DESIGN CERTIFICATION/COMBINED LICENSE
DC/COL-ISG-028

Assessing the Technical Adequacy of the Advanced Light-Water Reactor Probabilistic Risk Assessment for the Design Certification Application and Combined License Application

Interim Staff Guidance

November 2014

(For Use and Comment)

**Interim Staff Guidance on Assessing the Technical Adequacy of the
Advanced Light-Water Reactor Probabilistic Risk Assessment for the
Design Certification Application and Combined License Application
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Issuance Status

For Use and Comment

Purpose

The purpose of this document is to provide interim staff guidance (ISG) for assessing the technical adequacy of the probabilistic risk assessment (PRA) needed for an application for design certification (DC) of an advanced light-water reactor (ALWR) under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," specifically 10 CFR 52.47(a)(27), as well as an application for a combined license (COL) under to 10 CFR 52.79(a)(46). Specifically, this guidance addresses how these applicants can use American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) RA-Sa-2009, "Addenda to ASME/ANS RA-S-2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," (the PRA Standard), as endorsed by Regulatory Guide (RG) 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities."

This guidance is needed because the PRA Standard was developed based on current operating reactors. As a result, for PRAs developed for the DC and COL application stages, some supporting requirements in the PRA Standard are not applicable or cannot be achieved, while other supporting requirements need some clarification to understand how they can be achieved.

Background

The staff developed this guidance by first evaluating the applicability of the supporting requirements of the PRA Standard to PRAs developed for the DC and COL application stages. Then the staff evaluated the feasibility of meeting the applicable supporting requirements at the Capability Category I level.[1] For the applicable supporting requirements that needed some clarification, the staff developed guidance for addressing these supporting requirements at the Capability Category I level. This will ensure that the PRA relied on by the applicant is sufficient to provide confidence in the results and risk insights.

This guidance supplements RG 1.200 as an acceptable approach to demonstrate that the PRA used by the DC or COL applicant has a sufficient level of technical adequacy to support

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[1] The PRA Standard distinguishes the "capability" of the PRA using three categories. The delineation of the Capability Categories within the supporting requirements is generally, but not exclusively, that the degree of scope and level of detail, the degree of plant-specificity, and the degree of realism increase from Capability Category I to Capability Category III. In very general terms the Capability Categories can be considered to progress from "less detailed, more generic" (Capability Category I) to "state-of-practice," Capability Category II) to "state-of-art" (Capability Category III).

certification and licensing of reactors under 10 CFR Part 52. This interim guidance document is intended to provide the staff's position on using the PRA Standard for the DC and COL application until the guidance can be incorporated in a future revision of RG 1.200 and associated staff guidance, such as Section 19.0, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP Section 19.0) and Section C.I.19, "Probabilistic Risk Assessment and Severe Accident Evaluation" of RG 1.206, "Combined License Applications for Nuclear Power Plants."

This guidance only addresses the typical conditions for the DC and COL application. For example, the guidance is based on the expectation that DC applicants addressing the 10 CFR 52.47(a)(27) requirement will not have site-specific information, while the COL applicant addressing the 10 CFR 52.79(a)(46) requirement will have site-specific information. Applicants are also not expected to have detailed design and operational information, such as cable routing information, operating and maintenance procedures, and design-specific or plant-specific operating experience and data. If an applicant has more detailed information, this enhanced capability should be reflected in its PRA and application.

The positions presented in this guidance should not be relied on to address other types of applications that use PRA results and insights (e.g., risk-informed inservice inspections) or to address PRA requirements for COL holders/licensees (e.g., 10 CFR 50.71(h)(1)). Rather, such applications need to directly address the application-specific regulations and guidance, including the evaluation of the technical adequacy of the PRA needed for the specific application using the PRA Standard, as endorsed by RG 1.200.

Rationale

The following regulations explicitly require the development and/or update of a PRA for a DC or COL application under 10 CFR Part 52:

> **10 CFR 52.47(a)(27)** requires applicants for a DC under 10 CFR Part 52 to provide a description of the design-specific PRA and its results.

> **10 CFR 52.79(a)(46)** requires applicants for a COL under 10 CFR Part 52 to provide a description of the plant-specific PRA and its results.

> **10 CFR 52.79(d)(1)** requires COL applications that reference a standard DC to provide an update of the DC PRA information to account for site-specific design information and any design changes or departures.

> **10 CFR 52.79(e)(1)** requires COL applications that reference a manufactured nuclear power reactor licensed under subpart F of 10 CFR Part 52 to provide an update of the PRA information for the manufactured reactor to account for site-specific design information and any design changes or departures.

The staff review guidance for the DC and COL application PRA will be contained in Revision 3 of SRP Section 19.0. The technical changes to be incorporated in Revision 3 of SRP Section 19.0 include:

1.   guidance previously contained in Interim Staff Guidance DC/COL-ISG-003, "Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications," concerning the review of PRA information and severe accident assessments submitted to support the DC and COL applications,

2.   guidance previously contained in Interim Staff Guidance DC/COL-ISG-020, "Seismic Margin Analysis for New Reactors Based on Probabilistic Risk Assessment," concerning the review of information from the PRA-based seismic margin analysis (SMA) submitted in support of the DC and COL applications,

3.   guidance previously contained in Interim Staff Guidance DI&C/COL-ISG-003, "Interim Staff Guidance on Review of New Reactor Digital Instrumentation and Control Probabilistic Risk Assessments," concerning the review of digital instrumentation and control system PRA models

4.   additional guidance for the review of the PRA information and severe-accident assessments developed during the NRC reviews of DC and COL applications completed after Revision 2 of SRP Section 19.0 was issued.

Typically, the means for endorsing standards related to the technical adequacy of PRAs is provided by RG 1.200, which currently endorses ASME/ANS RA-Sa-2009 with a number of qualifications and clarifications. The guidance in RG 1.206, Section C.I.19.5, states that the applicant should adhere to the recommendations provided in RG 1.200. In addition, SRP Section 19.0 states that the staff will determine that the technical adequacy of the PRA is sufficient to justify the specific results and risk insights that are used to support the DC or COL application. It further refers to RG 1.200 for ensuring that an applicant's PRA is consistent with the prevailing PRA Standard, guidance, and good practices. Finally, Regulatory Issue Summary 2007-06, "Regulatory Guide 1.200 Implementation," dated March 22, 2007, states that PRAs required per 10 CFR Part 52 should use NRC-endorsed consensus standards to the extent practicable.

The current version of RG 1.200 was developed based on currently operating light-water reactor designs and does not specifically address how to apply the PRA Standard to an ALWR DC or COL application. The next revision of RG 1.200 is expected to be issued following the development of the next edition of the PRA Standard, which is not expected to be completed for a number of years. This guidance has been developed to convey the staff position on the use of the PRA Standard for an ALWR DC or COL application until these positions are reflected in the next revisions of RG 1.200, RG 1.206, and SRP Section 19.0, as appropriate.

Issue Discussion

The regulatory requirements and current guidance documents discussed establish a basis for demonstrating the technical adequacy of a PRA. This basis is primarily documented in RG 1.200; with staff review guidance associated with the DC and COL application in SRP Section 19.0. However, the PRA Standard and other PRA-related guidance documents endorsed by RG 1.200 were developed for currently operating nuclear power plants that have decades of operating experience. As a result, many supporting requirements assume that plant-specific operating experience and guidance are available to the PRA analyst, such as plant-specific equipment performance data, operators and trainers with plant-specific

experience, and plant-specific procedures. Many of the supporting requirements refer to the plant-specific experience and documents directly instead of using more general terms for experience and operational guidance. This approach is also reflected in a number of supporting requirements that discuss "plant-specific" features, when the purpose of the supporting requirement is to address design or site features. Ambiguity is created in the application of these supporting requirements to ALWR designs when developing and submitting a DC or COL application. In addition, for an ALWR design at the DC or COL application stage, there are other challenges to developing, documenting, and reviewing a PRA in ways consistent with the PRA Standard because of the status of the site, design, operational, and maintenance information and data. Specific challenges for the PRA developed for the DC or COL application include:

- DC applications do not include site-specific information related to site features and characteristics.

- The events/hazards screening criteria in the PRA Standard can be orders of magnitude above the total plant risk because the improved safety of ALWR designs, potentially results in screening significant risk contributors (relative to total plant risk) from the analysis.

- The specific layouts and routing of cabling and equipment and the capability of the equipment might not be fully known.

- There is no plant-specific operating experience and data.

- There is no plant-specific operating guidance (e.g., procedures, maintenance practices, testing frequencies, and equipment realignment frequencies).

- There are no trainers or operations staff with plant-specific experience to support interviews, reviews, or assessments.

- Walkdowns cannot be performed to confirm information and/or identify site-specific and plant-specific conditions.

- Uncertainties associated with the PRA are greater because of the lack of plant-specific information and experience, as identified above, and these additional uncertainties might affect other risk-informed applications of the PRA.

In turn, the above challenges create additional review and risk-informed application challenges. For example, the lack of specific knowledge and experience with a new reactor design, beyond the design organization, creates challenges associated with the ability to perform "peer reviews" that are fully consistent with the PRA Standard guidance.

Interim Staff Guidance

This section discusses how the PRA Standard should be used in determining the technical adequacy of the PRA for the DC application and COL application and addresses:

- PRA scope and capability
- PRA configuration control
- peer reviews
- operational guidance and practices
- large-release frequency (LRF)

In addition, this section includes a summary table that identifies, for each of the challenges presented above, the affected supporting requirements and the associated staff position on how the challenges should be addressed. Further, this section provides detailed tables that parallel each numbered Part of the PRA Standard containing the individual supporting requirements. The detailed tables address each supporting requirement, including clarifications and comments, for the DC application and COL application, as appropriate.

Scope and Capability of PRA for DC Application and COL Application

The first issue to discuss is the scope and capability of the PRA for the DC application and COL application. Consistent with SRP Section 19.0, meeting the applicable supporting requirements for Capability Category I and the high-level requirements in the PRA Standard should generally be sufficient for achieving a PRA scope and capability that is acceptable for the DC and COL applications. The vast majority of the supporting requirements through Part 5 of the PRA Standard explicitly address Capability Category I. There are a few situations in which no action is required to achieve Capability Category I. In some cases, not taking an action is conservative (e.g., not crediting recovery actions) and acceptable. In other cases, not taking the action is not necessarily conservative or appropriate for an ALWR DC application or COL application (e.g., not limiting the use of expert judgment) and the supporting requirement should be addressed in a way consistent with the Capability Category II level (or Capability Category III if no actions are required in Capability Category II either). These specific situations are identified in the detailed tables that address the individual supporting requirements.

Further, Part 6 of the PRA Standard addresses screening and conservative analysis for external hazards other than internal fire and seismic events. This part is followed by specific guidance for high winds (Part 7), external floods (Part 8), and other hazards (Part 9). The supporting requirements in Part 9 parallel the supporting requirements in Part 7 (high winds) and Part 8 (external floods), and is the general approach to addressing external hazards other than internal fires (of Part 4) and seismic events (of Part 5). Part 9 recognizes that a simplified and/or conservative approach might be appropriate in achieving Capability Category I for other hazards. The staff notes that Parts 7 and 8 do not define supporting requirements for Capability Category I in most cases; because they assume that if a hazard group passed through the Part 6 screening the user would need to perform the analysis to achieve Capability Category II. This assumption is generally acceptable for current operating reactors that use the PRA Standard for voluntary risk-informed licensing actions, because these applications typically require the PRA to address the supporting requirements at Capability Category II. However, this assumption need not be a restriction for ALWRs. For the PRA required for the DC application and COL application, it is acceptable to address the PRA Standard supporting requirements at the Capability Category I level. Therefore, if it is necessary to address these hazards, DC and COL application PRAs should use the more generally applicable supporting requirements in Part 9 for achieving Capability Category I. These supporting requirements augment the development and technical adequacy evaluation of PRAs for high winds (Part 7) and external flood (Part 8). The approach each application should use for addressing the

specific supporting requirements of each of these parts of the PRA Standard is provided in the detailed tables in this guidance.

Part 10 of the PRA Standard addresses SMA. The NRC explicitly states in RG 1.200 that this part of the PRA Standard is not endorsed by the NRC. For the DC and COL application PRAs, the staff has accepted the PRA-based SMA approach, which is described in Interim Staff Guidance DC/COL-ISG-020 and SRP Section 19.0. The PRA-based SMA approach uses the framework of Part 5 of the PRA Standard, but uses values for the seismic capacity of structures, systems, and components for which there is high confidence of low probability of failure (referred to as the HCLPF values). The PRA-based SMA model is quantified to derive a plant-level HCLPF. This is in contrast to using failure probabilities (with uncertainty distributions) to calculate a seismic core damage frequency (CDF) or LRF. That being the case, the staff position is that DC or COL applicants should not use Part 10 of the PRA Standard in the development or review of their PRA-based SMA. Rather, the DC or COL applicant should use the guidance contained in Interim Staff Guidance DC/COL-ISG-020 and SRP Section 19.0 for developing and reviewing the PRA-based SMA. Therefore, this guidance does not evaluate the specific supporting requirements of Part 10.

PRA Configuration Control

The applicant's configuration control program should be consistent with Section 1-5 of the PRA Standard, as endorsed by RG 1.200, which includes the following elements:

1. a process for monitoring PRA inputs and collecting new information

2. a process that maintains and upgrades the PRA to be consistent with the as-built, as-operated plant

3. a process that ensures that the cumulative impact of pending changes is considered when applying the PRA

4. a process that maintains configuration control of computer codes used to support PRA quantification

In addressing element 2 above for the DC and COL application, the PRA configuration control program addresses the "as-to-be-built" and "as-to-be-operated" plant, based on the available design, operational, and procedural information and guidance. The applicant's PRA configuration control program should include guidance addressing when the PRA needs to be updated and/or upgraded consistent with the regulations and the PRA Standard. In particular, the PRA configuration control program should include guidance on addressing design or plant conditions that differ from the PRA model consistent with elements 2 and 3 above, such as identified by design, site, or plant-specific change evaluations.

Peer Reviews or Self Assessments

As stated in SRP Section 19.0, the applicant must justify why the PRA is adequate in terms of scope, level of detail, and technical acceptability. While RG 1.200 contains the staff's guidance concerning peer reviews, SRP Section 19.0 states that the DC application's PRA is not required to have a peer review. SRP Section 19.0 further states that if a peer review or self-assessment

is conducted before the application, the staff should examine the documented results of the review. If certain aspects of the PRA deviates from accepted good practices, then the applicant should justify that the deviations do not impact the PRA results or risk insights. Otherwise, the applicant needs to correct incorporate accepted good practices in the PRA and resubmit the PRA results and risk insights.

The staff recognizes that when the applicant seeks an independent assessment of the technical adequacy of its PRA for the DC or COL application, the independent review team will likely not have specific knowledge of all aspects of the design in detail, but should have familiarity with the general design and operating philosophy based on the design and operating guidance available for that stage. In addition, the review documentation should identify any limitations associated with the review that would impact risk-informed applications due to the status of the design, site, operational, and maintenance information or data.

Addressing Operational Guidance and Practices

As stated previously, the current regulatory guidance for demonstrating the technical adequacy of a PRA for use in risk-informed decision-making, as documented in RG 1.200, was developed based on current operating reactors that have decades of operating experience. As a result, many of the supporting requirements in the PRA Standard refer directly to using plant-specific guidance (e.g., plant-specific procedures and operating practices) in developing various aspects of the PRA. For the ALWR designs at the DC and COL application stages, this plant-specific guidance might not exist. In these cases, the applicant should develop the PRA based on general design and operational guidance and general industry practices, doing so meets the objective of the PRA Standard's supporting requirements is met by using the available information appropriate for that stage.

When general design and guidance information and general industry practice is used, the PRA will contain more inherent assumptions and increased uncertainty. As a result, the applicant should document the limitations and impacts on the use of the PRA for other applications and to document the sources of uncertainty and assumptions resulting from the use of general operational information. In the individual tables provided below that address the supporting requirements for each part of the PRA Standard, new supporting requirements are included for each of the technical elements to capture the documentation of the assumptions, uncertainties, and their impacts on applications due to the status of the design, site, operational, and maintenance information or data.

Addressing Large-Release Frequency

The fact that the PRA Standard was developed for currently operating reactors means that the risk metrics considered in the standard are CDF and large early release frequency (LERF). For the DC application and COL application, the LERF metric is replaced by the LRF metric. The approach and factors considered in calculating the LRF are essentially the same as used for calculating the LERF. Therefore, these applications should use the LERF supporting requirements in assessing and reviewing the technical acceptability of the LRF approach.

Summary of PRA Technical Challenges and Associated Staff Positions

Table 1 contains a summary of the main PRA technical issues that are the most challenging to address at the DC and COL application stage, as described previously. For each issue, the affected supporting requirements are identified and the staff position is presented. Six general designations can result from the assessment of the supporting requirements, as defined below:

Can Meet: It is feasible to meet the supporting requirement for the specified DC or COL stage. Aspects of the supporting requirement might need to be clarified to be applicable for a DC or COL PRA.

Cannot Meet: It is not feasible to meet the supporting requirement for the specified DC or COL stage. Clarification is provided to establish whether any actions should be performed to address this condition, as appropriate.

Not Applicable: The supporting requirement is conditioned, directly or by implication, on an activity or input that does not exist or is not performed, or the supporting requirement criteria are not appropriate for use by ALWRs. A comment is provided to establish why the supporting requirement is not applicable and might include a clarification to establish what should be done, as appropriate.

Replace: The existing supporting requirement is not appropriate for use by ALWRs and needs to be replaced with a different requirement, which is provided as part of the staff position.

Enhance: The existing supporting requirement needs to be enhanced to specifically address the specified DC or COL stage.

New: No existing supporting requirement specifically addresses the needed requirement for the specified DC or COL stage. As a result, a new supporting requirement is provided.

For each of the technical issues presented in Table 1, the staff position is provided to establish, in general terms, how the applicant should address this challenge. The detailed tables that follow Table 1 provide specific clarifications or comments associated with each individual supporting requirement within the specific parts of the PRA Standard. Not every situation can be foreseen and, as a result, Table 1 and the detailed tables represent the typically expected conditions for most applicants. In some unique situations, an applicant might have information available to meet a supporting requirement in a manner different from that designated herein. Therefore, the user of this guidance should evaluate their conditions against the information presented in the detailed tables to determine whether conditions support a different assessment than what is provided in these tables; if so, they should document these conditions.

