

American Nuclear Society

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**criteria for assessing atmospheric
effects on the ultimate heat sink**

an American National Standard

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**American National Standard
Criteria for Assessing Atmospheric
Effects on the Ultimate Heat Sink**

Secretariat
American Nuclear Society

Prepared by the
**American Nuclear Society
Standards Committee
Working Group ANS-2.21**

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Foreword

(This Foreword is not a part of American National Standard “Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink,” ANSI/ANS-2.21-2012.)

Code of Federal Regulations, Title 10, “Energy,” Part 50, “Domestic Licensing of Production and Utilization Facilities” (10 CFR 50), Appendix A, “General Design Criteria for Nuclear Power Plants,” Criterion 44, “Cooling Water,” requires suitable redundancy in the cooling water system features of nuclear power plants to ensure that its safety function is accomplished. 10 CFR 50, Appendix A, Criterion 2, “Design Bases for Protection Against Natural Phenomena,” requires that systems, structures, and components important to safety be designed to withstand the effects of natural phenomena without loss of capability to perform its safety function. The redundancy features of the cooling water system of nuclear power plants are referred to as the ultimate heat sink. The ultimate heat sink is the complex of water sources, including necessary retaining structures (e.g., a pond or river with its dam), and the canals or conduits connecting the sources with, but not including, the cooling water system intake structures for a nuclear power unit. The sink constitutes the source of essential service water supply necessary to safely operate, shut down, and cool down a nuclear plant.

There is a need to provide consistency to calculations of atmospheric effects to ultimate heat sinks at nuclear facilities. Existing regulatory guidance (i.e., Regulatory Guide 1.27, “Ultimate Heat Sink for Nuclear Power Plants”) is dated (1970s vintage) and does not provide guidance on how to calculate effects to ultimate heat sinks using atmospheric parameters.

This standard establishes criteria for use of meteorological data collected at nuclear facilities to evaluate the atmospheric effects from meteorological parameters [e.g., dry-bulb temperature/wet-bulb temperature differential, precipitation, wind speed, short wave radiation, incoming solar (i.e., short wave) radiation, surface water temperature, and atmospheric pressure] on ultimate heat sinks.

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.

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