



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

NRC PDR

MAR 31 1981



Ms. Cathrine Quigg, Research Director
Pollution & Environmental Problems, Inc.
P. O. Box 309
Palestine, Illinois 60067

Dear Ms. Quigg:

This is in reply to your letter of March 12, 1981, to me regarding the conduct of employees at nuclear power stations.

The Nuclear Regulatory Commission (NRC) has established general criteria for security personnel at licensed nuclear facilities as given in the enclosed copy of Appendix B of Part 73 of NRC Rules and Regulations. This states: "Individuals shall have no established medical history or medical diagnosis of habitual alcoholism or drug addiction, or, where such a condition has existed, the individual shall provide certified documentation of having completed a rehabilitation program which would give a reasonable degree of confidence that the individual would be capable of performing assigned security job duties."

The NRC has also established procedures and criteria for the issuance of licenses to operators of licensed facilities as given in the enclosed copy of Part 55 of NRC Rules and Regulations. This states that any physical or mental condition which might cause impaired judgment or motor coordination may constitute sufficient cause for denial of an application for an operator's license. As well, the Office of Standards Development of NRC is developing a proposed rule prohibiting the use of alcohol and drugs by employees at nuclear power plants. NRC Regulatory Guide 1.134, Revision 1, a copy of which is enclosed, refers to an American National Standard (ANSI N546-1976) on "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants," also enclosed. The latter includes among disqualifying conditions an established history or clinical diagnosis of alcoholism or drug dependence and certain other psychological or mental conditions. The NRC will be looking at ways to better enforce the provisions of this standard. In addition, as part of the "NRC Action Plan Developed as a Result of the TMI-2 Accident" (NUREG-0660), the NRC staff is studying the question of which plant personnel, other than reactor operators and senior reactor operators, may need to be licensed by the NRC.

Sincerely,

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:
As stated

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PART 73 • PHYSICAL PROTECTION OF PLANTS AND MATERIALS

APPENDIX B—GENERAL CRITERIA FOR SECURITY PERSONNEL

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INTRODUCTION

Pursuant to the provisions of 73.50 and 73.55 of 10 CFR part 73, Requirements for Physical Protection of Plants and Materials, each licensee who is authorized to conduct certain activities with specified quantities of special nuclear material pursuant to 10 CFR Part 70 and each licensee who is authorized to operate a production or utilization facility pursuant to 10 CFR part 50, respectively, is required to establish a security organization, including trained and equipped guards to physically protect special nuclear material in their possession and their facilities against theft and industrial sabotage.

Further, pursuant to the provisions of 73.30 through 73.36 of 10 CFR part 73, certain shipments of special nuclear material are required to be accompanied by armed escorts.

Security personnel who are responsible for the protection of special nuclear material onsite and in transit and for the protection of the facility or shipment vehicle against industrial sabotage should, like other elements of the physical security system, be required to meet minimum criteria to assure that they will effectively perform their assigned security related job duties. In order to assure that those individuals responsible for security are properly equipped and qualified to execute the job duties prescribed for them, the NRC has developed general criteria which specifies security personnel qualification requirements.

These general criteria establish requirements for the selection, training, equipping, testing, and qualification of individuals who will be responsible for protecting special nuclear materials, nuclear facilities, and nuclear shipments.

DEFINITIONS

Terms defined in parts 50, 70, and 73 of this chapter have the same meaning when used in this appendix.

CRITERIA

I. Employment suitability and qualification.
A. Suitability: 1. Prior to employment, or assignment to the security organization, an individual shall meet the following suitability criteria:
 a. Educational development—Possess a high school diploma or pass an equivalent performance examination designed to meas-

ure basic job-related mathematical, language, and reasoning skills, ability, and knowledge, required to perform security job duties.

b. Felony convictions—Have no felony convictions involving the use of a weapon and no felony convictions that reflect on the individual's reliability.

2. Prior to employment or assignment to the security organization in an armed capacity, the individual, in addition to (a) and (b) above, must be 21 years of age or older.

B. Physical and mental qualifications. 1. Physical qualifications:

a. Individuals whose security tasks and job duties are directly associated with the effective implementation of the licensee physical security and contingency plans shall have no physical weaknesses or abnormalities that would adversely affect their performance of assigned security job duties.

b. In addition to a. above, guards, armed response personnel, armed escorts, and central alarm station operators shall successfully pass a physical examination administered by a licensed physician. The examination shall be designed to measure the individual's physical ability to perform assigned security job duties as identified in the licensee physical security and contingency plans. Armed personnel shall meet the following additional physical requirements:

(1) Vision: (a) For each individual, distant visual acuity in each eye shall be correctable to 20/30 (Snellen or equivalent) in the better eye and 20/40 in the other eye with eyeglasses or contact lenses. If uncorrected distance vision is not at least 20/40 in the better eye, the individual shall carry an extra pair of corrective lenses. Near visual acuity, corrected or uncorrected, shall be at least 20/40 in the better eye. Field of vision must be at least 70° horizontal meridian in each eye. The ability to distinguish red, green, and yellow colors is required. Loss of vision in one eye is disqualifying. Glaucoma shall be disqualifying, unless controlled by acceptable medical or surgical means, provided such medications as may be used for controlling glaucoma do not cause undesirable side effects which adversely affect the individual's ability to perform assigned security job duties, and provided the visual acuity and field of vision requirements stated above are met. On-the-job evaluation shall be used for individuals who exhibit a mild color vision defect.

(b) Where corrective eyeglasses are required, they shall be of the safety glass type.

(c) The use of corrective eyeglasses or contact lenses shall not interfere with an individual's ability to effectively perform assigned security job duties during normal or emergency operations.

(2) Hearing: (a) Individuals shall have no hearing loss in the better ear greater than 30 decibels average at 500 Hz, 1,000 Hz, and 2,000 Hz, with no level greater than 40 decibels at any one frequency (by ISO 1964 or ANSI 1969 audiometry).

(b) A hearing aid is acceptable provided suitable testing procedures demonstrate auditory acuity equivalent to the above stated requirement.

(c) The use of a hearing aid shall not decrease the effective performance of the individual's assigned security job duties during normal or emergency operations.

(3) Diseases—Individuals shall have no established medical history or medical diagnosis of epilepsy or diabetes, or, where such a condition exists, the individual shall provide medical evidence that the condition can be controlled with proper medication so that the individual will not lapse into a coma or

unconscious state while performing assigned security job duties.

(4) Addiction—Individuals shall have no established medical history or medical diagnosis of habitual alcoholism or drug addiction, or, where such a condition has existed, the individual shall provide certified documentation of having completed a rehabilitation program which would give a reasonable degree of confidence that the individual would be capable of performing assigned security job duties.

(5) Other physical requirements—An individual who has been incapacitated due to a serious illness, injury, disease, or operation, which could interfere with the effective performance of assigned security job duties shall, prior to resumption of such duties, provide medical evidence of recovery and ability to perform such security job duties.

