



Emergency Planning for Research Reactors

An American National Standard

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for Research Reactors**

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Foreword (This Foreword is not a part of the American National Standard “Emergency Planning for Research Reactors,” ANSI/ANS-15.16-2015.)

The American Nuclear Society (ANS) established Subcommittee ANS-15, Operation of Research Reactors, in the fall of 1970 for the purpose of preparing a standard for the operation of research reactors. In January 1972, this charter was expanded to include the multiple tasks involved in preparing all standards for research reactors. To implement this enlarged responsibility, a number of subcommittee working groups were established to develop standards for consideration and complementary action by Subcommittee ANS-15. ANS-15.16 is one of these groups.

In August 1980, the U.S. Nuclear Regulatory Commission (NRC) published new rules for *Code of Federal Regulations*, Title 10, “Energy,” Part 50, “Licensing of Production and Utilization Facilities,” Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities.” The changes to the regulations place emphasis on emergency preparedness in regard to notifying off-site authorities and initiating protective actions on the basis of severity of facility damage and potential as well as actual radiological releases that are occurring or have occurred. The regulations also require the identification of a spectrum of radiological emergencies applicable to a reactor facility and the grouping of these emergencies into specified classes of emergencies. They also require that a facility’s emergency plan identify emergency action levels (EALs) that are to be used to initiate the planned emergency responses for each emergency. In addition, the regulations require the determination of the need for establishing an off-site emergency planning zone (EPZ) on a case-by-case basis and require the identification of predetermined actions for protecting individuals within this zone.

In January of 1994, *Code of Federal Regulations*, Title 10, “Energy,” Part 20, “Standards for Protection Against Radiation” (10 CFR 20) was extensively revised to use the International System of Units (SI) and terminology. The NRC issued supportive guidance in the form of Appendix 1 to NUREG-0849 in April 1997. NRC Information Notice 97-34, issued in June 1997, informed licensees of revised guidance. As a result of the changes to 10 CFR 20, the working group was tasked to revise ANSI/ANS-15.16-1982 (R2000) to be consistent. The present revision incorporates the use of SI units, the regulatory positions from NRC Regulatory Guide 2.6, Revision 1, March 1983 relative to the content, approval, and revision control of emergency procedures, and the recognition of reactor facility physical security issues for emergency planning.

In 2014, ANSI/ANS-15.16-2008 was revised to incorporate security-related events into the emergency plan in a risk-informed way. Because of the low inventory of radioactive material, most research and test reactors do not meet the threshold levels that initiate either a General Emergency or a Site Area Emergency. In fact, many do not meet the threshold for an Alert classification. As such, the revisions ensured that security-related events were incorporated into emergency plans without creating emergency classifications that did not or would not otherwise exist.

ANSI/ANS-15.16-2015 identifies the elements of an emergency plan. It provides criteria and guidance that should be considered in formulating an emergency plan. The standard identifies the emergency classes that should be used to categorize the spectrum of radiological emergencies and provides guidance for establishing the emergency classification system. It provides examples of typical EALs associated with each emergency and guidance for establishing an EPZ. This standard is intended to be applicable to all research reactors. Research reactors that are not licensed by the NRC, such as those operated for the U.S. Department of Energy (DOE) will also find

this standard applicable. However, it is understood that more proscriptive guidance, for example, DOE Order 151.1C, *Comprehensive Emergency Management System*, provides more detail (DOE-specific) than is found in this standard.

The applicability of the emergency plan elements presented in this standard will vary from one research reactor facility to another depending upon the reactor power level and the potential radiological consequences that result from postulated events. The risk from credible radiological emergency situations at many research reactor facilities is usually minimal and may not require the application of all the emergency plan elements in this standard or the establishment of an EPZ.

This standard might reference documents and other standards that have been superseded or withdrawn at the time the standard is applied. A statement has been included in the reference section that provides guidance on the use of references.

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