

## NRC COMMENTS ON NEI 99-03, REV. 1

### MAIN TEXT

CMT #	PARA. OR SECTION	COMMENT	DISPOSITION	SKIP Disc.
1.	General	Instead of the term "Toxic Chemical" use "Hazardous Chemical" throughout the document.	ACCEPT. Editorial. Accept the comment with a find and replace.	S
2.	General	In some sections of the document there is extensive guidance provided on certain situations. For example, what constitutes systems outside the control room, acceptable test attributes, etc. Some common terms are used throughout the document. Usually, such terms are defined in the document. When the terms are used elsewhere within the document, instead of referring to the point of definition, attempts are made to paraphrase the definition within the text. When such paraphrasing is done, it is usually done in an incomplete manner such that the portions of the definition are excluded. This process confuses the reader and clouds the application of the document. For example, Footnote 4 of Appendix D provides a complete description of the systems to be considered in adjacent areas. Yet when referring to adjacent area ventilation systems, the systems referenced throughout the document are not as complete as Footnote 4.	ACCEPT. Agree to review the document for consistency, and to provide cross-references to the more detailed descriptions. It may be possible that the main body of NEI 99-03 needs to refer the user to more detailed discussions in the Appendices.	S
3.	General	Ultimately replace references to Draft Guides (DG) with references to issued Regulatory Guides.	ACCEPT. If the RGs are assigned in advance of the NEI 99-03 publishing, then the DG citations will be replaced with the RG citations.	S

4.	General	Throughout the document reference is made to radiological and toxic gas events. Such references need to be expanded to include radiological, hazardous chemical, and fire events.	Task Force believes that NEI 99-03 adequately addresses the need to evaluate the impact of smoke events. Concern that fire is inappropriate – it is addressed in 10CFR50 Appendix R.  The TF is willing to use the phrase “radiological, hazardous chemical, and smoke events”, when appropriate.	
5.	General	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?	The TF believes that the determination of the limiting condition is on a plant-specific basis, and that Appendices C and D provide the level of detail necessary to provide guidance.	
6.	General	In the verification process when references are made to flow rates this should be combined with a determination of flow sources.	FURTHER EXPLANATION NEEDED FROM STAFF WITH RESPECT TO SOURCES.	
7.	General	Appendix AA and BB will not be reviewed.	ACCEPT. No review required.	S
8.	§1.1	Change the end of the initial paragraph as follows, “. . . associated with the following aspects of control room habitability:”	ACCEPT. Implement	S
9.	§2.3.1	CR should be defined before its use.	ACCEPT. Define CR when it is first used.	S
10.	§3.1	1 <sup>st</sup> paragraph, last sentence, replace the words “may want to” with “should.”	ACCEPT. Implement	S
11.	§3.1.1	NEI 97-04, Revision 1 is not fully endorsed by the NRC. Reference only Regulatory Guide 1.186 since it provides the NRC guidance endorsed.	The text will be revised to cite both RG 1.186 and NEI 97-04 as sources of guidelines for identifying design basis information. The revised text will note that RG 1.186 has endorsed NEI 97-04 Appendix B.	S

12.	§3.1.2	Licensees should compare the design, configuration, maintenance and operation of their control room habitability systems (CRHSs) and the systems that are in adjacent areas and could interact with the control room envelope to their licensing and design bases to ensure consistency. The review of the configuration of the CRHSs should include the construction and the alignment of the systems and structures that make up the CRHSs. The CRH analyses assembled should include those systems that may impact control room habitability. These include ventilation systems that serve or traverse areas within the control room envelope or are located adjacent to the CRE.	<p>Add a bullet to follow the fourth bullet (which is addressing CR ventilation systems):.</p> <ul style="list-style-type: none"> <li>• All modes of Adjacent Area Ventilation Systems that may affect CRH function.</li> </ul> <p>(this would include duct work traversing the CRE)</p>	
13.	§3.2.1.1	Replace the first sentence with: "Licensees should compare the design, configuration, maintenance and operation of their CRHSs and the systems that are in adjacent areas and could interact with the control room envelope to their licensing and design bases to ensure consistency."	Add a second sentence to the first paragraph: "The effects of adjacent area ventilation systems should be considered."	
14.	§3.2.1.1.1	Delete the example in the 3rd bullet. The existing example is not appropriate and could be misleading. A system walkdown is unlikely to determine air sources.	ACCEPT. Delete the example from the third bullet.	S
15.	§3.2.1.1.3	<p>Change the word "licensing" in the 1st bulleted sentence to "licensing and design bases."</p> <p>Generally, acceptable, but the section seems weak. Words like ". . . establish the proper flow path," and ". . . they do not adversely affect" are subjective and open ended. These words need to be strengthened so that the statements and guidance are definitive.</p>	<p>ACCEPT. Change Section 3.2.1.1.3A first bullet to: "... do not invalidate the licensing and design bases while ...."</p> <p>The phrase "proper flow path" in the second bullet should be changed to: ???</p> <p>The intent is to create a clear, concise, strong document. The text will be revised to make this section stronger.</p>	

