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# REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 1.114  
(Task HF 601-4)

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

### A. INTRODUCTION

Paragraph (k) of § 50.54, "Conditions of Licenses," of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires that an operator or senior operator licensed pursuant to 10 CFR Part 55, "Operators' Licenses," 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 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 § 50.2 and § 55.4, 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. Paragraph 50.54(m)(2)(iii) requires that, 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 have a person holding a senior operator license for the nuclear power unit in the control room at all times. In 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 guide describes a method acceptable to the NRC staff for complying with the Commission's regulations that require the presence of an operator at the controls of a nuclear power unit and a senior operator

in the control room from which the nuclear power unit is being operated. In addition, this guide clarifies and provides guidance on the acceptable boundaries of the control room. The "vital area," as mentioned in 10 CFR 73.2(h) and 10 CFR 73.55(c), serves as the basis for the "control room vital area" as used in this regulatory guide.

The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

Any information collection activities mentioned in this regulatory guide are contained as requirements in 10 CFR Parts 50 or 55, which provide the regulatory basis for this guide. The information collection requirements in 10 CFR Parts 50 and 55 have been cleared under OMB Clearance Nos. 3150-0011 and 3150-0018, respectively.

### 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 for the presence of an operator at the controls of a facility. The operator at the controls of a nuclear power unit has many responsibilities that include, but are not limited to, (1) adhering to the unit's technical specifications, plant operating procedures, and NRC regulations; (2) reviewing operating data, including data logging and review, in order to ensure safe operation of the

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

Written comments may be submitted to the Regulatory Publications Branch, DFPS, ARM, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

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unit; and (3) being able to manually initiate engineered safety features during various transient and accident conditions.

In order for the operator at the controls of a nuclear power unit to be able to carry out these and other responsibilities in a timely fashion, the operator's attention must be given 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 capable of taking action to prevent any progress toward a condition that may be unsafe. 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 paragraph 50.54(m)(2)(iii) that a senior operator 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, is expected to be in sight of, or in audible range of, the operator at the controls or be in audible range of the control room annunciators. A senior operator's technical expertise is required in the control room in addition to a reactor operator's technical expertise 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 that (1) an individual is available who can provide the oversight function of the supervisor so that the probability of correctly detecting abnormal events early enough to mitigate potential adverse consequences is increased; (2) the senior operator in the control room is aware of plant conditions prior to and resulting from an abnormal event so that the senior operator's extra experience, training, and knowledge can be used to act promptly to mitigate that event; and (3) the operator at the controls is able to direct attention to performing the immediate actions necessary to mitigate an event, rather than having to brief the senior operator about the background of that event, if the senior operator had been absent from the control room.

### **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 be able to initiate prompt corrective action when necessary on receipt of any indication (instrument response or alarm) of a changing condition. Operational control panels are defined as 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 plant performance cannot be monitored. If the control room design is such that back panels must be monitored, either a senior operator or reactor operator assigned to the current control room shift must be within the 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 (defined by the administrative procedures described in response to Regulatory Position 1.3 of this guide) for any nonemergency reason (e.g., to confer with others or for personal reasons) without obtaining a qualified relief operator at the controls. In the event of an emergency affecting the safety of operations, the operator at the controls may momentarily be absent from the defined surveillance area in order to verify the receipt of an annunciator alarm or initiate corrective action provided 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 the areas that may be entered by the operator at the controls to verify receipt of an annunciator alarm or to initiate corrective action in the event of an emergency affecting 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 that proper transfer of responsibility occurs during the change of shifts or when an operator on duty is relieved as operator at the controls during a shift and should include, as a minimum, a definition of proper relief (e.g., what information is required to be passed on and 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 per shift for on-site staffing of nuclear power units by licensed operators contained in paragraph 50.54(m)(2)(i).

## 2. SENIOR OPERATOR IN THE CONTROL ROOM

2.1. A designated senior operator, as defined in paragraph 55.4 of 10 CFR Part 55, should be present in the control room to meet the requirements of paragraph 50.54(m)(2)(iii).

2.2. The senior operator in the control room is expected to 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 at the controls.

2.3. The senior operator should have the flexibility to periodically move for a brief period of 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 either

1. in sight of or in the audible range of the reactor operator at the controls, or
2. in the audible range of 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 (Section 2.2 above) where the senior operator nor-

mally should remain while performing designated duties.

2.5. Before assuming responsibility as senior operator in the control room, the relief senior operator should be properly briefed on the unit's status. Administrative procedures should describe what is required to ensure that 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, and should include, as a minimum, a definition of proper relief (e.g., what information is required to be passed on and 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 may have responsibility for all units operated from a single control room. This is one of the minimum requirements for on-site staffing per shift of nuclear power units by senior operators contained in paragraph 50.54(m)(2)(i).

## D. IMPLEMENTATION

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

Except in those cases in which an applicant or licensee proposes an acceptable alternative method for complying with paragraphs 50.54(k) and 50.54(m) of 10 CFR Part 50, the method described in this guide will be used in the evaluation of the performance of licensees and in the evaluation of applications for construction permits and operating licenses docketed after May 31, 1989.

## VALUE/IMPACT STATEMENT

A draft value/impact statement was published with the proposed Revision 2 to Regulatory Guide 1.114 (Task HF 601-4) when the draft guide was published for public comment in December 1986. No changes were necessary, so a separate value/impact

statement for the final guide has not been prepared. A copy of the draft value/impact statement is available for inspection and copying for a fee at the Commission's Public Document Room at 2120 L Street NW., Washington, DC, under Task HF 601-4.

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