



March 3, 2003

Rules and Directives Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Draft Regulatory Guide 1122, An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities, November 2002

Dear Sir:

The Board on Nuclear Codes and Standards (BNCS) is pleased to submit the following comments on draft Regulatory Guide 1122 (DG-1122). These comments specifically address the endorsement of ASME RA-S-2002 "Standard for Probabilistic Risk Assessment for Nuclear Power Plants" in Appendix A "NRC Regulatory Position on ASME PRA Standard".

In general, we are encouraged by the NRC's timely decision to recognize the general acceptability of the ASME PRA Standard to support risk-informed regulatory applications within its established scope. We also recognize that both the Regulatory Guide and the PRA Standard will require a period of trial use before questions of clarity, adequacy, and consistency of interpretation can be resolved. Thus, the Staff's intention to issue DG-1122 for trial use is quite appropriate and fully supported by BNCS. In the interim period, the ASME Committee on Nuclear Risk Management (CNRM) intends to address the clarifications and qualifications identified in Appendix A of DG-1122 and take the following actions:

- For the clarifications and qualifications considered appropriate, process changes to the PRA Standard as an Addendum or Revision that will incorporate the NRC position, or its intent.
- For the clarifications and qualifications that are not considered appropriate or adequate, submit comments supporting our position and, where appropriate, recommend a revised position or actions to resolve the concern

Please recognize that the positions discussed in this letter have not been processed through our consensus approval procedures and, therefore, may be modified before they are incorporated in the PRA Standard.

Three of the NRC proposed positions of special significance are addressed in the following paragraphs.

Definitions and usage of dominant, significant, and important – The ambiguities noted in DG-1122 associated with usage of these terms are acknowledged. CNRM has held extensive

Template = ADM-013

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discussions on this item, including the definition suggested by the NRC in DG-1122. It has been concluded that the NRC proposed definition might have some merit in specific situations, but it is not generally suitable for most instances where these terms are used in the PRA Standard. At this point in time, after much discussion concerning the definition of dominant, CNRM has been unable to reach a consensus on a quantitative definition. There are concerns among members of CNRM that use of an absolute versus relative treatment of “dominant” has a notable impact when the range of base core damage frequencies is considered. This topic will receive continuing attention by CNRM. In the interim, users are encouraged to document the manner in which they have interpreted the terms dominant and significant where this usage appears to make a difference in how a particular supporting requirement is addressed

In addition, CNRM has concluded that the terms “significant” and “important” should have been used in the PRA Standard to convey different and typically qualitative meanings both between each other and in relation to the term “dominant.” It is, therefore, undesirable to use a single quantitative definition for all three terms. The committee plans to develop separate definitions for each term, or perhaps drop one of them (as unnecessary), when used to denote sequences, contributors, scenarios, risk, etc. More definitive proposals should be available for discussion at the meeting we understand NRC is planning to hold on this topic in March 2003.

Identification of PRA Capability Category – The PRA Standard requires identification of the capability category when the PRA is used to support an application. (See Paragraph 3.5.) This paragraph also recognizes that the determination of Capability Category may have occurred during the Peer Review process. CNRM disagrees with the [implied] requirement of DG-1122 Appendix A that the Capability Category must be documented when the PRA is developed. While this might be desirable at some future time when current PRAs are upgraded or substantially revised, it is not consistent with the current state of existing PRAs. These PRAs were developed prior to the PRA Standard and may continue to be used in risk-informed applications consistent with the requirements of Section 3 of the Standard. As acknowledged in DG-1122, most of these PRAs have been subject to the Peer Review process consistent with NEI 00-02, hence the grading and scope of these Peer Reviews is not entirely consistent with the categorization and supporting requirements in Section 4 of the PRA Standard. It would pose an unnecessary burden to establish requirements beyond those identified in Appendix B of DG-1122 for existing PRAs. Users of the Standard could be encouraged to review and grade their PRA against the Standard as soon as practical; however, they should not be required to do it until the PRA is used in a risk-informed application. And then the requirement should only extend to those parts of the PRA necessary for the risk-informed application.