16.	§3.2.2.1	<p>3rd paragraph, revise to read, “. . . including accidents at adjacent units, on the radiological consequences to the reactor operators.”</p> <p>Also, in the 6th bullet, 1st paragraph, revise to read, “This potential limiting DBA must be considered.”</p> <p>In the 6th bullet, delete the second paragraph.</p> <p>Make conforming changes in any other applicable location.</p>	DISCUSS WITH STAFF. NEI 99-03 Rev. 1 permits licensees to maintain their current licensing basis with respect to accidents at adjacent units. Should a licensee choose to implement the analysis techniques described in DG-1113 and RG 1.183, then the licensee will need to consider accidents at adjacent units.	
17.	§3.2.3.2	<p>The recommended action is to be performed one time. Regulatory Guide 1.78 encourages licensees to conduct periodic surveys of stationary and mobile sources of hazardous chemicals in the vicinity of their plant sites. The periodicity should be based on the number, size, and type of industrial and transportation activities in the vicinity of the plant and regional and local changes in uses of land. The staff recommends conducting a survey of the location, types, and quantities of the mobile and stationary hazardous chemical sources at least once every three years, or more frequently as applicable. The staff also recommends annual performance of an onsite survey of hazardous chemical sources.</p>	Section 3.2.3.2 addresses the first (or baseline) hazardous chemical evaluation. The need to revisit this evaluation on a periodic basis is addressed in Section 4.4. Section 4.4.1 Item “c” specifically addresses the need to include a review of toxic chemical hazards.	
18.	§3.2.5.2	<p>1st paragraph; add the following sentence: “Consideration should be given to the undesirable propagation of fire byproducts through the operation of fire suppressant or ventilation systems. Such propagation should not simultaneously impact habitability in the control room envelope and at the alternate shutdown panel.”</p>	<p>NRC to CLARIFY the intent of this comment.</p> <p>NEI 99-03 refers to the propagation of smoke.</p>	

19.	§3.2.6.2	The bases of the Improved Standard Technical Specifications say that this SR demonstrates control room integrity with respect to unfiltered inleakage. The E741 integrated testing proves that it does not. Because 10 CFR 50.36 requires technical specifications to be derived from the safety analyses, the staff feels that the existing deficiency should be corrected. This correction is consistent with the NRC Administrative Letter 98-10, "Dispositioning Of Technical Specifications That Are Insufficient To Assure Plant Safety," which describes the staff's expectation that licensees correct technical specifications that are found to "contain non-conservative values or specify incorrect actions."	The Task Force believes that Sections 2.3.6 and 3.2.6 address the need to resolve any inadequacy of existing CREFS Technical Specifications.	
20.	§3.3, 3.3.1-3.3.3, 3.3.4.1	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.	The Staff needs to identify the text that represents an interpretation that is inconsistent with GL 91-18.  The Task Force believes that NEI 99-03 is not interpreting GL 91-18. The text facilitates CRH Guidance by citing the content of GL 91-18 that applies to CRH.	
21.	§3.3.4.2	Reference only Regulatory Guide 1.187 since it provides the NRC guidance endorsed.	RG 1.187 states that NEI 96-07 provides acceptable methods for compliance with 10CFR50.59. No change to Section 3.3.4.2 is necessary.  RG 1.187 needs to be added as a NEI 99-03 reference.	S
22.	§3.3.4.3	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 manual operator action, this is not acceptable. This comment also applies to Appendix C, §3.4.2.	Manual actions are acceptable. What is the regulatory basis for stating manual action is not acceptable?  This type of plant change is subject to 10CFR50.59. NRC Information Notice 97-78 provides guidance on crediting operator actions in place of automatic actions.	