2. Mental qualifications: a. Individuals whose security tasks and job duties are directly associated with the effective implementation of the licensee physical security and contingency plans shall demonstrate mental alertness and the capability to exercise good judgment, implement instructions, assimilate assigned security tasks, and possess the acuity of senses and ability of expression sufficient to permit accurate communication by written, spoken, audible, visible, or other signals required by assigned job duties.

b. Armed individuals, and central alarm station operators, in addition to meeting the requirement stated in paragraph a. above, shall have no emotional instability that would interfere with the effective performance of assigned security job duties. The determination shall be made by a licensed psychologist or psychiatrist, or physician, or other person professionally trained to identify emotional instability.

c. The licensee shall arrange for continued observation of security personnel and for appropriate corrective measures by responsible supervisors for indications of emotional instability of individuals in the course of performing assigned security job duties. Identification of emotional instability by responsible supervisors shall be subject to verification by a licensed, trained person.

C. Physical fitness qualifications—Subject to a medical examination conducted within the preceding 30 days and to a determination and written certification by a licensed physician that there are no medical contraindications to participation by the individual as disclosed by the medical examination, guards, armed response personnel and armed escorts shall demonstrate physical fitness for assigned security job duties by performing a practical physical exercise program within a specific time period. The exercise program performance objectives shall be described in the licensee training and qualifications plan, and shall consider such job related functions as strenuous activity, physical exertion, levels of stress, and exposure to the elements as they pertain to each individual's assigned security job duties for both normal and emergency operations. The physical fitness qualification of each guard, armed response person, and armed escort shall be documented and attested by a licensee security supervisor.

D. Contract security personnel—Contract security personnel shall be required to meet the suitability, physical, and mental requirements as appropriate to their assigned security job duties in accordance with section I of this appendix.

E. Physical requalification—At least every 12 months, central alarm station operators shall be required to meet the physical requirements of B.1.b of this section and

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guards, armed response personnel and armed escorts, shall be required to meet the physical requirements of paragraphs B.1.b (1) and (2), and C of this section.

F. Documentation—The results of suitability, physical, and mental qualifications data and test results shall be documented by the licensee or his agent.

G. Nothing herein authorizes or requires a licensee to investigate into or judge the reading habits, political or religious beliefs, or attitudes on social, economic, or political issues of any person.

II. Training and qualifications.

A. Training requirements—Each individual who requires training to perform assigned security related job tasks or job duties as identified in the licensee physical security or contingency plans, shall prior to assignment, be trained to perform such tasks and duties in accordance with the licensee or his agent's documented training and qualifications plan.

B. Qualification requirements—Each person who performs security related job tasks or job duties required to implement the licensee physical security or contingency plan shall, prior to being assigned to such tasks or duties, be qualified in accordance with the licensee's NRC approved training and qualifications plan. The qualifications of each individual shall be documented and attested by a licensee security supervisor.

C. Contract personnel—Contract personnel shall be trained, equipped, and qualified as appropriate to their assigned security related job tasks or job duties, in accordance with sections II, III, IV, and V of this appendix. The qualifications of each individual shall be documented and attested by a licensee security supervisor.

D. Security knowledge, skills, and abilities—Each individual assigned to perform the security related task identified in the licensee physical security or contingency plan shall demonstrate the required knowledge, skill, and ability in accordance with the specified standards for each task as stated in the NRC approved licensee training and qualifications plan. The areas of knowledge, skills, and abilities that shall be considered in the licensee's training and qualifications plan are as follows:

1. Protection of nuclear facilities, transport vehicles, and special nuclear material.
2. NRC requirements and guidance for physical security at nuclear facilities and for transportation.
3. The private security guard's role in providing physical protection for the nuclear industry.
4. The authority of private guards.
5. The use of nonlethal weapons.
6. The use of deadly force.
7. Power of arrest and authority to detain individuals.
8. Authority to search individuals and seize property.
9. Adversary group operations.
10. Motivation and objectives of adversary groups.
11. Tactics and force that might be used by adversary groups to achieve their objectives.
12. Recognition of sabotage related devices and equipment that might be used against the licensee's facility or shipment vehicle.
13. Facility security organization and operation.
14. Types of physical barriers.
15. Weapons, lock and key control system operation.
16. Location of SNM and/or vital areas within a facility.

17. Protected area security and vulnerability.

18. Types of alarm systems used.
19. Response and assessment to alarm announcements and other indications of intrusion.
20. Familiarization with types of special nuclear material processed.
21. General concepts of fixed site security systems.
22. Vulnerabilities and consequences of theft of special nuclear material or industrial sabotage of a facility.
23. Protection of security system information.
24. Personal equipment use and operation for normal and contingency operations.
25. Surveillance and assessment systems and techniques.
26. Communications systems operation, fixed site.
27. Access control systems and operation for individuals, packages, and vehicles.
28. Contraband detection systems and techniques.
29. Barriers and other delay systems around material access or vital areas.
30. Exterior and interior alarm systems operation.
31. Duress alarm operation.
32. Alarm stations operation.
33. Response force organization.
34. Response force mission.
35. Response force operation.
36. Response force engagement.
37. Security command and control system during normal operation.
38. Security command and control system during contingency operation.
39. Transportation systems security organization and operation.
40. Types of SNM transport vehicles.
41. Types of SNM escort vehicles.
42. Modes of transportation for SNM.
43. Road transport security system command and control structure.
44. Use of weapons.
45. Communications systems operation for transportation, shipment to control center and intraconvoy.
46. Vulnerabilities and consequences of theft of special nuclear material or industrial sabotage of a transport vehicle.
47. Protection of transport system security information.
48. Control of area around transport vehicle.
49. Normal convoy techniques and operations.
50. Familiarization with types of special nuclear materials shipped.
51. Fixed site station operations.
52. Access control system operation.
53. Search techniques and systems for individuals, packages and vehicles.
54. Escort and patrol responsibilities and operation.
55. Contingency response to confirmed intrusion or attempted intrusion.
56. Security system operation after component failure.
57. Fixed site security information protection.
58. Security coordination with local law enforcement agencies.
59. Security and situation reporting, documentation and report writing.
60. Contingency duties.
61. Self defense.
62. Use of and defenses against incapacitating agents.
63. Security equipment testing.
64. Contingency procedures.
65. Night vision devices and systems.
66. Mechanics of detention.

