

CPR PART 8

ATOMIC ENERGY FACILITY OPERATORS' LICENSES

(I) GENERAL PROVISIONS

Section 1. Purpose. The regulations in this Part establish procedures and criteria for the issuance of licenses to operators, including senior operators, of facilities licensed pursuant to Republic Act No. 5207, as amended, and Part 7 of the Code, and provide for the terms and conditions upon which the Commission will issue these licenses.

Section 2. Definitions. - As used in this Part:

- (a) **“Act”** means Republic Act No. 5207, as amended.
- (b) **“Commission”** means the Philippine Atomic Energy Commission.
- (c) **“Facility”** means any production facility or utilization facility as defined in Part 7 of the Code. Where an operator license is issued for operation of two or more facilities, "facility" shall mean all facilities identified in the license.
- (d) **“Operator”** is any individual who manipulates a control of a licensed facility. An individual is also deemed to manipulate a control if he directs another to manipulate a control.
- (e) **“Senior operator”** is any individual designated by an installation operator under Part 7 of the Code to direct the licensed activities of licensed operators.
- (f) **“Controls”** when used with respect to a nuclear reactor means apparatus and mechanisms the manipulation of which directly affect the reactivity or power level of the reactor. “Controls” when used with respect to any other facility means apparatus and mechanisms the manipulation of which could affect the chemical, physical, metallurgical, or nuclear process of the facility in such a manner as to affect the protection of public health and safety against radiation.
- (g) **“Code”** means the Code of PAEC Regulations.
- (h) **“Installation operator”** means the person licensed by the Commission as the operator of that installation. If no person is licensed by the Commission as the operator of the installation and the installation is operated by or for the Commission, "installation operator" shall be deemed to mean the Commission.
- (i) **“Person”** means any individual, partnership, private or public body, whether corporate or not, Government agency other than the Commission, any international organization enjoying legal personality under the law where the nuclear installation is situated, and any State or any of its constituent subdivisions; and any legal successor, representative, agent or agency of the foregoing.
- (j) **“Individual”** means a natural person.

- (k) **“Nuclear installation”** means
- (1) any nuclear reactor other than one with which a means of sea or air transport is equipped for use as a source of power whether for propulsion or for any other purposes;
 - (2) any factory using nuclear fuel for the production of nuclear material or any factory for the processing of nuclear materials, including any factory for the reprocessing of irradiated nuclear fuel; and
 - (3) any facility where nuclear material is stored, other than storage incidental to the carriage of such material.

Section 3. Scope. - The regulations in this Part apply to any individual who manipulates the controls of any facility licensed by the Commission pursuant to Part 7 of the Code and to any individual designated by the installation operator to be responsible for directing the licensed activities of licensed operators.

Section 4. Qualifications. - No individual shall be licensed as an operator for a licensed facility unless he is a Filipino citizen, not less than 25 years of age, a licensed electrical, mechanical, civil, electronic, or chemical engineer with required training and experience and meets and/or complies with the other requirements of this Part. The Commission may, from time to time, prescribe additional qualifications.

Section 5. License requirements.

- a) No individual may perform the function of an operator as defined in this Part except as authorized by a license issued by the Commission
- b) No individual may perform the function of a senior operator as defined in this Part except as authorized by a license issued by the Commission.

Section 6. Additional requirements. - The Commission may, by rule, regulation, or order, impose upon any licensee such requirements in addition to the regulations established in this Part or in the Code, as it deems appropriate or necessary to protect health and safety and to minimize danger to life or property.

Section 7. Communications. - All communications and reports concerning the regulations in this Part and applications filed under them, should be addressed to the Commissioner, Philippine Atomic Energy Commission, Don Mariano Marcos Avenue, Diliman, Quezon City, Metro Manila.

Section 8. Interpretations. - No interpretation of the meaning of the regulations in this Part by any officer or employee of the Commission other than a written interpretation by the Commission will be recognized to be binding upon the Commission.

Section 9. Specific exemptions. - The Commission may, upon application by an interested person, or upon its own initiative, grant such exemptions from the requirements of the regulations in this Part as it determines are authorized by law and will not endanger life or property and are otherwise in the national interest.

