retrained for the license. Also see Enclosure "B", item 4.

17. A new paragraph 55.33(c)(4) is added to read as follows:

Sec. 55.33 Renewal of licenses.

c * * *

(4) ~~Per-nuclear-power-plant-operator-license-renewal applications-received-after-December-31,-1981,-and~~ For non-degreed nuclear power plant senior operator license and shift supervisor license renewal applications received after January 1, 1985, ~~December-31,-1986,~~ the applicant for the license meets the minimum educational requirements in Appendix "B" to this part.[15]

18. A new paragraph 55.40(c) is added to read as follows:

§55.40 Modification and revocation of licenses.

* * * * *

(c) Any license may be revoked or suspended for failure to satisfactorily complete annual examinations as required by Appendix A to this part.[16]

APPENDIX A - Requalification Programs For Licensed Operators of Production and Utilization Facilities

19. Appendix A to 10 CFR Part 55 is amended by deleting the fourth paragraph of the "Introduction".

20. Paragraph 2 of Appendix A to 10 CFR Part 55 is amended as follows:

Requalification Program Requirements

* * * * *

2. Lectures. The requalification program shall include preplanned lectures on a regular and continuing basis throughout the license period

[15]Specifies effective dates of education requirements for nuclear power plant license renewal applicants.

[16]Reinforces the importance of completing annual examinations. Also see

in those areas of §§55.21 and 55.22 where annual operator and senior operator written examinations indicate that the level of knowledge needs to be upgraded.

Other training techniques including films, videotapes and other effective training aids may also be used.

Individual study on the part of each operator shall be encouraged. However, a requalification program based solely upon the use of films, videotapes or individual study, or all three , is not an acceptable substitute for a lecture series.

21. Paragraph 3.a of Appendix A to 10 CFR Part 55 is amended to read as follows:

Requalification Program Requirements

* * * * *

3. On-the-job training. The requalification program shall include on-the-job training so that:

a. Each licensed operator of a production or utilization facility manipulates the plant controls and each licensed senior operator either manipulates the controls or directs the activities of individuals during plant control manipulations during the term of their licenses. For reactor operators and senior operators, these manipulations shall consist of a variety of reactor startups, reactor shutdowns and other control manipulations that demonstrate skill and familiarity with the facility controls.[18]

[18] removes the inference that 10 reactivity control manipulations are enough to satisfy requalification program requirements. These requirements have been expanded by the May 28, 1980 letter from the Director of the Office of Nuclear Reactor Regulation and are expected to change as additional requirements in this area are developed.

22. Paragraph 3.e of Appendix A to 10 CFR Part 55 is amended to read as follows:

Requalification Program Requirements

* * * * *

3. On-the-job training. The requalification shall include on-the-job training so that:

e. A simulator may be used in meeting the requirements of paragraphs 3a and 3b if the simulator is of the type specified in Appendix B to Part 55. A simulator of the type specified in Appendix B to Part 55 shall be used to conduct abnormal, infrequent, and emergency event training for nuclear power plant operators and senior operators.[*]

23. Paragraph 4a of Appendix A to 10 CFR Part 55 is amended to read as follows:

Requalification Program Requirements

* * * * *

4. Evaluation. The requalification program shall include:

a. Annual examinations to determine that operators and senior operators have sufficient knowledge and expertise to continue licensed duties.

(1) The Commission staff or Commission accredited contractor staff will administer the examinations unless it directs the facility licensee to do so.

[*]Requires the use of a simulator in the requalification program. Also see Enclosure "B", item 2, Recommendation 7 of SECY-78-330E.

