

Revision to Operator and Senior Operator
Requalification Program

Submitted by the Penn State Breazeale Reactor
License No. R-2, Docket No. 50-005

March 23, 1988

A. PURPOSE

1. To assure that all operators and senior operators maintain competence.

B. ADMINISTRATION

1. The Director or Deputy Director shall appoint a facility training manager.
2. The training manager shall be responsible for:
 - a. Conducting the requalification program.
 - b. Assuring that the examinations are not compromised.
 - c. Maintaining records required by the program.
3. The requalification program shall be conducted over a period of 24 consecutive months.
4. A licensee conducting an exam shall be exempt from that exam.
5. During each one-year period, no licensee shall conduct and be exempt from more than one of the three exams (comprehensive written, oral procedure, and operating test).
6. No licensee shall conduct and be exempt from the same exam twice during the 24-month requalification program.
7. A licensee conducting and exempt from the comprehensive written exam during one 24-month requalification program shall not conduct and be exempt from this exam during the next 24-month requalification program.
8. Training following exam failure shall be lectures, tutoring, self-study, or on-the-job training as appropriate.

C. WRITTEN EXAMINATION

1. During each requalification program, a comprehensive written exam shall be given to all licensees in the subject areas listed. The exam shall sample the items listed in each subject area. The underlined items are additional items for senior operators.
 - a. Theory and Principles of Reactor Operation - Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects.
 - b. Features of Facility Design - General design features of the core, including core structure, fuel elements, control rods, core instrumentation, and coolant flow; general design features and mechanical components of the pool recirculation system, pool cooling system, systems for adding water to the pool, and equipment that could affect release of radioactive materials to the environment. Fuel handling facilities and procedures.
 - c. General and Specific Operating Characteristics - Causes and effects of temperature, reactivity changes due to temperature, and reactivity changes due to experiments and experimental facilities.
 - d. Instrumentation and Control - Design, components, and functions of reactivity control mechanisms and instrumentation.
 - e. Safety and Emergency Systems - Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. Components, capacity, and functions of emergency systems.

March 23, 1988

- f. Procedures, License, Technical Specifications, and Government Regulation - Administrative, normal, abnormal, and emergency operating procedures for the facility. Conditions and limitations in the facility license; facility operating limitations in the technical specifications and their bases; facility licensee procedures to obtain authority for design and operating changes in the facility; assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations; procedures and limitations involved in initial core loading, alterations in core configuration, and determination of various internal and external effects on core reactivity.
- g. Radiation Control and Safety - Purpose and operation of radiation monitoring systems, including alarms, and survey equipment; radiological safety principles and procedures; procedures and equipment available for handling and disposal of radioactive materials and effluents. Shielding and access limitations. Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.
2. A licensee receiving a grade of less than 70% in any subject shall receive training in that subject until the licensee can pass an examination in that subject with a grade of 70% or more.
3. A licensee receiving a grade of less than 70% (overall) shall, in the next two working weeks, be given an accelerated training program to remedy deficiencies.
4. At the end of this period, the licensee shall be given an oral examination.
 - a. If the results of this examination are negative, removal from licensed duties shall occur until the requirements of C2 are met.

- b. If the oral examination results are satisfactory, the licensee may continue performing licensed duties while receiving additional training until the requirements of C2 are met.

D. ORAL EXAMINATIONS

1. During each calendar year, each licensee is expected to review PSBR abnormal and emergency procedures. Subsequent to this, an oral examination shall be given to ensure familiarity with these procedures.
2. The oral examination shall be graded on a pass-fail basis.
3. If a negative result is obtained, the next two working weeks shall be devoted to an accelerated training program.
 - a. A retest shall be given at the end of this period.
 - b. If the results are still negative, the licensee shall be removed from licensed duties until the deficiency is remedied.

E. ON-THE-JOB TRAINING

1. Each licensee shall perform at least one control manipulation from shutdown to critical each calendar quarter. Each licensee shall perform annually each of the following reactor control manipulations. Senior operator licensees shall be credited with these manipulations if they direct control manipulations as they are performed.
 - a. Reactor start-up to include a range where reactivity feedback from nuclear heat addition is noticeable.
 - b. Reactor shutdown.
 - c. Power change in manual rod control greater than 10%.
 - d. Power change in automatic rod control greater than 10%.