Section 10. Exemptions from license. - Nothing in this Part shall be deemed to require a license for:

- a) An individual who manipulates the controls of a research or training reactor as part of his training as a student in a nuclear engineering course under the direction and in the presence of a licensed operator or senior operator;

- b) An individual who manipulates the controls of a facility as a part of his training to qualify for an operator's license pursuant to the regulations in this Part under the direction and in the presence of a licensed operator or senior operator.

(II) LICENSE APPLICATIONS

Section 11. Content of the Applications.

- a) Applications for licenses should be filed in triplicate, except for the report of medical examination, with the Commission. Each application for a license shall contain the following information:
 - 1) The full name, citizenship, age, address and professional status of the applicant;
 - 2) The education and pertinent experience of the applicant, including detailed information on the extent and nature of responsibility;
 - 3) Serial numbers of any operator and senior operator license issued by the Commission to the applicant and the expiration date of each;
 - 4) The specific facility for which the applicant seeks an operator or senior operator license;
 - 5) A written advice of the installation operator or his authorized representative that the applicant be administered either the operator or senior operator examinations;
 - 6) Evidence that the applicant has learned to operate the controls in a competent and safe manner and has need for an operator or a senior operator license in the performance of his duties. The Commission may accept as proof of this a certification of an authorized representative of the installation operator where the applicant's services will be utilized. This certification shall include details on courses of instruction administered by the installation operator, number of course hours, number of hours of training and nature of training received at the facility and in a simulator, and for reactors, the start-up and shutdown experience received.
 - 7) Individual reports of medical and psychological examinations by competent practitioners, in forms to be prescribed by the Commission. The Commission may subject said reports to verification and/or the applicant for re-examinations by Commission-designated practitioners;
 - 8) Clearances as may be prescribed by competent authorities.
- b) The Commission may at any time after the filing of the original application, and before the expiration of the license, require further information in order to enable it to determine whether the application should be granted or denied or whether a license should be revoked, modified or suspended.
- c) An applicant whose application has been denied because of his physical condition or general health may submit a further report of medical examination at any time as a supplement to his original application.

- d) Each application and statement shall contain complete and accurate disclosure as to all matters and things required to be disclosed. All applications and statements, other than the matters required by paragraphs (a) (5), (6), (7) and (8) of this Section shall be signed by the applicant.

Section 12. Requirements for the approval of application. An application for a license pursuant to the regulations in this Part will be approved if the Commission finds that:

- a) The physical and psychological conditions as well as the general health of the applicant are not such as might cause operational errors endangering public health and safety.
 - 1) Epilepsy, insanity, diabetes, hypertension, cardiac disease, fainting spells, defective hearing or vision or any other physical, mental or psychological condition which might cause impaired judgment or motor coordination may constitute sufficient cause for denial of the application.
 - 2) If an applicant's vision, hearing and general physical condition do not meet the minimum standards normally considered necessary, the Commission may approve the application and include conditions in the license to accommodate the physical defect. The Commission will consider the recommendations of the installation operator and of the examining physician in arriving at its decision.
- b) The applicant has passed the written examination and operating test to determine that he has learned to operate and, in the case of a senior operator, to operate and to direct the licensed activities of licensed operators in a competent and safe manner.
- c) The applicant's services as a licensed operator or senior operator will be utilized on the facility for which he seeks a license.

Section 13. Re-applications.

- a) Any applicant whose application for a license has been denied because of failure to pass the written examination or operating test or both may file a new application for license six months after the date of denial. Any new application shall be accompanied by a statement signed by an authorized representative of the installation operator, stating in detail the extent of additional training which the applicant has received and certifying that he is ready for re-examination. An applicant may file a last application six months after the date of denial of his second application.
- b) An applicant who has passed either the written examination or operating test and failed the other may request in a new application that he be excused from re-examination on the examination or test which he has passed. The Commission may in its discretion grant the request if it determines that sufficient justification is presented under all the circumstances.