23.	3.3.4.3, 4 <sup>th</sup> 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 <u>local</u> manual operator action, this is not acceptable. This comment also applies to Appendix C, §3.4.2.	Local manual actions are acceptable. What is the regulatory basis for stating local manual action is not acceptable?  This type of plant change is subject to 10CFR50.59. NRC Information Notice 97-78 provides guidance on crediting operator actions in place of automatic actions.	
24.	§4.2.1	With regard to preconditioning before a baseline test: (1) the preconditioning should represent 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. (2) There should be a warning that no preconditioning is acceptable for periodic tests.	Add the following sentence to the end of the third paragraph of Section 4.2.1: “This preconditioning should represent either restoring a deficiency to its design basis condition or a permanent design change.”  Add the following sentences to the end of the third paragraph of Section 4.3.2: “Preconditioning as defined in Section 4.2.1 is not acceptable for periodic retests. However, maintenance performed as part of the standard operation of the plant is not preconditioning.”	
25.	§4.2.3	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 cubic feet per minute) provided that the test was performed in a quality manner than minimized uncertainties and that the sources of uncertainty values are understood. The substance of this comment should be applied throughout NEI 99-03.	The basis for choosing 100 cfm as a breakpoint is not understood. The need for any breakpoint is not substantiated.  The guidance provided in NEI 99-03 Appendix D ensures that the testing is performed in a quality manner that minimizes uncertainties and that the sources of uncertainty values are understood. Appendix D Section 4.4.2.4 states that it is acceptable to use a nominal value in the analyses when the nominal values are in a reasonable range and the variability in results, as represented in the uncertainty, is understood.	

<p>26.</p>	<p>§4.3 &amp; footnote 1</p>	<p>While some scheduling tolerance is acceptable, the specified value of +/- one year is excessive when applied to schedule intervals of three years or more. With schedule intervals of such length, a utility has sufficient flexibility to schedule the tests and get them performed without invoking an additional year. The staff believes that this tolerance should be reduced to no more than three months to provide for unscheduled outages that might occur as a scheduled test is due.</p> <p>This scheduling tolerance does not apply to every time interval in this section as stated in the footnote. It applies only to time intervals in the future, and not those already past. For example, in the 3rd bullet, “. . . three years prior . . . ” is 3.0 years prior, not four years as permitted by footnote 1. “. . .three years after . . . ” can have a tolerance of no more than three months. The footnote and the position of the footnote reference at the title of Section 4.3, could create a situation in which an assessment might not be performed for five years after the last baseline.</p> <p>Licensees are allowed scheduling credit for a previous performed baseline test only if that test can be shown to satisfy the provisions of a baseline test as described in NEI 99-03, Appendix D, with the exceptions and clarifications to be provided for Appendix D.</p>	<p>Standard Tech Specs allow 25 percent scheduling tolerance, and 25 percent of 3 years is already 9 months. The Task Force believes that the specified value of 1 year is appropriate.</p> <p>The 3 and 6-year time frames were proposed by the NRC and adopted by the Task Force. The 1 year scheduling tolerance provides flexibility to accomplish the data collection task necessary to make a future performance-based testing frequency.</p> <p>The Task Force disagrees. A plant that has performed a test to measure inleakage prior to the issuance of guidance has met the intent of performing a baseline test. It is inappropriate to require these licensees to immediately perform a retest. To clarify this position, the Section 4.3 second paragraph should refer to “a test to measure inleakage” rather than “baseline test”, and the accompanying three bullets delete the word baseline.</p>	
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27.	Figure 1 and §4.3.1 through 4.3.3	Figure 1 does not reflect the corresponding staff figure discussed at the workshops. As a consequence of expanding the logic for corrective actions flowing out of an assessment, the industry used the completion of the corrective actions that result from an assessment as the starting point for the three-year clock. This is reflected in the text (e.g., in §4.3.1, “. . . three years following completion of the Section 4.2 baseline test AND any corrective actions . . .”). The staff’s position is that the time interval is to be taken as three years following the last successful performance of the action, whether it is a baseline test, assessment, or periodic test. Predicating the timing of the next action on the completion of a corrective action could forestall the next action for as long as it takes the item to work its way up the corrective action priority list. This is unacceptable.	<p>The Task Force agrees that it is inappropriate for the 3-year frequency to begin with the completion of corrective actions for minor deficiencies (without the need for retesting). The Task Force’s intent is for the 3-year frequency to begin with the completion of the most recent assessment or retest.</p> <p>Figure 1 will be redrawn to delete the arrow from the “Correct Deficiency” box to the arrow exiting the periodic retest’s “fix and retest” box.</p> <p>Figure 1 will be redrawn to show the line originating from the two “fix and retest” boxes and the “reanalyze” box to go directly into the “periodic retest” box, with the “(3 years)” note added to this redrawn line.</p> <p>Section 4.3.1 will be revised to reflect these changes.</p>	
28.	§4.3.3, 2nd bullet	Although the reference to the corrective action program is generally acceptable here, the staff expects that the corrective actions will be timely and continuous since the test failure indicates that the design basis may not be satisfied with regard to control room habitability. An operability determination and a reportability determination need to be made.	The Task Force agrees that operability and reportability determinations are required. However, since the need for these determinations is part of the correction action program, no further discussion is needed in Section 4.3.3.	S
29.	§4.3.4.2	Make procedure control a required part of the program.	Agree.	S