Section 5.4 PRA Maintenance and Upgrades – DG-1122 takes the position that PRA maintenance activities should be subject to (additional) Peer Reviews. The discriminator being proposed is when PRA maintenance significantly impacts the PRA results. Elsewhere in DG-1122, it is suggested that “significance” is a change of 1% in the core damage frequency (CDF) or the large early release frequency (LERF). This is not an acceptable approach for performing subsequent Peer Reviews. The CNRM believes that it is important to clearly separate the processes of maintenance and upgrades. Maintenance is defined as the process of keeping the PRA current with physical changes to the plant, changes to procedures, and changes resulting from operation. PRA upgrades involve changes to methodology and approaches to modeling or

analyzing performance. The purpose of the distinction is to clearly separate changes requiring Peer Reviews from those that do not. While future editions of the PRA Standard may find it appropriate to define some type of periodic review for the impact of accumulated changes, it is not an issue that needs prescription in the current edition of the Standard or clarification in DG-1122.

The attached table provides specific comments for those NRC proposed resolutions in DG-1122 Appendix A that are not considered appropriate or where an alternate resolution is proposed. Those currently considered acceptable are not addressed.

It is our objective to work with NRC staff and other stakeholders to reconcile as many differences as possible so that the PRA Standard can be used with few, if any, clarifications and qualifications. While this reconciliation may not be possible when the draft Regulatory Guide is issued for trial use and prior to the approval of our planned revisions, we hope that it will occur before the Guide is issued for unrestricted use.

Please contact Shannon Burke at 212-591-8514 if additional information or clarification is required

Sincerely,

A handwritten signature in black ink, appearing to read "CW Rowley". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

C. Wesley Rowley, PE
Vice President, Nuclear Codes & Standard
Encl: Table 1 Comments on DG 1122 Appendix A

TABLE 1 –COMMENTS ON DG 1122 APPENDIX A

Index No	Issue	NRC Proposed Resolution	CNRM Comment
1.1	The standard is only for current generation LWRs, the requirements may not be sufficient or adequate for other types of reactors	Clarification "This Standard sets forth requirements for PRAs used to support risk-informed decisions for commercial light water reactor nuclear power plants, and prescribes a method for applying these requirements for specific applications (additional or revised requirements may be needed for more advanced reactor designs)."	While we agree with the comment, no action to change the scope statement of the Standard is proposed. The stated scope of the Standard is sufficient to address current designs. Changes to address unique aspects of advanced or non-LWR designs will be processed as a need for these changes is identified. It is appropriate for this qualifier to be included in the body of the Regulatory Guide
2.2 Definitions			
accident sequence	The definition provided is very general and does not distinguish the different types of accident sequences developed in a PRA. This distinction is necessary because some of the SRs are dependent on the accident sequence type.	Clarification. <i>accident sequence</i> , a representation in terms of an initiating event followed by a sequence of failures or successes of events (such as system, function, or operator performance) that can lead to undesired consequences, with a specified end state (e.g., core damage or large early release). A representation in terms of an initiating event followed by a combination of system, function, and operator failures or successes, of an accident that can lead to undesired consequences, with a specified end state (e.g., core damage or large early release). An accident sequence may contain many unique variations of events (minimal cut sets) that are similar. <i>accident sequence, class</i> , a grouping of accident sequences by initiator type (e.g., LOCA, LOSP) or by similar functional loss (e.g., station blackout, loss of decay heat). <i>accident sequence, functional</i> , the sequence of events are represented by the key safety functions necessary to mitigate the effects of the initiating event. <i>accident sequence, systemic</i> , the sequence of events are represented by the front-line systems necessary to mitigate the effects of the initiating event. <i>accident sequence, scenario</i> , the sequence of events are represented by the specific components or trains, support systems and operator actions necessary to mitigate the effects of the initiating event.	Accept the definition of <i>accident sequence</i> . Reject the others. Except for the singular reference to classes of accident sequences in Paragraph 1.3, the other terms differentiating accident sequences are not used in the Standard. By policy, only those terms explicitly used in the Standard are defined. It is not considered necessary to define classes of accident sequences, because its usage in Section 1.3 is part of a generic discussion.
accident sequence, dominant	The first part of the definition provides little value and may be inaccurate, a large fraction may be outside the stated range (i.e., smaller or larger than 10 to 20). In addition, it is not clear what is meant	Clarification <i>accident sequence, dominant</i>: an accident sequence that is usually represented by the top 10 or 20 events or groups of events modeled in a PRA and accounts for a large fraction of the core damage or large early release frequency. <i>dominant, significant, important, contributor, an entity or entities (contributor(s) or event(s))</i>	While we agree with concern, the proposed merging of the meaning of these terms and use of a singular numerical discriminator is not appropriate. See discussion of "Definitions and usage of dominant, significant, and important" in the transmittal letter.

