

JCNRM BRIEFING ON APPROACH TO SCREENING AND RISK-SIGNIFICANCE IN NEXT EDITION OF RA-S-1.1

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Preface

There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things.

*Niccolo Machiavelli,
political philosopher and historian*



Introduction

- Addressing two consistency cross-cutting issues.
- Initial proposals developed by two small project teams.
- Initial comments from various JCNRM members, NRC, and others received and considered.
- Many future opportunities for comment during upcoming ballot process.
- Disclaimer – Presentation is as a representative of the JCNRM, not any other organization.



Discussion #1 - Screening

Issues

- The general approach to screening has been inconsistent – the concepts and types of criteria differ from Part to Part (and even TE to TE).
- The specific screening criteria (e.g., numerical screening values) are inconsistent.
- The absolute screening values used do not reflect the current CDF and LERF values given industry risk reduction efforts.
- One issue NOT addressed – the use of the word “screening” for both screening out and simplified analyses (i.e., screening values).



Discussion #1 - Screening

Overall Goals

- Allow applicability of common structure across standard with common goals
- Allow use for plants with high and low risk levels
- Allow qualitative and quantitative screening
- Criteria decreases based on hierarchy of impact and granularity
- Allow some degree of flexibility



Discussion #1 - Screening

SEE HANDOUT



Discussion #2 – Risk Significant

- Issue
 - The SRs sometimes refer to significant “x” and sometimes refer to risk-significant “x”.
 - Most of the time we really mean risk-significant, but the definitions are for significant.
 - Occasionally we don’t mean risk-significant, but how can you tell if the words are the same?
 - The definitions were really written for internal events, and do not always work for other hazards.
 - Result is that different Parts struggle with “defining” risk significant with the part.

Discussion #2 – Risk Significant

- General Approach
 - The SRs will always refer to risk-significant “x” when that is what is meant.
 - SR will not try to define what that means – simply state what the requirement is for risk-significant “x”.
 - Small (but broad) JCNRM team has re-written definitions for risk-significant “x” with sufficient specificity and flexibility to fit all needs.
 - The use of “significant” will be retained where appropriate.

Discussion #2 – Risk Significant

- Typical Change
 - Before: In support system modeling, **USE** realistic success criteria and timing for significant contributors.
 - After: In support system modeling, **USE** realistic success criteria and timing for *risk*-significant contributors.

Discussion #2 – Risk Significant

- Typical No Change:
 - Before *and* after: JUSTIFY the specified lower-bound magnitude (or probabilistically defined characterization of magnitudes based on a damage parameter) for use in the hazard analysis, such that earthquakes of magnitudes less than this value are not expected to cause significant damage to the engineered structures or equipment.

Discussion #2 – Risk Significant

- *risk-significant accident sequence*: an accident sequence whose characteristics, when realistically represented in the PRA, enable the identification of risk insights and development of the overall risk profile of the plant (i.e., to understand the relative importance of the accident sequence versus other accident sequences).
- *risk-significant accident progression sequence*: an accident progression sequence whose characteristics, when realistically represented in the PRA , enable the identification of risk insights and development of the overall risk profile of the plant (i.e., to understand the relative importance of the accident progression sequence versus other accident progression sequences).
- *risk-significant basic event*: a basic event whose probability, when realistically represented in the PRA, enables the identification of risk insights and development of the overall risk profile of the plant.

Discussion #2 – Risk Significant

- *risk-significant containment challenge: a containment challenge that results in a containment failure mode that is represented in a risk-significant accident progression sequence.*
- *risk significant contributor: a contributor to the PRA risk enables understanding of the risk insights and overall risk profile of the plant (i.e., if the contributor is not identified and understood, an important risk insight would be missed). This definition applies to the use of “risk-significant” to describe any item not otherwise specifically defined in this section.*
- *risk-significant cutset: a cutset enables understanding of the risk insights and overall risk profile of the plant (i.e., the insight would not be identified through higher frequency cutsets if this cutset was not present).*

Discussion #2 – Risk Significant

- *risk significant equipment: equipment associated with a significant basic event. (See also risk-significant basic event.)*
- *risk significant SSC: an SSC whose functions and characteristics, when realistically represented in the PRA, enable the identification of risk insights and development of the overall risk profile of the plant (i.e., to understand the relative importance of the SSC versus other SSCs).*
- Whenever a specific definition does not exist, the SR should take the form “...a [item] that is a risk-significant contributor [or basic event]...”. Examples,
 - There is no definition for risk-significant HFE, so an SR would refer to “an HFE that is a risk-significant basic event.”
 - There is no definition for risk-significant containment failure mode, so an SR would refer to “a containment failure mode that is a risk-significant contributor.”

Conclusion

- These are consistency issues that need to be addressed.
- The current status is that these are proposals to give a starting point for the review of the next edition.
- They will be subject to multiple rounds of review during the balloting process.

Closing

After you've done a thing the same way for two years, look it over carefully. After five years, look at it with suspicion. And after ten years, throw it away and start all over.

*Alfred Perlman,
railroad executive*