Table 1. Challenges to Meeting Capability Category I of the PRA Standard for an ALWR DC Application and COL Application

TECHNICAL ISSUE	AFFECTED SUPPORTING REQUIREMENTS	POSITION
Site-Specific Features and Characteristics	**Not Applicable** for DC: SHA-A1, SHA-A2, SHA-A3, SHA-A4, SHA-A5, SHA-B1, SHA-B2, SHA-B3, SHA-C1, SHA-C2, SHA-C3, SHA-C4, SHA-D1, SHA-D2, SHA-D3, SHA-D4, SHA-E1, SHA-E2, SHA-F1, SHA-F2, SHA-F3, SHA-G1, SHA-H, SFR-C2, SFR-C4, SFR-C6 **Cannot Meet** for DC: SHA-I, SFR-C1, EXT-A2	The staff recognizes that DC applications will not have regional or site-specific information on which to base their external hazards analysis or to ensure the information characterizes all credible hazards/sources at the site. DC applicants will establish site characteristics and site interface requirements upon which the specific hazards analysis will be performed. For COL applications, site-specific hazard information will be available to address these supporting requirements directly and/or confirm that the DC hazard bounds the actual site and regional characteristics.
Screening Events/Hazards for Analysis	**Not Applicable** for DC and COL: IFSN-A13, IFSN-A14, IFSN-A15, IFSN-A16, IFQU-A3, QNS-C1, EXT-B2, EXT-B4 **Replace** for DC and COL: IE-C6, IFSN-A12, EXT-B1, EXT-B3, EXT-C1 **Enhance** for DC and COL: QNS-A1, WPR-A6, XFPR-A6, XPR-A6	The staff recognizes that DC applications will not have regional or site-specific information on which to base the screening of external hazards or to ensure the information characterizes all credible hazards/sources at the site. DC applicants will establish site characteristics and site interface requirements on which specific hazards will be screened from further analysis. For COL applications, the site-specific conditions can be assessed to determine if there are additional hazards to consider. However, when performing this screening analysis, the qualitative and quantitative criteria (provided directly or as implied) in the PRA Standard should not be used for internal

Table 1. Challenges to Meeting Capability Category I of the PRA Standard for an ALWR DC Application and COL Application

TECHNICAL ISSUE	AFFECTED SUPPORTING REQUIREMENTS	POSITION
		and external events/hazards. This is because of the potentially low plant CDF and LRF. Screening based on the PRA Standard's cited CDF criteria is not appropriate for ALWRs because it infers a CDF of up to about 1×10^{-6}/year, which might be orders of magnitude greater than the base CDF at the site. The current version of the PRA standard does not identify unique screening criteria for new reactor designs that can have substantially lower risk profiles (e.g., plants with internal events CDF well below 1×10^{-6}/year). As stated in RG 1.200, the quantitative screening value should be adjusted according to the relative baseline risk value. Therefore, screening values lower than those in the PRA Standard need to be used commensurate with the lower CDF and LRF estimates expected for ALWRs. A number of supporting requirements are identified as not applicable and should not be used for screening purposes or are identified as needing to be replaced or enhanced with the criteria provided in the clarification.
Plant-Specific Layouts and Capabilities	**Cannot Meet for DC and COL:** CS-A2, CS-A3, CS-A4, CS-A5, CS-A6, CS-A7, CS-A8, CS-A9, CS-B1 **Not Applicable for DC and COL:** FSS-F1, FSS-F2, FSS-F3	If the DC or COL applicant has specific information regarding equipment locations and layouts and cable routing, then these supporting requirements can be achieved. However, the staff recognizes that DC and COL applications might not have some plant-specific information; particularly associated with equipment layout and locations and cable routing. Under these conditions, the applicant will likely use design and operational guidance documents, general good engineering practices, and "exclusion" approaches in their analyses, which are acceptable to the staff.

Table 1. Challenges to Meeting Capability Category I of the PRA Standard for an ALWR DC Application and COL Application

TECHNICAL ISSUE	AFFECTED SUPPORTING REQUIREMENTS	POSITION
Plant-Specific Operating Experience and Data	**Cannot Meet for DC and COL:** SY-A19, SY-A20, DA-C2, DA-C3, DA-C4, DA-C5, DA-C6, DA-C14, ES-B1 **Not Applicable for DC and COL:** IE-A3, IE-A4, IE-A7, IE-C2, IE-C4, DA-C10, DA-C11, DA-C16, DA-D8, IGN-A6, PRM-B2	The staff recognizes that DC and COL applications will not have plant-specific operating experience and associated data on which to base component failure rates and maintenance, surveillance, testing, and train realignment frequencies. That being the case, applicants either cannot meet the supporting requirement or, for cases in which the supporting requirement is conditioned on another supporting requirement, it is not applicable. The applicants should address these supporting requirements using generic data and general industry operating practices and documenting the assumptions used in developing their PRA. Supporting requirements ES-B1 and PRM-B2 require the use of other plant-specific information. For ES-B1 the staff does not expect the applicant to have fully identified the fire safe shutdown/Appendix R equipment. For PRM-B2 the staff does not expect the applicant to have performed full peer reviews. For both of these supporting requirements, the applicant should use the information available for that stage, as appropriate (e.g., initial fire safe shutdown equipment identification for fire safe shutdown and internal and external independent reviews) and to document associated assumptions.
Plant-Specific Guidance (Procedures, Operating Practices, etc.)	**Can Meet for DC and COL:** IE-C3, IE-C11, IE-C14, AS-A5, SC-A6, SY-A2, SY-A3, SY-B12, SY-B15 HR-A1, HR-A2, HR-A3, HR-D4, HR-D5, HR-E1, HR-E2, HR-2, HR-G4, HR-G6, HR-H2, QU-D2, LE-D6, IFSN-A3, , ES-A1, HRA-A2, HRA-B3, WPR-A11, XFPR-A11, XPR-A11	The staff recognizes that for the DC and COL application stages, plant-specific procedures and operating practices will not exist. The staff recognizes that the PRA at these stages will be based on design and operational guidance documents and typical industry practices, appropriate for that stage. That being the case, the staff believes applicants can meet these supporting requirements.

Table 1. Challenges to Meeting Capability Category I of the PRA Standard for an ALWR DC Application and COL Application

TECHNICAL ISSUE	AFFECTED SUPPORTING REQUIREMENTS	POSITION
Interviews	**Can Meet for DC and COL:** SY-A2, SY-A4 **Cannot Meet for DC and COL:** HR-E3, HRA-A4, SF-A5	There appear to be only a few supporting requirements that specifically require interviews or reviews to achieve CC I in the PRA Standard (and one other, SY-A2, identifies interviews as part of a list of sources of information). For SY-A4, the confirmation that the system model reflects the design of the system can be achieved through interviews of knowledgeable design and/or plant personnel, appropriate for that stage. This confirmation supporting requirement will be enhanced at the COL stage as additional system design information becomes available. There are also a few supporting requirements that require the review of procedure interpretations with plant operations and training personnel to verify that they reflect the operations and training practices or the assessment of training on procedures. The staff recognizes that, for DC and COL applications, the model will be based on design and guidance documents, because most procedures will not be developed at these stages and plant-specific procedures cannot be reviewed or assessed against. In addition, the staff recognizes that plant operators and training personnel will not exist to perform or support these reviews and assessments. That being the case, these supporting requirements are not feasible for these application stages.

Table 1. Challenges to Meeting Capability Category I of the PRA Standard for an ALWR DC Application and COL Application

TECHNICAL ISSUE	AFFECTED SUPPORTING REQUIREMENTS	POSITION
Walkdowns	**Cannot Meet for DC:** EXT-D1 **Cannot Meet for DC and COL:** IFPP-A5, IFSO-A6, IFSN-A17, IFQU-A11, PP-B7, FSS-D10, FSS-D11, FSS-H10, SFR-D1, SFR-E1, SFR-E2, SFR-E4, SFR-E5, SPR-B11, EXT-D2, WFR-A1,XFFR-A1, XFR-A2 **Not Applicable for DC and COL:** SFR-E3	The staff recognizes that, for DC and COL applications, walkdowns will not be able to be performed in most cases to collect or verify the information regarding specific site and design characteristics and features. The information considered in the PRA should be based on the available design and operational information for that stage.
Treatment of Uncertainties	**Enhance DC and COL:** IE-D1, IE-D3, AS-C1, AS-C3, SC-C1, SC-C3, SY-C1, SY-C3, HR-I1, HR-I3, DA-E1, DA-E3, QU-F1, QU-F4, LE-G1, LE-G4, IFPP-B1, IFPP-B3, IFSO-B1, IFSO-B3, IFSN-B1, IFSN-B3, IFEV-B1, IFEV-B3, IFQU-B1, IFQU-B3, PP-C1, PP-C3, ES-D1, CS-C1, CS-C2, CS-C3, CS-C4, QLS-B2, PRM-C1, FSS-H9, IGN-B1, IGN-B3, IGN-B5, QNS-D1, QNS-D2, CF-B1, HRA-E1, SF-B1, FQ-F1, SHA-J1, SHA-J3, SFR-G1, SFR-G3, SPR-F1, SPR-F3,	The staff recognizes that both increased uncertainty and reliance on more assumptions are associated with these application stages because of the status of the site, design, operational, and maintenance information and data. This additional uncertainty needs to be addressed in two aspects of how the supporting requirements are documented. First, by enhancing the existing supporting requirement related to documenting aspects that facilitate PRA applications, upgrades, and peer reviews, with the requirement to document limitations, and their bases, which would impact risk-informed applications because of the status of the site, design, operational, and maintenance information and data. (This might also include a discussion of sensitivity studies performed to provide a perspective on these impacts.) Second, by enhancing the existing supporting requirement related to characterizing the sources of model uncertainty and related assumptions with the requirement to document the sources of model uncertainty and assumptions specifically because of the status of the design, site, operational, and maintenance information or data.

Table 1. Challenges to Meeting Capability Category I of the PRA Standard for an ALWR DC Application and COL Application

TECHNICAL ISSUE	AFFECTED SUPPORTING REQUIREMENTS	POSITION
	EXT-E1, WHA-B1, WHA-B3, WFR-B1, WFR-B3, WPR-C1, WPR-C3, XFHA-B1, XFHA-B3, XFFR-B1, XFFR-B3, XFPR-C1, XFPR-C3, XHA-B1, XHA-B3, XFR-B1, XFR-B3, XPR-C1, XPR-C3 **New for DC and COL:** PP-C5, ES-D2, CS-D5, QLS-B4, PRM-C2, FSS-H11, QNS-D3, CF-B2, HRA-E2, SF-B2, FQ-F3, UNC-B1, UNC-B2, EXT-E3	For a few technical elements, it was necessary to develop a new supporting requirement to capture one or both of these enhancements.

Addressing Specific Supporting Requirements of the PRA Standard

In addressing 10 CFR 52.47(a)(27), DC applicants will not have regional or site-specific information on which to base their analysis. In this case, DC applicants will likely establish site characteristics and site-interface requirements, typically described in Chapter 2 of the DC as part of the site selection criterion, to bound the analysis. As a result, supporting requirements that require the use of regional and/or site-specific information cannot be met for the DC application. Instead, the determination of acceptability of the analyses should be based on a bounding approach and results. This lack of regional and site-specific information will also impact the ability of the DC applicant to perform and confirm (e.g., by walkdowns) the systems analyses that require the use of site-specific information. For these cases, the DC application will likely rely on generic information and general design documents in developing the systems analyses. The system models will also not be fully developed because the operational aspects and design details might not be fully established at the DC application stage. As a result, the system models will be based on guidance documents instead of plant-specific procedures and operating experience.

In addressing 10 CFR 52.79(a)(46), the COL applicants will have regional and site-specific information on which to base their analyses. COL applicants will either confirm and maintain the DC bounding analyses for their specific site or use the site-specific information in updating the analyses. If the COL applicant decides to rely on the DC bounding analysis and confirms it bounds the site parameters, then the supporting requirements for the use of regional and/or site-specific information will not be met, but the PRA may instead be determined to be acceptable based on the confirmation of the bounding results.

Many aspects of the systems analyses might also still not be fully developed and cannot be confirmed (e.g., by walkdowns) at the time of the COL application. As a result, the COL application may continue to rely on generic information and general design documents in the systems analyses. The system models will also not be fully complete because the operational aspects and details might not be fully established at the COL application stage. As a result, the system models will be based on guidance documents instead of plant-specific procedures and operating experience. The COL application should reflect the latest design and guidance, which may involve an update to the system models to reflect changes made since the DC application.

The detailed, supporting requirement-by-supporting requirement, evaluation is provided in the following tables for each Part of the PRA Standard. Not every situation can be foreseen and, as a result, Table 1 and the detailed tables represent the typically expected conditions for most applicants. Unique situations might occur in which the applicant has information available to meet a supporting requirement in a manner different from that designated herein. Therefore, the applicant should evaluate their conditions against the information presented in the following detailed tables to determine whether conditions support a different assessment than what is provided in these tables, if so, the applicant should document these conditions.

Addressing Part 2, Internal Events, Supporting Requirements

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
Initiating Events			
HLR-IE-A	The initiating event analysis shall provide a reasonably complete identification of initiating events.		
IE-A1	Can Meet	Can Meet	
IE-A2	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems (e.g., service water ultimate heat sink) to address these special initiators, while the COL applicant can directly address the site-specific support system initiators.
IE-A3	NOT APPLICABLE	NOT APPLICABLE	No plant-specific experience is available during these application stages. IE-A4 addresses the review for industry experience and because the objective of this supporting requirement is to ensure that the list of initiators is as complete as possible, these applications do not need to meet this supporting requirement.

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[2] In Tables 2 through 9, where the supporting requirement has no action defined to achieve Capability Category I, the staff evaluated the lowest capability category with a defined action (and, for Tables 7 and 8, the parallel supporting requirement of Part 9) to determine if it was appropriate to be addressed for the DC or COL application. This determination is provided in the "Clarifications and Comments" column of the table.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IE-A4	NOT APPLICABLE	NOT APPLICABLE	For most DCs and Reference COL plants, there will not be generic analysis of similar plants at the application stage. Subsequent COLs might have some experience from the initial plants to enable meeting the supporting requirement. The supporting requirement is using this information to ensure that the list of initiators is as complete as possible in reflecting relevant industry experience. That being the case, if there is no relevant industry experience, then the supporting requirement is Not Applicable. If there is relevant experience available, then the supporting requirement is feasible.
IE-A5	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems though the impact of the loss of the system (or train of the system) can still be evaluated. The COL applicant can directly address the site-specific support system design.
IE-A6	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems though the impact of the loss of the system (or train of the system) can still be evaluated. The COL applicant can directly address the site-specific support-system design.
IE-A7	NOT APPLICABLE	NOT APPLICABLE	For most DCs and Reference COLs, there will be no plant experience to draw from at the application stage. Subsequent COLs might have enough initial plant experience to draw from to enable meeting the supporting requirement. The supporting requirement is using this information to ensure that the list of initiators is as complete as possible in reflecting relevant experience. That being the case, if there is no relevant experience, then the supporting requirement is Not Applicable. If relevant experience is available, then the supporting requirement is feasible.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IE-A8	Can Meet	Can Meet	CC I contains no requirement for interviewing plant personnel, while interviews are needed to achieve CC II. The DC application and COL application PRAs should include interviews of the design/plant staff appropriate for that stage to ensure no potential initiating events have been overlooked; recognizing that the interviews will not reflect plant-specific experiences, but design and general experiences.
IE-A9	Can Meet	Can Meet	CC I contains no requirement for performing a precursor review using plant-specific operating experience, while such a review is needed to achieve CC II and a review of industry precursor events is needed to achieve CC III. It is not feasible to have plant-specific operating experience at these application stages, so the staff does not expect these applicants to perform additional precursor reviews and this supporting requirement is met with no action.
IE-A10	Can Meet	Can Meet	If the DC or COL is for a single unit or for a site in which there are no shared systems (including e.g., separate switchyards and service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may include assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.
HLR-IE-B	The initiating event analysis shall group the initiating events so that events in the same group have similar mitigation requirements (i.e., the requirements for most events in the group are less restrictive than the limiting mitigation requirements for the group) to facilitate an efficient but realistic estimation of CDF.		
IE-B1	Can Meet	Can Meet	
IE-B2	Can Meet	Can Meet	
IE-B3	Can Meet	Can Meet	
IE-B4	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IE-B5	Can Meet	Can Meet	If the DC or COL is for a single unit or for a site in which there are no shared systems (including e.g., separate switchyards and service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may make assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.
HLR-IE-C			The initiating event analysis shall estimate the annual frequency of each initiating event or initiating event group.
IE-C1	Can Meet	Can Meet	The supporting requirement directs the use of relevant generic and plant-specific data. Because plant-specific data will not be available for these application stages, the initiating event frequency will be calculated from relevant generic data. This approach meets the supporting requirement.
IE-C2	NOT APPLICABLE	NOT APPLICABLE	Because plant-specific data will not exist during these application stages it is not necessary to provide a justification for their use. That being the case, this supporting requirement is Not Applicable.
IE-C3	Can Meet	Can Meet	For DC and COL applications, the justification for credited recovery actions will likely be based on design and guidance documents; not procedures or training.
IE-C4	NOT APPLICABLE	NOT APPLICABLE	Because plant-specific data will not exist during these application stages, and thus generic and plant-specific data are not combined, it is not necessary to use a Bayesian update process to include plant-specific data or justify a generic prior. That being the case, this supporting requirement is Not Applicable.

**Table 2. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IE-C5	Can Meet	Can Meet	The supporting requirement requires that the frequency be calculated on a reactor year basis, which can be performed. However, because no operating experience data will exist for these application stages on which to estimate plant availability, an assumed availability will need to be used, with an appropriate justification. If 100% availability is used, which maximizes the at-power risk estimates, this availability should not be assumed for assessing the low power/shutdown risk estimate (i.e., for the low power/shutdown risk estimate a lower plant availability should be used and justified).
IE-C6	REPLACE	REPLACE	The current version of the PRA standard does not identify unique screening criteria for new reactor designs that can have substantially lower risk profiles (e.g., plants with internal events CDF well below 1×10^{-6}/year). As stated in RG 1.200, the quantitative screening value should be adjusted according to the relative baseline risk value. Screening values lower than those in ASME/ANS RA-Sa-2009 need to be used commensurately with the lower CDF and LRF estimates expected from ALWRs. As a result, this supporting requirement should be replaced with the following criteria: **USE** the following screening criteria to eliminate initiating events or groups from further evaluation: (a) the mean frequency of the initiating event is less than 1×10^{-6} per reactor year (/ry) and less than 10% of the internal events mean CDF and core damage could not occur unless at least two trains of mitigating systems are failed independent of the initiating event, or (b) the mean frequency of the initiating event is less than 1×10^{-7}/ry and less than 1% of the internal events mean CDF and the initiating event does not involve or create an ISLOCA [intersystem loss-of-coolant accident], containment bypass, containment

