



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

January 12, 2018

MEMORANDUM TO: Houman Rasouli, Branch Chief
Performance and Reliability Branch
Division of Risk Analysis
Office of Nuclear Regulatory Research

FROM: Anders Gilbertson, Reliability and Risk Analyst */RA/*
Performance and Reliability Branch
Division of Risk Analysis
Office of Nuclear Regulatory Research

SUBJECT: PUBLIC MEETING ON PROPOSED SCREENING CRITERIA
AND DEFINITIONS OF RISK-SIGNIFICANCE FOR THE NEXT
EDITION OF THE AMERICAN SOCIETY OF MECHANICAL
ENGINEERS AND AMERICAN NUCLEAR SOCIETY
LEVEL 1/LARGE EARLY RELEASE FREQUENCY
PROBABILISTIC RISK ASSESSMENT STANDARD

On November 17, 2017, the Nuclear Regulatory Commission (NRC) staff held a public meeting to discuss the proposed screening criteria and definitions of risk significance for the next edition of the American Society of Mechanical Engineers (ASME) and American Nuclear Society (ANS) Level 1/Large Early Release Frequency (LERF) probabilistic risk assessment (PRA) standard. External stakeholder participants included representatives from the ASME/ANS Joint Committee on Nuclear Risk Management (JCNRM), the Pressurized-Water Reactor Owners Group, the Nuclear Energy Institute, Arizona Public Service, NuScale Power, Dominion Energy, and Scientech. The meeting announcement and agenda was made publicly available on November 9, 2017, in the NRC's Agencywide Document Access and Management System (ADAMS) under accession number ML17320B104. The following is a summary of the presentations and discussions that occurred.

Members of the ASME/ANS JCNRM gave a presentation to provide contextual information on the development of a screening criteria table and revised definitions of terms related to risk-significance that are proposed for the next in edition of the ASME/ANS Level 1/LERF PRA standard. The NRC staff provided the following points of feedback.

Regarding the Proposed Screening Criteria Table

- Additional clarification should be provided regarding the application of the cumulative screening criterion. As written, the cumulative screening criterion can be interpreted as applying only to the total risk of screened items for a specific type of risk contributor. However, the cumulative screening criterion value should be applied to the total combined risk of all types of screened PRA items (i.e., hazard groups, initiating events,

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accident sequences, etc.). The logical scheme for applying the screening criteria within the context of screening a given PRA item and across the entire PRA screening analyses as a whole should be explicitly described both in the narrative text preceding the screening criteria table and in the table itself.

- It is important for users of the PRA standard to consider that some PRA items screened out of the base PRA may need to be included in the PRA model for a specific risk-informed regulatory activity. Additionally, the suitability of the screening criteria needs to be assessed for all applications. For example, the suitability of the accident sequence screening criteria should be assessed as applied in self-approval applications related to National Fire Protection Association (NFPA) standard NFPA 805.
- Consistency between the screening values across the different types of PRA items should be confirmed to ensure that screening under one type of PRA item is not substantially more permissive than another.
- A clear objective basis for determining whether an analysis is demonstrably conservative should be provided in the standard given the pervasive use of that qualifier and the reliance on that characterization to screen out PRA items.
- Regarding the accident sequence screening, Column (c) includes the phrase “exceeds this screening criterion;” however, the screening criterion that the pronoun “this” is referring to needs to be clarified. Additionally, it should be made clear how one would determine that group of sequences has similar characteristics.
- A non-mandatory appendix would be very helpful for providing the thinking behind and context for the proposed screening criteria framework.

Regarding the Revised Definitions of Terms Related to Risk-Significance

- The revised definitions should be supplemented with additional discussion as they are currently highly subjective and could preclude identification of potentially risk significant equipment or actions. For example, objective definitions of the terms “realistic” and “insight” should be provided to give a more complete understanding of whether a structure, system, or component or action is potentially risk significant. As another example, when considering two cut sets that provide the same risk insight but have different frequencies, the lower frequency cut set may be considered not to be risk-significant when it otherwise should be.
- The revised definitions of risk-significance are based largely on the level of analysis that has been performed for a given contributor (i.e., a realistic representation), which could cause risk-significant PRA items not to be identified. For example, a contributor that is intentionally represented in the PRA in a conservative manner may not be characterized as risk-significant by virtue of the fact that the contributor was not realistically represented.
- In general, risk-significance should be assessed quantitatively to provide a more objective basis for potential screening of PRA items. For example, the revised definitions could focus more on using different quantitative values of risk-importance measures (e.g., Fussell-Vesely, risk achievement worth) based on the characteristics of the overall risk profile (e.g., peaky versus flat profile).

- Given the subjective nature of the definitions related risk-significance, supporting requirements may need to be revised to include requirements on providing justification for PRA items that are judged not to be risk-significant.

Enclosures:

1. List of Meeting Attendees
2. Meeting Presentation (ADAMS Accession No. ML17320A207)
3. Handout on Screening Criteria (ADAMS Accession No. ML17320A208)

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ADAMS Accession No.: ML18011A396

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NAME	A. Gilbertson	H. Rasouli <i>(A. Gilbertson for)</i>
DATE	01/12/18	01/12/18

OFFICIAL RECORD COPY

LIST OF ATTENDEES

Public Meeting to Discuss Proposed Screening Criteria and Definitions of Risk-Significance for
the Next Edition of the ASME/ANS Level 1/LERF PRA Standard

November 17th, 2017 9:00 a.m. – 12:00 p.m.
Two White Flint North, Room 06A01
11545 Rockville Pike, Rockville, MD

<u>Name</u>	<u>Organization</u>
Mary Drouin	NRC/RES/DRA
Eryk Tunshi	NRC/RES/DRA
Hiroki Watanabe	NRC/RES/DRA
Kevin Coyne	NRC/RES/DRA
Anders Gilbertson	NRC/RES/DRA
Michelle Hayes	NRC/NRO/DSRA
Tony Nakanishi	NRC/NRO/DSRA
Courtney St. Peters	NRC/NRR/DRA
Sara Lyons	NRC/NRR/DRA
JS Hyslop	NRC/NRR/DRA
Shilp Vasavada	NRC/NRR/DRA
Mehdi Reisi Fard	NRC/NRR/DRA
Tom Hook	Arizona Public Service
Paul Amico	ASME/ANS JCNRM
Raymond Schneider	ASME/ANS JCNRM
Robert Budnitz	ASME/ANS JCNRM
Allen Moldenhauer	Dominion Energy
Victoria Anderson	Nuclear Energy Institute
Kevan Griffith	NuScale Power
Cindy Williams	NuScale Power
Roy Linthicum	PWROG
Jana Bergman	Scientech

ASME = American Society of Mechanical Engineers

ANS = American Nuclear Society

DRA = Division of Risk Analysis (RES)/Division of Risk Assessment (NRR)

DSRA = Division of Safety Systems, Risk Assessment, and Advanced Reactors

JCNMR = Joint Committee on Nuclear Risk Management

NRO = Office of New Reactors

NRR = Office of Nuclear Reactor Regulation

PWROG = Pressurized-Water Reactor Owners Group

RES = Office of Nuclear Regulatory Research