

NRC staff comments on NEI 24-11, Rev 1 “Fire Brigade Staffing Analysis for Advanced Reactor Technology”

These questions and comments are to support discussion during a public meeting with the Nuclear Energy Institute (NEI) to discuss NEI 24-11, Revision 1, “Fire Brigade Staffing Analysis for Advanced Reactor Technology”.

Comment Number	Section	Question / Comment
1	General	The staff would like to discuss the envisioned analysis steps for a successful implementation of the NEI 24-11 process. For example, is NEI 24-11 intended to get an applicant to a complete fire response methodology? What methodologies do the authors anticipate to address the various evaluation questions? A worked example for each step would be useful.
2	General	The staff would like to discuss how the NEI 24-11 process would work for a microreactor applicant, with a focus on differences from the process for a larger advanced reactor. For example, a microreactor installed on an exterior concrete pad does not have traditional fire areas with rated barriers and may not have any systems that can be protected in the conventional sense.
3	General	<p>The staff would like to discuss the interplay between the Enhanced Fire Protection Criteria (documented in RG 1.189 Section C.8) and the NEI 24-11 process.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• It is unclear to the staff what “equipment important to safety” means in the context of the enhanced fire protection criteria.</li> <li>• For a plant that meets the enhanced fire protection criteria, it appears that much of the detailed analysis described in section 5.2, “Fire Hazards and the Potential for Fire Hazards to Rapidly Grow and Damage Systems Important to Safety,” may be unnecessary because no SSCs needed to safely shut the plant down could be targets as described in this section because they would be located in a separate fire area.</li> </ul>
4	6.2.3	The staff would like to discuss the applicability of data collected from the current fleet to designs where the basic conditions differ (for example, staffing levels may be significantly lower at an advanced reactor, and this influences the timing of when a particular fire would be detected and likelihood that an incipient fire brigade would be able to extinguish it). How can the conclusion in section 6.2.3, under the question “Is the fire expected to be identified in the incipient stage?” be justified using data that does not appear to reflect the conditions at the plant?

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5	3.1.3	Regulatory Guide (RG) 1.189, “Fire Protection for Nuclear Power Plants”, is listed in section 3.1 (Fire Protection Program Regulatory Requirements). RG 1.189 is not a regulatory requirement and should be listed in Section 3.2 (NRC Fire Protection Guidance for Power Reactors).
6	3.1	RG 1.232, “Principal Design Criteria for Non-Light-Water Reactors”, is listed in section 3.1 (Fire Protection Program Regulatory Requirements). RG 1.232 is not a regulatory requirement and should be listed in Section 3.2 (NRC Fire Protection Guidance for Power Reactors).
7	3.3	Consider adding a note that indicates ANSI/ANS 15.17, “Fire Protection Program Criteria for Research Reactors” has been withdrawn and may contain outdated information.
8	6.2.1	<p>As a comment on how the eventual endorsement may be qualified:</p> <p>This section contains the statement: “Given that meeting this goal [the enhanced fire protection criteria for advanced reactors] is a prerequisite for the design, radiological release is not postulated due to fire damage.”</p> <p>Because the enhanced criteria requires that there is a success path somewhere outside the fire area that is free of fire damage, therefore assuring safe shutdown, the staff does not object to this statement with respect to <b>deterministic</b> space for the purposes of the fire response evaluation, provided that a thorough post-fire safe shutdown analysis is successfully performed, including consideration of associated circuits, multiple spurious operations, and other circuit analysis. However, this is not the case in <b>probabilistic</b> space, and every plant is expected to have a non-zero Core Damage Frequency (CDF) and Large Early Release Frequency (LERF), or design-specific equivalent metrics.</p>