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
			failure, or direct core damage (e.g., reactor pressure vessel rupture), or (c) the mean frequency of the initiating event is less than 1×10^{-8}/ry, or (d) the event does not result in a plant trip (manual or automatic) or a controlled manual shutdown. If credit is taken for operator actions to correct the condition to avoid a plant trip or controlled shutdown, then **ENSURE** that the credited operator actions and associated equipment have an exceedingly low probability of failure (i.e., collectively less than or equal to 1×10^{-5}) following the applicable supporting requirements of this part (e.g., Human Reliability Analysis – Subsection 2-2.5). **ENSURE** that the value specified in the criterion meets the applicable requirements in the Data Analysis (Subsection 2-2.6) and Level 1 Quantification (Subsection 2-2.7). **ENSURE** that the mean cumulative contribution to CDF of the internal initiating events that have been screened out is less than 5% of the total mean CDF for internal events. **ENSURE** that the mean cumulative contribution to LRF of the internal initiating events that have been screened out is less than 5% of the total mean LRF for internal events. If additional screening criteria are applied, **DEFINE** the applied criteria and **PROVIDE** a basis that demonstrates internal initiating events that are screened out using the criteria are not significant contributors to internal events risk.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IE-C7	Can Meet	Can Meet	CC I and CC II contain no requirement for performing time trend analysis; only CC III contains this requirement. At the application stage the initiating event frequencies should be based on generic information. That being the case, this supporting requirement is met at CC I.
IE-C8	Can Meet	Can Meet	If fault tree modeling is not used, then the supporting requirement is Not Applicable. If fault tree modeling is used, then meeting the supporting requirement is feasible. For DC applicants some support systems may not be amenable to developing fault tree models because of the lack of site-specific information, so applicants instead might use generic data or bounding analyses or will assume specific aspects of the design to enable modeling. The COL applicant will be able to use fault tree modeling approaches for addressing these site-specific support systems.
IE-C9	Can Meet	Can Meet	If fault tree modeling is not used, then the supporting requirement is Not Applicable. If fault tree modeling is used, then meeting the supporting requirement is feasible. For DC applicants some support systems might not be amenable to developing fault tree models because of the lack of site-specific information, so applicants instead might use generic data or bounding analyses. The COL applicant will be able to use fault tree modeling approaches for these site-specific support systems.
IE-C10	Can Meet	Can Meet	If fault tree modeling is not used, then the supporting requirement is Not Applicable. If fault tree modeling is used, then meeting the supporting requirement is feasible. For DC applicants some support systems may not be amenable to developing fault tree models because of the lack of site-specific information, so applicants instead might use generic data or bounding analyses. The COL applicant will be able to use fault tree modeling approaches for these site-specific support systems.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IE-C11	Can Meet	Can Meet	If fault tree modeling is not used, then the supporting requirement is Not Applicable. If fault tree modeling is used, then meeting the supporting requirement is feasible. For DC applicants some support systems might not be amenable to developing fault tree models because of the lack of site-specific information, so applicants instead might use generic data or bounding analyses. The COL applicant will be able to use fault tree modeling approaches for these site-specific support systems. Further, for DC and COL applicants, plant-specific information, such as procedures and operating experience, will not be available, but the applicants should use the available design and guidance documents to inform the assessment of recovery actions.
IE-C12	Can Meet	Can Meet	
IE-C13	Can Meet	Can Meet	For DCs, plant-specific features related to support systems may be assumed (e.g., service water ultimate heat sink), while COLs can directly include these features in determining the most applicable generic data to use for rare events.
IE-C14	Can Meet	Can Meet	For DCs and COLs the procedures will not be available, but design and guidance documents may be used in assessing the influences on ISLOCA frequency.
IE-C15	Can Meet	Can Meet	
HLR-IE-D	Documentation of the initiating event analysis shall be consistent with the applicable supporting requirements.		
IE-D1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and their bases, resulting from the status of the design, site, operational, and maintenance information or data that would affect applications.
IE-D2	Can Meet	Can Meet	
IE-D3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of design, site, operational, and maintenance information or data.
Accident Sequence Analysis			
HLR-AS-A	The accident sequence analysis shall describe the plant-specific scenarios that can lead to core damage following each modeled initiating event. These scenarios shall address system responses and operator actions, including recovery actions that support the key safety functions necessary to prevent core damage.		
AS-A1	Can Meet	Can Meet	
AS-A2	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
AS-A3	Can Meet	Can Meet	
AS-A4	Can Meet	Can Meet	
AS-A5	Can Meet	Can Meet	For DC and COL applications, the justification will likely be based on design and guidance documents; not on emergency or abnormal procedures.
AS-A6	Can Meet	Can Meet	
AS-A7	Can Meet	Can Meet	
AS-A8	Can Meet	Can Meet	
AS-A9	Can Meet	Can Meet	For DC and initial COLs, the thermal hydraulics will be primarily based on the design-related (deterministic and probabilistic) thermal hydraulics, although there might also be some similar plant analyses that could be utilized.
AS-A10	Can Meet	Can Meet	
AS-A11	Can Meet	Can Meet	
HLR-AS-B	Dependencies that can impact the ability of the mitigating systems to operate and function shall be addressed.		
AS-B1	Can Meet	Can Meet	
AS-B2	Can Meet	Can Meet	
AS-B3	Can Meet	Can Meet	
AS-B4	Can Meet	Can Meet	If the conditional split fraction method is not used, then this supporting requirement is Not Applicable.
AS-B5	Can Meet	Can Meet	
AS-B6	Can Meet	Can Meet	For DC and COL applications, non-normal plant configurations and maintenance practices might not be established, so dependencies between system alignments might not be completely recognized. Those aspects recognized at DC and COL stages should be defined and modeled in accordance with the supporting requirement.
AS-B7	Can Meet	Can Meet	
HLR-AS-C	Documentation of the accident sequence analysis shall be consistent with the applicable supporting requirements.		
AS-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations and bases, resulting from the status of the design, site, operational, and maintenance information or data that would affect applications.
AS-C2	Can Meet	Can Meet	
AS-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Success Criteria			

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HLR-SC-A	The overall success criteria for the PRA and the system, structure, component, and human action success criteria used in the PRA shall be defined and referenced, and shall be consistent with the features, procedures, and operating philosophy of the plant.		
SC-A1	Can Meet	Can Meet	
SC-A2	Can Meet	Can Meet	If core damage is defined based on the simplified definitions of NUREG/CR-4550, then a justification should be provided that establishes the appropriateness of the definition for the particular design.
SC-A3	Can Meet	Can Meet	
SC-A4	Can Meet	Can Meet	If the DC or COL is for a single unit site or for a site in which there are no shared systems (including e.g., separate switchyards and service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may make assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.
SC-A5	Can Meet	Can Meet	
SC-A6	Can Meet	Can Meet	For DC and COL applications, the justification will likely be based on design and guidance documents that reflect the "operating philosophy;" not on procedures.
HLR-SC-B	The thermal/hydraulic, structural, and other supporting engineering bases shall be capable of providing success criteria and event timing sufficient for quantification of CDF and LERF, determination of the relative impact of success criteria on structures, systems, or components (SSC) and human actions, and impact of uncertainty on this determination.		
SC-B1	Can Meet	Can Meet	
SC-B2	Can Meet	Can Meet	CC I contains no restriction regarding the use of expert judgment, while restriction is placed on the use of expert judgment to achieve CC II/III. The applicant should use expert judgment only in those situations for which there is a lack of available information or methods, consistent with CC II.
SC-B3	Can Meet	Can Meet	
SC-B4	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SC-B5	Can Meet	Can Meet	For DC and initial COL applications there might be no similar plants against which to check results, though this is identified as an approach within the example list. The objective of the supporting requirement is to check for reasonableness and acceptability of analysis results, which could also be achieved by comparison against the traditional design engineering analysis results and other means. That being the case, meeting, this supporting requirement is feasible for these application stages.
HLR-SC-C	Documentation of the success criteria shall be consistent with the applicable supporting requirements.		
SC-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would affect applications.
SC-C2	Can Meet	Can Meet	
SC-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Systems Analysis			
HLR-SY-A	The systems analysis shall provide a reasonably complete treatment of the causes of system failure and unavailability modes represented in the initiating events analysis and sequence definition.		
SY-A1	Can Meet	Can Meet	
SY-A2	Can Meet	Can Meet	For DC and COL applications, the pertinent information used for the systems analysis will be that which reflects the "as-to-be-built" and "as-to-be-operated" design appropriate for that application stage.
SY-A3	Can Meet	Can Meet	For DCs and COLs the procedures will not be available and some limits might not be established, but design and guidance documents may be used to enable the systems modeling.
SY-A4	Can Meet	Can Meet	The confirmation that the system model reflects the design of the system can be achieved through interviews of knowledgeable design and/or plant personnel, appropriate for that application stage. This confirmatory supporting requirement will be enhanced at the COL application stage as additional system design information becomes available.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SY-A5	Can Meet	Can Meet	For these application stages, the system alignments might be known for most, but not all systems.
SY-A6	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems. The COL applicant can directly address the site-specific support system design.
SY-A7	Can Meet	Can Meet	
SY-A8	Can Meet	Can Meet	
SY-A9	Can Meet	Can Meet	If "super components" or modules are not used, then the supporting requirement is Not Applicable. If "super components" or modules are used, then it is feasible to meet the supporting requirement.
SY-A10	Can Meet	Can Meet	
SY-A11	Can Meet	Can Meet	
SY-A12	Can Meet	Can Meet	
SY-A13	Can Meet	Can Meet	
SY-A14	Can Meet	Can Meet	
SY-A15	Can Meet	Can Meet	
SY-A16	Can Meet	Can Meet	
SY-A17	Can Meet	Can Meet	
SY-A18	Can Meet	Can Meet	
SY-A19	CANNOT MEET	CANNOT MEET	For these application stages actual practices and plant history will not be available to develop component and train unavailabilities, especially those related to corrective maintenance. Therefore, applicants cannot meet this supporting requirement. However, the applicants should use traditional/generic estimates for component and train unavailabilities in the system models.
SY-A20	CANNOT MEET	CANNOT MEET	For these application stages there is insufficient information to identify planned activities that would result in the unavailability of redundant equipment, especially as this supporting requirement cross-references DA-C14, which is related to reviewing plant experience. Therefore, this supporting requirement cannot be achieved. For these application stages, unless specific design features allow the unavailability of redundant equipment, the system models will likely assume such events are mutually exclusive and justify cases in which redundant components are allowed to be unavailable at the same time.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SY-A21	Can Meet	Can Meet	
SY-A22	Can Meet	Can Meet	This supporting requirement is met at CC I if no credit is taken for equipment operability when the potential exists for rated or design capabilities to be exceeded. That being the case, it is feasible to meet this supporting requirement at CC I.
SY-A23	Can Meet	Can Meet	
SY-A24	Can Meet	Can Meet	For these application stages, this supporting requirement is met by not modeling the repair of hardware faults. If repairs are modeled, then, consistent with DA-C15 and DA-D9, this supporting requirement is feasible in these application stages, though the utilization of industry experience will need to be justified.
HLR-SY-B	The systems analysis shall provide a reasonably complete treatment of common cause failures and intersystem and intra-system dependencies.		
SY-B1	Can Meet	Can Meet	The supporting requirement allows the use of generic data in modeling intra-system common cause failures. That being the case, the supporting requirement is feasible for systems modeling.
SY-B2	Can Meet	Can Meet	CC I and CC II contain no requirement for modeling inter-system common cause failures. The DC or COL applicant should address inter-system common cause failure (either modeling it or showing that it has no impact on the results) if it is supported by generic data.
SY-B3	Can Meet	Can Meet	
SY-B4	Can Meet	Can Meet	
SY-B5	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems. The COL applicant can directly address the site-specific support system design.
SY-B6	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems. The COL applicant can directly address the site-specific support system design.
SY-B7	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems. The COL applicant can directly address the site-specific support system design.

**Table 2. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SY-B8	Can Meet	Can Meet	This supporting requirement requires the identification, and accounting for, impacts of spatial and environmental hazards. This is feasible for these application stages, but likely only to a limited extent, that is consistent with the level of information available for that stage.
SY-B9	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems. The COL applicant can directly address the site-specific support system design.
SY-B10	Can Meet	Can Meet	
SY-B11	Can Meet	Can Meet	
SY-B12	Can Meet	Can Meet	This supporting requirement establishes that systems should not be eliminated from modeling simply because a recovery procedure exists. Rather, the systems should be modeled, with the recovery actions included in the model quantification. That being the case, the supporting requirement is feasible to meet, though recovery actions will likely be addressed using design and operational guidance documents for the DC and COL application stages. Further, DC applicants may make assumptions regarding the design of some of the support systems, while the COL applicant can directly address the site-specific support system design.
SY-B13	Can Meet	Can Meet	
SY-B14	Can Meet	Can Meet	This supporting requirement requires the identification of harsh environments, and inclusion of related dependent failures of multiple SSCs. This is feasible for these application stages, but likely only to a limited extent, that is consistent with the level of information available for that stage.
SY-B15	Can Meet	Can Meet	This supporting requirement requires the inclusion of operator interface dependencies. This is feasible for these application stages based on the information available for that stage.
HLR-SY-C	Documentation of the systems analysis shall be consistent with the applicable supporting requirements.		
SY-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SY-C2	Can Meet	Can Meet	
SY-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Human Reliability Analysis			
HLR-HR-A	A systematic process shall be used to identify those specific routine activities that, if not completed correctly, may impact the availability of the equipment necessary to perform system function modeling in the PRA.		
HR-A1	Can Meet	Can Meet	For DC and COL applications, the identification of activities that require realignment of equipment will likely be based on general design and guidance documents because test, inspection, and maintenance procedures and practices might not be developed.
HR-A2	Can Meet	Can Meet	For DC and COL applications, the identification of calibration activities that could adversely impact automatic system initiation will likely be based on general design and guidance documents because calibration procedures and practices might not be developed.
HR-A3	Can Meet	Can Meet	This supporting requirement uses the results of the identification activities of HR-A1 and HR-A2. For DC and COL applications, the determination of impacts will likely be based on general design and guidance documents because test, inspection, maintenance, and calibration procedures and practices might not be developed.
HLR-HR-B	Screening of activities that need not be addressed explicitly in the model shall be based on an assessment of how plant-specific operational practices limit the likelihood of errors in such activities.		
HR-B1	Can Meet	Can Meet	This supporting requirement is to establish rules for screening classes of activities. Though the example in the supporting requirement is not feasible for DC and COL applications because practices will not be established, screening criteria could be established based on design and guidance documents.
HR-B2	Can Meet	Can Meet	
HLR-HR-C	For each activity that is not screened, an appropriate human failure event (HFE) shall be defined to characterize the impact of the failure as an unavailability of a component, system, or function modeled in the PRA.		
HR-C1	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HR-C2	Can Meet	Can Meet	
HR-C3	Can Meet	Can Meet	
HLR-HR-D	The assessment of the probabilities of the pre-initiator HFEs shall be performed by using a systematic process that addresses the plant-specific and activity-specific influences on human performance.		
HR-D1	Can Meet	Can Meet	
HR-D2	Can Meet	Can Meet	
HR-D3	Can Meet	Can Meet	There is no requirement at CC I to perform an evaluation of the quality of the written procedures, administrative controls, or human-machine interfaces. The staff expects these aspects of the design and operation will not be fully developed and only guidance would be relied upon in developing the PRA. That being the case, this supporting requirement can be met with no action.
HR-D4	Can Meet	Can Meet	For DC and COL applications, the determination of recoveries will likely be based on general design and guidance documents because test, inspection, maintenance, and calibration procedures and practices might not be developed.
HR-D5	Can Meet	Can Meet	The objective of this supporting requirement is to evaluate the potential for dependencies between HFEs. For DC and COL applications, the determination will likely be based on general design and guidance documents because specific practices might not be developed.
HR-D6	Can Meet	Can Meet	
HR-D7	Can Meet	Can Meet	There is no requirement at CC I/II to check the reasonableness of the human-error probabilities (HEPs) in light of plant experiences. Further, at the DC and COL application stages, there will not be the plant experience available to check the HEPs. Therefore, this supporting requirement is met at CC I with no action needed.
HLR-HR-E	A systematic review of the relevant procedures shall be used to identify the set of operator responses required for each of the accident sequences.		
HR-E1	Can Meet	Can Meet	For DC and COL applications, the determination of key human response actions will likely be based on general design and guidance documents because procedures and operations might not be developed.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HR-E2	Can Meet	Can Meet	For DC and COL applications, the identification of operator actions will likely be based on general design and guidance documents.
HR-E3	CANNOT MEET	CANNOT MEET	This supporting requirement requires the review of the procedure interpretations with plant operations and training personnel to verify that they reflect the operations and training practices. For DC and COL applications, the model will likely be based on design and guidance documents; because procedures will not be available. In addition, plant operators and training practices will likely not be available to perform this review. That being the case, this supporting requirement is not feasible in these application stages.
HR-E4	Can Meet	Can Meet	There is no requirement at CC I to use simulator observations or talk-throughs with operators to confirm the response models. The staff expects that in most cases the DC and COL applicant will not be able to use plant-specific simulator observations or talk-throughs to make these confirmations and that being the case, this supporting requirement is met at CC I with no additional action.
HLR-HR-F	Human failure events shall be defined that represent the impact of not properly performing the required responses, in a manner consistent with the structure and level of detail of the accident sequences.		
HR-F1	Can Meet	Can Meet	
HR-F2	Can Meet	Can Meet	For DC and COL applications, the timing, procedural, cues/indications, and complexity aspects will likely be based on design and guidance documents and analyses.
HLR-HR-G	The assessment of the probabilities of the post-initiator HFEs shall be performed using a well-defined and self-consistent process that addresses the plant-specific and scenario-specific influences on human performance, and addresses potential dependencies between HFEs in the same accident sequence.		
HR-G1	Can Meet	Can Meet	
HR-G2	Can Meet	Can Meet	
HR-G3	Can Meet	Can Meet	This supporting requirement requires that the approach for HEP estimation have the capability to account for the information defined in HR-F2. That being the case, this supporting requirement is feasible because it is a requirement on the approach.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HR-G4	Can Meet	Can Meet	For these application stages, the timing aspects will likely be based on design and guidance documents and analyses and will be updated, as appropriate.
HR-G5	Can Meet	Can Meet	This supporting requirement allows the estimation of time required to complete actions to achieve CC I. That being the case, this supporting requirement is feasible at CC I.
HR-G6	Can Meet	Can Meet	Though plant history and experience will not be available and procedures and practices will not be available for these application stages, the supporting requirement is feasible because the check is for consistency and reasonableness in the HEPs relative to each other, which can be achieved.
HR-G7	Can Meet	Can Meet	The evaluation for dependencies for the DC and COL applications will likely be based on design and guidance documents and analyses.
HR-G8	Can Meet	Can Meet	
HLR-HR-H	Recovery actions (at the cutset or scenario level) shall be modeled only if it has been demonstrated that the action is plausible and feasible for those scenarios to which they are applied. Estimates of probabilities of failure shall address dependency on prior human failures in the scenario.		
HR-H1	Can Meet	Can Meet	
HR-H2	Can Meet	Can Meet	For DC and COL applications, neither procedures nor training will be available on which to credit operator recovery actions. However, this supporting requirement allows the justification for not having these aspects. That being the case, for DC and COL applications the credit for operator recovery actions will likely be based on design and guidance documents and analyses.
HR-H3	Can Meet	Can Meet	
HLR-HR-I	Documentation of the human reliability analysis shall be consistent with the applicable supporting requirements.		
HR-I1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
HR-I2	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HR-I3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
<td colspan="4" align="center">Data Analysis</td>			
HLR-DA-A	Each parameter shall be clearly defined in terms of the logic model, basic event boundary, and the model used to evaluate event probability.		
DA-A1	Can Meet	Can Meet	
DA-A2	Can Meet	Can Meet	
DA-A3	Can Meet	Can Meet	
DA-A4	Can Meet	Can Meet	
HLR-DA-B	Grouping components into a homogeneous population for parameter estimation shall consider both the design, environmental, and service conditions of the components in the as-built and as-operated plant.		
DA-B1	Can Meet	Can Meet	
DA-B2	Can Meet	Can Meet	
HLR-DA-C	Generic parameter estimates shall be chosen, and collection of plant-specific data shall be consistent with the parameter definitions of high level requirements (HLR)-DA-A and the grouping rationale of HLR-DA-B.		
DA-C1	Can Meet	Can Meet	This supporting requirement relates to the collection of generic data, which is feasible. Though the supporting requirement includes a caution against using generic data for test, maintenance, and repair unavailability, it does allow the use of generic data with justification. That being the case, for these application stages, the applicant will need to justify the appropriateness of the generic data used for test, maintenance, and repair unavailabilities.
DA-C2	CANNOT MEET	CANNOT MEET	Because plant-specific data will not be available, meeting the supporting requirement is not feasible in these application stages.
DA-C3	CANNOT MEET	CANNOT MEET	Because plant-specific data will not be available, meeting the supporting requirement is not feasible in these application stages.
DA-C4	CANNOT MEET	CANNOT MEET	Because there will not be maintenance or other operating experience records from which to extract plant-specific data, meeting the supporting requirement is not feasible in these application stages.
DA-C5	CANNOT MEET	CANNOT MEET	Because there will not be operating experience records from which to extract plant-specific data, meeting the supporting requirement is not feasible in these application stages.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
DA-C6	CANNOT MEET	CANNOT MEET	Because there will not be operating experience records from which to extract plant-specific data, meeting the supporting requirement is not feasible in these application stages.
DA-C7	Can Meet	Can Meet	To meet CC I, this supporting requirement allows the estimation of the surveillance tests and planned maintenance activities using plant requirements information, which might be available in design and guidance documents. For these application stages, it is feasible to meet this supporting requirement at CC I based on estimations using design and guidance documents.
DA-C8	Can Meet	Can Meet	To meet CC I, this supporting requirement allows the estimation of component standby times. For these application stages, it is feasible to meet this supporting requirement at CC I based on estimations using design and guidance documents.
DA-C9	Can Meet	Can Meet	The objective of this supporting requirement is to derive the operational time for standby components and is essentially the opposite estimation of DA-C8, which is for estimation of components' standby time. That being the case, even though the operational data will not be available for these application stages, an estimate of the operational time for standby components can be provided to meet CC I/II.
DA-C10	NOT APPLICABLE	NOT APPLICABLE	For these application stages, actual plant surveillance test data will not be available. As such, this supporting requirement is Not Applicable for these application stages.
DA-C11	NOT APPLICABLE	NOT APPLICABLE	For these application stages, actual plant maintenance and test durations will not be available. As such, this supporting requirement is Not Applicable for these application stages.
DA-C12	Can Meet	Can Meet	DC applicants may make assumptions regarding the design of some of the support systems. The COL applicant can directly address the site-specific support system design.