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	not clear what is meant by large fraction. The term "dominant" is also used to modify other events such as contributors, human events. Several different terms (modifiers) are used in the standard. In some places, these modifiers are used interchangeably (to have the same meaning) and in other places, they are used to convey different meanings (e.g., used to distinguish whether a requirement is imposed). A common and specific quantitative understanding of these modifiers is necessary. Specifically, these modifiers include: important, significant and dominant.	an entity or entities (contributor(s) or event(s) such as failure of a specific piece(s) of equipment, human failure event(s), accident sequence(s)) that exercises the most influence or control to an outcome, and where each dominant entity has the ability to effect the second significant figure of the quantitative outcome (i.e., x.yE-z).	
4.5	The standard provides SRs for different PRA capabilities, but there is no requirement for the PRA to identify which capability category is met for each SR.	Qualification "... a PRA will meet that HLR. The capability category that has been met for each SR shall be identified and documented. Boldface is used....in the three Capability Categories."	Disagree. This requirement is adequately addressed in Section 3.4 and 3.5. See discussion in the transmittal letter.
IE-A6	As written, there is an implication that more work is needed for Cat II than for Cat III, since it is not clear whether the interviews from other plants are to be used instead of or as a complement to plant specific interviews. However, interviews from other plants would appear to be more resource intensive.	Clarification Cat II: "INTERVIEW plant operations, ... to determine if potential initiating event have been overlooked." Information from interviews conducted at similar plants may be used.	Disagree with interpretation but agree that intent not clear. The intent was to allow use of interviews from other plants INSTEAD OF rather than IN ADDITION TO . Therefore, propose adding at end of last sentence: "[used] in lieu of plant-specific interviews. "
IE-C9	Fault tree modeling of an initiating event is plant-specific by definition (see IE-C6 thru IE-C8) and the treatment of recovery actions needs to be consistent with the requirements in the HRA section of the standard (HR-F and HR-G).	Clarification Cat I: No requirement to use plant-specific information in the fault tree modeling. "If fault tree modeling is used, USE plant-specific information in the assessment and quantification of recovery actions where available. See Human Reliability Analysis (para. 4.5.5) for further guidance. "	Agree that SR is inconsistently worded as-is. But Cat. I should not require plant-specific treatment of recovery actions. Disagree with comment, but retain for future revision of SR.

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IE-C12	For Cat I and II, there is no minimum list of features and procedures that could significantly influence the ISLOCA frequency.	Clarification Cat I and II: "In the ISLOCA frequency analysis, INCLUDE features of plant and procedures that could significantly influence the ISLOCA frequency: (a) configuration of potential pathways including numbers and types of valves and their relevant failure modes, existence and positioning of relief valves (b) provision of protective interlocks (c) relevant surveillance test procedures "	Agree with the suggested items, but these should also apply to Category III. Suggested words should be applied to all 3 categories; for Cat III follow with "Also, " and then the current list
AS-A6	As written, with the term "when practical," there is no minimum, there is no SR for when it is not practical.	Clarification "Where practical, sequentially ORDER....in the accident progression Where not practical, provide the bases and provide the rationale used for the ordering. "	Agree with comment but delete "provide the bases and" , since rationale covers this.
AS-A9	This SR appears to be redundant with SRs in SC; effects other than environmental are addressed by the requirements under success criteria.	Clarification Cat I, II and III: "...thermal-hydraulic analyses to determine accident progression parameters (e.g., timing, temperature, pressure, steam) the environmental effects (e.g., temperature, pressure, steam) during the accident progression that could potentially affect the operability of the mitigating systems. "	Disagree that focus of this SR should be environmental; this changes the meaning. No change at this time.
SY-A19	If there are not any engineering analyses, there can be no justification for the assumption	Qualification Cat I and II: "...If engineering analyses are not available, ASSUME that the equipment/system fails with a probability of 1.0. or JUSTIFY the assumed failure probability. "	Disagree. Do not always need a formal analysis to determine that there is a reasonable likelihood of success.
SY-A23	There are no commonly used analysis methods for recovery in the sense of repair, other than use of actuarial data.	Clarification "....is justified through an adequate recovery analysis or examination of data collected in accordance with DA-C14. " (See DA-C14.)	Disagree. Requirement for actuarial data is too stringent; providing an adequate basis, perhaps plant-specific experience or common practice should be acceptable.
SY-B11	It is not clear what is an acceptable justification for deviating from the standard; as such, the requirement is too open ended.	Clarification "... MODEL them unless a justification is provided (i.e., that is unique to the system and highly reliable)."	The intended meaning of the suggested parenthetical insert is unclear. Request additional clarification.
SY-B12	It is not clear what is an acceptable justification for deviating from the standard; as such, the requirement is too open ended.	Clarification " COMPARE MODEL the limitation of the available inventories of air, power, and cooling with those required respect to supporting the mission time. TREAT these inventories in the model unless a justification is provided. "	Agree in principle. Propose a modified version of this comment: "MODEL the ability of the available inventories of air, power, and cooling to support the mission time."