(III) WRITTEN EXAMINATIONS AND OPERATING TESTS

Section 14. Scope of examinations. - The written examination and operating test for a license as an operator or senior operator are designed to test the applicant's understanding of the facility design, the theory of operation and his familiarity with the controls and operating procedures of the facility. The written examination is based in part on information in the safety analysis report, operating manuals and license for the facility.

Section 15. Content of operator written examination. - The operator written examination, to the extent applicable to the facility, will include questions on:

- a) **Principles of Reactor Plant Operation.**
 - 1) Hydraulics and fluid flow fundamentals.
 - 2) Thermodynamics - fundamentals of transformation of energy; fundamentals of heat transfer and heat generation.

- 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) 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 system 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 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 system designed to prevent or mitigate accidents, including instrumentation, inter-locks, and automatic and manual control features.
 - 2) Set points for automatic features.
 - 3) Components, capacity, and functions of reserve and emergency system.
 - 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) Types of radiation
 - 3) Radiological limits
 - 4) Radiological safety principles and procedures.
 - 5) Shielding and distance effects on radiation.

Section 16. 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 Section 15 and the following:

- a) **Theory of Reactor Plant Operation**
- 1) Hydraulics and fluid flow theory
 - 2) Thermodynamics - theory on transformation of energy; heat transfer theory
- b) **Reactor Theory**
- 1) Detailed theory of fission process, neutron multiplication, source effects, control and rod effects, and criticality indications.
- 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.
 - 3) Shielding effects on radiation and related calculational problems.
- d) **Specific Operating Characteristics**
- 1) Coolant chemistry
 - 2) Reactivity calculations for criticality and changing 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) Installation operator procedures required to obtain authority for design and operating changes in the facility.
 - 4) Installation operator procedures for the review and approval of experiments and tests.
 - 5) Emergency procedures including site and offsite notifications.

Section 17. 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 the use of a simulator, the operating test

shall be administered using a plant specific simulator, as required by Appendix B of this Part, and those that do not shall be administered in a walk-through oral examination. The operating tests, to the extent applicable to the facility) requires the applicant to demonstrate an understanding of:

- a) Pre-start-up procedures for the facility, including associated plant 'equipment which could affect reactivity.
- b) Required manipulation of console controls to bring the facility from shutdown to designated power levels.
- c) The source and significance of annunciator signals and condition indicating signals and remedial action responsive thereto.
- d) The instrumentation system and the source and significance of reactor instrument readings.
- e) The behavior characteristics of the facility.
- f) The control manipulation required to obtain desired operating results during normal, abnormal and emergency situations.
- g) The operation of the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems and the relation of the proper operation of these Systems to the operation of the facility.
- h) The operation of the facility's auxiliary systems which could affect reactivity.
- i) The use and functions of the facility's radiation monitoring systems, including fixed radiation monitors and alarms, portable survey instruments, and personnel monitoring equipment.
- j) The significance of radiation hazards, including permissible levels of radiation, levels in excess of those authorized and procedures to reduce excessive levels of radiation and to guard against personnel exposure.
- k) The emergency plan for the facility, including the operator's or senior operator's responsibility to decide whether the plan should be executed and the duties assigned under the plan.
- l) The necessity for a careful approach to the responsibility associated with the safe operation of the facility.

Section 18. Waiver of examination and test requirements. On application, the Commission may waive any or all of the requirements for a written examination and operating test if it finds that the applicant:

- a) Has had extensive actual operating experience at a comparable facility within two years prior to the date of application.
- b) Has discharged his responsibilities competently and safely and is capable of continuing to do so. The Commission may accept as proof of the applicant's past performance a certification of an authorized representative of the installation operator by which the applicant was previously employed. The certification shall contain a description of the applicant's operating experience, including an approximate number

of hours the applicant operated the controls of the facility, the duties performed, and the extent of his responsibility.

- c) Has learned the operating procedures for and is qualified to operate competently and safely the facility designated in his application, including the satisfactory completion of the facility's requalification program prescribed in Appendix A of this Part. The Commission may accept as proof of the applicant's qualifications a certification of an authorized representative of the installation operator where the applicant's services will be utilized.

Section 19. Administration of operating test prior to initial criticality.