**Table 2. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
DA-C13	Can Meet	Can Meet	This supporting requirement allows the use of conservative estimates for determining the period of equipment unavailability if reliable estimates are not available. For these application stages, conservative estimates will likely be used for equipment unavailability durations.
DA-C14	CANNOT MEET	CANNOT MEET	For these application stages there is not sufficient information to identify planned activities that would result in the unavailability of redundant equipment, especially as this supporting requirement is related to reviewing plant experience. Therefore, this supporting requirement cannot be achieved. For these application stages, unless specific design features allow redundant equipment to be unavailable, the system models will likely assume that such events are mutually exclusive and will justify cases in which redundant components are allowed to be unavailable at the same time.
DA-C15	Can Meet	Can Meet	This supporting requirement allows the use of applicable industry experience when plant-specific experience is not sufficient to estimate repair modeling. That being the case, meeting, this supporting requirement is feasible for these application stages, though any industry experience credited must be justified as being applicable to the component.
DA-C16	NOT APPLICABLE	NOT APPLICABLE	For these application stages, plant-specific data for recovery of loss of power, loss of service water, etc., will not exist and generic information will likely be used, if any is available (i.e., for loss of service water recovery may not be credited). That being the case, this supporting requirement is Not Applicable for these application stages.
HLR-DA-D	The parameter estimates shall be based on relevant generic industry or plant-specific evidence. Where feasible, generic and plant-specific evidence shall be intergraded using acceptable methods to obtain plant-specific parameter estimates. Each parameter estimate shall be accompanied by a characterization of the uncertainty.		
DA-D1	Can Meet	Can Meet	This supporting requirement allows the use of generic information. As such, this supporting requirement is feasible for these application stages at CC I.
DA-D2	Can Meet	Can Meet	
DA-D3	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
DA-D4	Can Meet	Can Meet	There is no requirement for Bayesian updating to achieve CC I. Because generic information sources will typically be used, the need to perform Bayesian updates is not expected in these application stages. Therefore, this supporting requirement is met at CC I with no additional action.
DA-D5	Can Meet	Can Meet	
DA-D6	Can Meet	Can Meet	
DA-D7	Can Meet	Can Meet	
DA-D8	NOT APPLICABLE	NOT APPLICABLE	For these application stages, design changes may occur from DC through COL. However, this supporting requirement relates to plant-specific historical data for components becoming non-applicable because of design or operational changes. Because plant-specific data will not be available for these application stages, this supporting requirement is Not Applicable.
DA-D9	Can Meet	Can Meet	This supporting requirement is added by Regulatory Guide 1.200 and requires the estimation of the probability of failure to repair components in time to prevent core damage based on the data collected in DA-C15. Consistent with DA-C15, this supporting requirement is feasible in these application stages, though it will be utilizing industry experience that will need to be justified.
HLR-DA-E	Documentation of the data analysis shall be consistent with the applicable supporting requirements.		
DA-E1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
DA-E2	Can Meet	Can Meet	
DA-E3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Quantification			
HLR-QU-A	The level 1 quantification shall quantify core damage frequency and shall support the quantification of LERF.		
QU-A1	Can Meet	Can Meet	
QU-A2	Can Meet	Can Meet	
QU-A3	Can Meet	Can Meet	
QU-A4	Can Meet	Can Meet	
QU-A5	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
QU-B	The quantification shall use appropriate models and codes, and shall account for method-specific limitations and features.		
QU-B1	Can Meet	Can Meet	
QU-B2	Can Meet	Can Meet	
QU-B3	Can Meet	Can Meet	
QU-B4	Can Meet	Can Meet	
QU-B5	Can Meet	Can Meet	
QU-B6	Can Meet	Can Meet	
QU-B7	Can Meet	Can Meet	
QU-B8	Can Meet	Can Meet	
QU-B9	Can Meet	Can Meet	
QU-B10	Can Meet	Can Meet	If the aspects cited in the supporting requirement are not used, then this supporting requirement is Not Applicable. If these aspects are used, then this supporting requirement is feasible.
HLR-QU-C	Model quantification shall determine that all identified dependencies are addressed appropriately.		
QU-C1	Can Meet	Can Meet	
QU-C2	Can Meet	Can Meet	
QU-C3	Can Meet	Can Meet	If event tree linking is not used, then this supporting requirement is Not Applicable. If linking event trees is used, then this supporting requirement is feasible.
HLR-QU-D	The quantification results shall be reviewed, and significant contributors to CDF (and LERF), such as initiating events, accident sequences, and basic events (equivalent unavailabilities and human failure events), shall be identified. The results shall be traceable to the inputs and assumptions made in the PRA.		
QU-D1	Can Meet	Can Meet	
QU-D2	Can Meet	Can Meet	This supporting requirement involves the review of the results for modeling and operational consistency. Though there will not be procedures and no plant-specific experience for the DC and COL application stages, the review for operational consistency review can still be achieved by considering the plant configurations and any pertinent industry experience and considering the design and procedural guidance information.
QU-D3	Can Meet	Can Meet	

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
QU-D4	Can Meet	Can Meet	There is no requirement to compare results to similar plants to achieve CC I. Further, there are likely different design features for DC and reference COL applications that would make comparisons to other plants not practical. Therefore, the supporting requirement is met at CC I with no additional action. For subsequent COLs, the results should be compared against prior COL results.
QU-D5	Can Meet	Can Meet	
QU-D6	Can Meet	Can Meet	
QU-D7	Can Meet	Can Meet	
HLR-QU-E	Uncertainties in the PRA results shall be characterized. Sources of model uncertainty and related assumptions shall be identified, and their potential impact on the results understood.			
QU-E1	Can Meet	Can Meet	
QU-E2	Can Meet	Can Meet	
QU-E3	Can Meet	Can Meet	
QU-E4	Can Meet	Can Meet	
HLR-QU-F	Documentation of the quantification shall be consistent with the applicable supporting requirements.			
QU-F1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
QU-F2	Can Meet	Can Meet	
QU-F3	Can Meet	Can Meet	
QU-F4	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
QU-F5	Can Meet	Can Meet	
QU-F6	Can Meet	Can Meet	
LERF Analysis			
GENERAL CLARIFICATION: The approach in the standard for addressing LERF is also generally applicable for addressing LRF. Thus, reference in the standard to large early release or LERF should be interpreted as large release or LRF, respectively, for application to ALWRs.			
HLR-LE-A	Core damage sequences shall be grouped into plant damage states based on their accident progression attributes.			
LE-A1	Can Meet	Can Meet	
LE-A2	Can Meet	Can Meet	
LE-A3	Can Meet	Can Meet	
LE-A4	Can Meet	Can Meet	
LE-A5	Can Meet	Can Meet	
HLR-LE-B	The accident progression analysis shall include an evaluation of contributors (e.g., phenomena, equipment failures, and human actions) to a large early release.			

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
LE-B1	Can Meet	Can Meet	A correction to the supporting requirement is that the table cross reference should be to Table 22.8-9. In addition, if NUREG/CR-6595 is used, it should be justified as being applicable.
LE-B2	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-B3	Can Meet	Can Meet	A correction to the supporting requirement is that the cross reference should be to Table 2-2.3-3(b) related to success criteria thermal hydraulic and other engineering analyses.
HLR-LE-C	The accident progression analysis shall include identification of those sequences that would result in a large early release.		
LE-C1	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-C2	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-C3	Can Meet	Can Meet	There is no requirement to address repair of equipment for CC I, while credit for repair is allowed for CC II/III. This supporting requirement is met by not modeling the repair of hardware faults, which is appropriate given the information available for these application stages. Though the requirement is met at CC I by taking no action, if repairs are modeled, then the applicant needs to address the supporting requirement at Capability Category II/III consistent with SY-A24, DA-C15, and DA-D9; the applicant should recognize that it will only be utilizing industry experience that will need to be justified.
LE-C4	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-C5	Can Meet	Can Meet	
LE-C6	Can Meet	Can Meet	
LE-C7	Can Meet	Can Meet	
LE-C8	Can Meet	Can Meet	
LE-C9	Can Meet	Can Meet	The applicant can achieve CC I by not taking any credit for equipment operations or operator actions in adverse environments. If NUREG/CR-6595 is used, it should be justified as being applicable.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
LE-C10	Can Meet	Can Meet	There is no requirement for CC I because it is supporting LE-C9. Though this supporting requirement is met at CC I by taking no action, if an applicant does take credit for continued operation or actions in adverse conditions and provides justification in LE-C9, then the applicant must also meet at least CC II for LE-C10.
LE-C11	Can Meet	Can Meet	The applicant can achieve CC I by not taking any credit for equipment operations or operator actions that could be impacted by containment failure. If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-C12	Can Meet	Can Meet	There is no requirement for CC I because it is supporting LE-C11. Though this supporting requirement is met at CC I, if an applicant does take credit for continued operation or actions that could be impacted by containment failure and thus, provides justification in LE-C11, then the applicant must also meet at least CC II for LE-C12.
LE-C13	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
HLR-LE-D	The accident progression analysis shall include an evaluation of the containment structural capability for those containment challenges that would result in a large early release.		
LE-D1	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-D2	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-D3	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-D4	Can Meet	Can Meet	
LE-D5	Can Meet	Can Meet	
LE-D6	Can Meet	Can Meet	DC and COL applicants will rely on design and guidance documents, rather than plant-specific procedures to support the analysis of steam-generator (SG) tube rupture. If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-D7	Can Meet	Can Meet	
HLR-LE-E	The frequency of different containment failure modes leading to a large early release shall be quantified and aggregated.		
LE-E1	Can Meet	Can Meet	
LE-E2	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.

Table 2. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 2, Internal Events at Power[2]

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
LE-E3	Can Meet	Can Meet	If NUREG/CR-6595 is used, it should be justified as being applicable.
LE-E4	Can Meet	Can Meet	COMMENT: A correction to the supporting requirement is that the cross referenced tables should be 2-2.7-2(a), 2-2.7-3(b), and 2-2.7-4(c).
HLR-LE-F	The quantification results shall be reviewed, and significant contributors to LERF, such as plant damage states, containment challenges, and failure modes, shall be identified. Sources of model uncertainty and related assumptions shall be identified, and their potential impact on the results understood.		
LE-F1	Can Meet	Can Meet	
LE-F2	Can Meet	Can Meet	
LE-F3	Can Meet	Can Meet	COMMENT: A correction to the supporting requirement is that the cross referenced tables should be 2-2.7-5(d) and 2-2.7-6(e).
HLR-LE-G	Documentation of the LERF analysis shall be consistent with the applicable supporting requirements.		
LE-G1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications. If the NUREG/CR-6595 approach is used to meet a supporting requirement, also include: **DOCUMENT** the basis for the use of NUREG/CR-6595 for each affected supporting requirement.
LE-G2	Can Meet	Can Meet	
LE-G3	Can Meet	Can Meet	
LE-G4	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions and limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data.
LE-G5	Can Meet	Can Meet	
LE-G6	Can Meet	Can Meet	

Addressing Part 3, Internal Flood, Supporting Requirements

In addition to the general limitations, DC applications addressing 10 CFR 52.47(a)(27) and COL applications addressing 10 CFR 52.79(a)(46) might not have developed the specific pipe routing and flooding protection/mitigation information. This might impact the manner in which the applicant models internal floods. Where specific information is lacking, the applicant will likely rely on the design guidelines and good engineering practices. Further, the supporting requirements requiring walkdowns are not feasible for these application stages.

Many supporting requirements refer back to the internal events PRA supporting requirements. As such, these supporting requirements should also consider the evaluation of the applicability and feasibility of the referenced supporting requirement, including any pertinent comments or clarifications.

Table 3. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
Internal Flood Plant Partitioning
HLR-IFPP-A	A reasonably complete set of flood areas of the plant shall be identified.
IFPP-A1	Can Meet	Can Meet	
IFPP-A2	Can Meet	Can Meet	
IFPP-A3	Can Meet	Can Meet	If the DC or COL is for a single unit or for a site in which there are no shared systems or structures (including e.g., separate service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may make assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.
IFPP-A4	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to reflect the as-to-be-built, as-to-be-operated plant.
IFPP-A5	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information collected in IFPP-A1 through A4.
HLR-IFPP-B	Documentation of the internal flood plant partitioning shall be consistent with the applicable supporting requirements.
IFPP-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IFPP-B2	Can Meet	Can Meet	
IFPP-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Internal Flood Source Identification
HLR-IFSO-A	The potential flood sources in the flood areas, and their associated internal flood mechanisms, shall be identified and characterized.
IFSO-A1	Can Meet	Can Meet	DC and COL applications might have physical layout information for most components, but might need to assume physical layouts for some components.

**Table 3. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IFSO-A2	Can Meet	Can Meet	If the DC or COL is for a single unit or for a site in which there are no shared systems or structures (including e.g., separate service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may make assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.
IFSO-A3	Can Meet	Can Meet	
IFSO-A4	Can Meet	Can Meet	
IFSO-A5	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to determine the release characteristics for the flooding sources.
IFSO-A6	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information collected in IFSO-A1 through A5.
HLR-IFSO-B	Documentation of the internal flood sources shall be consistent with the applicable supporting requirements.		
IFSO-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IFSO-B2	Can Meet	Can Meet	
IFSO-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
<td colspan="4" align="center">Internal Flood Scenario Development</td>			
HLR-IFSN-A	The potential internal flood scenarios shall be developed for each flood source by identifying the propagation path(s) of the source and the affected SSCs.		
IFSN-A1	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to determine the propagation pathways.
IFSN-A2	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to determine the design features that can terminate or contain the flooding. In some cases, these features may be assumed based on general practices of good engineering.

**Table 3. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IFSN-A3	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to determine the automatic and operator responses that can terminate or contain the flooding. In some cases, these features/actions may be assumed based on general practices of good engineering.
IFSN-A4	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to determine these design features. In some cases, these features may be assumed based on general practices of good engineering.
IFSN-A5	Can Meet	Can Meet	
IFSN-A6	Can Meet	Can Meet	
IFSN-A7	Can Meet	Can Meet	
IFSN-A8	Can Meet	Can Meet	There is no requirement to address intra-area propagation to achieve CC I because it is conditioned on meeting CC I for supporting requirement IFPP-A2 in which the definition of flood areas results in no propagation to other modeled areas. This supporting requirement is met at CC I with no action, if IFPP-A2 is also met at CC I. However, if IFPP-A2 is addressed by achieving CC II/III, then this supporting requirement must also be performed (and evaluated) at CC II/III.
IFSN-A9	Can Meet	Can Meet	
IFSN-A10	Can Meet	Can Meet	This supporting requirement is feasible to the extent of limitations and issues identified in the previous IFSN supporting requirements.
IFSN-A11	Can Meet	Can Meet	If the DC or COL is for a single unit or for a site in which there are no shared systems or structures (including e.g., separate service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may make assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.

**Table 3. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IFSN-A12	REPLACE	REPLACE	Consistent with the replacement clarification for supporting requirement IE-C6, operator actions credited in correcting a condition to avoid a plant trip or shutdown should be demonstrated to have a low probability of failure. In addition, any other criteria used in screening should be demonstrated to not screen out flood events/areas that are significant contributors to flood risk. As a result, this supporting requirement should be replaced with the following criteria: **SCREEN OUT** flood areas where flooding of the area does not cause an initiating event or result in a plant trip (manual or automatic) or a controlled manual shutdown. If credit is taken for operator actions to correct the condition to avoid a plant trip or controlled shutdown, then ENSURE the credited operator actions and associated equipment have an exceedingly low probability of failure (i.e., collectively less than or equal to 1×10^{-5}) following the applicable supporting requirements of Part 2 (e.g., Human Reliability Analysis – Subsection 2-2.5) AND either of the following applies: (a) the flood area (including adjacent areas where flood sources can propagate) contains no mitigating equipment modeled in the PRA; OR (b) the flood area has no flood sources sufficient (e.g., through spray, immersion, or other applicable mechanism) to cause failure of the equipment identified in IFSN-A5. **DO NOT USE** failure of a barrier against inter-area propagation to justify screening (i.e., for screening, do not credit such failures as a means of beneficially draining the area). If additional qualitative screening criteria are applied, **DEFINE** the applied criteria and **PROVIDE** a basis that demonstrates internal flooding events that are screened out using the criteria are not significant contributors to internal flood risk.

Table 3. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
`IFSN-A13	NOT APPLICABLE	NOT APPLICABLE	Given that drains can be plugged or covered and sump pumps can fail, qualitative screening should not credit this capability, but rather address the flood events quantitatively considering mitigation system performance and potential failures. That being the case, at this stage of screening of internal flood events, this supporting requirement should be considered not applicable and should not be used.
IFSN-A14	NOT APPLICABLE	NOT APPLICABLE	Consistent with the replacement clarification for supporting requirement IE-C6 and IFSN-A12, operator actions credited in correcting a condition to avoid a plant trip or shutdown should be demonstrated to have an exceedingly low probability of failure. Because this condition is reflected in clarification for supporting requirement IFSN-A12, this supporting requirement is not necessary and should not be used.
IFSN-A15	NOT APPLICABLE	NOT APPLICABLE	For this supporting requirement, criterion (a) is redundant with IFSN-A12 (without the condition that it cause an initiating event/shutdown), criterion (b) has the same condition as provided above for supporting requirement IFSN-A13 related to drains and sump pumps, and criterion (c) is a qualitative version of the quantitative criteria below in supporting requirement IFEV-A8, for which it is more appropriate to use the quantitative criterion for screening. That being the case, this supporting requirement is not necessary and should not be used.
IFSN-A16	NOT APPLICABLE	NOT APPLICABLE	This supporting requirement is redundant with IFSN-A14 and, like IFSN-A14, should not be used.
IFSN-A17	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information collected in IFSN-A1 through A16.
HLR-IFSN-B	Documentation of the internal flood scenarios shall be consistent with the applicable supporting requirements.		
IFSN-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IFSN-B2	Can Meet	Can Meet	

Table 3. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IFSN-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Internal Flood-Induced Initiating Event Analysis			
HLR-IFEV-A	Plant initiating events caused by internal flood shall be identified and their frequencies estimated.		
IFEV-A1	Can Meet	Can Meet	
IFEV-A2	Can Meet	Can Meet	
IFEV-A3	Can Meet	Can Meet	
IFEV-A4	Can Meet	Can Meet	If the DC or COL is for a single unit or for a site in which there are no shared systems or structures (including e.g., separate service water) then this supporting requirement is Not Applicable. For multi-unit designs, a DC may make assumptions regarding shared support system arrangements, while a COL can address the designs for the alignment of site-specific shared support systems.
IFEV-A5	Can Meet	Can Meet	
IFEV-A6	Can Meet	Can Meet	
IFEV-A7	Can Meet	Can Meet	DC and COL applications will likely rely on design and guidance documents to determine human-induced flood potentials during maintenance.
IFEV-A8	Can Meet	Can Meet	COMMENT: The reference for the screening criteria is incorrect in the supporting requirement and should be to IE-C6 of Part 2, as applied to flooding events.
HLR-IFEV-B	Documentation of the internal flood-induced initiating events shall be consistent with the applicable supporting requirements.		
IFEV-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IFEV-B2	Can Meet	Can Meet	
IFEV-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Internal Flood Accident Sequences and Quantification			
HLR-IFQU-A	Internal flood-induced accident sequences shall be quantified.		
IFQU-A1	Can Meet	Can Meet	
IFQU-A2	Can Meet	Can Meet	

Table 3. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 3, Internal Flood at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IFQU-A3	NOT APPLICABLE	NOT APPLICABLE	With the corrected cross-reference in supporting requirement IFEV-A8 to supporting requirement IE-C6, the criterion in this supporting requirement is essentially the same as clarification replacement IE-C6 criterion (c). That being the case, this supporting requirement is redundant and not necessary.
IFQU-A4	Can Meet	Can Meet	
IFQU-A5	Can Meet	Can Meet	
IFQU-A6	Can Meet	Can Meet	
IFQU-A7	Can Meet	Can Meet	
IFQU-A8	Can Meet	Can Meet	
IFQU-A9	Can Meet	Can Meet	
IFQU-A10	Can Meet	Can Meet	
IFQU-A11	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information collected in IFQU-A1 through A11.
HLR-IFQU-B	Documentation of the internal flood accident sequences and quantification shall be consistent with the applicable supporting requirements.		
IFQU-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IFQU-B2	Can Meet	Can Meet	
IFQU-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Addressing Part 4, Fires, Supporting Requirements

In addition to the general limitations, DC applications addressing 10 CFR 52.47(a)(27) and COL applications addressing 10 CFR 52.79(a)(46) might not have specific cable routing, ignition sources, and target locations in each fire plant analysis unit. This might impact the manner in which the applicant models internal fires. Consistent with the fire PRA methods, where information is lacking, the "exclusion approach," consistent with CS-A11 (and its associated note), can be used. Further, the approach to analyzing internal fires for these application stages will likely be more general and simplified for most areas (e.g., performing "full room burnout" to demonstrate acceptably low impacts instead of identifying specific ignition sources). Supporting requirements are considered herein in light of this more general approach. Further, for these stages the supporting requirements requiring walkdowns are not feasible.

