

From: Mark Blumberg
To: Koc@nei.org
Date: 1/17/03 3:13PM
Subject: Advance Comments on NEI 99-03, Revision 1

Kurt,

Attached are the staff's second installment of requested comments on NEI 99-03, Revision 1. As previously discussed, the staff will continue to provide our comments in parts. The staff will provide further comments on or before January 24. The attached comments include those on Appendix D. Note we will be providing additional comments on Appendix D. Please feel free to contact me if you have any questions.

W. MARK Blumberg
U.S. Nuclear Regulatory Commission
Probabilistic Safety Assessment Branch
301-415-1083

CC: Reinhart, F. Mark

NRC Staff Comments on NEI 99-03, Revision 1 (Appendix D, Testing Program)

Overall issues:

In some cases, there is a reasonably complete discussion of a testing aspect. Subsequent sections may repeat excerpts from the fuller discussion, but omit important caveats, etc. It would be better if the subsequent sections referred to the fuller discussion. For example, Appendix D, §3.3 addresses the need to use *recognized* industry standards and that “. . . *the industry standard must be relevant to the determination of inleakage for the specific application . . .*” However, subsequent phrasing often simply refers to “. . . *industry standard . . .*” A similar situation exists with excerpts related to testing the limiting or bounding case without a cross-reference back to the full discussion in Appendix D, §4.1, §4.2.

The text is heavily biased against the tracer gas test, and the staff feels that the document does not adequately give a user the complete picture regarding the pros and cons of all methods. For example, there is a discussion regarding the potentially higher measurement uncertainty associated with tracer gas testing, but no mention of the inability of the component test method to detect unsuspected inleakage, or the dependence of the method on the quality of the self-assessment.

Sections of NEI 99-03 need to point to Appendix D. These include situations where changes in design or operating procedures impact control room envelope inleakage characteristics.

Generic Letter 91-18 stands on its own. An interpretation of Generic Letter 91-18 within these sections and corresponding subsections will not be endorsed by the staff. For example see §4.1 d).

There needs to be a consistent treatment when the document either references the design or licensing bases. For example in Appendix D, §4.1, item e) the text refers to only the design bases. The staff suggests referencing both the licensing and design bases and that these document remain consistent with one another or just the licensing bases since the design bases is a subset of the licensing bases.

Specific Comments on NEI 99-03, Revision 1 Appendix D, Testing Program

- §3.1 The staff would like to see this text be revised to include the provision that a comprehensive test be capable of reliably measuring and detecting unknown inleakage.
- §3.2, second ¶ Delete text after the 1st sentence. This text belongs in the discussion regarding component testing.
- §4.1.b) The staff agrees that this items is applicable to the baseline test. Since the item is a prerequisite, e.g., requirement, the disclaimer could be interpreted as a requirement for a baseline test and permissive for a periodic test. Thus, §4.1.b) should be expanded with something such as:
- Acceptable pre-conditioning represents either restoring a deficiency to its design basis condition or a permanent design change. Interim actions that will not become part of the ongoing control room integrity program are not acceptable. Such test pre-conditioning should not be performed for periodic tests since this would inappropriately mask integrity degradation that occurs between tests.*
- Footnote 3 on page D-2 Change the footnote to read, “An assessment of the control room boundary is essential if inleakage is going to be determined.” See also the comment for §4.1.g).
- §4.1.g) Add the following prerequisite for non Baseline tests: Perform an assessment of the control room boundary in accordance with Appendix C, §4.3.3 and §4.3.4.
- Note before §4.2 Add: “All plant should verify system flow rates and sources.”
- §4.2 b) Regarding the use of one test to represent the inleakage characteristic for all types of challenges. Add: “Although the CRE ventilation systems may be performing in a similar manner for the different challenges, the ventilation systems serving, traversing and located in adjacent areas may not perform in a similar manner and may impact the inleakage characteristics of the CRE.”
- §4.2, last ¶ The last sentence should be clarified.
- Footnote 4, page D-3 The footnote does a good job of defining the functions that ventilation systems in adjacent areas can be performing. It is a complete definition that should be used throughout the document.

The staff believes this text belongs in the text rather than in a footnote.

Footnote 5, page D-3

In footnote 5, for a plant designed for two operating modes (pressurization mode during a radiological challenge, and a recirculating mode during a hazardous chemical challenge) two separate tests should not be a *consideration*. Rather they should be a *requirement*.