(2) The administrator of the examinations shall administer a written, oral, and practical (performed on a simulator for nuclear power plant operators and senior operators) examination.[20]

24. Paragraph 4d of Appendix A to 10 CFR Part 55 is amended to read as follows:

Requalification Program Requirements

* * * * *

4. Evaluation. The requalification program shall include:

d. To meet the requirements of paragraph 4c, simulation of emergency or abnormal conditions may be accomplished by using the control panel of the facility involved or by using a simulator. Where the control panel of the facility is used for simulation, the actions taken or to be taken for the emergency or abnormal condition shall be discussed; actual manipulation of the plant controls is not required. If a simulator is used it shall be the same type as specified in Appendix B to Part 55.[21]

25. A new Appendix B to 10 CFR Part 55 is added to read as follows:[22]

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[20] Requires the annual examinations to include a written, oral, and practical portion.

[21] Refers to Appendix B to Part 55 when describing the type of simulator to be used.

[22] Adds education, experience, training, and certification requirements for approval of commercial nuclear power plant license applications. Also see Enclosure "B", Item 1.

APPENDIX B - QUALIFICATIONS OF APPLICANTS FOR NUCLEAR POWER PLANT OPERATOR AND SENIOR OPERATOR LICENSES FOR INDIVIDUALS DESIGNATED TO EXERCISE CONTROL OF UNIT SHIFT OPERATIONS

I. INTRODUCTION

Section 55.10 of 10 CFR Part 55 requires, in part, that a license application contain the education of the applicant, pertinent experience of the applicant, and evidence that the applicant has learned to operate the controls in a competent and safe manner. The minimum acceptable qualifications of nuclear power plant applicants are listed in this appendix.

II. QUALIFICATION REQUIREMENTS FOR INDIVIDUALS IN CONTROL OF UNIT SHIFT OPERATIONS - SHIFT SUPERVISORS.

A. EDUCATION

~~1. Individuals assigned to and occupying these positions after December 31, 1984 shall have a Bachelor degree that includes 60 semester hours of college level education in technical subjects including mathematics, reactor physics, chemistry, materials, reactor thermodynamics, fluid mechanics, heat transfer, electrical theory, and reactor control theory.~~

1. Except as noted below, individuals assigned to these positions after the effective date of this regulation must have a minimum of 60 semester hours of college level education in technical subjects including mathematics, reactor physics, chemistry, materials, reactor thermodynamics, fluid mechanics, heat transfer,

electrical theory, and reactor control theory. Above a minimum requirement, credit toward the 60 semester hour requirement may be obtained at the rate of 6 semester hours per year of experience before January 1, 1985, as an NRC licensed operator or senior operator. The minimum requirements to obtain a shift supervisor license are 6 semester hours after January 1, 1982, 12 semester hours after January 1, 1983, 18 semester hours after January 1, 1984, and 24 semester hours after January 1, 1985. The minimum requirement for renewing a shift supervisor license after January 1, 1985 is 24 semester hours.

Individuals holding the position of shift supervisor before the effective date of the rule have until the time of their first renewal after January 1, 1985 to meet the basic 60 semester hours requirement and they may obtain experience credit at the rate of 6 semester hours per year as an NRC licensed operator or senior operator before January 1, 1985 for up to 36 units.

A Bachelor degree in engineering will be taken to fulfill the educational requirements of the Appendix.

B. EXPERIENCE

2. Individuals occupying these positions after January 1, 1982 ~~December 31, 1981~~ shall have five years of responsible nuclear power plant experience, including two years of control room experience as a licensed senior operator. Similar experience on other nuclear power plants may

substitute for this experience. In no case shall individuals be given this broad responsibility without having a minimum of one year of control room experience as a senior operator on the unit at which the supervisory designation is made. Before initial facility operation, the Commission may waive this last requirement and substitute case-by-case requirements to accommodate the fact that the facility has not yet been in operation.

C. TRAINING

3. Individuals assigned to the positions shall have:

a. a senior operator license for the unit at which the supervisory designation is made.

b. received instruction in the following supervisory skills: leadership, interpersonal communications, command responsibilities and limits, motivation of personnel, problem analysis, and administrative requirements for the particular supervisory position, and

c. received three months of shift training, with no other concurrent duties assigned on the unit for which the supervisory designation is made. During this training the applicant shall, under the observation and control of a designated shift supervisor, exercise control over overall shift operations. Before initial facility operation, the Commission may waive this requirement and substitute case-by-case requirements to accommodate the fact that the facility has not yet been in operation.