- e. Power change using square wave mode.
- f. Power change using pulse mode.
- 2. Each licensee shall actively perform the functions of the licensed position for a minimum of four hours per calendar quarter. A licensee not meeting this requirement shall have an inactive license until the conditions of G3 are met.
- 3. Meetings shall be held as deemed necessary at which facility design, license, and procedure changes are explained and discussed.
- 4. Written material concerning facility design, license, and procedure changes shall be distributed and/or circulated.

F. OPERATING TEST

- 1. A SRO shall administer an operating test to each licensee during each year, to ensure the licensee has the knowledge, competence, and dexterity to safely operate the reactor and respond to situations that may arise, and to ensure familiarity with features of facility design with special emphasis on design changes. The operating test shall choose a representative sample from among items a through m and shall include item n.
 - a. Perform pre-startup (reactor checkout) procedure.
 - b. Manipulate the console controls as required to operate the facility between shutdown and designated power levels.
 - c. Identify annunciators and condition-indicating signals and perform or describe appropriate remedial actions.
 - d. Identify the instrumentation systems and the significance of facility instrument readings.
 - e. Observe and safely control or describe how to safely control the operating behavior characteristics of the facility.

March 23, 1988

- f. Describe or perform control manipulations required to obtain desired operating results during normal, abnormal, and emergency situations.
- g. Demonstrate or describe the operation of the pool recirculation system, pool cooling system, and systems for adding water to the pool.
- h. Demonstrate or describe the operation of the facility's equipment that could effect release of radioactive materials to the environment.
- i. Demonstrate or describe the use and function of the facility's radiation monitoring systems, including fixed radiation monitors and alarms, portable survey instruments, and personnel monitoring equipment.
- j. Demonstrate knowledge of significant radiation hazards, including permissible levels in excess of those authorized, and ability to perform other procedures to reduce excessive levels of radiation and to guard against personnel exposure.
- k. Demonstrate knowledge of the emergency plan for the facility, including, as appropriate, the operator's or senior operator's responsibility to decide whether the plan should be executed; demonstrate knowledge of the duties under the plan.
- l. Demonstrate the knowledge and ability as appropriate to the assigned position to assume the responsibilities associated with the safe operation of the facility.
- m. Demonstrate the ability to function within the control room team as appropriate to the assigned position, in such a way that the facility licensee's procedures are adhered to and that the limitations in its license and amendments are not violated.

March 23, 1988

- n. Demonstrate knowledge of features of facility design, with special emphasis on design changes.
2. An operating test checklist shall be filled out by the evaluator for all licensees and graded on a pass-fail basis.
3. In case of a failure the licensee shall be:
 - a. Removed from licensed duties.
 - b. Given training in areas of deficiency.
 - c. Returned to duty upon permission of the evaluator.

G. LICENSEE REQUALIFICATION REQUIREMENTS TO RETURN TO ACTIVE LICENSE STATUS FOLLOWING AN ABSENCE FROM DUTY DURING A CALENDAR QUARTER

1. The licensee shall meet any reactivity requirement deficiencies of Section E1.
2. The licensee shall pass the operating test as per Section F.
3. The licensee shall complete a minimum of six hours of shift functions under the direction of an operator or senior operator as appropriate.
4. The licensee shall pass any written or oral exams as per Sections C and D that were given during the absence from duty.
5. The licensee shall be informed of any facility design, license, or procedure changes during the absence.

H. RECORDS

1. Records of the requalification program shall be maintained in each licensee file until the next license renewal.
2. The records shall contain copies of written exams administered including the answers given by the licensees.

Docket No. 50-005

March 23, 1988

3. Records of documentation and results of additional training and examinations in areas where licensee deficiencies were noted shall be retained.
4. Results of the oral examination shall be recorded.
5. Operating test checklists shall be maintained in each licensee's file.
6. Reactivity manipulation checklists shall be maintained in each licensee's file.
7. Duty hour requirements for each calendar quarter shall be documented.
8. Records shall be maintained for actions taken to return licensees to active license status as described in Section G.

I. REFERENCE

1. ANSI/ANS-15.4-1977 - Selection and Training of Personnel for Research Reactors.