

ASME/ANS RA-S-2008
(Revision of ASME RA-S-2002)

Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**



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CONTENTS

Foreword	iv
Preparation of Technical Inquires to the Committee on Nuclear Risk Management	v
Committee Roster	vi
Preface	viii
PART 1 LEVEL 1 AND LERF PROBABILISTIC RISK ASSESSMENT GENERAL REQUIREMENTS	1
Section 1-1 Introduction	1
Section 1-2 Acronyms and Definitions	7
Section 1-3 Risk Assessment Application Process	20
Section 1-4 Risk Assessment Technical Requirements	26
Section 1-5 PRA Configuration Control	28
Section 1-6 Peer Review	29
Section 1-7 References	31
Section 1-8 For Further Reading	32
Nonmandatory Appendix	
1-A PRA Maintenance, PRA Upgrade, and the Advisability of Peer Review	33
PART 2 INTERNAL EVENTS AT POWER PROBABILISTIC RISK ASSESSMENT REQUIREMENTS	39
Section 2-1 Risk Assessment Technical Requirements for Internal Events at Power	39
Section 2-2 Peer Review for Internal Events at Power	119
Section 2-3 References	121
PART 3 FIRES AT POWER PROBABILISTIC RISK ASSESSMENT REQUIREMENTS	122
Section 3-1 Risk Assessment Technical Requirements for Fire Events at Power	122
Section 3-2 Peer Review for Fire PRA at Power	186
Section 3-3 References	189
Nonmandatory Appendix	
3-A FPRA Methodology	190
PART 4 EXTERNAL EVENTS AT POWER PROBABILISTIC RISK ASSESSMENT REQUIREMENTS	205
Section 4-1 Risk Assessment Technical Requirements for External Events at Power	205
Section 4-2 Peer Review for External Events at Power	273
Section 4-3 Documentation Requirements for External Events at Power	275
Section 4-4 References	276
Nonmandatory Appendices	
4-A List of External Events Requiring Consideration	280
4-B Seismic Probabilistic Risk Assessment Methodology: Primer	283
4-C Seismic Margin Assessment Methodology: Primer	288
4-D Seismic Margin Assessment Applications Guidance, Including Seismic Margin Assessment With Enhancements	295
PART 5 LOW POWER AND SHUTDOWN PRA	N/A
[To be supplied]	N/A



FOREWORD

The ASME Board on Nuclear Codes and Standards (BNCS) and American Nuclear Society (ANS) Standards Board mutually agreed in 2004 to form a Nuclear Risk Management Coordinating Committee (NRMCC). This committee was chartered to coordinate and harmonize Standards activities related to probabilistic risk assessment (PRA) between the two Standards development organizations (SDO). A key activity resulting from NRMCC was the development of PRA Standards structured around the Levels of PRA (i.e., Level 1, Level 2, Level 3) to be jointly issued by the two societies.

The scope of the initial issue of the ASME RA-S standard included Level 1 and Large Early Release Frequency (LERF) for internal events at power. In parallel with the development of ASME RA-S, ANS was developing companion PRA Standards covering external events, internal fire, and low power and shutdown conditions. These Standards are ANSI/ANS-58.21–2003, ANSI/ANS-58.23–2007, and ANS-58.22 (in development), respectively. ANS-58.22 will be added once it is approved as a revision or addendum. The three existing Standards are assembled together as a revision to ASME RA-S. Consequently, this revision to ASME RA-S is being issued with the revised identity of ASME/ANS RA-S–2008.

A major objective of the combined Standard is to ensure consistency in format, organization, language, and level of detail of the Standard. In assembling the component Standards the following criteria were used:

- (a) the requirements in the Standards would not be revised or modified
- (b) no new requirements would be included
- (c) the numbering scheme of the technical requirements would be preserved
- (d) the common requirements across the Standards would be consolidated into a single place
- (e) the commentary and nonmandatory requirements would be retained

Implementation of the consensus process for this Standard revealed that preserving the exact same requirements from the component Standards created certain technical issues that will need to be addressed in a revision or addendum of ASME/ANS RA-S–2008.

During the development of the ASME RA-S and the ANS companion, titled PRA Standards for Internal Fires, External Events, and Low Power and Shutdown Conditions, concerns were raised by stakeholder organizations and SDOs with respect to stability and consistency in requirements between the Standards. Thus, a key objective of this Standard is to improve consistency and foster stability by enabling future changes to be applied across the various PRA scopes that previously existed as separate Standards. It is anticipated that efficiencies and improvements will result from maintaining, interpreting, and implementing one PRA Standard as opposed to four separate Standards. Additionally, the identification of common processes in general requirements sections for such areas as PRA configuration control, peer review, maintenance versus upgrade, and use in risk-informed applications can now be provided, which further supports consistency and stability. Using a single committee responsible for this Standard provides a single point of response to inquiries and places the expertise necessary to address and coordinate activities in a single cognizant group supported by responsible technical societies. In addition, this Standard is intended to determine the technical adequacy of a PRA such that the PRA can be used in decision making.

The Committee on Nuclear Risk Management (CNRM) operates under procedures accredited by the American National Standards Institute (ANSI) as meeting the criteria of consensus procedures for American National Standards. The initial Standard was approved by the ASME Board on Nuclear Codes and Standards and subsequently approved by ANSI on April 9, 2008.

CNRM is responsible for ensuring that this Standard is maintained and revised as necessary following its original publication. This includes appropriate coordination with and linkage to other Standards under development for related risk-informed applications.



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