Radiation Protection at Research Reactor Facilities

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4. the inquiry stated in a clear, concise manner;
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Foreword

(This foreword is not a part of American National Standard “Radiation Protection at Research Reactor Facilities,” ANSI/ANS-15.11-2016.)

In the fall of 1970, the American Nuclear Society Standards Committee established ANSI-15, Operation of Research Reactors, under the auspices of the N17 Consensus Committee, Research Reactors, Reactor Physics, Radiation Shielding, and Computational Methods, to provide needed standards for the operation, use, and regulation of research reactors. Since then, numerous standards have been developed, and several working groups have been established, among them ANSI-15.11.


Work on this standard began in November of 2013 and culminated in March of 2016 with approval by the Research and Advanced Reactor Consensus Committee. The current revision addresses applicable changes and provides directions on implementation, including meeting the objectives and principles of as-low-as-is-reasonably-achievable (ALARA) levels of radiation.

In preparing this standard, the intent has been to specify objectives that will achieve the following results:

1. Establish a comprehensive radiation protection program that deals with all matters involving radiation and radioactive materials at research reactors;
2. Limit exposures and releases to ALARA levels without seriously restricting the operation of existing reactors, inhibiting growth and upgrade, or discouraging the development of new research reactors;
3. Set a reasonably low activity level threshold, above which measurements will be required that will allow for the use of readily available instrumentation without resorting to extraordinary means.

In the process of creating standards with respect to existing and varied practices in many operating facilities, it is important to consider the following:

1. It is not intended that the standard be used as a demand model for backfitting purposes;
2. The standard can be a significant aid for existing and new owners or operators;
3. The standard can be helpful for a facility undergoing change or modification;
4. The standard’s considered use can assist in implementing regulatory requirements.

Prior to using the standard, individual facilities ought to carefully examine their license, permit, or other requirements for limiting conditions that might not be compatible with the
standard or new regulatory requirements and that might require change, amendment, or special authorization. Care also ought to be exercised in using appropriate units as might be specified by authorities.

The standard does not address certain conditions that do not occur or are known not to exist at research reactor facilities such as planned special exposures, facilities-specific public dose limits, and hot particle contamination. Individual facilities ought to address these issues, if needed, in their programs.

The family of American National Standards developed by ANS-15 for research reactors are the following:

- ANSI/ANS-15.7-1977 (R1986), “Research Reactor Site Evaluation” (withdrawn);
- ANSI/ANS-15.10-1994, “Decommissioning of Research Reactors” (withdrawn);
- ANSI/ANS-15.11-2016, “Radiation Protection at Research Reactor Facilities”;

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 “References” section that provides guidance on the use of references.

This standard does not incorporate the concepts of generating risk-informed insights, performance-based requirements, or a graded approach to quality assurance. The user is advised that one or more of these techniques could enhance the application of this standard.

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Radiation Protection at Research Reactor Facilities

1 Scope

This standard establishes the elements of a radiation protection program and the criteria necessary to provide an acceptable level of radiation protection for personnel at research reactor facilities and the public consistent with keeping exposures and releases as low as is reasonably achievable (ALARA).

2 Acronyms and definitions

2.1 Shall, should, and may

shall, should, and may: The word “shall” is used to denote a requirement; the word “should” is used to denote a recommendation; and the word “may” is used to denote permission, neither a requirement nor a recommendation.

2.2 List of acronyms

ALARA: as low as is reasonably achievable
ALI: annual limit on intake
DAC: derived air concentration
DAC-hour: derived air concentration-hour
ICRP: International Commission on Radiological Protection
ICRP 60: ICRP Publication 60
ICRP 103: ICRP Publication 103
ICRU: International Commission on Radiation Units and Measurements
LDE: lens dose equivalent
MQA: measurement quality assurance
NCRP: National Council on Radiation Protection and Measurements
NCRP 91: NCRP Report No. 91
NRC: U.S. Nuclear Regulatory Commission
NVLAP: National Voluntary Laboratory Accreditation Program
TEDE: total effective dose equivalent
TLD: thermoluminescent dosimeter