67. Basic armed and unarmed defensive tactics.

68. Response force deployment.
 69. Security alert procedures.
 70. Security briefing procedures.
 71. Response force tactical movement.
 72. Response force withdrawal.
 73. Response force use of support fire.
 74. Response to bomb and attack threats.
 75. Response to civil disturbances (e.g. strikes, demonstrators).
 76. Response to confirmed attempted theft of special nuclear material and/or industrial sabotage of facilities.
 77. Response to hostage situations.
 78. Site specific armed tactical procedures and operation.
 79. Security response to emergency situations other than security incidents.
 80. Basic transportation defensive response tactics.
 81. Armed escort deployment.
 82. Armed escort adversary engagement.
 83. Armed escort formations.
 84. Armed escort use of weapons fire (tactical and combat).
 85. Armed escort and shipment movement under fire.
 86. Tactical convoying techniques and operations.
 87. Armed escort tactical exercises.
 88. Armed escort response to bomb and attack threats.
 89. Verification of shipment documentation and contents.
 90. Continuous surveillance of shipment vehicle.
 91. Normal and contingency operation for shipment mode transfer.
 92. Armed personnel procedures and operation during temporary storage between mode transfers of shipments.
 93. Armed escort threat assessment and response.
 94. System for and operation of shipment vehicle lock and key control.
 95. Techniques and procedures for isolation of shipment vehicle during a contingency situation.
 96. Transportation coordination with local law enforcement agencies.
 97. Procedures for verification of shipment locks and seals.
 98. Transportation security and situation reporting, documentation, and report writing.
 99. Procedures for shipment delivery and pickup.
 100. Transportation security system for escort by road, rail, air and sea.
- E. Requalification—Security personnel shall be requalified at least every 12 months to perform assigned security related job tasks and duties for both normal and contingency operations. Requalification shall be in accordance with the NRC approved licensee training and qualifications plan. The results of requalification shall be documented and attested by a licensee security supervisor.
- III. Weapons training.
- A. Guards, armed response personnel and armed escorts, requiring weapons training to perform assigned security related job tasks or job duties shall be trained in accordance with the licensee's documented weapons training programs. Each individual shall be proficient in the use of his assigned weapon(s) and shall meet prescribed standards in the following areas:
1. Mechanical assembly, disassembly, range penetration capability of weapon, and bullseye firing.
 2. Weapons cleaning and storage.
 3. Combat firing, day and night.
 4. Safe weapons handling.
 5. Clearing, loading, unloading, and re-loading.

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6. When to draw and point a weapon.
7. Rapid fire techniques.
8. Close quarter firing.
10. Zeroing assigned weapons.

IV. Weapons qualification and requalification program.

Qualification firing for the handgun and the rifle shall be for daylight firing and each individual shall perform night firing for familiarization with assigned weapons(s). The results of weapons qualification and requalification shall be documented by the licensee or his agent.

A. Handgun—Guards, armed escorts and armed response personnel shall qualify with a revolver or semiautomatic pistol firing the national police course, or an equivalent nationally recognized course. Qualifying score shall be an accumulated total of 70 percent of the maximum obtainable score.

B. Semiautomatic Rifle—Guards, armed escorts and armed response personnel, assigned to use the semiautomatic rifle by the licensee training and qualifications plan, shall qualify with a semiautomatic rifle by firing the 100-yard course of fire specified in section 17.5(1) of the National Rifle Association, High Power Rifle Rules book (effective March 15, 1976),¹ or a nationally recognized equivalent course of fire. Targets used shall be as stated in section 17.5 for the 100-yard course. Time limits for individuals shall be as specified in section 8.2 of the NRA rule book, regardless of the course fired. Qualifying score shall be an accumulated total of 80 percent of the maximum obtainable score.

C. Shotgun—Guards, armed escorts, and armed response personnel assigned to use the 12 gauge shotgun by the licensee training and qualifications plan shall qualify with a full choke or improved modified choke 12 gauge shotgun firing the following course:

Range	Position	No. Rounds ¹	Target ¹
15 yds.....	Hip fire point.	4	B-27
25 yds.....	Shoulder....	4	B-27

¹The 4 rounds shall be fired at 4 separate targets within 10 seconds using 00 gauge (9 pellet) shotgun shells.

²As set forth by the National Rifle Association (NRA) in its official rules and regulations, "NRA Target Manufacturers Index," December 1976.

To qualify the individual shall be required to place 50 percent of all pellets (36 pellets) within the black silhouette.

D. Requalification—Individuals shall be weapons requalified at least every 12 months in accordance with the NRC approved licensee training and qualifications plan, and in accordance with the requirements stated in A, B, and C of this section.

V. Guard, armed response personnel, and armed escort equipment.

A. Fixed Site—Fixed site guards and armed response personnel shall either be equipped with or have available the following security equipment appropriate to the individual's assigned contingency security related tasks or job duties as described in the licensee physical security and contingency plans:

1. Semiautomatic rifles with following nominal minimum specifications:
 - (a) 223 caliber.
 - (b) Muzzle velocity, 1980 ft./sec.

¹Copies of the "NRA High Power Rifle Rules" may be examined at, or obtained from, the National Rifle Association, 1600 Rhode Island Avenue NW., Washington, D.C. 20036.

- (c) Muzzle energy, 955 foot-pounds.
- (d) Magazine or clip load of 10 rounds.
- (e) Magazine reload, 0.10 seconds.
- (f) Operable in any environment in which it will be used.

2. 12 gauge shotguns with the following capabilities:

- (a) 4 round pump or semiautomatic.
- (b) Operable in any environment in which it will be used.
- (c) Full or modified choke.

3. Semiautomatic pistols or revolvers with the following nominal minimum specifications:

- (a) .354 caliber.
- (b) Muzzle energy, 250 foot-pounds.
- (c) Full magazine or cylinder reload capability 0.6 seconds.
- (d) Muzzle velocity, 850 ft./sec.
- (e) Full cylinder or magazine capacity, 6 rounds.
- (f) Operable in any environment in which it will be used.

4. Ammunition:

- (a) For each assigned weapon as appropriate to the individual's assigned contingency security job duties and as readily available as the weapon:

- (1) 18 rounds per handgun.
- (2) 100 rounds per semiautomatic rifle.
- (3) 12 rounds each per shotgun (00 gauge and slug).

(b) Ammunition available on site—two (2) times the amount stated in (a) above for each weapon.

5. Personal equipment to be readily available for individuals whose assigned contingency security job duties, as described in the licensee physical security and contingency plans, warrant such equipment:

- (a) Helmet, combat.
- (b) Gas mask, full face.
- (c) Body armor (bullet-resistant vest).
- (d) Flashlights and batteries.
- (e) Baton.
- (f) Handcuffs.
- (g) Ammunition/equipment belt.

6. Binoculars.

7. Night vision aids, i.e., hand-fired illumination flares or equivalent.

8. Tear gas or other nonlethal gas.

9. Duress alarms.

10. Two-way portable radios (handi-talkie) 2 channels minimum, 1 operating and 1 emergency.

B. Transportation—Armed escorts shall either be equipped with or have readily available the following security equipment appropriate to the individual's assigned contingency security related tasks or job duties, as described in the licensee physical security and contingency plans:

1. Semiautomatic rifles with the following nominal minimum specifications:

- (a) 223 caliber.
- (b) Muzzle velocity, 1,980 ft./sec.
- (c) Muzzle energy, 955 foot-pounds.
- (d) Magazine or clip of 10 rounds.
- (e) Reload capability, 0.10 seconds.
- (f) Operable in any environment in which it will be used.

2. 12 gauge shotguns.

- (a) 4 round pump or semiautomatic.
- (b) Operable in any environment in which it will be used.
- (c) Full or modified choke.