Many supporting requirements refer back to the internal events PRA supporting requirements and some refer to other supporting requirements within this Part. As such, these supporting

requirements should also consider the evaluation of the applicability and feasibility of the referenced supporting requirement, including any pertinent comments or clarifications.

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
Plant Partitioning			
HLR-PP-A	The Fire PRA shall define the global boundaries of the analysis so as to include all plant locations relevant to the plant-wide Fire PRA.		
PP-A1	Can Meet	Can Meet	
HLR-PP-B	The Fire PRA shall perform a plant partitioning analysis to identify and define the physical analysis units to be considered in the Fire PRA.		
PP-B1	Can Meet	Can Meet	
PP-B2	Can Meet	Can Meet	Because CC I is met if no credit is taken for partitioning elements that lack a fire resistance rating, this supporting requirement is met at CC I by not taking any credit. If partitioning is credited, then it must be performed (and evaluated) to CC II/III.
PP-B3	Can Meet	Can Meet	Because CC I is met if no credit is taken for partitioning based on spatial separation, this supporting requirement is met at CC I by not taking any credit. If spatial separation is credited, then it must be performed (and evaluated) to CC II/III.
PP-B4	Can Meet	Can Meet	Because this supporting requirement is met if no credit is taken for the cited partitioning elements, this supporting requirement is met by not taking the credit. If credit is taken for any of the cited elements, then the supporting requirement is not met because this limitation on credit spans all three capability categories.
PP-B5	Can Meet	Can Meet	Because CC I is met if no credit is taken for partitioning elements based on active fire barrier elements (unless these are credited in the regulatory fire protection program), this supporting requirement is met at CC I by not taking the credit. If active elements are credited, then it must be performed (and evaluated) to CC II/III.
PP-B6	Can Meet	Can Meet	
PP-B7	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information collected in PP-B1 through B6.
HLR-PP-C	The Fire PRA shall document the results of the plant partitioning analysis in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
PP-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
PP-C2	Can Meet	Can Meet	
PP-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions associated with internal fire plant partitioning, including those uncertainties and assumptions resulting from the status of the design, site, operational, and maintenance information or data.
PP-C4	Can Meet	Can Meet	
Equipment Selection			
HLR-ES-A	The Fire PRA shall identify equipment whose failure, caused by an initiating fire including spurious operation, will contribute to or otherwise cause an initiating event.		
ES-A1	Can Meet	Can Meet	For the DC and COL applications, the identification of equipment resulting in manual trip will likely be based on design and general operational guidance documents, instead of specific procedures.
ES-A2	Can Meet	Can Meet	Because this supporting requirement supports ES-A1 in identifying additional equipment that could adversely affect the equipment identified in ES-A1, the same consideration applies to this supporting requirement. Further, DC applicants may make assumptions regarding the design of some of the support systems, while the COL applicant can directly address the site-specific support system design.
ES-A3	Can Meet	Can Meet	The objective of this supporting requirement is applicable (i.e., include equipment whose fire-induced failures contribute to or cause unique fire-induced initiating events not already identified). For the DC and COL applications, the fire safe shutdown/Appendix R analysis might not be fully established. That being the case, the applicant will likely identify equipment based on the internal events PRA. COMMENT: The reference to supporting requirement IE-C4 is incorrect; the reference should be to IE-C6.

**Table 4. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 4, Fires at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
ES-A4	Can Meet	Can Meet	The objective of this supporting requirement is applicable (i.e., include equipment whose fire-induced failures contribute to or cause unique fire-induced initiating events not already identified). For the DC and COL applications, the fire safe shutdown/Appendix R analysis might not be fully established. That being the case, the applicant will likely identify equipment based on the internal events PRA and general design documentation. COMMENT: The reference to supporting requirement IE-C4 is incorrect and is supposed to be to IE-C6.
ES-A5	Can Meet	Can Meet	
ES-A6	Can Meet	Can Meet	
HLR-ES-B	The Fire PRA shall identify equipment whose failure including spurious operation would adversely affect the operability/functionality of that portion of the plant design to be credited in the Fire PRA.		
ES-B1	CANNOT MEET	CANNOT MEET	For the DC and COL applications, the fire safe shutdown/Appendix R equipment might not be established. As stated in the notes, this is the starting point for identifying mitigating equipment and is expected to be an iterative process. That being the case, the applicant will likely use other means of identifying mitigating equipment in addition to the fire safe shutdown/Appendix R source, such as the equipment identified for mitigation in the internal events PRA.
ES-B2	Can Meet	Can Meet	
ES-B3	Can Meet	Can Meet	
ES-B4	Can Meet	Can Meet	Because this supporting requirement supports ES-B1through B3 in identifying additional equipment that could adversely affect the equipment identified previously, the same consideration applies to this supporting requirement. Further, DC applicants may make assumptions regarding the design of some of the support systems, while the COL applicant can directly address the site-specific support system design.
ES-B5	Can Meet	Can Meet	
HLR-ES-C	The Fire PRA shall identify instrumentation whose failure including spurious operation would impact the reliability of operator actions associated with that portion of the plant design to be credited in the Fire PRA.		
ES-C1	Can Meet	Can Meet	
ES-C2	Can Meet	Can Meet	

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HLR-ES-D	The Fire PRA shall document the Fire PRA equipment selection, including that information about the equipment necessary to support the other Fire PRA tasks (e.g., equipment identification; equipment type; normal, desired, failed states of equipment; etc.) in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
ES-D1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
ES-D2	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
<td colspan="4" align="center">Cable Selection</td>			
HLR-CS-A	The Fire PRA shall identify and locate the plant cables whose failure could adversely affect credited equipment or functions included in the Fire PRA plant response model, as determined by the equipment selection process.		
CS-A1	Can Meet	Can Meet	The notes for this supporting requirement recognize the explicit identification of individual cables is not required if CS-A11 is used. That being the case, meeting this supporting requirement is feasible at a general level for the DC and COL applications.
CS-A2	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach" consistent with CS A11.
CS-A3	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach" consistent with CS-A11.
CS-A4	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach" consistent with CS-A11. If no additional cables are selected, then this supporting requirement is Not Applicable.
CS-A5	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach" consistent with CS-A11.

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
CS-A6	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach," consistent with CS-A11.
CS-A7	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach," consistent with CS-A11.
CS-A8	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach," consistent with CS-A11.
CS-A9	CANNOT MEET	CANNOT MEET	For the DC and COL applications, cable and circuit information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach," consistent with CS-A11.
CS-A10	Can Meet	Can Meet	For the DC and COL applications, complete cable and circuit routing information might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach," consistent with CS-A11. The notes for this supporting requirement recognize the exclusion approach may be used.
CS-A11	Can Meet	Can Meet	
HLR-CS-B	The Fire PRA shall (a) perform a review for additional circuits that are either required to support a credited circuit (i.e., per HLR-CS-A) or whose failure could adversely affect a credited circuit. (b) identify any additional equipment and cables related to these additional circuits in a manner consistent with the other equipment and cable selection requirements of this standard.		

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
CS-B1	CANNOT MEET	CANNOT MEET	For the DC and COL applications, the electrical overcurrent coordination and protection analysis might not be available and the applicant will likely use design and operational guidance documents, general good practices of engineering, and the "exclusion approach," consistent with CS-A11 in identifying additional circuits and cables.
HLR-CS-C	The Fire PRA shall document the cable selection and location process and results in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
CS-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
CS-C2	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
CS-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
CS-C4	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
CS-C5	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Qualitative Screening			
HLR-QLS-A	The Fire PRA shall identify those physical analysis units that screen out as individual risk contributors without quantitative analysis.		
QLS-A1	Can Meet	Can Meet	For the DC and COL applications, the cable and circuit information might not be available and the applicant will likely rely on the "exclusion approach," consistent with CS-A11. As a result, the physical analysis units retained for quantification will be based on this approach and thus, the supporting requirement is feasible.
QLS-A2	Can Meet	Can Meet	This supporting requirement is based on the results from ES, in particular ES-A1. As a result, the physical analysis units retained for quantification will be based on these results, so meeting the supporting requirement is feasible.
QLS-A3	Can Meet	Can Meet	

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
QLS-A4	Can Meet	Can Meet	If no additional criteria are used for screening, then this supporting requirement is Not Applicable.
HLR-QLS-B	The Fire PRA shall document the results of the qualitative screening analysis in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
QLS-B1	Can Meet	Can Meet	
QLS-B2	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
QLS-B3	Can Meet	Can Meet	
QLS-B4	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Plant Response Model			
HLR-PRM-A	The Fire PRA shall include the Fire PRA plant response model capable of supporting the HLR requirements of Fire Quantification (FQ).		
PRM-A1	Can Meet	Can Meet	
PRM-A2	Can Meet	Can Meet	
PRM-A3	Can Meet	Can Meet	
PRM-A4	Can Meet	Can Meet	
HLR-PRM-B	The Fire PRA plant response model shall include fire-induced initiating events, both fire-induced and random failures of equipment, fire-specific as well as non–fire-related human failures associated with safe shutdown, accident progression events (e.g., containment failure modes), and the supporting probability data (including uncertainty) based on the supporting requirements provided under this HLR that parallel, as appropriate, Part 2 for Internal Events PRA.		
PRM-B1	Can Meet	Can Meet	
PRM-B2	NOT APPLICABLE	NOT APPLICABLE	This supporting requirement involves the consideration of peer review findings on the internal events PRA, which likely will not exist for these application stages at the level expected for peer reviews per the Standard. That being the case, this supporting requirement is Not Applicable, though findings and insights from internal and independent reviews of the internal events PRA may be performed and should be reviewed consistent with the objective of this supporting requirement.
PRM-B3	Can Meet	Can Meet	
PRM-B4	Can Meet	Can Meet	COMMENT: The cross-reference should be to supporting requirement PRM-B3 instead of supporting requirement PRM-B2.

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
PRM-B5	Can Meet	Can Meet	For DC and COL applications the information relied on will likely be design and general operational guidance and good engineering practices for fire response.
PRM-B6	Can Meet	Can Meet	For DC and COL applications the information relied on will likely be design and general operational guidance and good engineering practices for fire response.
PRM-B7	Can Meet	Can Meet	
PRM-B8	Can Meet	Can Meet	
PRM-B9	Can Meet	Can Meet	
PRM-B10	Can Meet	Can Meet	
PRM-B11	Can Meet	Can Meet	
PRM-B12	Can Meet	Can Meet	
PRM-B13	Can Meet	Can Meet	
PRM-B14	Can Meet	Can Meet	
PRM-B15	Can Meet	Can Meet	
HLR-PRM-C	The Fire PRA shall document the Fire PRA plant response model in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
PRM-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
PRM-C2	NEW	NEW	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
Fire Scenario Selection and Analysis			
HLR-FSS-A	The Fire PRA shall select one or more combinations of an ignition source and damage target set to represent the fire scenarios in terms of fire ignition sources and target sets for each unscreened physical analysis unit upon which estimation of the risk contribution (CDF and LERF) of the physical analysis unit will be based.		
FSS-A1	Can Meet	Can Meet	For DC and COL applications, this identification will likely be general, especially as it relates to transient fire sources, and to the level of analysis. In many cases, the analysis will likely rely on bounding approaches, such as "full room burnout," to demonstrate insignificant or acceptably low results to support addressing this supporting requirement at a general level.
FSS-A2	Can Meet	Can Meet	
FSS-A3	Can Meet	Can Meet	
FSS-A4	Can Meet	Can Meet	
FSS-A5	Can Meet	Can Meet	Feasible within the limitations and constraints of FSS-A1.
FSS-A6	Can Meet	Can Meet	

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HLR-FSS-B	The Fire PRA shall include an analysis of potential fire scenarios leading to the MCR abandonment.		
FSS-B1	Can Meet	Can Meet	
FSS-B2	Can Meet	Can Meet	
HLR-FSS-C	The Fire PRA shall characterize the factors that will influence the timing and extent of fire damage for each combination of an ignition source and damage target sets selected per HLR-FSS-A.		
FSS-C1	Can Meet	Can Meet	
FSS-C2	Can Meet	Can Meet	
FSS-C3	Can Meet	Can Meet	
FSS-C4	Can Meet	Can Meet	
FSS-C5	Can Meet	Can Meet	
FSS-C6	Can Meet	Can Meet	
FSS-C7	Can Meet	Can Meet	If multiple suppression paths are not credited, then the supporting requirement is Not Applicable
FSS-C8	Can Meet	Can Meet	For DC and COL applications, the determination that fire wrap will be used in specific areas will likely be based on general design and operational guidance documents and the results from early analysis results recognizing the iterative nature of the development of the internal fire PRA. If fire wraps are not credited, then the supporting requirement is Not Applicable, which is the likely approach for most DC and COL applicants.
HLR-FSS-D	The Fire PRA shall quantify the likelihood of risk-relevant consequences for each combination of an ignition source and damage target sets selected per HLR-FSS-A.		
FSS-D1	Can Meet	Can Meet	
FSS-D2	Can Meet	Can Meet	
FSS-D3	Can Meet	Can Meet	
FSS-D4	Can Meet	Can Meet	
FSS-D5	Can Meet	Can Meet	
FSS-D6	Can Meet	Can Meet	
FSS-D7	Can Meet	Can Meet	
FSS-D8	Can Meet	Can Meet	
FSS-D9	Can Meet	Can Meet	No action is required to achieve CC I. At these application stages the fire analysis will typically assume widespread damage. That being the case, the fire analysis would generally capture potential smoke damage within the limits of the assumed fire damage (e.g., assuming the loss of all equipment in an analysis unit given a fire). Therefore, this supporting requirement is met at CC I with no additional action.

**Table 4. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 4, Fires at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
FSS-D10	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to confirm that the combination of fire sources and target sets that were selected according to supporting requirement FSS-A5 appropriately reflect the as-to-be-built plant conditions.
FSS-D11	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify that other aspects of the selected fire scenarios not covered by supporting requirement FSS-D10 have been characterized appropriately for each analyzed fire scenario.
HLR-FSS-E	The parameter estimates used in fire modeling shall be based on relevant generic industry and plant-specific information. Where feasible, generic and plant-specific evidence shall be integrated using acceptable methods to obtain plant-specific parameter estimates. Each parameter estimate shall be accompanied by a characterization of the uncertainty.		
FSS-E1	Can Meet	Can Meet	Feasible with generic information only.
FSS-E2	Can Meet	Can Meet	
FSS-E3	Can Meet	Can Meet	
FSS-E4	Can Meet	Can Meet	
HLR-FSS-F	The Fire PRA shall search for and analyze risk-relevant scenarios with the potential for causing fire-induced failure of exposed structural steel.		
FSS-F1	NOT APPLICABLE	NOT APPLICABLE	For DC and COL applications, locations of exposed structural steel are likely not known. The applicants may rely on general design documents and good engineering practices to exclude this condition in many, if not all, locations. If that approach is relied on, then this supporting requirement (and the related supporting requirements FSS-F2 and F3) are Not Applicable.
FSS-F2	NOT APPLICABLE	NOT APPLICABLE	Even though this supporting requirement has no requirement identified to achieve CC I, it is conditioned on FSS-F1, which is identified as Not Applicable. As a result, this supporting requirement is also considered Not Applicable. If FSS-F1 is addressed at CC I/II, then this supporting requirement needs to also be addressed (and evaluated) at CC II/III.
FSS-F3	NOT APPLICABLE	NOT APPLICABLE	If no scenarios are selected in accordance with FSS-F1, then this supporting requirement is also Not Applicable. However, if FSS-F1 is addressed at CC I/II, then this supporting requirement needs to be addressed (and evaluated) at CC I or greater.
HLR-FSS-G	The Fire PRA shall evaluate the risk contribution of multi-compartment fire scenarios.		

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
FSS-G1	Can Meet	Can Meet	Feasible within the limitations and conditions of supporting requirements FSS-C1 through FSS-C8.
FSS-G2	Can Meet	Can Meet	
FSS-G3	Can Meet	Can Meet	
FSS-G4	Can Meet	Can Meet	If no passive fire barriers are credited, then the supporting requirement is Not Applicable.
FSS-G5	Can Meet	Can Meet	
FSS-G6	Can Meet	Can Meet	
HLR-FSS-H	The Fire PRA shall document the results of the fire scenario and fire modeling analyses including supporting information for scenario selection, underlying assumptions, scenario descriptions, and the conclusions of the quantitative analysis, in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
FSS-H1	Can Meet	Can Meet	
FSS-H2	Can Meet	Can Meet	
FSS-H3	Can Meet	Can Meet	
FSS-H4	Can Meet	Can Meet	
FSS-H5	Can Meet	Can Meet	
FSS-H6	Can Meet	Can Meet	
FSS-H7	Can Meet	Can Meet	
FSS-H8	Can Meet	Can Meet	
FSS-H9	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
FSS-H10	CANNOT MEET	CANNOT MEET	Because plant-specific walkdowns cannot be performed at these application stages, it is not feasible to meet this supporting requirement.
FSS-H11	NEW	NEW	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data associated with the analyses as documented in FSS-H1 through H8 that would impact applications.
Ignition Frequency			
HLR-IGN-A	The Fire PRA shall develop fire ignition frequencies for every physical analysis unit that has not been qualitatively screened.		
IGN-A1	Can Meet	Can Meet	
IGN-A2	Can Meet	Can Meet	
IGN-A3	Can Meet	Can Meet	

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
IGN-A4	Can Meet	Can Meet	There is no requirement for performing a review of plant-specific experience to achieve CC I. It is not feasible to have plant-specific operating experience at these application stages and therefore, the staff does not expect these applicants to perform additional reviews; this supporting requirement is met with no additional action.
IGN-A5	Can Meet	Can Meet	The supporting requirement requires that the frequency be calculated on a reactor year basis, which can be performed. However, because no operating experience data will exist for these application stages upon which to estimate plant availability, an assumed availability will need to be used, with an appropriate justification, consistent with Part 2, IE-C5.
IGN-A6	NOT APPLICABLE	NOT APPLICABLE	Because there is no plant-specific data for these application stages, it is not necessary to use a Bayesian update process because only generic data will be used and, that being the case, it is not necessary to justify any distribution for a prior. As a result, this supporting requirement is Not Applicable.
IGN-A7	Can Meet	Can Meet	
IGN-A8	Can Meet	Can Meet	
IGN-A9	Can Meet	Can Meet	
IGN-A10	Can Meet	Can Meet	
HLR-IGN-B	The Fire PRA shall document the frequency estimation in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
IGN-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IGN-B2	Can Meet	Can Meet	
IGN-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
IGN-B4	Can Meet	Can Meet	
IGN-B5	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Quantitative Screening			

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HLR-QNS-A	If quantitative screening is performed, the Fire PRA shall establish quantitative screening criteria to ensure that the estimated cumulative impact of screened physical analysis units on CDF and LERF is small.		
QNS-A1	ENHANCE	ENHANCE	This supporting requirement identifies the need to establish quantitative screening criteria. This supporting requirement needs to be consistent with the screening criteria in supporting requirement IE-C6. That being the case, add the following to this supporting requirement: **USE** supporting requirement IE-C6, of Part 2, as applied to fires, for screening fire areas.
HLR-QNS-B	If quantitative screening is performed, the Fire PRA shall identify those physical analysis units that screen out as individual risk contributors.		
QNS-B1	Can Meet	Can Meet	
QNS-B2	Can Meet	Can Meet	
HLR-QNS-C	VERIFY that the cumulative impact of screened physical analysis units on CDF and LERF is small.		
QNS-C1	NOT APPLICABLE	NOT APPLICABLE	With the enhancement to QNS-A1 cross-referencing to supporting requirement IE-C6, the criterion in this supporting requirement is essentially redundant and not necessary.
HLR-QNS-D	The Fire PRA shall document the results of quantitative screening in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
QNS-D1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
QNS-D2	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
QNS-D3	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Circuit Failures			
HLR-CF-A	The Fire PRA shall determine the applicable conditional probability of the cable and circuit failure mode(s) that would cause equipment functional failure and/or undesired spurious operation based on the credited function of the equipment in the Fire PRA.		
CF-A1	Can Meet	Can Meet	
CF-A2	Can Meet	Can Meet	
HLR-CF-B	The Fire PRA shall document the development of the elements above in a manner that facilitates Fire PRA applications, upgrades, and peer review.		

