

From: Mark Blumberg
To: Koc@nei.org
Date: 1/22/03 4:45PM
Subject: Advance Comments on NEI 99-03, Revision 1

Kurt,

Attached are the staff's third installment of the requested comments on NEI 99-03, Revision 1. Note that we may have further comments on Friday. Please feel free to contact me if you have any questions.

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

Overall issues:

Replace the comment sent on 01 15 03 with the following:

Main Text, 3.3.4.3,
4th bullet

Securing a non-emergency ventilation system that contributes to inleakage during operation and pressurization is an acceptable method to correct a leakage problem if this securing is done by a plant modification. If the securing is done by a local manual operator action, this is not acceptable. This comment also applies to Appendix C, §3.4.2.

Appendix D, §3, second bullet,
§4.2a, and §4.3.3, third
bullet on the first list.

When testing the CRE for its inleakage characteristic for a particular type of challenge, testing should be conducted with all ventilation systems (those within the CRE and those serving, traversing or located in areas adjacent to the CRE) performing in a manner consistent with the facility's licensing basis unless it is determined that such a testing mode would underestimate the inleakage characteristics for such a challenge. The cited sections refer to a bounding configuration.

General Questions

Where does the user of NEI 99-03 go to determine the alignment (design information) of systems adjacent to the control room during integrity testing and how is the operation of these adjacent ventilation systems accounted for in the determination of the limiting condition?

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

§4.3, short ¶

The staff would like to see a provision requiring that the test documentation include a written justification for a conclusion that a particular test configuration bounds the accident configuration, e.g:

If such deviations from the licensing bases alignments are needed, a sensitivity evaluation should be performed to demonstrate with reasonable assurance that the measured inleakage is bounding for the licensing bases configuration that would exist during an accident. This evaluation should be documented with the test results.

§4.3.2	During the workshops it was stated that those who did a component test would have their methods peer reviewed. This does not show up in appendix D §4.3.2. This should be added to this section.
§4.3.2, second bulleted list	The staff feels the following bullet should be added to the list: "Correlation between E741 and component tests indicates that control room envelope wall, ceiling and floor inleakage is minimal."
§4.3.2, "Step 2", 3 rd ¶	Reference to §5.2 should be a reference to §4.2. Also, ". . . <i>temperature differences</i> . . ." should read ". . . <i>temperature, seasonal and daily temperature differences</i> . . ."
§4.4.1.1	<p>Several of the bullets in this section have general applicability to any test performed at a nuclear site. For example bullets 1, 9 and 10 and parts of the bullets 6 and 8 all contain information that should be preliminary actions for any tests performed at a plant. Likewise, there are several bullets that are generic to inleakage testing. The staff suggests that those that are generic to any test performed at a plant be removed. Secondly, for those that are generic to integrity testing create a general section under 4.4, entitled, "Preliminary Actions," and place these preliminary actions in this section.</p> <p>Under the 6th bullet, the staff recommends that the following be considered: NEI 99-03 should address the fact that some ductwork will have a different alignment during a radiological event than under a fire or hazardous chemical challenge. The responses of ventilation systems within and external to the CRE will also function in a manner particular to the challenge. This must be understood in the establishment of the test protocol.</p>
§4.4.2.1, 1 st bullet & Footnote 8	<p>Based upon the following comments the staff believes the reference to 0.05 and 0.01 inches WG should be deleted from footnote 8. The staff also recommends replacing "<i>Use 0.125" WG or 0.05" WG if no other pressure differential is specified by design.</i>" with "<i>Use 0.125" WG if no other pressure differential is specified by licensing basis.</i>"</p> <p>The staff does not believe that the conclusion regarding more stable pressure differentials within adjacent areas as opposed to atmospheric variation can be supported. Internal pressure differentials can be created by solar heating or the response of moderating HVAC systems to temperature changes within the buildings. Accident conditions in adjacent areas, temperature or pressure caused by high energy line breaks, etc., are not likely modeled in the performance of the test. One pressure differential</p>

ought to be used. I think the uncertainty associated with these changes may be comparable if not greater to those in the environment, e.g., a high energy line break may increase pressure by 10's of psi in short periods; barometric pressure doesn't change at this rate.