3. Semiautomatic pistols or revolvers with the following nominal minimum specifications:

- (a) .354 caliber.
- (b) Muzzle energy, 250 foot-pounds.
- (c) Full magazine or cylinder reload capability, 0.6 seconds.
- (d) Muzzle velocity, 850 ft./sec.
- (e) Full cylinder or magazine capacity, 6 rounds.

(f) Operable in any environment in which it will be used.

4. Ammunition for each shipment.

- (a) For each assigned weapon as appropriate to the individual's assigned contingency security job duties and as readily available as the weapon:

- (1) 36 rounds per handgun.
- (2) 120 rounds per semiautomatic rifle.
- (3) 12 rounds each per shotgun (00 gauge and slug).

5. Escort vehicles, bullet resisting, equipped with communications systems, red flares, first aid kit, emergency tool kit, tire changing equipment, battery chargers for radios (where appropriate, for recharging portable radio batteries).

6. Personal equipment to be readily available for individuals whose assigned contingency security job duties, as described in the licensee physical security and contingency plans, warrant such equipment:

- (a) Helmet, combat.
- (b) Gas mask, full face.
- (c) Body armor (bullet-resistant vest).
- (d) Flashlights and batteries.
- (e) Baton.
- (f) Ammunition/equipment belt.
- (g) Pager/duress alarms.

7. Binoculars.

8. Night vision aids, i.e., hand-fired illumination flares or equivalent.

9. Tear gas or other nonlethal gas.

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UNITED STATES NUCLEAR REGULATORY COMMISSION

RULES and REGULATIONS

TITLE 10, CHAPTER 1, CODE OF FEDERAL REGULATIONS - ENERGY

PART 55

OPERATORS' LICENSES

POOR ORIGINAL

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APPENDICES

Appendix A—Requalification Programs for Licensed Operators of Production and Utilization Facilities.

AUTHORITY: The provisions of this Part 55 issued under secs. 107, 161, 68 Stat. 939, 948; 42 U.S.C. 2137, 2201. For the purposes of sec. 223, 68 Stat. 958, as amended; 42 U.S.C. 2273, §55.3 issued under 1611, 68 Stat. 949; 42 U.S.C. 2201 (i). Sec. 55.40 issued under secs. 186, 187, 68 Stat. 955; 42 U.S.C. 2236, 2237. Secs. 202, 206, Pub. L. 93-438, 88 Stat. 1244, 1246; 42 U.S.C. 5842, 5846.

GENERAL PROVISIONS

§ 55.1 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 the Atomic Energy Act of 1954, as amended, or section 202 of the Energy Reorganization Act of 1974 and Part 50 of this chapter; and provide for the terms and conditions upon which the Commission will issue these licenses.

§ 55.2 Scope.

The regulations contained in this part apply to any individual who manipulates the controls of any facility licensed pursuant to Part 50 of this chapter and to any individual designated by a facility licensee to be responsible for directing the licensed activities of licensed operators.

§ 55.3 License Requirements.

(a) No person may perform the function of an operator as defined in this part except as authorized by a license issued by the Commission;

(b) No person may perform the function of a senior operator as defined in this part except as authorized by a license issued by the Commission.

§ 55.4 Definitions.

As used in this part:

(a) "Act" means the Atomic Energy Act of 1954 including any amendments thereto.

(b) "Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

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

(d) "Operator" is any individual who manipulates a control of a facility. An individual is deemed to manipulate a control if he directs another to manipulate a control.

(e) "Senior operator" any individual designated by a facility licensee under Part 50 of this chapter 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

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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 health and safety against radiation.

(g) "United States" when used in a geographical sense, includes all territories and possessions of the United States, and Puerto Rico.

§ 55.5 Communications.

Except where otherwise specified, all communications and reports concerning the regulations in this part, and applications filed under them should be addressed to the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street, N.W., Washington, D.C. or at 7920 Norfolk Avenue, Bethesda, Md.

§ 55.6 Interpretations.

Except as specifically authorized by the Commission in writing, 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 General Counsel will be recognized to be binding upon the Commission.

EXEMPTIONS

§ 55.7 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 public interest.

§ 55.8 Additional requirements.

The Commission may, by rule, regulation, or order, impose upon any licensee such requirements in addition to those established in the regulations in this part, as it deems appropriate or necessary to protect health and to minimize danger to life or property.

* Amended 45 FR 18905

§ 55.9 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 license under this part under the direction and in the presence of a licensed operator or senior operator.

LICENSE APPLICATIONS

§ 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, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street N.W., Washington, D.C., or 7920 Norfolk Avenue, Bethesda, Md.

Each application for a license shall contain the following information:

(1) The full name, citizenship, age, address and present employment 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) The written request of an authorized representative of the facility license that the operating test be administered to the applicant of the facility.

(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 facility licensee where the applicant's services will be utilized. This certification shall include details on courses of instruction administered by the facility licensee, number of course hours, number of hours of training and nature of training received at the facility, and for reactors, the startup and shutdown experience received.

(7) A report of a medical examination by a licensed medical practitioner, in one copy in the form prescribed in § 55.60.

(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 items 5, 6, and 7 of paragraph (a) of this section shall be signed by the applicant.

§ 55.11 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 condition and 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 or mental condition which might cause impaired judgment or motor coordination may constitute sufficient cause for denial of an 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 facility licensee or holder of an authorization and of the examining physician or

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Form NRC-396 in arriving at its decision.

(b) The applicant has passed a written examination and operating test as may be prescribed by the Commission 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 service as a licensed operator or senior operator will be utilized on the facility for which he seeks a license or on a similar facility within the United States.

§ 55.12 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 two months after the date of denial. Any new application shall be accompanied by a statement signed by an authorized representative of the facility licensee by whom he applicant will be employed, 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 third application six months after the date of denial of his second application, and may file further successive applications two years after the date of denial of each prior 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.

WRITTEN EXAMINATIONS AND OPERATING TESTS

§ 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 and his 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.

§ 55.21 Content of operator written examination.

The operator written examination, to the extent applicable to the facility, will include questions on:

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

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

(c) Mechanical design features of the reactor primary system.

(d) Auxiliary systems which affect the facility.

(e) General operating characteristics, including causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for them.

(f) Design, components and functions of reactivity control mechanisms and instrumentation.

(g) Design, components and functions of safety systems, including instrumentation, signals, interlocks, automatic and manual features.

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

(i) Shielding, isolation and containment design features, including access limitations.

(j) Standard and emergency operating procedures for the facility and plant.

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

(l) Radiological safety principles and procedures.

§ 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 items specified in § 55.21 and in addition on the following:

(a) Conditions and limitations in the facility license.

(b) Design and operating limitations in the technical specifications for the facility.

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

(d) Radiation hazards which may arise during the performance of experiments,

shielding alterations, maintenance activities and various contamination conditions.

(e) Reactor theory, including details of fission process, neutron multiplication, source effects, control rod effects, and criticality indications.

(f) Specific operating characteristics, including coolant chemistry and causes and effects of temperature, pressure and reactivity changes.

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

(h) Fuel handling facilities and procedures.

(i) Procedures and equipment available for handling and disposal of radioactive materials and effluents.