D. CERTIFICATION:

1. An authorized representative the highest level of corporate management responsible for operations of the facility must certify that the applicant has completed the training and educational elements required by the facility licensee and this Appendix and has demonstrated to the satisfaction of the facility licensee that the applicant's personal characteristics and previous experiences are sufficient to supervise the shift operations in a competent and safe manner.

III. QUALIFICATION REQUIREMENTS FOR APPLICANTS FOR SENIOR OPERATOR LICENSES

A. EDUCATION:

~~For initial license applications received after December 31, 1984, and for renewal applications received after December 31, 1986, the applicant must have as a minimum a Bachelors degree that includes 60 semester hours of college level education in technical subjects including mathematics, reactor physics, chemistry, materials, reactor thermodynamics, heat transfer, electrical theory, and reactor control theory.~~

Except as noted below, initial applications received after the effective date of this regulation, the applicant must have a minimum of 45 semester hours of college level education in technical subjects including mathematics, reactor physics, chemistry, materials, reactor thermodynamic

fluid mechanics, heat transfer, electrical theory. Above a minimum requirement, credit toward the 45 semester hour requirement may be obtained at the rate of 6 semester hours per year of experience, before January 1, 1985, as an NRC licensed operator. The minimum requirements to obtain a senior operator license are 6 semester hours after January 1, 1983, 12 semester hours after January 1, 1984, and 18 semester hours after January 1, 1985. The minimum requirement for renewing a senior operator license after January 1, 1985 is 18 semester hours.

Individuals holding a senior operator license before the effective date of the rule have until the time of their first renewal after January 1, 1985 to meet the basic 45 semester hours requirement and they may obtain experience credit at the rate of 6 semester hours per year as an NRC licensed operator or senior operator before January 1, 1985 for up to 27 units.

A bachelor degree in engineering will be taken to fulfill the educational requirements of this Appendix.

B. EXPERIENCE:

The Applicant must have a minimum of two years of experience at a nuclear power plant including six months at the facility for which the license is sought. One year of experience shall be as a nuclear power plant licensed operator. The remaining year shall be composed of experience as a nuclear power plant licensed operator or as a nuclear power plant staff engineer involved in the dat-to-day activities of the plant, or a combination of both. Before initial facility operation, the Commission may waive this requirement and substitute case-by-case requirements to accommodate the fact that the facility has not yet been in operation.

C. TRAINING: The applicant must have:

1. Received training on and must have demonstrated ability to satisfactorily operate a simulator whose reference plant, is with respect to the facility for which a license is sought unless otherwise approved by the Commission:

   a. Is the same type of facility (e.g., PWR, BWR, HTGR

   b. Has the same type of control room (e.g., conventional advanced);

   c. Has the same type of steam generator (e.g., once through, recirculating type); and

   d. Has the same number of primary system loops;

2. Received instruction in the areas listed in Sections 55.21 and 55.22 ~~of Part 55 of this chapter may be used to fulfill education requirements specified in paragraph III.A of this Appendix~~; and

3. Received three months of shift training, with no other concurrent duties at the facility for which the license is sought. During this training the applicant has, under the observation and control of a licensed senior operator, supervised the manipulation of the facility controls and performed duties a licensed senior operator would perform. Before initial facility operation, the Commission may waive this requirement and substitute case-by-case requirements to accommodate the fact that the facility has not yet been in operation.

D. CERTIFICATION:

1. An authorized representative (the highest level of corporate management responsible for operations) of the facility must certify that the applicant has completed the training required by the facility licensee and this Appendix and has demonstrated to the satisfaction of the facility licensee an ability to supervise the operation of the controls in a competent and safe manner.