The description of reference 8, referring to the Guidelines for Construction of Hospital and Health Care Facilities by the American Institute of Architects and the ASHRAE HVAC 2001 Applications Handbook as the justification for the value of 0.05 inches WG is inappropriate. These guidelines and applications apply to rooms that do not have the multiple divisions within the zone nor the numerous ventilation systems which traverse, serve or are located in areas adjacent to the CRE which may affect the CRE pressure.

§4.4.2.1, 2nd list

Sufficient guidance is not provided on the performance of the ΔP measurement and some of the guidance which is provided is erroneous. There is a need to know the location of ventilation systems which serve, traverse or are located in adjacent areas. The guidance to measure the pressure relative to all adjacent areas is probably not specific enough. The areas which need to be measured probably are most readily identified by using a drawing in conjunction with a walkdown. Areas where pressure measurements need to be made include those where a ventilation system is located, there is a change in boundary, or a change in ventilation systems which traverse or serve the area. Pressures also need to be measured behind false walls.

§4.4.2.1, last bullet, 2nd list

It is indicated that if an adjacent area is determined to be at a higher pressure than the CRE, then actions may be taken to reduce the pressure in the adjacent area. If that is the case and all systems are functioning in accordance with their licensing basis then a component test cannot be performed.

§4.1, "Prerequisites to Testing," subparagraph e) called for the systems to be placed into their design basis configuration. §4.3, "Determine System Mode of Operation for Testing" also calls for design basis alignment or bounding equivalent, with deviations documented.

The text in this bullet appears to allow the test personnel to modify the alignments on an ad hoc basis. This is unacceptable. The staff believes that it is common protocol that if a test cannot be completed without deviation of procedure, the test is terminated and necessary corrective actions completed and procedures changes are made and approvals are obtained prior to continuing with the test. If the design characteristics change then a new

licensing basis needs to be initiated and a re-assessment of the applicability of a component test would be made. Simply re-configuring the control room or adjacent area ventilation systems is not the answer for it may introduce other consequences, e.g., less ventilation flow thereby affecting cooling and, in turn, equipment.

§4.4.2.3.A, Footnote 10	The reference to ANSI N510-1989 as N510 should be deleted in this footnote. It is no longer an ANSI Standard but has been replaced by ASME N510. A more appropriate and accurate test is ASTM E2029-99.
§4.4.2.3.B	The document does not state how many components need to be tested to account for the identified leakage. The document should state that a sufficient number of components need to be tested to assure that 95% of the leakage identified through the E741 test is accounted for.
Footnote 11	Clarify this footnote. Flow measurements are acceptable in lieu of what? Does it allow no testing? Is it a statement that the uncertainty is included only when a large amount of unfiltered inleakage can be tolerated?
§4.4.2.4	<p>This material is applicable to the tracer gas test as well, and the section should be renumbered as §4.4.3 or §4.5. This section is generically applicable to any testing method and should not be located only within the component test method section.</p> <p>This text allows the use of nominal test results, uncorrected for test uncertainties. The staff believes that this is acceptable for low-leakage control rooms (e.g., nominal leakage less than 100 cfm) provided that the test was performed in a quality manner that minimized uncertainties and that the sources of uncertainty are understood.</p>
Table D-1, footnotes	There are several unqualified references to “standards.” These references omit the caveat included in §3.3, i.e., <i>“The industry standard must be relevant to the determination of inleakage for the specific application.”</i>
Table D-1, page D-14	Suggest deleting AG-1 and N510 from Table D-1 as it provides testing guidance that is inconsistent with the testing attributes of §3 of Appendix D.
Table D-2, Electr. conduits	There is no technical basis for excluding conduits. Also, this item should be expanded to address cable trays.

In the Discussion Section of Table D-2, for several vulnerabilities the discussion states that the positive pressure measurements of the CRE will show that this vulnerability would not exhibit inleakage as the leakage would be out of the CRE. This assumption is only true if a correlation has been performed using E741. Such a correlation would be required to demonstrate that the walls, floors and ceilings are not a source of inleakage (pressurization flow) since the positive ΔP may originate from air inleakage sources which are unidentified. Consequently, the ΔP measurement is only beneficial if you know the sources of pressurization flow.

Specific Comments on NEI 99-03, Revision 1 Appendix B, Compensatory Measures

References 5 and 6 need to be updated. The latest version of both the Regulatory Guides and the NUREG is Revision 1.