§ 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. The operating test, to the extent applicable to the facility requires the applicant to demonstrate and 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 function of the facility's radiation monitoring systems,

*Amended 31 FR 12774.

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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.

§ 55.24 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 facility licensee or holder of an authorization 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 procedure for and is qualified to operate competently and safely the facility designated in his application. The Commission may accept as proof of the applicant's qualifications a certification of an authorized representative of the facility licensee or holder of an authorization where the applicant's services will be utilized.

§ 55.25 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.

LICENSES

§ 55.30 Issuance of licenses.

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

§ 55.31 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) If a licensee has not been actively performing the functions of an operator or senior operator for a period of four months or longer, he 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. The Commission may accept as evidence, a certification by an authorized representative of the facility licensee by which the licensee has been employed.

†(f) Such other conditions as the Commission may impose to protect health or to minimize danger to life or property.

§ 55.32 Expiration.

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

§ 55.33 Renewal of licenses.

(a) Application for renewal of a license shall be signed by the applicant and shall contain the following information:

(1) The full name, citizenship, address and present employment 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. In the case of an application for license renewal filed within two years after September 17, 1973, if the facility licensee has not implemented the requalification program requirements in time for the applicant to complete an approved requalification program before the effective term of his current license expires, the applicant shall submit a statement showing his current enrollment in an approved requalification program and describing those portions of the program which he had completed by the date of his application for license renewal.

†(5) Evidence that the licensee has discharged his license responsibilities competently and safely. The Commission may accept as evidence of this a certificate of an authorized representative of the facility licensee or holder of an authorization by which the licensee has been employed;

†(6) A report by a licensed medical practitioner in the form prescribed in § 55.60.

(b) In any case in which a licensee not less than thirty days prior to the expiration of his existing license has filed an

†Redesignated 38 FR 22221.

38 FR 3197

38 FR 3197

38 FR 3197

38 FR 3197

38 FR 2221

38 FR 3197

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application in proper form for renewal or for a new license, 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 condition and 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 completed a requalification program or is presently enrolled in a requalification program if the completion of the requalification program will occur after the expiration of his license as provided in subparagraph (a)(4) of this section.

(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 take a written examination or an operating test or both.

(3) There is a continued need for a license to operate or direct operators at the facility designated in the application.

MODIFICATION AND REVOCATION OF LICENSES

§55.40 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 section 182 of 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.

§ 55.41 Notification of disability.

The licensee shall notify the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, within fifteen (15) days after its occurrence of any disability referred to in § 55.11(a)(1) which occurs after the submission of his medical examination form.

ENFORCEMENT

§ 55.50 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

CERTIFICATE OF MEDICAL EXAMINATION

§ 55.60 Examination form.

(a) An applicant shall complete and sign Form NRC-396, "Certificate of Medical Examination."

(b) The examining physician shall complete and sign Form NRC-396 and shall mail the completed form to the Director of Nuclear Reactor Regulation or Director of Nuclear Material Safety and Safeguards, as appropriate, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555.

NOTE: Copies of Form NRC-396 may be obtained by writing to the Director of Nuclear Reactor Regulation or Director of Nuclear Material Safety and Safeguards, as appropriate, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555.

§ 55.61 [Deleted 40 FR 8774.]

NOTE.—The reporting and record keeping requirements contained in this part have been approved by the General Accounting Office under B-180225 (R0113), (R0358).

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U.S. NUCLEAR REGULATORY COMMISSION

Revision 1
March 1979

REGULATORY GUIDE

OFFICE OF STANDARDS DEVELOPMENT

REGULATORY GUIDE 1.134

MEDICAL EVALUATION OF NUCLEAR POWER PLANT PERSONNEL REQUIRING OPERATOR LICENSES

A. INTRODUCTION

Section 55.10, "Contents of Applications," and § 55.33, "Renewal of Licenses," of 10 CFR Part 55, "Operators' Licenses," require that each application for an initial or renewal operator or senior operator license contain a report of medical examination by a licensed medical practitioner in the form prescribed in § 55.60, "Examination Form." Section 55.11, "Requirements for the Approval of Applications," and § 55.33 of 10 CFR Part 55 state that an application for an initial or renewal operator or senior operator license will be approved if, among other things, the physical condition and general health of the applicant are not such as might cause operational errors endangering public health and safety. This guide describes a method acceptable to the NRC staff for providing the information needed by the Commission for its evaluation of the medical qualifications of applicants for initial or renewal operator or senior operator licenses for nuclear power plants. The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

B. DISCUSSION

Section 55.60 of 10 CFR Part 55 requires the licensed medical practitioner and the applicant for an initial or renewal operator or senior operator license to complete and sign Form NRC-396, "Certificate of Medical Examination." The examination form is then sent to the NRC and becomes part of the license application. The NRC often has to request additional information because the licensed medical practitioner's evaluation of the applicant's medical history or physical condition is not sufficiently detailed to determine an applicant's qualification.

*Lines indicate substantive changes from previous issue.

Working Group ANS-3.4 of Subcommittee ANS-3, Reactor Operations, of the American Nuclear Society has developed a standard prescribing minimum requirements necessary to determine that the physical condition and general health of nuclear reactor operators are not such as might cause operational errors. This standard was approved by the American National Standards Committee N18, Nuclear Design Criteria, and was subsequently approved by the American National Standards Institute (ANSI) on April 12, 1976. The criteria presented in ANSI N546-1976,¹ "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants," should provide an examining licensed medical practitioner with a basis for determining if an abnormal health condition exists and if that condition is potentially disqualifying. Establishing minimum health requirements should aid in the more uniform and complete preparation of Form NRC-396 and should reduce instances when the NRC has to request additional medical information. However, it should be recognized that, although it is the licensed medical practitioner's responsibility to identify and evaluate potentially disqualifying physical conditions, the final determination of the applicant's medical qualification is made by the NRC.

Section 3.2 of ANSI N546-1976 requires that the facility operator forward to the designated medical examiner a report on each employee referred for a reactor operator medical examination prior to the examination. This section goes on to recommend that the report address such areas as work performance, attendance, and behavioral changes noted since the previous evaluation. It is recognized that the reporting of pertinent observations to a licensed medical practitioner by facility supervisory

¹Copies may be obtained from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60525.

USNRC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the NRC staff of implementing or interpreting parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations, and compliance with them is not required. Methods and techniques differ from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience. This guide was revised as a result of substantive comments received from the public and additional staff review.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

The guides are issued in the following ten broad divisions:

- | | |
|-----------------------------------|-----------------------------------|
| 1. Power Reactors | 6. Products |
| 2. Research and Test Reactors | 7. Transportation |
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| 4. Environmental and Site | 9. Antitrust and Financial Review |
| 5. Materials and Plant Protection | 10. General |

Requests for single copies of issued guides (which may be reproduced) or for placement on an automatic distribution list for single copies of future guides in specific divisions should be made in writing to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Technical Information and Document Control.