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HR-G8	Clarification "COMPARE MODEL the limitation of the available inventories of air, power, and cooling with those required respect to supporting the mission time. TREAT these inventories in the model unless a justification is provided"	Clarification DEFINE and JUSTIFY (provide evidence that there are not any dependencies, e.g., shaping factors, management, among the human failure events such that cutsets were inappropriately truncated) the minimum probability...."	Disagree. Suggest the following words to replace words added in parentheses: "DEFINE and JUSTIFY (accounting for the dependencies identified in supporting requirement HR-G7) the minimum probability...." Note, if there is concern that there will be premature truncation of cutsets with multiple HFEs, then it is noted that supporting requirements (SRs) QU-C1 and QU-C2 deal with that issue. Also, propose adding a reference to HR-G8 in SR QU-C2.
HR-H1	To be consistent with HR-H2 and HR-H3, it is necessary that this SR clearly indicate that recovery does not include repair, which is dealt with actuarially, not by modeling via human reliability analysis.	Clarification Cat I and II: "INCLUDE....the dominant sequences. Recovery actions are limited to those to which HRA techniques can be applied, such as system reconfiguration, or simple actions such as manually opening or closing a failed valve, but not repair." Cat III: "INCLUDE...components. Recovery actions are limited to those to which HRA techniques can be applied, such as system reconfiguration, or simple actions such as manually opening or closing a failed valve, but not repair."	Disagree with the concept that "repair" could be not included as a recovery action. However, if repair of equipment is to be considered justified, then an adequate recovery analysis (e.g., one that considers equipment availability, repair procedure availability, adequate time available, environmental conditions appropriate to allow repair) must be performed. Propose to add words similar to discussion for SR LE-C2.
HR-H2	The criteria provided for crediting recovery actions are incomplete; there are other factors equally important that are to be addressed before credit can be allowed. As written, there is no requirement to justify multiple recovery actions which can result in inaccurate and misleading results.	Qualification "....skill of the craft exist (c) attention is given to the relevant performance shaping factors provided in HR-G3 (d) there is sufficient manpower to perform the action. If credit is taken for multiple operator recovery actions, ENSURE that it has been determined that the appropriate manpower is available, taking into account such things as the fluctuating manpower with time of the day."	Agree to accept the two additional conditions (e.g., items (c) and (d)). However, do not agree to include the paragraph after items (c) and (d), i.e., beginning with "If credit is taken..." In lieu of adding this paragraph, the words "availability of personnel" are proposed to be added to the list in SR HR-G7.
DA-C14	This SR, which provides a justification for crediting equipment repair, assumes plant specific data will be sufficient to justify this credit. For such components as pump repair, plant specific data is insufficient and a broader base is necessary.	Qualification "IDENTIFY instances of plant-specific component repair from both plant-specific and industry experience and for each repair, COLLECT...."	Agree with modification in principle. Propose changing the words from "both plant-specific and industry experience" to "both plant-specific and-or applicable industry experience". It is not appropriate to require use of both sets of data for each repair.