The Commission may administer a simulated operating test to an applicant for a license to operate a reactor prior to its initial criticality if a written request by an authorized representative of the facility licensee is sufficient for the Commission to find that:

- a) There is an immediate need for the applicant's services.
- b) The applicant has had extensive actual operating experience at a comparable reactor.
- c) The applicant has a thorough knowledge of the reactor control system, instrumentation and operating procedures under normal, abnormal, and emergency conditions.
- d) The reactor control mechanism and instrumentation are in such condition as ~determined by the Commission to permit effective administration of a simulated operating test.

(IV) LICENSES

Section 20. Issuance of licenses. On determining that an application meets the requirements of the Act and the regulations in this Part, the Commission will issue a license in such form and containing such conditions and limitations as it deems appropriate and necessary.

Section 21. Conditions of the licenses. Each license shall contain and is subject to the following conditions, whether stated in the license or not:

- a) Neither the license nor any right under the license shall be assigned or otherwise transferred.
- b) The license is limited to the facility for which it is issued.
- c) The license is limited to those controls of the facility specified in the license.
- d) The license is subject to, and the licensee shall observe, all applicable rules, regulations and orders of the Commission.
- 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 installation operator, this demonstration shall

include recertification one 8i~Rllator of the same type as required by Appendix B of this Part.

(2) The Commission may accept as evidence, a certification by an authorized representative of the installation operator by which the licensee is employed.

- f) The operator shall participate in a requalification program pursuant to Appendix A of this Part and shall satisfactorily complete the required annual examinations.
- g) Such other conditions as the Commission may impose to protect health and safety of the public or to minimize danger to life or property.

Section 22. Expiration. Each operator and senior operator license shall expire two years after the date of issuance.

Section 23. Renewal of license.

- a) Application for renewal of a license shall be signed by the applicant and shall contain the following information:
 - 1) The full name, citizenship, age, address and professional status of the applicant;
 - 2) The serial number of the license for which renewal is sought;
 - 3) The experience of the applicant under his existing license, including the approximate number of hours during which he has operated the facility;
 - 4) A statement that during the effective term of his current license the 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 his uncompleted participation in the program.
 - 5) Evidence that the licensee has discharged his license responsibilities competently and safely. The Commission may accept as evidence of this a certification of an authorized representative of the installation operator by which the licensee has been employed;
 - 6) A report by a licensed medical practitioner in the form prescribed in Section 26.
- 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 of 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.
- c) The license will be renewed if the Commission finds that:
 - 1) The physical and psychological conditions as well as the general health of the licensee continue to be such as not to cause operational errors which might endanger public health and safety; and
 - 2) (i) The licensee has been actively and extensively engaged as an operator or as a senior operator, under his existing license, has

- discharged his responsibilities competently and safely and is capable of continuing to do so.
- (ii) The licensee has satisfactorily completed a requalification program pursuant to Appendix A of 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 examination or both.
- 3) There is a continued need for a license to operate or direct operators at the facility designated in the application.

(V) MODIFICATION AND REVOCATION OF LICENSES

Section 24. Modification and revocation of licenses.

- a) The terms and conditions of all licenses shall be subject to amendment, revision, or modification by reason of amendments to the Act or by reason of rules, regulations or orders issued in accordance with the Act or any amendments thereto.
- b) Any license may be revoked, suspended or modified in whole or in part, for any material false statement in the application or any statement of fact required under the Act or because of conditions revealed by such application or statement of fact or any report, record, inspection or other means which would warrant the Commission to refuse to grant a license on an original application, or for violation of, or failure to observe any of the terms and conditions of the Act, or the license, or of any rule, regulation or order of the Commission, or any conduct determined by the Commission to be a hazard to safe operation of the facility.
- c) Any license may be revoked or suspended for failure to satisfactorily complete the annual examinations as required by Appendix A of this Part.

Section 25. Notification of disability. The licensed operator concerned and/or the installation operator, as the case may be, shall notify the Commission within fifteen days after the occurrence on said operator of any of the disabilities referred to in Section 12(a) (I) which occurs after the submission of his medical examination form.