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personnel can provide valuable background information to support the medical evaluation. However, there is a concern for potential abuse, in that observations by supervisory personnel may be biased and extend into areas not pertinent to the evaluation. In regard to the provisions of Section 3.2 of ANSI N546-1976, responsible facility supervisory personnel should determine from the licensed medical practitioner what information, including such items as those identified in Section 3.2, is needed to make the judgments required by Form NRC-396 and should forward only the information specified or requested. Information provided by the facility operator should be used only as background information and should be subject to evaluation.

Paragraph 55.11(a)(1) specifies, in part, that any mental or physical condition that might cause impaired judgment or motor coordination may constitute sufficient cause for denial of an operator license application. While ANSI N546-1976 addresses in some detail the physical conditions that may be cause for denial of an application, the standard is more general in identifying the mental conditions that may be cause for denial. Because of inherent difficulties in evaluating mental conditions and because of the broad nature of potentially disqualifying mental conditions presented in ANSI N546-1976, potentially disqualifying mental conditions should be evaluated by a licensed psychologist, psychiatrist, or physician professionally trained to identify the condition.

None of the provisions of ANSI N546-1976 or this guide should be construed to mean that the reading habits, political or religious beliefs, or attitudes on social, economic, or political issues of an individual should be investigated or judged.

C. REGULATORY POSITION

The requirements contained in ANSI N546-1976, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants,"¹ provide an acceptable method for determining the medical qualifica-

tions of applicants for initial or renewal operator or senior operator licenses for nuclear power plants, subject to the following:

1. Section 3.2 of ANSI N546-1976 requires that the facility operator forward to the designated medical examiner a report on each employee referred for a reactor operator medical examination prior to the examination and that the report include information specified by the designated medical examiner. ANSI N546-1976 further presents recommendations as to what other type of information is to be addressed. The facility operator should determine from the licensed medical practitioner what information, including such items as those identified in Section 3.2 of the standard are needed to make the judgments required by Form NRC-396, "Certificate of Medical Examination," and should forward only the information specified or requested. Information submitted by the facility operator should be used only as background information and should be subject to evaluation.

2. If, in the medical evaluation of the reactor operator, there is an indication of a potentially disqualifying condition in areas such as those specified in Sections 5.3.8 and 5.4.15 of ANSI N546-1976, evaluation of the condition should be conducted by a licensed psychologist, psychiatrist, or physician professionally trained to identify and evaluate such conditions.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the staff's plans for utilizing this regulatory guide.

Except in those cases in which an acceptable alternative method for complying with specified portions of the Commission's regulations is proposed, the method described herein will be used in the evaluation of Form NRC-396, "Certificate of Medical Examination," submittals in connection with applications for initial or renewal operator or senior operator licenses received after June 1979.

American National Standard

medical certification and monitoring
of personnel requiring operator licenses
for nuclear power plants

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published by the
American Nuclear Society
244 East Ogden Avenue
Evanston, Illinois 60201, USA

American National Standard
Medical Certification and Monitoring
of Personnel Requiring Operator Licenses
for Nuclear Power Plants

Secretariat
American Nuclear Society

Prepared by the
American Nuclear Society
Standards Committee
Working Group ANS-3.4

Published by the
American Nuclear Society
244 East Ogden Avenue
Hinsdale, Illinois 60521

Approved April 12, 1976
by the
American National Standards Institute, Inc.

American National Standard

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Published by

American Nuclear Society
244 East Ogden Avenue, Hinsdale, Illinois 60521

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Printed in the United States of America

Foreword

(This Foreword is not a part of American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants, N546-1976/ANS-3.4)

The organization which operates a nuclear power plant has the responsibility for safe and efficient operation of the plant. Inherent in this overall responsibility is the responsibility to select and retain operators and senior operators that are physically capable of such operations. The selection of operators and senior operators is of great importance since they perform and direct the manipulations of mechanisms and controls that affect the safe operation of the reactor. This Standard provides the minimum requirements necessary for an examining physician to determine that the physical condition and general health of the operators are not such as might cause operational errors.

This Standard was developed by Working Group ANS-3.4 of the American Nuclear Society Standards Committee which had the participation of the following members during the period it prepared and approved the Standard:

J. L. Craig, M.D., Chairman, <i>General Mills, Inc.</i>	R. L. Craig, M.D., <i>Tennessee Valley Authority</i>
W. R. Albers, M.D., <i>U.S. Energy Research and Development Administration</i>	T. J. Doyle, M.D., <i>Consolidated Edison Company</i>
P. F. Collins, <i>U.S. Nuclear Regulatory Commission</i>	G. A. Poda, M.D., <i>E.I. duPont de Nemours and Company</i>
M. J. Cooney, <i>Philadelphia Electric Company</i>	

The membership of Subcommittee ANS-3 at the time of their approval of this Standard was:

G. C. Andognini, Chairman, <i>Boston Edison Company</i>	H. J. Green, <i>Tennessee Valley Authority</i>
F. L. Kelly, Secretary, <i>Nuclear Services Corporation</i>	R. F. Jones, <i>Crouse Company</i>
H. T. Babb, <i>South Carolina Electric & Gas Company</i>	J. A. List, <i>Consultant</i>
S. E. Bryan, <i>U.S. Nuclear Regulatory Commission</i>	H. L. Ottoson, <i>Southern California Edison Company</i>
J. C. Carroll, <i>Pacific Gas & Electric Company</i>	F. A. Palmer, <i>Commonwealth Edison Company</i>
M. J. Cooney, <i>Philadelphia Electric Company</i>	J. A. Prestele, <i>Electric Power Research Institute</i>
	R. H. Vollmer, <i>U.S. Nuclear Regulatory Commission</i>
	G. K. Whitman, <i>Argonne National Laboratory</i>

The American National Standards Committee N18, Nuclear Design Criteria, which reviewed and approved this Standard in 1975, had the following membership:

L. J. Koch, Chairman
 A. H. Redding, Vice Chairman
 C. B. Zitek, Secretary

<i>Organization Represented</i>	<i>Name of Representative</i>
American Chemical Society	W. Morris
	C. E. Stevenson (Alt)
American Concrete Institute	Paul E. Mast
American Nuclear Society	L. J. Koch
American Society of Civil Engineers	M. I. Goldman
	Charles Gogolick (Alt)
American Society of Mechanical Engineers	J. S. Bitel
	R. H. Holyoak (Alt)
American Public Health Association, Inc.	James R. Coleman
American Welding Society	J. R. McGuffey
Atomic Industrial Forum	Ivan F. Stuart
Electric Light & Power Group	J. E. Howard
	G. A. Olson (Alt)
Federal Power Commission	Alton P. Donnell
	Bernard P. Chew (Alt)
Health Physics Society	James M. Smith, Jr.
	Roy L. Clark (Alt)
Institute of Electrical & Electronics Engineers	R. G. Benham
	O. W. Bilharz, Jr. (Alt)
Institute of Nuclear Materials Management	John Arendt
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Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants

1. Scope

This Standard applies to nuclear reactor operators licensed or otherwise designated by the facility operator.