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DA-D3	<p>For Cat II, a mean value is required for CDF and LERF; assigning mean values only to events that "contribute measurably" can result in combining events where some have mean values and some are point estimates, which does not result in a mean CDF or LERF.</p> <p>Cat II and III, as written, a mean value of the uncertainty intervals is required, which is incorrect (caused by incorrect comma after representation of").</p>	<p>Qualification: Cat II: "PROVIDE a mean value of, and a statistical representation of the uncertainty intervals for, the parameter estimates that contribute measurably to CDF and LERF. The parameter estimates that contribute measurably are those events that are retained in the sequences that survive truncation in the final quantification of CDF and LERF. Acceptable systematic methods include Bayesian updating, frequentist method, or expert judgment." Cat III: "PROVIDE a mean value of, and a statistical representation of the uncertainty intervals for, the parameter estimates. Acceptable systematic methods include Bayesian updating, frequentist method, or expert judgment."</p>	<p>The comma change for both Capability Categories II and III is acceptable. However, the pseudo-definition for "contribute measurably" is rejected. As written, "contribute measurably" would include "everything." This will be reviewed after resolution of the terms dominant, significant and important.</p>
DA-D5	<p>Cat I, does not appear to be consistent with SY-B1. Cat II and III: the SR already provides the generally used and known approaches, therefore, it is not clear what is an acceptable justification for an alternative. As such, the requirement is too open ended.</p>	<p>Clarification Cat I: "USE the Beta-factor approach (i.e., the screening approach in NUREG/CR-5485) or an equivalent for the estimation of CCF parameters." Cat II and III: "...JUSTIFY the use of alternative methods (i.e., provide evidence of peer review or QA of the method which demonstrates its acceptability)</p>	<p>Accept comment for Capability Category I. For Capability Categories II & III, accept the comment except substitute the word "verification" for "QA." The term Quality Assurance is not correct in this context.</p>
IF-C2	<p>It is not clear what is an acceptable justification for deviating from the standard; as such, the requirement is too open ended.</p>	<p>Clarification "....JUSTIFY any credit given, particularly any credit given for <i>INCLUDE credit only when there are available</i> non-flood proof doors or barriers, and credit procedures or skill of the craft exist for isolation of a flood source including the method of detection (i.e., operator detection via control room indication or alarms), accessibility to the isolation device, and time available to perform the action.</p>	<p>Agree in principle. Suggest the following change to replace what was added: "INCLUDE credit for non-flood proof doors as or barriers for isolation of flooding only where the credit is justified by consideration of methods of detection, accessibility to the isolation device, and time available to perform the action with due consideration of procedures and skill of the craft."</p>
Table 4.5.8-1	<p>HLR-QU-A and Table 4.5.8-2(a) objective statement just before table: These objective statements do not exactly agree.</p>	<p>Clarification HLR-QU-A: "...core damage frequency and shall support the quantification of LERF."</p>	<p>Disagree. Suggest that the words "...and support the quantification of LERF." be deleted from HLR-QU-A. By policy, all LERF considerations are with the LERF element</p>

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LE-B2	The modifiers (e.g., may, possible) in Cat I, II, and III appear to eliminate the distinction between Category I, II, and III, and do not provide a minimum in Cat I or II.	Clarification Cat I: "...An acceptable alternative is the approach in NUREG/CR-6595 [Note (1)]." Realistic loads may be used when available. Cat II: USE containment loads....that are realistic when possible for significant challenges to containment. Conservative treatment may be <i>is</i> used for non-dominant LERF contributors. Cat III: USE containment loads....that are realistic when possible for significant challenges to containment.	Agree with comment, except that for Category II, delete the sentence beginning " Conservative treatment.... " Use of alternate, conservative treatment for other loads is implied by the preceding sentence.
LE-C2	It is not clear what is an acceptable justification; as such, the requirement is too open ended. Credit for equipment repair is to be consistent with the Level 1 requirements.	Clarification Cat II and III: "...Repair of equipment may be considered if it can be established that the plant conditions do not preclude repair and actuarial data exists from which to estimate the repair failure probability. " appropriate justified	Disagree with the requirement for actuarial data. Propose the following change: "Repair of equipment may be considered if justified through an adequate recovery analysis (e.g., one that considers equipment availability, repair procedure availability, adequate time available, environmental conditions appropriate to allow repair). "
LE-C4	The modifiers (e.g., may, possible) in Cat I, II and III appear to eliminate the distinction between Category I, II and III, and do not provide a minimum in Cat I or II.	Clarification Cat I: "USE conservative system success criteria." Realistic criteria may be used. Cat II: "...Conservative system success criteria may be <i>is</i> used for non-dominant LERF contributors."	Suggested changes are not quite consistent with changes suggested for LE-B2, LE-C8, & LE-C9. Cat I: Comment acceptable; Cat II: "USE realistic system success criteria for dominant LERF contributors " Delete the sentence beginning " Conservative system success "
LE-C8	The modifiers (e.g., may, possible) in Cat I, II and III appear to eliminate the distinction between Category I, II and III, and do not provide a minimum in Cat I or II.	Clarification Cat I: "...An acceptable alternative is the approach in NUREG/CR-6595 [Note (1)]." A realistic treatment may be used. Cat II: "...in a realistic manner when possible . Conservative treatment may be <i>is</i> used for non-dominant LERF contributors. Cat III: "TREAT .. in a realistic manner" when possible.	Cat I: Comment acceptable; Cat II: "TREAT containment environmental impacts ... in a realistic manner for dominant LERF contributors. " Delete the sentence beginning " Conservative treatment "; Cat III: Comment acceptable.
LE-C9	The modifiers (e.g., may, possible) in Cat I, II and III appear to eliminate the distinction between Category I, II and III, and do not provide a minimum in Cat I or II.	Clarification Cat I: "...An acceptable alternative is the approach in NUREG/CR-6595 [Note (1)]." A realistic treatment may be used. Cat II: "...in a realistic manner when possible . Conservative treatment may be <i>is</i> used for non-dominant LERF contributors. Cat III: "TREAT .. in a realistic manner" when possible.	Cat I: Comment acceptable; Cat II: "Treat containment failure impacts ... in a realistic manner for dominant LERF contributors. " Delete the sentence beginning " Conservative treatment "; Cat III: Comment acceptable.