30.	§4.3.4.3	<p>This section relegates review of offsite toxic gases to the six-year assessment. The staff believes that facilities should be assessing the impact more frequently than every six years. The staff believes that such facilities would want to establish arrangements with those facilities to receive notification of changes in chemical inventories that would be reported to public officials under SARA III. This is not an onerous burden.</p>	<p>The purpose of the six-year CRH assessment as it relates to toxic chemical control is to review the plant's existing chemical controls program and licensee commitments. The time interval between offsite hazardous chemical inventory assessments is addressed in a licensee's toxic gas licensing basis.</p> <p>Task Force believes that a six-year interval between offsite hazardous chemical assessments is adequate, unless a licensee's toxic gas licensing basis requires more frequent assessments.</p>	
31.	§4.3.4.4	<p>The staff believes that the CR HVAC engineer's recommendation needs to be expanded to system engineers involved with systems and structure identified during the system assessment as having a potential impact on control room habitability.</p> <p>The CR HVAC engineer needs to be familiar with habitability issue and review each related modification package for impact on CRH.</p>	<p>Section 5 would ensure adequate training to allow the individual(s) responsible for CRH to be familiar with the potential impact of changes various plant systems and structure (including those of adjacent areas). As such, no text change is needed.</p> <p>Agreed. The CR HVAC engineer should be familiar with habitability issue and review each related modification package for impact on CRH.</p>	
32.	§4.3.4.7	<p>Add a control to address fire.</p>	<p>Fire is addressed by 10CFR50 Appendix R. This guidance document addresses smoke; the Section 4.3.4 administrative controls necessitate smoke controls.</p>	
33.	§4.3.5	<p>Changes to test and assessment frequency, after sufficient experience, need to be proposed to the NRC staff.</p>	<p>Changes to test and assessment frequencies are at the licensee's discretion unless previously reviewed and approved by the Staff. This paragraph is consistent with existing licensee commitment change processes.</p>	

34.	Figure 1	<p>This figure is different from that presented by the staff. Figure 1 does not provide a failure path for the retest following a repair or if re-analysis cannot relax the acceptance criteria. The staff expects that following a failed periodic retest, efforts to fix and retest will continue in a timely manner until a successful test is performed. The three-year interval to the next periodic retest starts upon obtaining a successful retest result.</p>	Addressed in Resolution to Comment 27.	S
35.	§4.4.1	<p>First paragraph, first sentence, revise to read, “. . . to assure that the plant maintains the. . . .”</p> <p>With the exception of item b, which requires the review of procedure revisions to ensure that control room issues were considered, the language requires a review of the individual process control. The staff expects that reviews of the various process controls will also evaluate the effectiveness of such controls. For example, in item f, rather than “. . . Review maintenance controls to ensure that CRH issues were considered . . .” The item should read, “. . . Review applicable maintenance work packages to ensure that CRH issues were considered . . .”</p> <p>The assessment plan should include the measurement of flow rates, performance of a flow balance, and the determination of air sources associated with those flow rates.</p> <p>Add subparagraph g to address fire.</p>	<p>Accept. Revise the first paragraph, first sentence, to read, “. . . to assure that the plant maintains the . . . .”</p> <p>Accept. In the subitem lead-in sentences, change “controls” to “controls and their effectiveness”.</p> <p>Assessments do not require new testing. A CRH assessment involves reviewing non-in-leakage test results generated during the preceding 3-year time interval.</p> <p>Fire is addressed by 10CFR50 Appendix R. This guidance document addresses smoke.</p>	
36.	prior to §4.4.2	The cross-reference to Section 4.3.1 is subject to the comments above on that section.	Agreed.	S
37.	§5	The staff believes that training is warranted.	The training needs analysis will identify the extent of training required.	