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
CF-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
CF-B2	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Human Reliability Analysis			
HLR-HRA-A	The Fire PRA shall identify human actions relevant to the sequences in the Fire PRA plant response model.		
HRA-A1	Can Meet	Can Meet	
HRA-A2	Can Meet	Can Meet	For DC and COL applications, the determination of key human response actions will likely be based on general design and guidance documents because procedures and operations might not be developed.
HRA-A3	Can Meet	Can Meet	There is no requirement to identify new, undesired operator actions due to spurious indications to achieve CC I. It is recognized that plant procedures will not be available at these application stages and only operational guidance will be available. Though this supporting requirement is met at CC I with no additional action, it is related to ES-C1 and ES-C2 and it should be performed (and evaluated) consistent with (i.e., at the same capability category level of) these supporting requirements.
HRA-A4	CANNOT MEET	CANNOT MEET	This supporting requirement requires the review of the procedure interpretations with plant operations and training personnel to verify it reflects the operations and training practices. For DC and COL applications, the model will likely be based on design and guidance documents; procedures will not be available. In addition, plant operators and training practices will likely not exist to perform this review. That being the case, this supporting requirement is not feasible in these application stages.
HLR-HRA-B	The Fire PRA shall include events where appropriate in the Fire PRA that represents the impacts of incorrect human responses associated with the identified human actions.		
HRA-B1	Can Meet	Can Meet	
HRA-B2	Can Meet	Can Meet	

Table 4. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 4, Fires at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HRA-B3	Can Meet	Can Meet	For DC and COL applications, the timing, procedural, cues/indications, and complexity aspects will likely be based on design and guidance documents and analyses.
HRA-B4	Can Meet	Can Meet	There is no requirement to include in the PRA undesired operator actions that could be taken in response to fire-induced instrumentation failure in order to achieve CC I. It is recognized that plant procedures will not be available at these application stages and only operational guidance will be available. Though this supporting requirement is met at CC I with no additional action, it is related to ES-C1 and ES-C2 and it should be performed (and evaluated) consistent with (i.e., at the same capability category level of) these supporting requirements.
HLR-HRA-C	The Fire PRA shall quantify HEPs associated with the incorrect responses accounting for the plant-specific and scenario-specific influences on human performance, particularly including the effects of fires.		
HRA-C1	Can Meet	Can Meet	
HLR-HRA-D	The Fire PRA shall include recovery actions only if it has been demonstrated that the action is plausible and feasible for those scenarios to which it applies, particularly accounting for the effects of fires.		
HRA-D1	Can Meet	Can Meet	
HRA-D2	Can Meet	Can Meet	
HLR-HRA-E	The Fire PRA shall document the HRA, including the unique fire-related influences of the analysis, in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
HRA-E1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact risk-informed applications, upgrades, and peer review.
HRA-E2	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Seismic Fire			
HLR-SF-A	The Fire PRA shall include a qualitative assessment of potential seismic/fire interaction issues in the Fire PRA.		
SF-A1	Can Meet	Can Meet	
SF-A2	Can Meet	Can Meet	For DC and COL applications, available design information will be used in considering fire detection and suppression systems and the potential impacts from seismic events.

**Table 4. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 4, Fires at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SF-A3	Can Meet	Can Meet	For DC and COL applications, available design information will be used in considering fire detection and suppression systems and the potential impacts from seismic events.
SF-A4	Can Meet	Can Meet	For DC and COL applications, the response to seismic events will likely be based on design and operational guidance documents.
SF-A5	CANNOT MEET	CANNOT MEET	For DC and COL applications, specific fire brigade training procedures will likely not be available and, that being the case, it will not be possible to assess the extent that training addresses seismic event impacts on fire response, In addition, the storage and placement of firefighting equipment and routes likely will not be known. As a result, it will not be possible to assess the how a seismic event might impact these features. If training, procedures and storage and placement of equipment are not available, typical or expected fire brigade training procedures should be reviewed with knowledgeable design staff.
HLR-SF-B	The Fire PRA shall document the results of the seismic/fire interaction assessment in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
SF-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
SF-B2	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Fire Risk Quantification			
HLR-FQ-A	Quantification of the Fire PRA shall quantify the fire-induced CDF.		
FQ-A1	Can Meet	Can Meet	
FQ-A2	Can Meet	Can Meet	
FQ-A3	Can Meet	Can Meet	
FQ-A4	Can Meet	Can Meet	
HLR-FQ-B	The fire-induced CDF quantification shall use appropriate models and codes and shall account for method-specific limitations and features.		
FQ-B1	Can Meet	Can Meet	
HLR-FQ-C	Model quantification shall determine that all identified dependencies are addressed appropriately.		
FQ-C1	Can Meet	Can Meet	
HLR-FQ-D	The frequency of different containment failure modes leading to a fire-induced large early release shall be quantified and aggregated, thus determining the fire-induced LERF.		
FQ-D1	Can Meet	Can Meet	

**Table 4. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 4, Fires at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
HLR-FQ-E	The fire-induced CDF and LERF quantification results shall be reviewed, and significant contributors to CDF and LERF, such as fires and their corresponding plant initiating events, fire locations, accident sequences, basic events (equipment unavailabilities and human failure events), plant damage states, containment challenges, and failure modes, shall be identified. The results shall be traceable to the inputs and assumptions made in the Fire PRA.		
FQ-E1	Can Meet	Can Meet	
HLR-FQ-F	The documentation of CDF and LERF analyses shall be consistent with the applicable SRs.		
FQ-F1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact risk-informed applications, upgrades, and peer review.
FQ-F2	Can Meet	Can Meet	
FQ-F3	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Uncertainty and Sensitivity Analysis			
HLR-UNC-A	The Fire PRA shall identify sources of CDF and LERF uncertainties and related assumptions and modeling approximations. These uncertainties shall be characterized such that their potential impacts on the results are understood..		
UNC-A1	Can Meet	Can Meet	
UNC-A2	Can Meet	Can Meet	Feasible within the limitations and constraints of the cited sections in the fire analysis.
HLR-UNC-B	The Fire PRA shall document the identified sources of CDF and LERF uncertainties and related assumptions and modeling approximations in a manner that facilitates Fire PRA applications, upgrades, and peer review.		
UNC-B1	NEW	NEW	**DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
UNC-B2	NEW	NEW	**DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Addressing Part 5, Seismic Events, Supporting Requirements

The seismic event analyses used to support DC applications addressing 10 CFR 52.47(a)(27) and COL applications addressing 10 CFR 52.79(a)(46) will likely be based on the "PRA-based seismic margins," approach. Information on the use of this approach for DC and COL

applications is provided in Interim Staff Guidance DC/COL-ISG-020 and SRP Section 19.0. In addition, DC applications will not have regional or site-specific information on which to base their analyses. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard analysis will be performed. As a result, the seismic hazard portion of the PRA Standard is considered not applicable for the DC application stage and the development and review of this aspect should use the Interim Staff Guidance DC/COL-ISG-020 and associated portions of SRP Section 19.0. For COL applications, site-specific hazard information will be available to address the seismic hazards supporting requirements directly and/or confirm that the DC hazard analysis bounds the actual site and regional characteristics.

Further, the seismic fragility analyses using the PRA-based seismic margins approach results in not developing mean fragilities (failure probabilities and uncertainty distributions) for SSCs, but rather, the development of high confidence of low probability of failure (HCLPF) values, typical of margins-type analyses. These HCLPF values will likely be developed from generic data sources. The basic events using the HCLPF values will be incorporated into the plant response model similar to other PRA basic events are incorporated, except that the HCLPF value is represented by a capacity (e.g., peak ground acceleration) instead of a failure probability. The quantification will also be performed using margins-type approaches, such as "min-max," rules or convolution techniques, to derive a plant-level HCLPF.

In addition to the general limitations, DC and COL applications might not contain specific information that may impact the manner in which the applicant models seismic events. Further, for these stages the supporting requirements requiring walkdowns are not feasible.

Many supporting requirements refer back to the internal events PRA supporting requirements. As such, these supporting requirements for which this is the case, reviewers should also consider the evaluation of the applicability and feasibility of the referenced supporting requirement, including any pertinent comments or clarifications.

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
Seismic Hazard Analysis			
HLR-SHA-A	The frequency of earthquakes at the site shall be based on a site-specific probabilistic seismic hazard analysis (existing or new) that reflects the composite distribution of the informed technical community. The level of analysis shall be determined based on the intended application and on site-specific complexity.		

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-A1	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site and regional characteristics. These applications will follow ISG DC/COL-ISG-020.
SHA-A2	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020.
SHA-A3	NOT APPLICABLE	Can Meet	If peak ground accelerations are used instead of spectral accelerations, then frequencies (i.e., Hz) do not need to be considered and this supporting requirement is Not Applicable. These applications will follow ISG DC/COL-ISG-020.
SHA-A4	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020.
SHA-A5	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-B	To provide inputs to the probabilistic seismic hazard analysis, a comprehensive up-to-date database, including geological, seismological, and geophysical data; local site topography; and surficial geologic and geotechnical site properties shall be compiled. A catalog of historical, instrumental, and paleoseismicity information shall also be compiled.		
SHA-B1	NOT APPLICABLE	Can Meet	DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. If these characteristics/requirements cover the geological, seismological, geophysical, and geotechnical databases, then the applicant can meet the supporting requirement (if not, then it is not met) For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.

**Table 5. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-B2	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis or ensure the information characterizes all credible seismic sources that might contribute to the frequency of vibratory ground motion at the site. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site and regional characteristics. These applications will follow ISG DC/COL-ISG-020.
SHA-B3	NOT APPLICABLE	Can Meet	DC applications will not have the site information on which to determine what historical data needs to be included or excluded. Rather, DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site and regional characteristics. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-C	To account for the frequency of occurrence of earthquake ground motions in the site region, the probabilistic seismic hazard analysis shall examine all credible sources of potentially damaging earthquakes. Both the aleatory and epistemic uncertainties shall be addressed in characterizing the seismic sources.		
SHA-C1	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.
SHA-C2	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020.

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-C3	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis or ensure that the total uncertainties are accounted for. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.
SHA-C4	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. If an existing study is not used, then the supporting requirement is Not Applicable. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-D	The probabilistic seismic hazard analysis shall examine mechanisms influencing vibratory ground motion that can occur at a site given the occurrence of an earthquake of a certain magnitude at a certain location. Both the aleatory and epistemic uncertainties shall be addressed in characterizing the ground motion propagation.		
SHA-D1	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.
SHA-D2	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020.

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-D3	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis or ensure all important uncertainties are accounted for. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.
SHA-D4	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements upon which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. If an existing study is not used, then the supporting requirement is Not Applicable. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-E	The probabilistic seismic hazard analysis shall account for the effects of local site response.		
SHA-E1	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.

**Table 5. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-E2	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis or ensure that all important uncertainties have been accounted for. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-F	Uncertainties in each step of the hazard analysis shall be propagated and displayed in the final quantification of hazard estimates for the site. The results shall include fractile hazard curves, median and mean hazard curves, and uniform hazard response spectra. For certain applications, the probabilistic seismic hazard analysis shall include seismic source deaggregation and magnitude-distance deaggregation.		
SHA-F1	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020.
SHA-F2	NOT APPLICABLE	Can Meet	For DC applications, though sensitivity studies can be performed, they cannot be assured as identifying factors that are important to the site hazard, because some of the information will likely be conservative and might mask the importance of some factors. For COL applications, site-specific hazard information will be available to address the supporting requirement directly. These applications will follow ISG DC/COL-ISG-020.
SHA-F3	NOT APPLICABLE	Can Meet	These applications will follow ISG DC/COL-ISG-020. **COMMENT:** Mean hazard curves are needed for <u>either</u> a peak ground acceleration <u>or</u> a spectral acceleration; not necessarily both.
HLR-SHA-G	For further use in the seismic PRA, the spectral shape shall be based on a site-specific evaluation taking into account the contributions of deaggregated magnitude-distance results of the probabilistic seismic hazard analysis. Broad-band, smooth spectral shapes, such as those presented in NUREG/CR-0098 (for lower-seismicity sites such as most of those east of the U.S. Rocky Mountains) are also acceptable if they are shown to be appropriate for the site. The use of uniform hazard response spectra is also acceptable unless evidence comes to light that would challenge these uniform hazard spectral shapes.		

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-G1	NOT APPLICABLE	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed. Though the objective of most DC applicants will be to bound most sites, this cannot be ensured until actual sites are identified and evaluated. For COL applications, site-specific hazard information will be available to address the supporting requirement directly and/or confirm that the DC hazard bounds the actual site characteristics. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-H	When use is made of an existing study for probabilistic seismic hazard analysis purposes, it shall be confirmed that the basic data and interpretations are still valid in light of current information, the study meets the requirements outlined in A through G above, and the study is suitable for the intended application.		
SHA-H	NOT APPLICABLE	Can Meet	If existing studies are not used, then the supporting requirement is Not Applicable. DC applicants are not expected to use existing studies because the approach of most DC applicants will be to bound site characteristics. If existing studies are used, then the applicant can meet the supporting requirement while recognizing the limitations of high level requirements SHA-A through G. COL applicants can meet the supporting requirement. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-I	A screening analysis shall be performed to assess whether, in addition to the vibratory ground motion, other seismic hazards, such as fault displacement, landslide, soil liquefaction, or soil settlement, need to be included in the seismic PRA for the specific application. If so, the seismic PRA shall address the effect of these hazards through assessment of the frequency of hazard occurrence or the magnitude of hazard consequences, or both.		

**Table 5. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SHA-I	CANNOT MEET	Can Meet	The PRA Standard does not identify any supporting requirements and this evaluation is based on the high level requirement, Regulatory Guide 1.200 established a more focused high level requirement and converted the current high level requirement into two supporting requirements. Though the objective of most DC applicants will be to bound most sites, this cannot be ensured until actual sites are identified and evaluated. That being the case, DCs cannot address the potential for sites to have fault displacements, etc. and be able to address their frequency or magnitude of hazard consequences generically. Rather, DC applicants will establish site characteristics and site interface requirements on which the seismic hazard for the analysis will be performed, which will likely exclude these considerations. Therefore, DCs cannot meet this supporting requirement, though COLs can meet the supporting requirement. These applications will follow ISG DC/COL-ISG-020.
HLR-SHA-J	Documentation of the probabilistic seismic hazard analysis shall be consistent with the applicable supporting requirements.		
SHA-J1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
SHA-J2	Can Meet	Can Meet	
SHA-J3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Seismic Fragility Analysis			
HLR-SFR-A	The seismic-fragility evaluation shall be performed to estimate plant-specific, realistic seismic fragilities of SSCs whose failure may contribute to core damage or large early release, or both.		
SFR-A1	Can Meet	Can Meet	For DC and COL applications, basic events will use HCLPF values (in terms of acceleration) to represent the seismic fragilities of SSCs.
SFR-A2	Can Meet	Can Meet	
HLR-SFR-B	If screening of high-seismic-capacity components is performed, the basis for the screening shall be fully described.		

**Table 5. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SFR-B1	Can Meet	Can Meet	If screening is not performed, this supporting requirement is Not Applicable. However, it is likely that some level of screening will be performed for high-seismic-capacity SSCs.
SFR-B2	Can Meet	Can Meet	
HLR-SFR-C	The seismic-fragility evaluation shall be based on realistic seismic response that SSCs experience at their failure levels.		
SFR-C1	CANNOT MEET	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis or ensure the spectral shape bounds the site-specific conditions. DC applicants will establish site characteristics and site interface requirements on which the seismic response analysis will be performed. Though the objective of most DC applicants will be to bound most sites and the note indicates an allowance for using a general spectral shape if site-specific shapes are not available, this cannot be ensured to bound the site until actual sites are identified and evaluated. For COL applications, site-specific response spectra information will be available to address the supporting requirement directly and/or confirm that the DC response spectra bounds the actual site characteristics.
SFR-C2	NOT APPLICABLE	Can Meet	If the conditional activity cited in this supporting requirement is not performed, then the supporting requirement is Not Applicable. This will be the case for DC applications because site-specific information is not available. For COL applications, the applicant can meet this supporting requirement.
SFR-C3	Can Meet	Can Meet	If the conditional activity cited in this supporting requirement is not performed, then the supporting requirement is Not Applicable. Because design response analysis will be available, even for DC applications, the applicant can meet this supporting requirement.

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SFR-C4	NOT APPLICABLE	Can Meet	If a new analysis is not performed, then the supporting requirement is Not Applicable. This will be the case for the DC applications because regional or site-specific information will not be available to make this judgment. Rather, DC applicants will establish site characteristics and site interface requirements on which the seismic response analysis will be performed. For COL applications, site-specific information will be available to address the supporting requirement directly.
SFR-C5	Can Meet	Can Meet	If the median-centered response analysis approach is not performed, then the supporting requirement is Not Applicable. DC applicants will establish site characteristics and site interface requirements on which the seismic response analysis will be performed, which might involve this approach, as well as for COL applications.
SFR-C6	NOT APPLICABLE	Can Meet	If the soil-structure interaction analysis is not performed, then the supporting requirement is Not Applicable. This will be the case for the DC applications since regional or site-specific information will not be available to conduct this analysis. For COL applications, site-specific information will be available to address the supporting requirement directly.
HLR-SFR-D	The seismic-fragility evaluation shall be performed for critical failure modes of SSCs such as structural failure modes and functional failure modes identified through the review of plant design documents, supplemented as needed by earthquake experience data, fragility test data, generic qualification test data, and a walkdown.		
SFR-D1	CANNOT MEET	CANNOT MEET	Though failure modes will be identified from design documents, for DC and COL applications, walkdowns will not be able to be performed to verify the information or identify additional failure modes.
SFR-D2	Can Meet	Can Meet	Though the applicant can meet this supporting requirement, for DC and COL applications, the evaluation will be somewhat limited due to the status of the design.
HLR-SFR-E	The seismic-fragility evaluation shall incorporate the findings of a detailed walkdown of the plant focusing on the anchorage, lateral seismic support, and potential systems interactions.		
SFR-E1	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information or identify additional failure modes.

