American Nuclear Society

WITHDRAWN

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criteria for remote shutdown for light water reactors

an American National Standard

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REAFFIRMED

August 31, 2001
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American National Standard Criteria for Remote Shutdown for Light Water Reactors

Secretariat
American Nuclear Society

Prepared by the
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Standards Committee
Subcommittee MC-1

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by the
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American National Standard

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Foreword

(This Foreword is not a part of American National Standard Criteria for Remote Shutdown for Light Water Reactors, ANSI/ANS-58.6-1996.)

Criterion 19 of the General Design Criteria for Nuclear Power Plants, contained in Appendix A of Title 10, "Energy," Code of Federal Regulations, Part 50, "Licensing of Production and Utilization Facilities," stipulates that a control room be provided for safe unit operation, and also that controls external to this control room be provided with a capability to achieve hot shutdown for boiling water reactors, hot standby for pressurized water reactors, and a potential capability to achieve cold shutdown. This standard addresses the criteria necessary for controls external to the control room in response to the latter part of Criterion 19, "Control Room." In addition, the alternate (or alternative) or dedicated shutdown criteria of 10 CFR 50 Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"—now embodied in the acceptance criteria of the NRC Standard Review Plan 9.5.1 and the NRC Branch Technical Position CMEB 9.5-1—are addressed in this revision.

A specific mechanism for control room evacuation is not postulated in this standard or in Criterion 19, although the working group did specifically consider a fire-induced control room evacuation during revision of the standard. Mechanistic events occurring within the control room are beyond the scope of this standard, but should be addressed in other standards, particularly one dealing with control room design and philosophy. Other standards provide interfacing criteria and design requirements, including electrical and control system criteria. Thus, this standard should be regarded as only one of a group of standards which collectively address plant safety and control.

The criteria are divided into two parts: Assumptions for Design, and Criteria for Remote Shutdown. Although the second part gives the criteria specifically needed to define remote shutdown operation, the designer cannot implement these criteria without proper consideration of surrounding effects and conditions throughout the plant. Consequently, the first part gives guidance in the form of assumptions about plant operating conditions. A combination of the two parts is then used by the designer to allow an integrated approach to implement the remote shutdown requirements.

In general, the criteria require a design which allows the operator to place the plant in a "tripped" condition, leave the control room, and continue shutdown operation at a remote station. An Alternate Shutdown Station is the centralized location for central administration and communication in the event of a control room evacuation occurrence. Local Control Station(s) (e.g., at breaker panels) throughout the plant may be utilized in coordination with the Alternate Shutdown Station. The Alternate Shutdown Station and the Local Control Station(s) are separate and remote from the control room and cable-spreading areas. From these shutdown locations, the safety-related functions of reactivity control, core coolant inventory control, pressure control, and core residual heat removal can be administered and monitored as needed to maintain a safe shutdown. The systems and controls needed are required to be capable of operation from normal and emergency power supplies and must have other attributes normally associated with safety-related systems. However, since the control room evacuation occurrence is a "special event", the single failure criterion does not apply; i.e., an additional single failure is not postulated to occur in addition to the occurrence which requires evacuation of the control room. In order to limit the possibility of unintended simultaneous operation of the plant from the control room and the

alternate or local control shutdown locations, the criteria require Control Transfer Devices to be installed, or administrative procedures to be used, to permit operations to be from only one location at any time. In order to initiate remote shutdown operation, the Control Transfer Devices must be in the appropriate mode.

This standard was originally developed under ANS-51 and balloted affirmatively by that committee. Subsequently, the N18 Committee, Nuclear Design Criteria, balloted on the standard in April 1978. Further review and comments were received from the American Nuclear Society's Nuclear Power Plant Standards Committee (NUPPSCO) in October 1979. Subsequently, the standard was balloted by NUPPSCO in March 1980 and further reviewed at a July 1980 NUPPSCO meeting. The 1983 version of the standard is based on resolution of ballot comments and further review at the November 1981 NUPPSCO meeting.

The standard was reaffirmed at the March 1989 NUPPSCO meeting subject to a general revision of the standard. Such a revision was balloted by the ANS Management Committee MC-1 in its October 1992 meeting and the standard was balloted by NUPPSCO in its April 1993 meeting.

This revision of the standard was prepared under the direction of Subcommittee MC-1, LWR Management Committee, of the Standards Committee of the American Nuclear Society, and the revision effort was chaired by **M. P. Horrell, Raytheon Nuclear Inc.** The membership of MC-1 at the time of preparation was:

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The American Nuclear Society's Nuclear Power Plant Standards Committee (NUPPSCO) had the following membership at the time of its approval of this standard:

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