§4.3, short ¶

This short reference does not carry with it the necessary attributes identified in Appendix D, §3. Replace “*Acceptable standards are listed in Table D-1*” with “*Section 3.1-3.3 of this document identifies attributes of acceptable test methods.*”

The choice of test method should be based upon the method that will best identify inleakage and not the method that is most economical. Likewise, the consideration of uncertainty is focused on the uncertainty of test results but ignores the uncertainty of not identifying all of the inleakage. These considerations should be incorporated in the text.

Add the following after the last sentence: “The selection of one test method over another may hinge upon the ability of a certain test to assure that all inleakage is measured.”

§4.3.1

The discussion in this section is biased as it only provides negatives aspects of the testing method. The section should discuss the positive aspects of this method to present a balanced view.

Footnote 6, page D-4

Footnote 6 is irrelevant to the purpose of this document. What has happened in the past is not indicative of what will happen in the future. There may be techniques that do not require exceptions. Therefore, delete the text addressing the exceptions.

§4.3.1, second bullet

While it is true that multizone buildings are more difficult to test than single zones, most control room envelopes are single zone spaces. ASTM E741 defines a single zone. This should be reflected within the bullet.

§4.3.1, third bullet

Opening normally closed doors, removing ceiling tiles, and using portable fans to assist in mixing are actions taken by testers to reduce the time before equilibrium is reached so that sampling may begin sooner. If these actions are not taken, the control room envelope will still reach equilibrium but it takes longer to perform the test. The above noted actions merely reduce the time at which the concentration within the CRE is in equilibrium so that testing may begin consistent with ASTM E741.

§4.3.1, last bullet	To a large degree, this item is likely applicable to all testing methods and might be better in Appendix D, §4.2.
§4.3.1.1, E741 exceptions	This section should be deleted. See the comment for Appendix D, Footnote 6.
§4.3.2, first ¶	The discussion in this section is biased as it only provides positives aspects of the testing method. The section should discuss the negative aspects of this method to present a balanced view.
4.3.2, first ¶, second sent.	It is erroneous to state that a component test will identify the total inleakage of a CRE. Such a statement is true only if all of the leakage locations are identified and tested.
§4.3.2, third ¶	To the criteria for similar design and operation, emphasize that this includes design and operation of spaces and ventilation systems external to the CRE. Also, the staff believes that each application of benchmarking is a change in methodology that must be approved by the NRC staff.
§4.3.2, first bulleted list	This bullet does not belong with the other two bullets. Since this aspect is also true for integrated tracer gas tests, yet it is not mentioned within the text of §4.3.1, it further reinforces the comment for §4.3.1. At least one facility has performed tracer gas tests for years with their plant staff. The staff therefore, believes the bullet should be deleted.
§4.3.2, second bulleted list	The staff considers that the bullet items to be prerequisites that all need to be satisfied before a component test can be found appropriate.
§4.3.2, "Step 1," second ¶	(1) Particular attention needs to be paid to rooms within the CRE that contain ventilation intake plenums, since these can create localized negative pressure differentials. (2) Similarly, particular attention needs to be paid to areas within the CRE that are opposite to areas exterior to the CRE and are subject to localized positive pressurization. (3) An evaluation should be performed to ascertain that the observed pressure differentials can be attributed to intentional filtered pressurization flow, and are not the result of unknown unfiltered inleakage.
§4.3.2, "Step 2"	The reference to Appendix C is potentially confusing since Appendix C applies to baseline testing and §4.4 of the text to periodic testing, but Appendix D applies to both. Consistent with the staffs comments for §4.1.g), the staff believes that sections of

Appendix C should be performed each time a periodic test is performed.

§4.3.2, "Step 3",

Several sentences are incomplete excerpts from previous text and the omitted text is important. It would be better if these sentences referred back to the fuller discussion. For example: ". . . *these integrated component test methods should be performed using industry standards . . .*" §3.3 contains a caveat that ". . . *the industry standard must be relevant to the determination of leakage for the specific application . . .*" This is an important caveat.

§4.3.3, overall

The text refers to ". . . licensees may propose . . ." The text, however, doesn't say to whom and whether they can implement it without prior staff review. The staff believes that each alternative test method is a change in methodology that must be approved by the NRC staff.

§4.3.3, last bullet, first list

There appears to be a typo in the last bullet of the first bullet list -- there is no §5.3.2. My suspicion is that it meant to refer to §4.3.2. As such, the above comment on §4.3.2, 2nd ¶ applies equally here as well.