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SFR-E2	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to verify the information or identify additional failure modes, so observations and conclusions cannot be documented.
SFR-E3	NOT APPLICABLE	NOT APPLICABLE	If components are not screened out, then the supporting requirement is Not Applicable, which will likely be the case for DC and COL applications. If components are screened out, then a justification for the screening needs to be provided.
SFR-E4	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to identify the potential for seismically-induced fires and flooding. These considerations will need to be based on general design information, including consideration of the information from the internal flooding and internal fire PRAs.
SFR-E5	CANNOT MEET	CANNOT MEET	For DC and COL applications, walkdowns will not be able to be performed to identify the potential for sources of interactions and their consequences. These considerations will need to be based on general design information, including layout drawings.
HLR-SFR-F	The calculation of seismic fragility parameters such as median capacity and variabilities shall be based on plant-specific data supplemented as needed by earthquake experience data, fragility test data, and generic qualification test data. Use of such generic data shall be justified.		
SFR-F1	Can Meet	Can Meet	For DC and COL applications, the component seismic fragility will not have plant-specific data. That being the case these applicants will rely on the supplemental sources in establishing HCLPF values (instead of median capacities with variabilities) for the components, similar to the discussion in the note to this supporting requirement.
SFR-F2	Can Meet	Can Meet	For DC and COL application, this supporting requirement will used the exception clause in the supporting requirement and justify the use of generic fragility information for the analysis.
SFR-F3	Can Meet	Can Meet	For DC and COL applications, the screening for low-ruggedness relays will rely on design documentation that will likely establish that low-ruggedness relays will not be used in the design. That being the case, the analysis will not identify any relays for this evaluation.

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SFR-F4	Can Meet	Can Meet	The objective of this supporting requirement is to establish seismic fragilities that address LERF aspects. For ALWRs in addressing LRF, the applicant can meet this supporting requirement, recognizing the limitations and conditions identified for the prior supporting requirements in SFR.
HLR-SFR-G	Documentation of the seismic-fragility evaluation shall be consistent with the applicable supporting requirements.		
SFR-G1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
SFR-G2	Can Meet	Can Meet	
SFR-G3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
Seismic Plant Response Analysis			
HLR-SPR-A	The seismic-PRA systems model shall include seismic-caused initiating events and other failures including seismic-induced SSC failures, non-seismic-induced unavailabilities, and human errors that give rise to significant accident sequences and/or significant accident progression sequences.		
SPR-A1	Can Meet	Can Meet	
SPR-A2	Can Meet	Can Meet	
SPR-A3	Can Meet	Can Meet	
SPR-A4	Can Meet	Can Meet	
HLR-SPR-B	The seismic-PRA systems model shall be adapted to incorporate seismic-analysis aspects that are different from corresponding aspects found in the full-power, internal-events PRA systems model.		
SPR-B1	Can Meet	Can Meet	
SPR-B2	Can Meet	Can Meet	
SPR-B3	Can Meet	Can Meet	If screening is not performed, the supporting requirement is Not Applicable. For these application stages, the applicant can meet this supporting requirement.
SPR-B4	Can Meet	Can Meet	
SPR-B5	Can Meet	Can Meet	
SPR-B6	Can Meet	Can Meet	This supporting requirement is closely related to SFR-F3.
SPR-B7	Can Meet	Can Meet	
SPR-B8	Can Meet	Can Meet	
SPR-B9	Can Meet	Can Meet	
SPR-B10	Can Meet	Can Meet	

Table 5. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 5, Seismic Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
SPR-B11	CANNOT MEET	CANNOT MEET	This supporting requirement is closely related to SFR-E4. For DC and COL applications, walkdowns will not be able to be performed to identify the potential for seismically-induced fires and flooding. These considerations will need to be based on general design information, including consideration of the information from the internal flooding and internal fire PRAs.
HLR-SPR-C	The seismic-PRA systems model shall reflect the as-built and as-operated plant being analyzed.		
SPR-C1	Can Meet	Can Meet	
HLR-SPR-D	The list of SSCs selected for seismic-fragility analysis shall include the SSCs that participate in accident sequences included in the seismic-PRA systems model.		
SPR-D1	Can Meet	Can Meet	
HLR-SPR-E	The analysis to quantify core damage frequency and large early release frequency shall appropriately integrate the seismic hazard, the seismic fragilities, and the systems-analysis aspects.		
SPR-E1	Can Meet	Can Meet	For the DC and COL applications, this integration will use margins-type approaches to result in a plant-level HCLPF value.
SPR-E2	Can Meet	Can Meet	
SPR-E3	Can Meet	Can Meet	
SPR-E4	Can Meet	Can Meet	
SPR-E5	Can Meet	Can Meet	For the DC and COL applications, this integration will use margins-type approaches. As a result, the integration will result in a plant-level HCLPF value.
SPR-E6	Can Meet	Can Meet	
HLR-SPR-F	Documentation of the seismic plant response analysis and quantification shall be consistent with the applicable supporting requirements.		
SPR-F1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
SPR-F2	Can Meet	Can Meet	
SPR-F3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Addressing Part 6, Screening and Conservative Analysis of Other External Hazards, Supporting Requirements

In addition to the general limitations, DC applications addressing 10 CFR 52.47(a)(27) and COL applications addressing 10 CFR 52.79(a)(46) might not have specific information that could impact the manner in which the applicant can screen external hazards. In particular, DC

applications will not have regional or site-specific information on which to base their analyses. In this case, DC applicants will likely establish site characteristics and site interface requirements, typically described in Chapter 2 of the DC as part of the site selection criterion, to bound the analysis. This information may be relied on in screening some external hazards at the DC application stage and can be confirmed and/or reassessed at the COL application stage. The DC and COL applications will likely rely on general design information, good engineering practices, and generic data in addressing the capabilities of structures and components. Further, for these stages the supporting requirements requiring walkdowns are not feasible.

The screening of external hazards for ALWRs also needs to consider the overall CDF and LRF. That being the case, some of the Supporting Requirements in this Part might need to be adjusted to ensure significant contributors to overall CDF and LRF are not screened out.

Some supporting requirements refer back to the internal events PRA supporting requirements. As such, these supporting requirements should also consider the evaluation of the applicability and feasibility of the referenced supporting requirement, including any pertinent comments or clarifications.

Table 6. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 6, Screening and Conservative Analysis Of Other External Hazards at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
Screening and Conservative Analysis			
HLR-EXT-A	All potential external hazards (i.e., all natural and man-made hazards) that may affect the site shall be identified.		
EXT-A1	Can Meet	Can Meet	
EXT-A2	CANNOT MEET	Can Meet	In DC applications, given that a site is not identified, bounding site parameters can be assessed or siting criteria presented to eliminate hazards, but unique site hazards would not be known. In COL applications, the site-specific conditions can be assessed to determine whether there are additional hazards to consider.
HLR-EXT-B	Preliminary screening, if used, shall be performed using a defined set of screening criteria.		

**Table 6. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 6, Screening and Conservative Analysis
Of Other External Hazards at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
EXT-B1	REPLACE	REPLACE	In DC applications, given that a site is not identified, only bounding site parameters can be assessed or siting criteria presented to eliminate hazards. In COL applications, the site-specific conditions can be assessed to determine whether there are additional hazards to consider. In screening out hazards, design capability (similar to relying on meeting SRP or GDC) should not be the basis for screening. Similarly, a slow developing hazard should not be the basis for screening. That being the case, the original Criteria 1 and 5 should not be used. Comments also indicated that Criterion 2 (now Criterion 1) also needed to be clear about what is inferred by "significantly lower" and added that application of any criterion must take into account the range of magnitudes of the hazard for the frequencies of interest. Based on these comments, the following replacement supporting requirement should be used: Initial Preliminary Screening: For screening out an external hazard, any one of the following screening criteria provides an acceptable basis: *Criterion 1:* The hazard has a significantly lower mean frequency of occurrence than another hazard, taking into account the uncertainties in the estimates of both frequencies, and the hazard could not result in worse consequences than the consequences from the other hazard. The phrase "significantly lower " implies that the screened hazard has a mean frequency of occurrence that is at least two orders of magnitude less than that is, 1% or less of) the mean frequency of occurrence of the other event.

**Table 6. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 6, Screening and Conservative Analysis
Of Other External Hazards at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
EXT-B1	REPLACE	REPLACE	*Criterion 2:* The hazard does not result in a plant trip (manual or automatic) or a controlled manual shutdown and does not impact any SSCs that are required for accident mitigation from at-power transients or accidents. If credit is taken for operator actions to correct the condition to avoid a plant trip or controlled shutdown, then **ENSURE** the credited operator actions and associated equipment have an exceedingly low probability of failure (i.e., collectively less than or equal to 1×10^{-5}) following the applicable supporting requirements of this part (e.g., Human Reliability Analysis – Subsection 2-2.5). *Criterion 3:* The impacts of the hazard cannot occur close enough to the plant to affect it. *Criterion 4:* The hazard is included in the definition of another hazard. Application of any screening criterion must take into account the range of magnitudes of the hazard for the recurrence frequencies of interest.
EXT-B2	NOT APPLICABLE	NOT APPLICABLE	Screening based solely on meeting the 1975 Standard Review Plan design criteria is not appropriate because it infers a CDF that might be orders of magnitude greater than the base CDF at the site. At this stage of screening of external hazards, this supporting requirement should be considered not applicable and not used.

**Table 6. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 6, Screening and Conservative Analysis
Of Other External Hazards at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
EXT-B3	REPLACE	REPLACE	In DC applications, given that a site is not identified, only bounding site parameters can be assessed or siting criteria presented to eliminate hazards. In COL applications, the site-specific conditions can be assessed to determine whether there are additional hazards to consider. Because this supporting requirement interfaces with EXT-B1 in using the design or licensing basis hazards information, it needs to be replaced with the following text that focuses on the specific site and regional conditions: **BASE** the application of the screening criteria for a given external hazard on a review of information on the site characteristics and on the surrounding area/regional features, characteristics, and facilities/operations relevant to that event.
EXT-B4	NOT APPLICABLE	NOT APPLICABLE	This supporting requirement is not applicable to DC or COL applications, because it addresses changes to site parameters and characteristics since the issuance of the original operating license.
HLR-EXT-C	A bounding or demonstrably conservative analysis, if used for screening, shall be performed using defined quantitative screening criteria.		

**Table 6. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 6, Screening and Conservative Analysis
Of Other External Hazards at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
EXT-C1	REPLACE	REPLACE	In DC applications, given that a site is not identified, only bounding site parameters can be assessed or siting criteria presented to eliminate hazards. In COL applications, the site-specific conditions can be assessed to determine whether there are additional hazards to consider. Screening based on the cited criteria is not appropriate because it might yield a CDF that is orders of magnitude greater than the base CDF at the site. The current version of the PRA standard does not identify unique screening criteria for new reactor designs that can have substantially lower risk profiles (e.g., plants with internal events CDF well below 1×10^{-6}/year). As stated in RG 1.200, the quantitative screening value should be adjusted according to the relative baseline risk value. Lower screening values need to be used that are commensurate with the lower CDF and LRF estimates expected from ALWRs. Therefore, replace this supporting requirement with the following: **SCREEN OUT** external hazards if (a) the quantitative screening criteria in SR IE-C6 of Part 2, as applied to the external hazard, are met, OR (b) the external hazard affects, directly and indirectly, only components in a single system, AND it can be shown that the product of the frequency of the external hazard and the probability of SSC failure given the hazard is at least two orders of magnitude lower than the product of the non-hazard (i.e., internal events) frequency for the corresponding initiating event in the PRA, and the random (non–external hazard) failure probability of the same SSCs that are assumed failed by the external hazard. If the external hazard impacts multiple systems, directly or indirectly, **DO NOT** screen on this basis.

**Table 6. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 6, Screening and Conservative Analysis
Of Other External Hazards at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
EXT-C2	Can Meet	Can Meet	In DC applications, given that a site is not identified, only generic and/or bounding frequencies and parameters can be established based on the site characteristics and site interface requirements. In COL applications, the site-specific frequencies and parameters can be established or the DC information confirmed as bounding.
EXT-C3	Can Meet	Can Meet	
EXT-C4	Can Meet	Can Meet	
EXT-C5	Can Meet	Can Meet	
EXT-C6	Can Meet	Can Meet	
EXT-C7	Can Meet	Can Meet	
HLR-EXT-D	The basis for the screening out of an external hazard shall be confirmed through a walkdown of the plant and its surroundings.		
EXT-D1	CANNOT MEET	Can Meet	In DC applications, given that a site is not identified, a confirmatory site walkdown is not possible. In COL applications, the site-specific conditions can be assessed by a walkdown.
EXT-D2	CANNOT MEET	CANNOT MEET	In DC applications, given that a site is not identified, a confirmatory site walkdown is not possible. In COL applications, the plant construction has not been completed and as such specific plant confirmatory walkdowns are not possible.
HLR-EXT-E	Documentation of the screening out of an external hazard shall be consistent with the applicable supporting requirements.		
EXT-E1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
EXT-E2	Can Meet	Can Meet	
EXT-E3	NEW	NEW	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Addressing Part 7, High Wind Events, Supporting Requirements

In addition to the general limitations, DC applications addressing 10 CFR 52.47(a)(27) and COL applications addressing 10 CFR 52.79(a)(46) might not have specific information that could impact the manner in which the applicant models high winds. Further, for these stages the supporting requirements requiring walkdowns and surveys to confirm the analyses are not feasible.

As noted in ASME/ANS-RA-Sa-2009, Section 7-2, "Technical Requirements for High Wind Events PRA At-Power," the fact that the high wind events are not screened out in accordance with the screening criteria in Part 6 (as modified by the comments provided previously on Part 6), the supporting requirements in this Part typically correspond to Capability Category II (i.e., Capability Category I would involve the simplified and/or conservative screening approaches identified in Part 6). As a result, many supporting requirements in this Part designate Capability Category I as "Not Defined." However, consistent with the discussion in Part 9, Section 9-2, "Technical Requirements for Other External Hazards PRA At-Power," it is acceptable to introduce conservatisms in any given step as long as the impact on overall CDF and LRF is evaluated and the associated uncertainty addressed. Where simplifications and conservatisms are used, the supporting requirement would be more appropriately considered Capability Category I. Therefore, the DC/COL applicants should develop high wind event PRAs, if necessary, considering the parallel generic supporting requirements of Part 9 for achieving Capability Category I.

Some supporting requirements refer back to the internal events PRA supporting requirements. As such, these supporting requirements should also consider the evaluation of the applicability and feasibility of the cited supporting requirements, including any pertinent comments or clarifications.

Table 7. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 7, High Winds Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
Wind Hazard Analysis			
HLR-WHA-A	The frequency of high winds at the site shall be based on site-specific probabilistic wind hazard analysis (existing or new) that reflects recent available regional and site-specific information. Uncertainties in the models and parameter values shall be properly accounted for and fully propagated in order to obtain a family of hazard curves from which a mean hazard curve can be derived.		

Table 7. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 7, High Winds Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
WHA-A1	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants will likely establish site characteristics and site interface requirements to generically bound or represent the analysis. At the COL application stage site-specific information is available and can be used directly or in confirming the DC analysis. For those hazards evaluated, it is feasible to represent the hazards by a distribution consistent with the supporting requirement, though using generic or representative information.
WHA-A2	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants will likely establish site characteristics and site interface requirements to generically bound or represent the analysis. At the COL application stage site-specific information is available and can be used directly or in confirming the DC analysis. For those hazards evaluated, it is feasible to represent the hazards by a distribution consistent with the supporting requirement, though using generic or representative information.
WHA-A3	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants will likely establish site characteristics and site interface requirements to generically bound or represent the analysis. At the COL application stage site-specific information is available and can be used directly or in confirming the DC analysis.

**Table 7. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 7, High Winds Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
WHA-A4	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. Though the supporting requirement is feasible in that a missile hazards analysis can be performed, some information related to barriers might not be fully developed at the DC or COL application stages. That being the case, these features will likely be based on design guidelines and good engineering practices.
WHA-A5	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. However, the objective of the supporting requirement is to identify the number, type, and location of missiles to support the missile analysis of WHA-A4. At the DC and COL stage, this analysis would be based on generic or bounding information, which is typically provided from the references for a site with construction activities nearby.
HLR-WHA-B	Documentation of the wind hazard analysis shall be consistent with the applicable supporting requirements.		
WHA-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
WHA-B2	Can Meet	Can Meet	
WHA-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
<td colspan="4" align="center">High Wind Fragility Analysis</td>			
HLR-WFR-A	A wind fragility evaluation shall be performed to estimate plant-specific, realistic wind fragilities for those structures, or systems, or components, or a combination thereof whose failure contributes to core damage or large early release, or both.		

**Table 7. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 7, High Winds Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
WFR-A1	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed, although DC applicants will likely use generic information based on design and guidance documents. At the COL application stage site-specific information is available and can be used directly or in confirming the DC analysis, though generic data will likely still be used for structure and component fragilities. However, plant walkdowns cannot be performed for either DC or COL applications. The information collected should include the available and pertinent information for that application stage to reflect the system design and will be enhanced at the COL stage as additional system-design information becomes available.
WFR-A2	Can Meet	Can Meet	
HLR-WFR-B	Documentation of the wind fragility analysis shall be consistent with the applicable supporting requirements.		
WFR-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
WFR-B2	Can Meet	Can Meet	
WFR-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
High Wind Plant Response Model			
HLR-WPR-A	The high wind PRA systems model shall include wind-caused initiating events and other failures that can lead to core damage or large early release. The model shall be adapted from the internal events, at-power PRA systems model to incorporate wind-analysis aspects that are different from the corresponding aspects in the at-power, internal events PRA systems model.		
WPR-A1	Can Meet	Can Meet	
WPR-A2	Can Meet	Can Meet	
WPR-A3	Can Meet	Can Meet	
WPR-A4	Can Meet	Can Meet	
WPR-A5	Can Meet	Can Meet	

Table 7. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009, Part 7, High Winds Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
WPR-A6	ENHANCE	ENHANCE	In DC applications, given that a site is not identified, only bounding site parameters can be assessed or siting criteria presented to eliminate hazards. In COL applications, the site-specific conditions can be assessed to determine whether there are additional hazards to consider. The supporting requirement comes after already passing through the Screening of Part 6 (EXT-B1, B2, B3, and C1) using conservative estimates. Therefore, whatever additional screening is performed should be consistent with the previous screening approaches; also, applicants should verify that screened out hazards are not significant contributors. Therefore, this supporting requirement should be enhanced as follows: If any additional screening criteria are applied, **ENSURE** (a) supporting requirement IE-C6 of Part 2, as applied to the external hazard, is met, **OR** (b) the external hazard affects only components in a single system, **AND** it can be shown that the product of the frequency of the external hazard and the probability of SSC failure given the hazard is two orders of magnitude lower than the product of the non-hazard (i.e., internal events) frequency for the corresponding initiating event in the PRA, and the random (non–external hazard) failure probability of the same SSCs that are assumed failed by the external hazard. If the external hazard impacts multiple systems, **DO NOT** screen on this basis. **ENSURE** that the mean cumulative contribution to CDF of the high wind events that have been screened out is less than 5% of the total mean CDF for high wind events
			ENSURE that the mean cumulative contribution to LERF of the high wind events that have been screened out is less than 5% of the total mean LERF for high wind events.