2. Definitions

2.1 Limitations. The definitions given below are of a restricted nature for the purpose of this Standard.

2.2 Glossary of Terms

controls. Apparatus and mechanisms the manipulation of which directly affect the reactivity or power level of the reactor.

designated medical examiner. A licensed medical practitioner designated by the facility operator to perform reactor operator medical examinations.

facility operator. An authorized representative of a holder of a License pursuant to Title 10, Code of Federal Regulations, Part 50, "Licensing of Production and Utilization Facilities" [1]¹, or any government, public, or private organization which is the owner and operator or is the designated responsible operator of a reactor facility.

multi-person facility. A facility where it is mandatory that more than one qualified individual be present in the control room or other specified control areas when the reactor is operating.

nuclear power plant. A nuclear power plant is any plant using a nuclear reactor to produce electric power, process heat, or space heating.

nuclear reactor. Any assembly of fissionable material which is designed to achieve a controlled, self-sustaining neutron chain reaction.

¹Numbers in brackets refer to corresponding numbers in Section 7, References.

nuclear reactor operator. An individual who manipulates the controls or directs others to manipulate the controls.

shall, should and may. The word "shall" is used to denote a requirement; the word "should" to denote a recommendation; and the word "may" to denote permission, neither a requirement nor a recommendation.

solo operation. Operation of the controls, including monitoring of instrumentation during steady station operations, with no other qualified person in the control room or other specified control areas, such as the refueling console.

3. Health Evaluation Responsibility

3.1 General Aspects. The primary responsibility for assuring that qualified personnel are on duty rests with the facility operator. The health requirements set forth herein are considered the minimum necessary to determine that the physical condition and general health of the individual are not such as might cause operational errors endangering public health and safety.

The designated medical examiner should have a clear understanding of the duties and responsibilities of a nuclear reactor operator.

3.2 Facility Operator's Report to the Designated Medical Examiner. The facility operator shall forward to the designated medical examiner a report on each employee referred for a reactor operator medical examination prior to the examination. This report shall include information specified by the designated medical examiner and should address areas such as work performance, attendance, and behavioral changes noted since the previous review. Incidents of ineptness, poor judgment, and lack of physical or emotional stamina should be noted. Unusual absence or lateness and accident experience should be recorded.

Potential psychological or medical problems that could impair judgment or ability to perform assignments are more likely to be identified by the designated medical examiner if he is provided with this background information.

4. Medical Examination Frequency

Nuclear reactor operators shall be examined biennially for continued medical qualification.

5. Health Requirements and Disqualifying Conditions

5.1 Basis of Requirements. The physical condition and the general health of nuclear operators who have the responsibility for the safe operation of a nuclear reactor must be such that they are capable of properly operating under normal, abnormal and emergency conditions and able to perform the associated tasks. Consequently, any physical condition or corrective device that restricts the mobility of the individual or precludes the wearing of protective clothing and equipment is a liability to safe operation. Any condition which can cause sudden incapacitation such as epilepsy, mental disorder, diabetes, hypertension, cardiovascular disease, fainting spells and defective hearing or vision is also a liability to safe operation. The potential consequences of insidious incapacitation are most serious in solo operation, but need to be considered at any facility.

Many of the conditions indicated above may be accommodated by restricting the activities of the individual, requiring close surveillance of the condition, imposing a temporary medical regime, or requiring another individual to be present when the individual in question is performing his assigned duties.

5.2 General Requirements

5.2.1 Capacity. The examinee shall demonstrate stability and capacity for all of the following:

- (1) Mental alertness and emotional stability
- (2) Acuity of senses and ability of expression to allow rapid, accurate communication by spoken, written, and other audible, visible, or tactile signals
- (3) Physique, motor power, range of

motion, and dexterity to allow ready access to and safe execution of assigned duties.

5.2.2 Freedom from Incapacity. The examinee shall be free of any of the following conditions which are considered by the designated medical examiner as significantly predisposing to incapacity for duty:

- (1) Mental or physical impairments
- (2) Any medical, surgical, or other professional treatment
- (3) Any other source or use of treatment, drugs, chemicals, diets, or other agents
- (4) Any condition, habit, or practice which might result in sudden or unexpected incapacitation

5.3 Disqualifying Conditions. A history or other indication of any disqualifying condition shall be considered disqualifying unless adequate supplemental findings demonstrate that no disqualifying condition exists. Such demonstration shall include at least the specific narrative entries by the designated medical examiner and relevant aspects of medical history and physical examination. The need for additional investigative procedures or specialty evaluation should be considered. The presence of any of the following conditions shall disqualify.

5.3.1 Respiratory

- (1) Frequent severe attacks of asthma within the previous two years or a history which indicates a need for continued or prolonged use of medication for relief, prevention, or control of attacks
- (2) Tracheostomy or laryngectomy
- (3) Incapacitating chronic pulmonary disease

5.3.2 Cardiovascular

- (1) Ischemic heart disease, myocardial infarction, coronary insufficiency or angina pectoris shall disqualify for solo operator duty. If thorough history, physical examination, electrocardiogram (ECG), and other test procedures indicate satisfactory cardiac function and reserve, the examinee may be considered for qualification as an operator in a multi-person facility provided it is demonstrated that all duties of such an assignment are within the physical capabilities of the examinee.
- (2) Heart failure.
- (3) Arrhythmia other than benign extrasystoles.

- (4) Prosthetic valve.
- (5) Artificial pacemaker.
- (6) Peripheral vascular insufficiency.
- (7) Arterial aneurysm.

5.3.3 Endocrine, Nutritional or Metabolic

(1) Diabetes mellitus. Uncontrolled diabetes, ketoacidosis, diabetic coma, or insulin shock within the previous two years.

(a) Requirements for use of insulin shall disqualify for solo operation. Well-controlled stable diabetics requiring insulin may qualify for a multi-person facility if history and examination findings indicate such duties are within their physical capacity and that such duties and scheduling will not interfere with control measures for their diabetes.

(b) Stable diabetics adequately controlled by diet or oral medication may be qualified as solo operators.

(2) Other conditions requiring the continued or frequent use of steroids.

5.3.4 Integumentary. Recurrent severe dermatitis or hypersensitivity to irritants or sensitizers sufficient to interfere with wearing of personal protective equipment or likely to be aggravated by personal decontamination procedures.

5.3.5 Hematopoietic Dysfunction.

- (1) Polycythemia
- (2) Agranulocytosis
- (3) Leukemia and Lymphoma
- (4) Other significant hematopoietic dyscrasia

5.3.6 Malignant Neoplasms. Malignant neoplasm shall disqualify unless review of medical history and current medical evaluation indicate clinical remission which renders the examinee capable of meeting all other requirements of this Standard.

5.3.7 Neurological

(1) History of epilepsy shall disqualify for solo operator duties. Examinee may be considered for qualification for a multi-person facility if he has remained seizure free for at least the previous five years with medication or has remained seizure free during the previous two years without medication. Before considering such qualification, history and examination findings must document the fact that the residuals of, or medication to control the seizure disorder do not impair the examinee's capacity to perform all required duties. Evaluation and prognosis by a

neurologist should be considered.