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LE-D1	<p>It is not clear what is an acceptable justification; as such, the requirement is too open ended.</p> <p>The 'may' term in Cat I and II appears to eliminate the distinction between Cat I and II, and does not provide a minimum in Cat I or II.</p>	<p>Clarification</p> <p>Cat I: "...USE a conservative evaluation of containment capacity for dominant containment failure modes. A realistic evaluation may be used.....</p> <p>EVALUATE impact of vent pipe bellows, and INCLUDE in as potential failure modes, as required..... Such considerations may need to be included for small volume containments...."</p> <p>Cat II: "...PERFORM a realistic containment capacity analysis for dominant containment failure modes. The analysis may include some conservative parameters USE a conservative evaluation of containment capacity for nondominant containment failure modes.</p> <p>EVALUATE impact of vent pipe bellows, and INCLUDE in as potential failure modes, as required ...JUSTIFY applicability to the plant being evaluated. Analyses may consider use of similar containment designs or estimating containment capacity based on design pressure and a realistic multiplier relating containment design pressure and median ultimate failure pressure. Quasi-static containment capability evaluations ...Such considerations may need to be included for small volume containments...."</p>	<p>Accept comment for Cat I. For Cat II, do not accept the suggested sentence beginning "Use a conservative..."</p> <p>For Cat III, delete the word "dominant" in the first two sentences.</p>
LE-D2	<p>It is not clear what is an acceptable justification; as such, the requirement is too open ended.</p>	<p>Clarification</p> <p>Cat I: "...JUSTIFY applicability of generic and other analyses. Analyses may consider conservative comparison with similar failure locations in similar containment designs. An acceptable alternative...."</p>	<p>Accept comment, except in Cat I, and delete "conservative" in the added wording.</p>
LE-D3	<p>Stating a "realistic evaluation is acceptable" in Cat I appears to eliminate the distinction between Cat I and II, and does not provide a minimum in Cat I.</p> <p>It is not clear what is an acceptable justification; as such, the requirement is too open ended.</p>	<p>Clarification</p> <p>Cat I: "USE a conservative evaluation of interfacing system failure probability for dominant failure modes. A realistic evaluation is acceptable. IF generic analyses generated for similar plants are used, JUSTIFY applicability to the plant being evaluated. Analyses may consider conservative comparison with similar interfacing systems in similar containment designs."</p> <p>Cat II: "PERFORM a realistic interfacing system failure probability analysis. Evaluation.... may include conservatisms. USE a conservative evaluation of interfacing system failure probability for non-dominant failure modes...JUSTIFY applicability to the plant being evaluated. Analyses may consider realistic comparison with similar interfacing systems in similar containment designs</p> <p>Cat III: "PERFORM a realistic interfacing system failure probability analysis for dominant the failure modes...."</p>	<p>For Cat I, accept comment, but delete "conservative" in the added wording.</p> <p>For Cat II, in first sentence, add "significant "realistic" as suggested and add at end of first sentence "for dominant failure modes" and delete the second sentence. Do not accept "Use a conservative evaluation..."</p> <p>Delete "realistic" before "comparison" in the last sentence. Accept remainder of comment.</p> <p>For Cat III, accept comment.</p>