**Table 7. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009, Part 7, High Winds Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
WPR-A5	Can Meet	Can Meet	
WPR-A7	Can Meet	Can Meet	
WPR-A8	Can Meet	Can Meet	
WPR-A9	Can Meet	Can Meet	
WPR-A10	Can Meet	Can Meet	
WPR-A11	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration to examine the system recoveries modeled in the internal events PRA and to adjust them based on the hazard impacts can and should be performed. At the DC and COL stage such consideration would be based on design and operational guidance.
HLR-WPR-B	The analysis to quantify core damage and large early release frequencies shall appropriately integrate the wind hazard, the wind fragilities, and the plant response aspects.		
WPR-B1	Can Meet	Can Meet	The supporting requirement is feasible consistent with the comments associated with the hazards identified for supporting requirements WHA-A1 through A5.
WPR-B2	Can Meet	Can Meet	
HLR-WPR-C	Documentation of the high wind plant response model development and quantification shall be consistent with the applicable supporting requirements.		
WPR-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
WPR-C2	Can Meet	Can Meet	
WPR-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Addressing Part 8, External Flood Events, Supporting Requirements

In addition to the general limitations, DC applications addressing 10 CFR 52.47(a)(27) and COL applications addressing 10 CFR 52.79(a)(46) might not have specific information that could impact the manner in which the applicant models external flood events. Further, for these stages the supporting requirements requiring walkdowns and surveys to confirm the analyses are not feasible.

As noted in ASME/ANS-RA-Sa-2009, Section 8-2, "Technical Requirements for External Flood Events PRA," the fact that the external flooding events are not screened out in accordance with the screening criteria in Part 6 (as modified by the comments provided previously on Part 6), the supporting requirements in this Part typically correspond to Capability Category II (i.e., Capability Category I would involve the simplified and/or conservative screening approaches identified in Part 6). As a result, many supporting requirements in this Part designate Capability Category I as "Not Defined." However, consistent with the discussion in Part 9, Section 9-2, for other external hazards, it is acceptable to introduce conservatisms in any given step as long as the impact on overall CDF and LRF is evaluated and the associated uncertainty is addressed. Where simplifications and conservatisms are used, the supporting requirement would be more appropriately considered Capability Category I. Therefore, DC/COL applicants should develop high wind event PRAs, if necessary, considering the parallel generic supporting requirements of Part 9 for achieving Capability Category I.

Some supporting requirements refer back to the internal events PRA supporting requirements. As such, these supporting requirements should also consider the evaluation of the applicability and feasibility of the cited supporting requirements, including any pertinent comments or clarifications.

**Table 8. Addressing Capability Category I Supporting Requirements from Part 8,
"Requirements for External Flood Events At-Power PRA," of
ASME/ANS RA-Sa-2009**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
External Flooding Hazard Analysis			
HLR-XFHA-A	The frequency of external flooding at the site shall be based on site-specific probabilistic hazard analysis (existing or new) that reflects recent available regional and site-specific information. The external-flooding hazard analysis shall use up-to-date databases. Uncertainties in the models and parameter values shall be properly accounted for and fully propagated to obtain a family of hazard curves from which a mean hazard curve can be derived.		

**Table 8. Addressing Capability Category I Supporting Requirements from Part 8,
"Requirements for External Flood Events At-Power PRA," of
ASME/ANS RA-Sa-2009**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XFHA-A1	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants are expected to establish site characteristics and site-interface requirements to generically bound or represent the analysis. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis.
XFHA-A2	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants are expected to establish site characteristics and site-interface requirements to generically bound or represent the analysis. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis.
XFHA-A3	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants are expected to establish site characteristics and site-interface requirements to generically bound or represent the analysis. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis.

Table 8. Addressing Capability Category I Supporting Requirements from Part 8, "Requirements for External Flood Events At-Power PRA," of ASME/ANS RA-Sa-2009

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XFHA-A4	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants are expected to establish site characteristics and site-interface requirements to generically bound or represent the analysis. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis.
XFHA-A5	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants are expected to establish site characteristics and site-interface requirements to generically bound or represent the analysis. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis.
XFHA-A6	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants are expected to establish site characteristics and site-interface requirements to generically bound or represent the analysis. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis.
XFHA-B	Documentation of the external flood hazard analysis shall be consistent with the applicable supporting requirements.		
XFHA-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and their bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
XFHA-B2	Can Meet	Can Meet	
XFHA-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

**Table 8. Addressing Capability Category I Supporting Requirements from Part 8,
"Requirements for External Flood Events At-Power PRA," of
ASME/ANS RA-Sa-2009**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
External Flood Fragility Analysis			
XFFR-A	An external flood fragility evaluation shall be performed to estimate plant-specific, realistic susceptibilities, fragilities for those structures, or systems, or components, or a combination thereof, whose failure contributes to core damage or large early release, or both.		
XFFR-A1	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed. DC applications will likely use generic information based on design and guidance documents and associated generic data for the fragilities. At the COL application stage, site-specific information is available and can be used directly or in confirming the DC analysis, while generic data would still be used for many structures. However, plant walkdowns cannot be performed for either DC or COL applications. The information collected should include the available and pertinent information for that application stage to reflect the system design and will be enhanced at the COL stage as additional system-design information becomes available.
XFFR-A2	Can Meet	Can Meet	
XFFR-B	Documentation of the external flood fragility analysis shall be consistent with the applicable supporting requirements.		
XFFR-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and their bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
XFFR-B2	Can Meet	Can Meet	
XFFR-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
External Flood Plant Response Model			

**Table 8. Addressing Capability Category I Supporting Requirements from Part 8,
"Requirements for External Flood Events At-Power PRA," of
ASME/ANS RA-Sa-2009**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XFPR-A	The external flooding-PRA systems model shall include flood-caused initiating events and other failures that can lead to core damage or large early release. The model shall be adapted from the internal events, at-power PRA systems model to incorporate flood-analysis aspects that are different from the corresponding aspects in the at-power, internal events PRA systems model.		
XFPR-A1	Can Meet	Can Meet	Feasible for a COL application. For a DC application, site characteristics would have to be assumed.
XFPR-A2	Can Meet	Can Meet	
XFPR-A3	Can Meet	Can Meet	
XFPR-A4	Can Meet	Can Meet	
XFPR-A5	Can Meet	Can Meet	
XFPR A6	ENHANCE	ENHANCE	In DC applications, given that a site is not identified, only bounding site parameters can be assessed or siting criteria presented to eliminate hazards. In COL applications, the site-specific conditions can be assessed to determine whether there are additional hazards to consider. The supporting requirement comes after already passing through the screening of Par 6 (EXT B1, B2, B3, and C1) using conservative estimates. Therefore, whatever additional screening is performed should be consistent with the previous screening approaches; also, applicants should verify that screened out hazards are not significant contributors. Therefore, this supporting requirement should be enhanced as follows: If any additional screening criteria are applied, ENSURE that (a) supporting requirement IE C6 of Part 2, as applied to the external hazard, is met, OR

Table 8. Addressing Capability Category I Supporting Requirements from Part 8, "Requirements for External Flood Events At-Power PRA," of ASME/ANS RA-Sa-2009

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
			(b) the external hazard affects only components in a single system, AND the product of the frequency of the external hazard and the probability of SSC failure (given the hazard) is at least two orders of magnitude lower than the product of the non hazard (i.e., internal events) frequency for the corresponding initiating event in the PRA and the random (non external hazard) failure probability of the same SSCs that are assumed failed by the external hazard.
			If the external hazard impacts multiple systems, **DO NOT** screen on this basis. **ENSURE** that the mean cumulative contribution to CDF of the external-flood events that have been screened out is less than 5% of the total mean CDF for external-flood events. **ENSURE** that the mean cumulative contribution to LERF of the external-flood events that have been screened out is less than 5% of the total mean LERF for external-flood events.
XFPR-A7	Can Meet	Can Meet	
XFPR-A8	Can Meet	Can Meet	
XFPR-A9	Can Meet	Can Meet	
XFPR-A10	Can Meet	Can Meet	
XFPR-A11	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration (to examine the system recoveries modeled in the internal-events PRA and to adjust them based on the hazard impacts) can and should be performed. At the DC and COL stages, such consideration would be based on design and operational guidance.
HLR-XFPR-B	The analysis to quantify core damage and large early release frequencies shall appropriately integrate the external flood hazard, the external flood fragilities, and the systems-analysis aspects.		
XFPR-B1	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed.

Table 8. Addressing Capability Category I Supporting Requirements from Part 8, "Requirements for External Flood Events At-Power PRA," of ASME/ANS RA-Sa-2009

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XFPR-B2	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration can be performed.
HLR-XFPR-C	Documentation of the external flood plant response model development and quantification shall be consistent with the applicable supporting requirements.		
XFPR-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and their bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
XFPR-C2	Can Meet	Can Meet	
XFPR-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Addressing Part 9, Other External Events, Supporting Requirements

In accordance with ASME/ANS-RA-Sa-2009, Section 9-1.3, the analysis of other external hazards relates to those external hazards beyond seismic (Part 5) that are not screened out (Part 6, subject to the comments provided above on Part 6). Further, as noted in ASME/ANS-RA-Sa-2009, Section 9-2, the fact that the specific external hazard is not screened out in accordance with the screening criteria in Part 6 (as modified by the comments provided previously on Part 6), the supporting requirements in this Part typically correspond to Capability Category II (i.e., Capability Category I would involve the simplified and/or conservative screening approaches identified in Part 6), though this section also indicates that it is acceptable to introduce conservatisms in any given step as long as the impact on overall CDF and LRF is evaluated and the associated uncertainty is addressed. Where simplifications and conservatisms are used, the supporting requirement would be more appropriately considered Capability Category I. High winds and external flooding are specifically addressed in Parts 7 and 8, respectively.

In addressing 10 CFR 52.47(a)(27), DC applications will not have regional or site-specific information on which to base their analysis of the "other" external hazards. In this case, DC applicants will likely establish site characteristics and site interface requirements, typically described in Chapter 2 of the DC as part of the site selection criterion, to bound the results for these other external hazards. In those cases where the supporting requirements require the use of regional and/or site-specific information for the DC application, the use of the site characteristics and site interface requirements would be considered as achieving the supporting requirement at Capability Category I consistent with the "extent necessary for the analysis." This lack of regional and site-specific information will also impact the ability of the DC applicant to perform and confirm (e.g., by walkdowns) the fragility analyses that require the use of site-specific information for structures and equipment and the DC application will likely rely on

generic information and general design documents in developing the fragility analyses. The system response model will also not be fully developed as the operational aspects and design details might not be fully established at the DC application stage. As a result, the system response model will build-off the internal events system response models, which will be based on guidance documents instead of plant-specific procedures and operating experience.

In addressing 10 CFR 52.79(a)(46), the COL application will have regional and site-specific information on which to base their analysis of the other external hazards. COL applicants will either confirm and maintain the DC bounding analysis for their specific site or develop a site-specific analysis for these other external hazards. If the COL applicant decides to use the DC bounding analysis and confirms it bounds the site parameters, then the supporting requirements that require the use of regional and/or site-specific information are met at the same level as the DC application. Many aspects of the fragility analysis might also still not be fully developed and cannot be confirmed (e.g., by walkdowns) at the time of the COL application. As a result, the COL application may continue to rely on generic information and general design documents in the fragility analysis. The system response model will also not be fully complete because the operational aspects and details might not be fully established at the COL application stage. As a result, the system response model will build-off the internal events system response models, which will be based on guidance documents instead of plant-specific procedures. The COL application should reflect the latest design and guidance, which may involve an update to the system response model to reflect changes since the DC application.

Some supporting requirements refer back to the internal events PRA supporting requirements. As such, these supporting requirements should also consider the evaluation of the applicability and feasibility of the cited supporting requirement, including any pertinent comments or clarifications.

Table 9. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009 Part 9 Other External Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
External Hazard Analysis			
HLR-XHA-A	The analysis of the hazard (the frequency of occurrence of different intensities of the external hazard) shall be based on a site-specific probabilistic evaluation reflecting recent available data and site-specific information. The analysis can be based on either historical data or a phenomenological model, or a mixture of the two.		
XHA-A1	Can Meet	Can Meet	DC applications will not have regional or site-specific information on which to base their analysis. Instead, DC applicants will likely establish site characteristics and site interface requirements to generically bound or represent the analysis. This meets the "to the extent necessary for the analysis" aspect of the supporting requirement. At the COL application stage site specific information is available and can be used directly or in confirming the DC analysis.

**Table 9. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009 Part 9 Other External Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XHA-A2	Can Meet	Can Meet	For those hazards evaluated, it is feasible to represent the hazards by a distribution that is consistent with the supporting requirement (although it uses generic or representative information. At the COL application stage site specific information is available and can be used directly or in confirming the DC analysis.
XHA-A3	Can Meet	Can Meet	
XHA-A4	Can Meet	Can Meet	
HLR-XHA-B	Documentation of the external hazard analysis shall be consistent with the applicable supporting requirements.		
XHA-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
XHA-B2	Can Meet	Can Meet	
XHA-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
<td colspan="4" align="center">External Hazard Fragility Analysis</td>			
HLR-XFR-A	The fragility of a structure, or system, or component, or a combination thereof (SSC) shall be evaluated using plant-specific, SSC-specific information and an accepted engineering method for evaluating the postulated failure.		
XFR-A1	Can Meet	Can Meet	DC applications will likely use generic information based on design and guidance documents. This meets the "to the extent necessary for the purposed of the analysis" aspect of the supporting requirement. At the COL application stage site specific information is available and can be used directly or in confirming the DC analysis. The information collected should include the available and pertinent information for that application stage to reflect the system design and will be enhanced at the COL stage as additional system design information becomes available.

Table 9. Addressing Capability Category I Supporting Requirements from ASME/ANS RA-Sa-2009 Part 9 Other External Events at Power

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XFR-A2	CANNOT MEET	CANNOT MEET	DC applications will likely use generic information based on design and guidance documents. This meets the "to the extent necessary for the purposed of the analysis" aspect of the supporting requirement. At the COL application stage site specific information is available and can be used directly or in confirming the DC analysis. However, plant walkdowns cannot be performed for either DC or COL applications. The information collected should include the available and pertinent information for that application stage to reflect the system design and will be enhanced at the COL stage as additional system design information becomes available.
XFR-A3	Can Meet	Can Meet	
XFR-A4	Can Meet	Can Meet	
HLR-XFR-B	Documentation of the external hazard fragility analysis shall be consistent with the applicable supporting requirements.		
XFR-B1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
XFR-B2	Can Meet	Can Meet	
XFR-B3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.
External Hazard Plant Response Model			
HLR-XPR-A	The external hazard PRA plant model shall include external hazard-caused initiating events and other failures that can lead to core damage or large early release. The model shall be adapted from the internal events, at-power PRA systems model to incorporate external hazard-analysis aspects that are different from the corresponding aspects in the at-power, internal events PRA systems model (HLR-XPR-A).		
XPR-A1	Can Meet	Can Meet	
XPR-A2	Can Meet	Can Meet	
XPR-A3	Can Meet	Can Meet	
XPR-A4	Can Meet	Can Meet	
XPR-A5	Can Meet	Can Meet	

**Table 9. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009 Part 9 Other External Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
XPR-A6	ENHANCE	ENHANCE	In DC applications, given that a site is not identified, only bounding site parameters can be assessed or siting criteria presented to eliminate hazards. In COL applications, the site specific conditions can be assessed to determine whether there are additional hazards to consider. The supporting requirement comes after already passing through the Screening of Part 6 (EXT-B1, B2, B3, and C1) using conservative estimates. Therefore, whatever additional screening is performed should be consistent with the previous screening approaches; also, applicants should verify that screened out hazards are not significant contributors. Therefore, this supporting requirement should be enhanced as follows: If any additional screening criteria are applied, ENSURE that (a) supporting requirement IE C6 of Part 2, as applied to the external hazard, is met, OR (b) the external hazard affects only components in a single system, AND it can be shown that the product of the frequency of the external hazard and the probability of SSC failure given the hazard is two orders of magnitude lower than the product of the non–hazard (i.e., internal events) frequency for the corresponding initiating event in the PRA, and the random (non–external hazard) failure probability of the same SSCs that are assumed failed by the external hazard.

**Table 9. Addressing Capability Category I Supporting Requirements from
ASME/ANS RA-Sa-2009 Part 9 Other External Events at Power**

Supporting Requirement	DC Application	COL Application	Clarifications and Comments
			If the external hazard impacts multiple systems, **DO NOT** screen on this basis. **ENSURE** that the mean cumulative contribution to CDF of the specific external hazard events that have been screened out is less than 5% of the total mean CDF for that external hazard. **ENSURE** that the mean cumulative contribution to LERF of the specific external hazard events that have been screened out is less than 5% of the total mean LERF for that external hazard.
XPR-A7	Can Meet	Can Meet	
XPR-A8	Can Meet	Can Meet	
XPR-A9	Can Meet	Can Meet	
XPR-A10	Can Meet	Can Meet	
XPR-A11	Can Meet	Can Meet	For this supporting requirement, CC I is identified as "Not Defined." However, the CC II/III consideration to examine the system recoveries modeled in the internal events PRA and to adjust them based on the hazard impacts can and should be performed. At the DC and COL stage such consideration would be based on design and operational guidance.
HLR-XPR-B	The analysis to quantify core damage and large early release frequencies shall appropriately integrate the external hazard, the fragilities, and the plant response aspects.		
XPR-B1	Can Meet	Can Meet	
XPR-B2	Can Meet	Can Meet	
XPR-B3	Can Meet	Can Meet	
HLR-XPR-C	Documentation of the external hazard plant response analysis and quantification shall be consistent with the applicable supporting requirements		
XPR-C1	ENHANCE	ENHANCE	Add: **DOCUMENT** the limitations, and bases, resulting from the status of the design, site, operational, and maintenance information or data that would impact applications.
XPR-C2	Can Meet	Can Meet	
XPR-C3	ENHANCE	ENHANCE	Add: **DOCUMENT** the sources of model uncertainty and related assumptions resulting from the status of the design, site, operational, and maintenance information or data.

Final Resolution

The NRC staff will subsequently incorporate the contents of this guidance into the next revision of RG 1.200, RG 1.206, and SRP Section 19.0, as appropriate.

Applicability

This guidance is applicable all DC applications under 10 CFR 52.47(a)(27) and all COL applications under 10 CFR 52.79(a)(46). This guidance shall be implemented on the day following its issuance. It shall remain in effect until it has been superseded, withdrawn, or incorporated in a revision RG 1.200, RG 1.206, and SRP Section 19.0, as appropriate.

References

1.   10 CFR Part 52. *Code of Federal Regulations,* Title 10, *Energy*, Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

2.   10 CFR 52.47. *Code of Federal Regulations,* Title 10, *Energy*, "Contents of Applications; Technical Information."

3.   10 CFR 50.71. *Code of Federal Regulations,* Title 10, *Energy*, "Maintenance of Records, Making Of Reports."

4.   10 CFR 52.79. *Code of Federal Regulations,* Title 10, *Energy*, "Contents of Applications; Technical Information In Final Safety Analysis Report."

5.   American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) RA-Sa-2009, "Addenda to ASME/ANS RA-S–2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," ANS, La Grange Park, Illinois, February 2009.

6.   Interim Staff Guidance DC/COL-ISG-003, "PRA Information to Support Design Certification and Combined License Applications," U.S. Nuclear Regulatory Commission, May 2008

7.   Interim Staff Guidance DC/COL-ISG-020, "Implementation of a Probabilistic Risk Assessment-Based Seismic Margin Analysis for New Reactors," U.S. Nuclear Regulatory Commission, March 2010.

8.   Interim Staff Guidance DI&C/COL-ISG-003, "Review of New Reactor Digital Instrumentation and Control Probabilistic Risk Assessments," U.S. Nuclear Regulatory Commission, August 2008.

9.   NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, March 2007.

10.   Regulatory Guide 1.200, Revision 2, "An Approach For Determining the Technical Adequacy of Probabilistic Risk Assessment Results For Risk-Informed Activities," U.S. Nuclear Regulatory Commission, March 2009.

11.   Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, June 2007.

12.   Regulatory Issue Summary 2007-06, "Regulatory Guide 1.200 Implementation," U.S. Nuclear Regulatory Commission, March 22, 2007.