(VI) CERTIFICATE OF MEDICAL EXAMINATION

Section 26. Medical Examination form.

- a) An applicant shall complete and sign a "Certificate of Medical Examination" in the form that will be prescribed by the Commission.
- b) The examining physician shall complete and sign said form and shall file the completed form with the Commissioner, Philippine Atomic Energy Commission, Don Mariano Marcos Avenue, Diliman, Quezon City, Metro Manila.

(VII) PENAL PROVISION

Section 27. Violation. Any person who shall willfully violate, attempt to violate, or conspire to violate any provision of the Act for which no penalty is specifically provided or any regulation, order or license issued under this Part, shall, upon conviction thereof, suffer the penalty of imprisonment of not more than two years or a fine of not more than Five Thousand Pesos (P 5,000.00) or both.

(VIII) EFFECTIVITY

Section 28. Effectivity. The regulations in this Part shall take effect fifteen (15) days following the publication in the Official Gazette, except that if the Commission finds that the national interest requires, the regulations in this Part may be made effective immediately upon furnishing copies of the regulations to the persons affected.

Quezon City; 30 June 1981

APPROVED:

ZOILO M. BARTOLOME, Ph. D.
Commissioner

Lt. Col. A. VER ALBANO (CWS) PA
Deputy Commissioner

APPENDIX A

REQUALIFICATION PROGRAMS FOR LICENSED OPERATORS OF PRODUCTION AND UTILIZATION FACILITIES

INTRODUCTION

Section 5 of Part 8 of the Code requires that individuals who manipulate the controls of production and utilization facilities be licensed as operators by the Commission and that individuals who direct the licensed activities of licensed operators be licensed as senior operators. Further, Section 23 thereof, requires that each licensed individual demonstrate his continued competence every two years in order for his license to be renewed. Competence may be demonstrated, in lieu of reexamination, by satisfactory completion of a requalification program which has been reviewed and approved by the Commission.

Periodic requalification for all operators and senior operators of production and utilization facilities is necessary for the personnel to maintain competence, particularly to respond to abnormal and emergency situations. The complexity of design and operating modes of production and utilization facilities require that ongoing comprehensive requalification programs be conducted for all licensed operators and senior operators as a matter of sound principle and practice.

Licensed operators and senior operators of production and utilization facilities who have been actively and extensively engaged as operators or as senior operators shall participate in requalification programs meeting the requirements of this Appendix. Individuals who maintain operator or senior operator licenses for the purpose of providing backup capability to the operating staff shall participate in the requalification programs except to the extent that their normal duties preclude the need for specific retraining in particular areas. Licensed operators or senior operators whose licenses are conditioned to permit manipulation of specific controls only shall participate in those portions of the requalification program appropriate to the duties they perform.

REQUALIFICATION PROGRAM REQUIREMENTS

1. **Schedule.** - The requalification program shall be conducted for a continuous period not to exceed two years, and upon conclusion shall be promptly followed, pursuant to a continuous schedule, by successive requalification programs.
2. **Lectures.** - The requalification program shall include preplanned lectures on a regular and continuing basis throughout the license period in those areas of Sections 15 and 16 of Part 8 where annual operator and senior operator written examinations indicate that the levels of knowledge need 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.

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 consists of a variety of reactor startups, reactor shutdowns and other control manipulations that demonstrate skill and familiarity with the facility controls.
- b. Each licensed operator and senior operator has demonstrated satisfactory understanding of the operation of all apparatus and mechanisms and knows the operating procedures in each area for which he is licensed.
- c. Each licensed operator and senior operator is cognizant of facility design changes, procedure changes, and facility license changes.
- d. Each licensed operator and senior operator reviews the contents of all abnormal and emergency procedures on a regularly scheduled basis.
- e. A simulator as specified in Appendix B of Part 8 shall be used in meeting the requirements of paragraphs 3a and 3b. Such simulator shall be used to conduct abnormal, infrequent, and emergency training for operators and senior operators.