(2) History of a disturbance of consciousness within the past five years without satisfactory medical explanation of the cause shall disqualify for solo operation.

(3) Organic brain syndrome.

(4) Any other convulsive disorder, disturbance of consciousness or neurologic condition that the designated medical examiner finds makes the examinee unable to safely perform all operator duties.

5.3.8 Mental. An established history or clinical diagnosis of any of the following:

(1) Any psychological or mental condition which could cause impaired alertness, judgment, or motor ability shall constitute sufficient cause for disqualification. A history of clinically significant emotional or behavioral problems shall require, thorough clinical evaluation which may include, but not necessarily be limited to, psychological testing and psychiatric evaluation.

(2) A personality disorder that is severe enough to have repeatedly manifested itself by overt acts.

(3) History or threat of suicide attempt.

(4) History of a psychotic disorder.

(5) Alcoholism is used in this section to mean a condition in which a person's intake of alcohol is great enough to damage his physical health, and personal or social functioning; or a condition when alcohol has become a prerequisite to his normal functioning.

(6) Drug dependence is used in this section to mean a condition in which a person is addicted to, or dependent on, drugs other than alcohol, tobacco, or ordinary caffeine-containing beverages, as evidenced by non-prescribed habitual use of the drug.

(7) History or presence of any other clinically significant mental, character, behavior or personality disorder including anxiety, obsessive-compulsive, conversion, disassociative, depressive, or phobic reactions shall disqualify if the designated medical examiner finds that the condition or any treatment thereof makes the examinee potentially unable to safely perform all operator duties.

5.3.9 Medication. Any medication taken in such a dosage that the taking or temporary delay of taking might be expected to result in incapacity. For example, certain dosages or requirements for steroids, anticoagulants, an-

tiarrhythmics, sedatives, tranquilizers, or insulin.

5.4 Specific Minimum Capacities Required for Medical Qualifications

5.4.1 Head, Face, Neck, Scalp. Configuration suitable for fitting and effective use of personal protective equipment.

5.4.2 Nose. Ability to detect odor of products of combustion and of tracer or marker gases.

5.4.3 Mouth and Throat. Capacity for clear speech.

5.4.4 Ears. Puretone audiometric threshold average better than 30 dB (American National Standard Specification for Audiometers, 1969) or 30 dB (International Organization for Standardization, Standard Reference 0 for Calibration of Pure Tone Audiometers, 1964), or 20 dB (American Standard Specification for Audiometers for General Diagnostic Purposes, 1951), for speech frequencies 500, 1000, 2000 Hz in better ear. If audiometric scores are unacceptable, qualification may be based upon on-site demonstration to the satisfaction of the facility operator of the examinee's ability to safely detect, interpret, and respond to speech and other auditory signals.

Qualification should be considered if a hearing aid is required to meet hearing requirements.

5.4.5 Eyes

(1) Near and distant visual acuity 20/40 in better eye, corrected or uncorrected

(2) Peripheral visual fields by confrontation to 120° or greater

(3) Color vision adequate to distinguish among red, green, and orange-yellow signal lamps, and any other coding required for safe operation of the particular facility as defined by the facility operator

(4) Adequate depth perception, either by stereopsis or secondary clues as demonstrated by practical test

5.4.6 Respiratory. Capacity and reserve to perform strenuous physical exertion in emergencies, and ability to utilize respiratory protective filters and air supply masks. (In pulmonary functional studies which include a forced vital capacity and f.e.v. 1 second would be helpful to the examining physician in determining the candidate's ability to perform assigned work.)

5.4.7 Cardiovascular. Normal configuration and function, capacity for exertion during

emergencies, and pulse rate between 50 and 100 bpm, regular. Resting pulse rate outside this range must be specifically noted by the examining physician to be normal or of no clinical significance. Full symmetrical pulses in extremities and neck. Normotensive (160/100 or less) with tolerance to rapid postural changes. If the examination reveals significant cardiac arrhythmia, murmur, untreated hypertension (over 160/100), cardiac enlargement or other evidence of cardiovascular abnormality, a report of an evaluation by a physician proficient in cardiovascular evaluations shall accompany the medical examination report. This consultation shall include, but is not limited to, an interpretation of an ECG and chest x-ray.

5.4.8 Abdomen and Viscera. If hernia is present, it must be adequately supported by appropriate device or not be of such nature as to interfere with the performance of assigned duty or present significant potential for incapacity.

5.4.9 Musculo-skeletal. Normal symmetrical structure, range of motion and power. If any impairment exists, the applicant shall demonstrate ability to effectively complete all expected duties.

5.4.10 Skin. Capability to tolerate use of personal protective covering and decontamination procedures.

5.4.11 Endocrine/Nutrition/Metabolic. Normal. Ability to change schedule or delay meals without potential incapacity.

5.4.12 Hematopoietic. Normal function.

5.4.13 Lymphatic. Normal function.

5.4.14 Neurological. Normal central and peripheral nervous system function. Tactile discrimination (Stereognosis) sufficient to distinguish among various shapes of control knobs and handles by touch.

5.4.15 Psychiatric. Normal mental status including orientation. Ability to function in emergencies and unusual environments such as: confined or crowded spaces, alone, in darkness, on elevations, on open metal grids, and on ladders. This ability is to be determined by the clinical judgment of the examining physician.

5.4.16 Laboratory.

(1) Normal hemoglobin, white blood cell count, and differential

(2) In urinalysis, absence of proteins and glycosuria unless the absence of a disqualifying systemic or genitor-urinary condition has been demonstrated

(3) Normal electrocardiogram (ECG)

(4) Any other medical investigative procedures, including chest x-ray, which the designated medical examiner considers necessary for adequate medical evaluation shall be conducted

6. Waiver or Specifically Limited Approval

6.1 Application Requirements and Criteria. If an examinee fails to meet any of the above specified minimum requirements but can demonstrate to the satisfaction of the facility operator complete capacity to perform operational duties, the designated medical examiner may recommend waiver of that portion of this Standard. It is the examinee's responsibility to supply additional information necessary for consideration of the granting of such a waiver. Documentation supporting the waiver shall include:

(1) Medical history and results of physical examination and other pertinent medical findings

(2) Specific statements by the designated medical examiner as to the individual's capacity and the potential effects of any impairment on

the individual's job performance

(3) Description by the facility operator of specific practical tests and demonstrations of ability to perform those duties which might be reasonably expected to be affected by the impairment

(4) Certification from the designated medical examiner and facility operator indicating that the individual can safely perform his assigned duties

6.2 Specifically Limited Approval. Examinees who do not meet all requirements for either qualification or waiver for unrestricted operator duties may request specifically limited approval. Consideration of any such request shall require the facility operator's concurrence and recommendations and all other information necessary for a waiver application (see 6.1). The facility operator shall also propose the exact wording of any such specific limitation.

7. Reference

- [1] Title 10, Code of Federal Regulations Part 50 "Licensing of Production and Utilization Facilities," Government Printing Office, Washington, D.C.