



# REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

## REGULATORY GUIDE 1.114

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### GUIDANCE TO OPERATORS AT THE CONTROLS AND TO SENIOR OPERATORS IN THE CONTROL ROOM OF A NUCLEAR POWER UNIT

#### A. INTRODUCTION

This guide describes a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for use in complying with Commission regulations that require the presence of an operator at the controls of a nuclear power unit and the presence of a senior operator in the control room from which the nuclear power unit is being operated. In addition, this regulatory guide clarifies and provides guidance on the acceptable boundaries of the control room. The “vital area,” as defined in Title 10, Section 73.2, “Definitions,” of the *Code of Federal Regulation* (10 CFR 73.2) and in 10 CFR 73.55(c), serves as the basis for the “control room vital area” as used in this regulatory guide.

In accordance with 10 CFR 50.54(k), an operator or senior operator who is licensed pursuant to 10 CFR Part 55, “Operators’ Licenses,” must be present at the controls at all times during the operation of a facility. General Design Criterion 19, “Control Room,” of Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” requires, in part, that a control room be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain the nuclear power plant in a safe condition under accident conditions. As defined in 10 CFR 50.2, “Definitions,” and 10 CFR 55.4, “Definitions,” the term “controls,” when used with respect to nuclear reactors, means apparatus and mechanisms, the manipulation of which directly affects the reactivity or power level of the reactor. Under 10 CFR 50.54(m)(2)(iii), when a nuclear power unit is in an operational mode other than cold shutdown or refueling, as defined by the unit’s technical specifications, each licensee must have a person possessing an active senior operator license for the nuclear power unit present in the control room at all times. In

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This guide was issued after consideration of comments received from the public.

Regulatory guides are issued in 10 broad divisions—1, Power Reactors; 2, Research and Test Reactors; 3, Fuels and Materials Facilities; 4, Environmental and Siting; 5, Materials and Plant Protection; 6, Products; 7, Transportation; 8, Occupational Health; 9, Antitrust and Financial Review; and 10, General.

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addition to this senior operator, a licensed operator or senior operator must be present at the controls at all times for each fueled nuclear power unit.

This regulatory guide contains information collection requirements covered by 10 CFR Part 50, 10 CFR Part 55, and 10 CFR Part 73 that the Office of Management and Budget (OMB) approved under OMB control numbers 3150-0011, 3150-0018, and 3150-0002, respectively. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information request or requirement unless the requesting document displays a currently valid OMB control number.

## **B. DISCUSSION**

### **1. Operator at the Controls**

Operating experience has shown that a need exists for guidance on acceptable methods of complying with the Commission's requirement that an operator must be present at the controls of a facility. The operator at the controls of a nuclear power unit has many responsibilities including the following:

- adhering to the unit's technical specifications, plant operating procedures, and NRC regulations;
- reviewing operating data, including data logging and review, to ensure that the unit is operating safely; and
- being able to manually initiate engineered safety features during various transient and accident conditions.

To carry out these and other responsibilities in a timely fashion, the operator at the controls of a nuclear power unit must pay attention to the condition of the unit at all times. The operator must be alert to ensure that the unit is operating safely and must be able to take action to prevent any progress toward an unsafe condition. This is facilitated by control room design and layout in which all controls, instrumentation displays, and alarms required for the safe operation, shutdown, and cooldown of the unit are readily available to the operator in the control room.

### **2. Senior Operator in the Control Room**

A need exists for guidance on acceptable methods of complying with the Commission's requirement in 10 CFR 50.54(m)(2)(iii) that a senior operator must be present in the control room at all times when a nuclear power unit is in an operational mode other than cold shutdown or refueling as defined by the unit's technical specifications. A senior operator currently assigned to control room duties and within the confines of the control room must be in sight of, or in audible range of, the operator at the controls or must be in audible range of the control room annunciators. The technical expertise of both a senior operator and a reactor operator is required in the control room because of the differences in their training programs and experience.

The staffing rule requires the continuous presence of a senior operator in the control room to ensure the following:

- a. An individual is available who can provide the oversight function of the supervisor and improve the probability of correctly detecting abnormal events early enough to mitigate potential adverse consequences.
- b. The senior operator in the control room is aware of plant conditions before, and resulting from, an abnormal event. This helps ensure that the extra experience, training, and knowledge of the senior operator is available to aid in promptly mitigating the event.
- c. The operator at the controls can concentrate on performing the immediate actions necessary to mitigate the event rather than having to brief the senior operator about the event if the senior operator was absent from the control room when the event occurred.