4. Evaluation. - The requalification program shall include:

- a. Annual examinations, consisting of written, oral and practical portions, to determine that operators and senior operators have sufficient knowledge and expertise to continue licensed duties.
 - (1) The Commission will administer the examinations unless it directs the installation operator to do so.
 - (2) The administrator of the examination shall administer a written, oral and practical (performed on a simulator) examination.
- b. Written examinations which determine licensed operators' and senior operators knowledge of subjects covered in the requalification program and provide a basis for evaluating their knowledge of abnormal and emergency procedures.
- c. Systematic observation and evaluation of the performance and competency of licensed operators and senior operators by supervisors and/or training staff members including evaluation of action taken or to be taken during actual or simulated abnormal and emergency conditions.
- 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 type of simulator as specified in Appendix B of Part 8. 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.
- e. Provisions for each licensed operator and senior operator to participate in an accelerated requalification program where performance evaluations conducted pursuant to paragraphs 4a through 4d clearly indicate the need.

5. Records.

- a. Records of the requalification program shall be maintained for a period of two years from the date of the recorded event to document the participation of each licensed operator and senior operator in the requalification program. The records shall contain copies of written examinations administered, the answers given by the licensee, results of evaluations and documentation of any additional training administered in areas in which an operator or senior operator has exhibited deficiencies.
- b. Records which must be maintained pursuant to this Appendix may be the original or a reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations.
- c. If there is a conflict between the Commission's regulations in this Part, license condition₁ or other written Commission approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the regulations in this Part for such records shall apply unless the Commission, pursuant to Section 9, has granted a specific exemption from the period retention requirements specified in the regulations in this Part.

6. Alternative training program. The requirements of this Appendix may be met by requalification programs conducted by persons other than the installation operator if such requalification programs are similar to the program described in paragraphs 1 through 5 and the alternative program has been approved by the Commission.

7. Applicability to research and test reactors and non-reactor facilities. To accommodate specialized modes of operation and differences in control, equipment, and operator skills and knowledge, the requalification program for each licensed operator and senior operator of a research or test reactor or of a non-reactor facility shall conform generally but need not be identical to the requalification program outlined in paragraph 1 through 6 of this Appendix; However, significant deviations from the requirements of this Appendix shall be permitted only if supported by written justification and approved by the Commission.

APPENDIX B

QUALIFICATIONS OF APPLICANTS FOR NUCLEAR POWER PLANT OPERATOR AND SENIOR OPERATOR LICENSES

(I) INTRODUCTION

Section 10 in relation to Section 4 of Part 8 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 applicant. are listed in this appendix.

(II) QUALIFICATION REQUIREMENTS FOR APPLICANTS FOR SENIOR OPERATOR LICENSES

A. EDUCATION

For initial license and for renewal applications, the applicant must be a licensed engineer as prescribed in Section 4 of Part 8 and must have had received at least 60 semester hours of formal instructions and/or training in technical subjects including mathematics, reactor physics, chemistry, materials, reactor thermodynamics, fluid mechanics, heat transfer, electrical theory, and reactor control theory.

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 day-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, 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, HTCR);
 - b. Has the same type of control room (e.g. conventional, advanced);
 - c. Has the same type of steam generator (e.g. once through, u-tube);
and
 - d. Has the same number of primary system loops;
2. Received instruction in the areas listed in Sections 15 and 16 of Part 8 ~ portion of this instruction may be used to fulfill education requirements specified in paragraph II.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 installation operator must certify that the applicant has completed the training required by the installation operator and this Appendix and has demonstrated to the satisfaction of the installation operator 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 of paragraph II.C of this Appendix; and
 - e. The differences between the simulator used to meet the requirements of paragraph II.C.I 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.

III. QUALIFICATION REQUIREMENTS FOR APPLICANTS FOR OPERATOR LICENSES

A. EDUCATION: Same as those prescribed for applicants for senior operator licenses.

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). 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., conventional, advanced);
 - b. Has the same type of control room (e.g., conventional, advanced);
 - c. Has the same type of steam generator (e.g., once through, u-tube); and
 - d. Has the same number of primary system loops.
2. Received instructions in the areas listed in Section 15; and

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 a 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 installation operator and this Appendix and has demonstrated to the satisfaction of the installation operator 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 III.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.