Fact Sheet

United States Nuclear Regulatory Commission
Office of Public Affairs
Washington DC 20555
Telephone: 301/415-8200 E-mail: opa@nrc.gov

Reactor Operator Licensing

Background

The Nuclear Regulatory Commission licenses the individuals who operate the controls of a nuclear power plant. There are two categories of licenses, a reactor operator and a senior reactor operator. A senior reactor operator is a supervisory position overseeing the work of the reactor operators. The license is issued after the individual passes both a written examination and an operating test. The senior reactor operator examination also measures the ability of the individual to direct the activities of licensed operators.

Section 107 of the Atomic Energy Act of 1954, as amended, requires the NRC to determine the qualifications of individuals applying for an operator's license, to prescribe uniform conditions for licensing those individuals, and to issue licenses as appropriate. Additionally, Section 306 of the Nuclear Waste Policy Act of 1982 directed the NRC to promulgate regulations, or other appropriate guidance, for training and qualifying nuclear power plant operators, including requirements governing the administration of requalification examinations and operating tests at nuclear power plant simulators. These statutory requirements are implemented by the NRC's regulations located in Part 55, "Operators' Licenses," in Title 10 of the Code of Federal Regulations (CFR). Detailed NRC policies, procedures, and guidelines that pertain to those regulations are published in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors."

Initial Licensing Process

Before the NRC licenses an individual to operate or supervise the controls of a nuclear power reactor, the applicant must have several years of related experience and complete extensive classroom, simulator, and on-the-job training covering reactor theory, thermodynamics, power plant components, system design and operation, integrated plant operations, and emergency response. The licensed operator training programs at power reactors are developed and implemented by reactor facility licensees using a systematic approach to training that:

- sequentially analyzes the jobs to be performed,
- derives learning objectives based upon the job requirements,
- develops training materials to implement the stated learning objectives,
- evaluates the operators' mastery of those learning objectives, and
- uses feedback to revise the training based on the operator's performance on the job.

The National Nuclear Accrediting Board reviews and accredits the operator training programs. The Board operates under the auspices of the Institute of Nuclear Power Operations (INPO) and its activities are monitored by the NRC.

When prospective operators have completed their training, they must complete an application that describes their qualifications and requires the reactor facility licensee for which the applicant will work to certify that the applicant has satisfied the facility licensee's training and experience requirements to be a licensed operator or senior operator. Applicants must also undergo a physical examination and be certified physically and mentally fit to be an operator. If the NRC determines that the applicant's qualifications and physical condition are acceptable, the applicant is scheduled to take the NRC licensing examination.

The examination process begins with a written exam covering reactor theory, thermodynamics, and mechanical components. This generic fundamentals examination, which is prepared for the NRC by a contractor, is actually administered early in the applicant's training program and is a prerequisite for taking the site-specific examination. The site-specific examination consists of a written examination covering the nuclear power plant systems, procedures, and administrative requirements, and an operating test that includes a plant walk-through and a performance demonstration on the facility licensee's power plant simulator. The written examinations and operating tests are prepared, administered, and graded using the guidance in NUREG-1021.

In 1999, the NRC amended its regulations to allow facility licensees to draft the site-specific written examinations and operating tests and submit them to the NRC for review and approval prior to administration or to request the NRC to prepare the tests. Typically, about three out of four site-specific examinations and tests are drafted by facility licensees, while NRC examiners continue to administer all of the operating tests.

If the applicant passes the written examinations and the operating test, the NRC will issue a license containing any conditions that it considers appropriate and necessary.

License Conditions

The operator's and senior operator's licenses are only valid to operate the facility on which the applicant was trained and tested. Each license is also subject to a number of conditions regardless of whether they are stated in the license. For example, all licensed operators and senior operators are required to:

- observe all applicable rules, regulations, and orders of the NRC;
- maintain their proficiency and complete their facility licensee's requalification training and examination program;
- have a medical examination by a physician every two years; and
- notify the NRC if they develop a permanent physical or mental condition that could adversely affect the performance of their duties.

Moreover, all licensed operators and senior operators are required to participate in their facility licensee's drug and alcohol testing programs, and they are prohibited from using, possessing, or selling illegal drugs and from performing licensed duties while under the influence of alcohol or any prescription, over-the-counter, or illegal substance that could adversely affect their performance.

The NRC-approved operator requalification training programs are run on continuous cycles that may not exceed 24 months in duration. Each operator must successfully complete the program and pass a comprehensive written examination and an annual operating test developed and administered by the facility licensee. The NRC actively monitors the operator requalification programs as part of its Reactor Oversight Process, with each program receiving a standard inspection every other year. The inspection:

-- verifies that the facility licensee's program adequately evaluates how well the operators and crews have mastered the training objectives;
-- assesses the facility licensee's ability to evaluate and revise the program based on the operator's performance;
-- assesses whether the operators at the facility satisfy the conditions of their licenses;
– assesses the adequacy of the facility licensee's simulation facility; and
-- determines the need for additional inspections or NRC-conducted requalification examinations at the facility.

License Renewal

Licenses expire six years after the date of issuance or upon termination of employment with the facility licensee. If an operator or senior operator submits a renewal application to the NRC at least thirty days before the expiration date of the existing license, the license does not expire until the NRC determines the final disposition of the renewal application. The renewal process requires the applicant to provide written evidence of his or her experience under the existing

license, a certification from the facility licensee that the applicant is a safe and competent performer who has satisfactorily completed the requalification program for the facility, and certification that the applicant's medical condition and general health are satisfactory. The NRC will renew the license if, on the basis of the application and certifications, it determines that the applicant continues to meet the regulatory requirements.

For additional information, refer to the Operator Licensing web site at http://www.nrc.gov/reactors/operator-licensing.html .

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