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LE-D4	<p>The 'may' term in Cat I appears to eliminate the distinction between Cat I and II, and does not provide a minimum in Cat I.</p> <p>It is not clear what is an acceptable justification; as such the requirement is too open ended.</p>	<p>Clarification</p> <p>Cat I: "USE a conservative evaluation of secondary side isolation capability for dominant SG tube failure modes. A realistic evaluation may be used IF generic analyses generated for similar plants are used, JUSTIFY applicability to the plant being evaluated. Analyses may consider conservative comparison with similar isolation capability in similar containment designs."</p> <p>Cat II: "PERFORM a realistic secondary side isolation capability analysis for dominant SG tube failure modes. Evaluation ...may include conservatisms. USE a conservative evaluation of secondary side isolation capability for nondominant SG tube failure modes....JUSTIFY applicability to the plant being evaluated. Analyses may consider realistic comparison with similar isolation capability in similar containment designs"</p> <p>Cat III: "PERFORM a realistic secondary side isolation capability analysis for dominant SG tube failure modes..."</p>	<p>For Cat I, accept comment, but delete "conservative" in the added wording. For Cat II, same as LE-D3 resolution. For Cat III, accept comment.</p>
LE-D5	<p>The modifiers (e.g., may, possible) in Cat I, II and III appear to eliminate the distinction between Cat I, II and III, and do not provide a minimum in Cat I or II.</p>	<p>Clarification</p> <p>Cat I: "TREAT induced SG tube rupture in a conservative manner." A realistic treatment may be used.</p> <p>Cat II: "TREAT induced SG tube rupture in a realistic manner, when practical. Conservative treatment may be used, when justified."</p>	<p>Accept comment. Also add "thermally-induced" between "TREAT" and "SG" for all categories.</p>
LE-D6	<p>The 'may' term in Cat I appears to eliminate the distinction between Cat I and II, and does not provide a minimum in Cat I.</p>	<p>Clarification</p> <p>Cat I: "TREAT containment isolation in a conservative manner." A realistic treatment may be used.</p> <p>Cat II: "TREAT containment isolation in a realistic manner for dominant contributors. Conservative treatment is may be used for non-dominant contributors.</p>	<p>For Cat I, accept comment. For Cat II, delete sentence "Conservative parameter estimates..."</p>
LE-E2	<p>Modifiers in Cat II appear to eliminate the distinction between Cat II and III, and therefore, there is not a minimum in Cat II.</p>	<p>Clarification</p> <p>Cat II: "USE realistic parameter estimates when possible for dominant LERF sequences. Conservative parameter estimates are used for non-dominant LERF sequences."</p> <p>Cat III: "USE realistic parameter estimates when possible."</p>	<p>For Cat II, accept comment but delete sentence; "Conservative parameter estimates..."</p>

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5.4	As a PRA is maintained, it may go through changes such that the results are significantly impacted (e.g., very different contributors, order of magnitude change in CDF).	Clarification 3 rd para. "Changes to a PRA due to PRA maintenance and PRA upgrade (where applicable) shall meet the requirements of Section 4. Prior to an application, if the changes have significantly impacted the PRA results, the maintained PRA shall receive a peer review and which-satisfy the peer review requirements specified in Section 6, but limited to aspects of the PRA that have been maintained. Upgrades of a PRA shall receive a peer review and shall satisfy the peer review requirements specified in Section 6, but limited to aspects of the PRA that have been upgraded. "	Agree to add "and PRA upgrade" in the first sentence of this paragraph, but disagree with other additions. Maintenance should not require peer review. See discussion in the transmittal letter.
5.8(e)	It is unclear what is to be documented from the peer review.	Clarification "(e) record of the performance and results of the appropriate PRA reviews (consistent with the requirements of Section 6.6) "	Disagree. Documentation of Peer Reviews is covered in Section 6
6.1	The purpose, as written, implies that it is solely an audit against the requirements of Section 4. A key objective of the peer review is to ensure when evaluating the PRA against the requirements in Section 4, the "quality" (i.e., strengths and weaknesses) of the PRA; this goal is to be clearly understood by the peer review team.	Clarification "...The peer review shall assess the PRA to the extent necessary to determine if the methodology and its implementation meet the requirements of this Standard to determine the strengths and weaknesses in the PRA. Therefore, the peer review shall also assess the appropriateness of the significant assumptions. The peer review need not assess..."	Agree to add phrase "to determine the strengths and weaknesses in the PRA." However disagree with addition of the following sentence: "Therefore, the peer review shall also assess the appropriateness of the significant assumptions." The term significant as used qualitatively in the standard encompasses a substantial volume of assumptions and determinations. The scope of this added requirement is undefined and could be well beyond the scope of a peer review. As stated in 6.1 Purpose "The peer review shall assess the PRA to the extent necessary to determine if the methodology and its implementation meet the requirements of this Standard. The peer review need not assess all aspects of the PRA against all Section 4 requirements; however, enough aspects of the PRA shall be reviewed for the reviewers to achieve consensus on the adequacy of methodologies and their implementation for each PRA Element. Essentially all PRA Element requirements in Section 4 include the need to document important or key assumptions and 6.3, paragraph 2 states: "The results of the overall PRA, including models and assumptions, ..." Therefore, it is not considered necessary to add a statement that could be interpreted as requiring a review of all 'significant', 'important', or 'key' assumptions documented in the PRA.
6.1.1	See issue discussed on 5.4.	Clarification "....When peer reviews are conducted on PRA maintenance or PRA upgrades, the latest review shall be considered the review of record...."	Disagree. Maintenance should not require peer review. See discussion in transmittal letter