2. The certification must contain details on (these items may be incorporated by reference to other correspondence):

a. The courses of instruction;

b. The number of course hours;

c. The number of hours of training;

d. The nature of the training used to fulfill the requirements of paragraph III.C of this Appendix; and

e. The differences between the simulator used to meet the requirements of paragraph III.C.1 of this Appendix and the facility for which the applicant seeks a license, as well as the actions taken to help ensure that these differences will not result in the applicant misinterpreting plant response or taking incorrect action.

IV. QUALIFICATION REQUIREMENTS FOR APPLICANTS FOR OPERATOR LICENSES

A. EDUCATION: For initial applications received after December 31, 1981, the applicant must hold a high school diploma.

) A. Addition

(The following additional wording is being considered as an alternative.) In addition to the above, during the period January 1 to December 31, 1984, at least 25 percent of new recipients of reactor operator licenses must possess a Bachelor of Science (BS) or Bachelor of Engineering (BE)

JA Addition

degree that includes at least 60 semester hours of specific technical subjects. During the period January 1 to December 31, 1985, and each calendar year thereafter, at least 50 percent of new recipients of reactor operator licensee must possess a BS or BE degree that includes at least 60 semester hours of specific technical subjects.

B. EXPERIENCE: The applicant must have a minimum of:

Three years of experience in the testing, operation, and maintenance of power generating plants (not necessarily nuclear). Two years of this experience may be substituted by a Bachelor degree in engineering or by 45 semester hours of college level education in technical subjects including mathematics, reactor physics, chemistry, materials, reactor thermodynamics, fluid mechanics, heat transfer, electrical theory, and reactor control theory. One year of this experience must be at the facility for which a license is sought, including six months of duties as a non-licensed operator. Before initial facility operation, the Commission may waive this requirement and substitute case-by-case requirements to accommodate the fact that the facility has not yet been in operation.

C. TRAINING: The applicant must have:

1. Received training on and demonstrated ability to satisfactorily operate a simulator whose reference plant, with respect to the facility for which a license is sought unless otherwise approved by the Commission:

   a. Is the same type of facility (e.g., PWR, BWR, HTGR);

   b. Has the same type of control room (e.g., conventional advanced);

   c. Has the same type of steam generator (e.g., once through recirculating type); and

   d. Has the same number of primary system loops;

2. Received instruction in the areas listed in Sec. 55.21; a

3. Received three months of shift training, with no other concurrent duties, at the facility for which a license is sought. During this training the applicant must have, under the observation and control of an licensed operator manipulated the facility controls and performed duties a licensed operator would perform. Before initial facility criticality, the Commission may waive this requirement and substitute case-by-case requirements, to accommodate the fact that the facility has not yet been in operation.

D. CERTIFICATION:

1. An authorized representative (the highest level of corporate management responsible for operations) of the facility must certify that the applicant has completed the training required by the facility licensee and this Appendix and has demonstrated to the satisfaction of the facility licensee an ability to operate the controls in a competent and safe manner.

2. The certification must contain details on (these items may be incorporated by reference to other correspondence):

a. The courses of instruction;

b. The number of course hours;

c. The number of hours of training;

d. The nature of the training used to fulfill the requirements of paragraph IV.C of this Appendix; and

e. The differences between the simulator and the facility for which the applicant seeks a license, as well as the actions taken to help ensure that these differences will not result in the applicant misinterpreting plant response or taking incorrect action.

REGULATORY FLEXIBILITY STATEMENT

In accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission hereby certifies that this rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. This proposed rule affects the process of selection and training of operators and senior operators by utilities and the licensing of those personnel by the NRC. Utilities do not fall within the definition of a small business found in Section 3 of the Small Business Act, 15 U.S.C. 632.

(Secs. 107, 161 b. and i., Pub. L. 83-703, 68 Stat. 939, 948; Sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1242, 42 U.S.C. 2137, 2201, 5841).

Dated at _____ this _____ day of _____, 19__.

For the Nuclear Regulatory Commission.

_____

Samuel J. Chilk
Secretary of the Commission