## **C. REGULATORY POSITION**

### **1. Operator at the Controls**

- 1.1 The operator at the controls of a nuclear power unit should have an unobstructed view of, and access to, the operational control panels, including instrumentation displays and alarms, to initiate prompt corrective action when necessary on receipt of any indication (i.e., instrument response or alarm) of a changing condition. Operational control panels are control panels that enable the operator at the controls to perform required manual safety functions and equipment surveillance and to monitor plant conditions under normal and accident conditions.
- 1.2 The operator at the controls should not normally leave the area where continuous attention, including visual surveillance of annunciators and instrumentation, can be given to reactor operating conditions and where the operator has access to the reactor controls. For example, the operator should not routinely enter areas behind control panels where he cannot monitor plant performance. If the control room design is such that an operator must enter areas behind control panels to monitor back panels, either a senior operator or reactor operator assigned to the current control room shift must be within view of the control panels during the time that the normally assigned operator is monitoring the back panels. The operator at the controls should not, under any circumstances, leave the surveillance area (i.e., defined by the administrative procedures described in response to Regulatory Position 1.3 below) for any nonemergency reason (e.g., to confer with others or for personal reasons) without ensuring that a qualified relief operator is at the controls. In an emergency that affects the safety of operations, the operator at the controls may momentarily be absent from the defined surveillance area to verify the receipt of an annunciator alarm or to initiate corrective action, provided that the operator remains within the confines of the control room.
- 1.3 Administrative procedures should be established that define and outline (preferably with sketches) the specific area within the control room designated as the “surveillance area” where the operator at the controls should remain. The procedures should define the surveillance area and other areas that the operator at the controls may enter to verify the receipt of an annunciator alarm or to initiate corrective action in an emergency that affects the safety of operations.

- 1.4 Before assuming responsibility as the operator at the controls, the relief operator should be properly briefed on the unit's status. Administrative procedures should describe what is required to ensure the proper transfer of responsibility during the change of shifts or when an operator on duty is relieved as operator at the controls during a shift. The procedures should include, as a minimum, a definition of proper relief (e.g., what information the operator must pass on to the relief operator and that must be acknowledged between the two operators).
- 1.5 A single operator should not assume responsibility as the operator at the controls for more than one nuclear power unit at the same time. This is one of the minimum requirements in 10 CFR 50.54(m)(2)(i) for onsite staffing of nuclear power units per shift by licensed operators.

## **2. Senior Operator in the Control Room**

- 2.1 A designated senior operator, as defined in 10 CFR 55.4, should be present in the control room to meet the requirements of 10 CFR 50.54(m)(2)(iii).
- 2.2 The senior operator in the control room should spend most of the time in that portion of the control room where there is direct and prompt access to information on current unit conditions and where the senior operator can directly supervise and communicate with the operator or operators at the controls.
- 2.3 The senior operator should have the flexibility to move periodically for a brief time to other parts of the control room, as long as the senior operator is at all times within the control room vital area and meets either of the following conditions.
  - a. The senior operator can see or hear the reactor operator at the controls.
  - b. The senior operator can hear the control room annunciators.
- 2.4 Administrative procedures should be established that define and outline (preferably with sketches) the specific area within the control room (see Regulatory Position 2.2 above) where the senior operator normally should remain while performing designated duties.
- 2.5 Before assuming responsibility as the senior operator in the control room, the relief senior operator should be properly briefed on the unit's (or units') status. Administrative procedures should describe what is required to ensure that the proper transfer of responsibilities occurs when a senior operator on duty in the control room is relieved of control room responsibility during a shift or during a change of shifts. The procedures should include, as a minimum, definitions of proper relief (e.g., what information the operator must pass on to the relief operator and that must be acknowledged between the two senior operators) and notification to the control room shift crew by the senior operator in charge.
- 2.6 A single senior operator in the control room should not assume the responsibility for more than one control room, but he or she may be responsible for all units operated from a single control room. This is one of the minimum requirements in 10 CFR 50.54(m)(2)(i) for onsite staffing of nuclear power units per shift by senior operators.

## **D. IMPLEMENTATION**

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance.

In some cases, applicants or licensees may propose or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for license applications, license amendment applications, and amendment requests.