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6.1.2	See issue discussed on 5.4.	Clarification 3rd para: "NEI-00-02 provides an example of an acceptable review methodology (subject to clarifications and qualifications described in Appendix B of this regulatory guide); however, the differences...."	This comment is appropriate for DG 1122, but not for ASME RA-S-2002
6.2.2	As written, in Section 6.2.2.2, it appears that the constraints on the team members only apply when the review is performed for a PRA upgrade. See issue discussed on 5.4.	Clarification "6.2.2.1 The peer review team members individually shall (a) be knowledgeable...(b) be experiencedfor which the reviewer is assigned. The peer review team members shall (a) not be allowed to review their own work or work for which they have contributed, (b) not be allowed to review a PRA for which they have a conflict of interest, such as a financial or career path incentive or disincentive that may influence the outcome of the peer review. 6.2.2.2 When a peer review is being performed on a PRA maintenance or a PRA upgrade, reviewers shall have knowledge and experience appropriate for the specific PRA Elements being reviewed. However, the other requirements of this Sections shall also apply." The peer review team members shall (a) not be allowed to review their own work or work for which they have contributed, (b) not be allowed to review a PRA for which they have a conflict of interest, such as a financial or career path incentive or disincentive that may influence the outcome of the peer review.	Agree to move the Team requirements to 6.2.2.1. Do not agree to add maintenance to 6.2.2.2. See comment on 5.4
6.2.3	See issue discussed on 5.4. As written, it appears that the last paragraph could allow a team to be composed of a single member.	Clarification 5th para: "...such as a review of a maintenance or upgrade of a PRA element,..." 6th para: "Exceptions to the requirements of this paragraph may be taken based on the availability of appropriate personnel to develop a team (<i>where a team is a group of several individuals</i>) All such exceptions shall be documented in accordance with para. 6.6 of this Standard."	Disagree with proposed change in 5th paragraph See 5.4 Disagree with change in 6 th paragraph. Typical dictionary definitions identify a 'team' as more than one person. The recommended change could be misinterpreted to allow a single person team.
6.3	As written, there does not appear to be a minimum set. The requirement as written provides "suggestions." A minimal set of items is to be provided; the peer reviewers have flexibility in deciding on the scope and level of detail for each of the minimal items.	Clarification 1st para: "The peer review team shall use the requirements.... of this Standard. For each PRA element, a set of review topics required for the peer review team are provided in the subparagraphs of para. 6.3. Some subparagraphs of para. 6.3 contain specific suggestions for the review team to consider during the review. Additional material for those Elements may be reviewed depending on the results obtained. The judgment of the reviewer shall be used to determine the specific scope and depth of each review topic for each PRA element."	Disagree. The intent is clearly stated in the 5 th sentence "The suggestions are not intended to be a minimum..." Peer Review teams must be allowed to select the scope and level of detail for the review and not be bound by prescriptive requirements. A Peer Review is not an Audit.

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6.3.6 (a)	As written, it does not appear that review of the data values would include the defined boundary for the component, which is an essential aspect of the review. It is not clear that "contributing" would include components, if degraded would have a significant impact.	Clarification "(a) data values and the defined component boundary for component failure modes contributing to the CDF or LERF (including active components with high RAW values) calculated in the PRA"	Accept first part in principle. Will add: "(including component boundary definitions)" in first sentence Disagree with second insert (including active components with high RAW values) . The standard does not require determination of RAW values for components during development of a PRA; therefore, the Peer Review Team may not have this information available for review.
6.6.1	As written, It is not clear whether certain essential items are included in the documentation requirements that are necessary to accomplish the goal of the peer review.	Clarification "(j) identification of the strengths and weaknesses that have a significant impact on the PRA. (k) assessment (e.g., significance) of the assumptions playing a key role in the PRA results (l) confirmation of the capability categories noted in the PRA for each SR from Section 4.5 of the Standard."	Accept (j) Accept a modified (k) "assessment of assumptions that have a significant impact on the PRA results" Reject (l) See discussion on Item 4.5 and in the transmittal letter. In both cases it is assumed that usage of the word 'significant' in this context does not imply a strict numerical test and the term might be changed to "important" or "key" after resolution of the definition issue discussed in the letter.