**APPENDIX B**

<b>CMT #</b>	<b>PARA. OR SECTION</b>	<b>COMMENT</b>	<b>DISPOSITION</b>	<b>SKIP</b>
B-1.	§4	References 5 and 6 need to be updated. The latest version of both the Regulatory Guides and the NUREG is Revision 1.	Agreed. Both Revisions for each reference will be cited.	S

**APPENDIX C**

<b>CMT #</b>	<b>PARA. OR SECTION</b>	<b>COMMENT</b>	<b>DISPOSITION</b>	<b>SKIP</b>
C-1.	§3.1.1 & 3.1.2	<p>These sections need to address non-CREVs systems that do not traverse the boundary but can impact pressure differentials.</p> <p>These sections appear to be limited to ventilation systems. They also need to address penetrations to the CRE, such as cable trays, conduits, floor and equipment drains.</p>	<p>These issues are addressed in Section C.3.2.2 (last bullet). Section C.3.4 addresses Table C-1, which cites various boundary information items.</p> <p>These issues are addressed in Section C.3.4.3 and Table C-1.</p> <p>The Task Force believes that NEI 99-03 is acceptably detailed.</p>	

C-2.	§3.2	<p>This section calls for “justification” for deviations from the licensing basis configuration. This should be stronger, e.g.:</p> <p>If such deviations from the licensing and design bases alignments are needed, a sensitivity evaluation should be performed to demonstrate with reasonable assurance that the measured inleakage is bounding for the licensing and design bases configuration that would exist during an accident. This evaluation should be documented with the test results.</p> <p>Reference to §5.2 of Appendix D is in error.</p>	<p>Add the following sentence after the second sentence:</p> <p>“This justification should include an evaluation to demonstrate with reasonable assurance that the measured inleakage is bounding for the licensing and design bases configuration that would exist during an accident. This evaluation should be documented with the test results.”</p> <p>Rewrite to reference Section 4.2 of Appendix D.</p>	
C-3.	§3.2.1	<p>The configuration of ventilation systems that serve areas external but adjacent to the CRE boundary can create pressure differentials that impact the CRE. While this section addresses external ventilation systems, it is with regard to those systems that traverse the boundary. An activity to identify the impacts of external ventilation systems on pressure differentials should be added.</p> <p>Add the following to the 1st sentence of the 2nd paragraph: “and to verify that the as built systems are consistent with controlled documents.”</p>	<p>Section C.3.4.1 and C.3.2.2 address this issue.</p> <p>Accept. Section 3.2.1.1.1 of the main text already states this. Revise per Staff suggestion.</p>	
C-4.	§3.2.3	<p>In the 2nd sentence of the 2nd paragraph the phrase “ the user may consider” should read “the user should consider.”</p>	<p>Accept. Revise as recommended.</p>	S

C-5.	§3.3, 1 <sup>st</sup> bullet	This item should require confirmation that the components are constructed, operated, and maintained with the design basis. Also, it appears that a note should be added to this section to identify the limitations of walkdowns. For example, for some components they cannot be used to confirm that components are constructed or configured in accordance with their design, especially without testing.	In Section C.3.3, first bullet, change the word “constructed” to “configured”. A walkdown cannot confirm all design and construction attributes in accordance with the design basis.	
C-6.	§3.4.2	It is important to note that leakage from components of this nature could be a source of unrecognized pressurization of the CRE that could adversely affect the results of pressurization tests.	Agreed. In C.3.4.2 between the two paragraphs, add:  “Note: Excessive leakage from ducting routed through the CRE may assist in pressurizing the CRE. Sealing these leaks could result in reduced CRE pressure.”	S
C-7.	§3.4.5	<p>This discussion is acceptable overall, but should not be limited to isolation dampers. On systems in which the difference between normal pressurization and accident pressurization modes is the position of a bypass damper around a filter bank (dampers used to divert flow), leakage through these bypass dampers constitutes unfiltered inleakage. Balancing dampers that establish a particular flow rate necessary for pressurization can have an impact if inappropriately set.</p> <p>It is also recommended that the paragraph in Section 3.4.5 of NEI 99-03, Rev. 0, page H-7 concerning the historical unreliability of louvered dampers be put back in this section.</p>	<p>Change Section C.3.4.5 title to: “Ventilation System Dampers”</p> <p>Add the following to the end of the first paragraph: “On systems in which the difference between normal pressurization and accident pressurization modes is the position of a bypass damper around a filter bank (dampers used to divert flow), leakage through these bypass dampers constitutes unfiltered inleakage. Balancing dampers that establish a particular flow rate necessary for pressurization can have an impact if inappropriately set.”</p> <p>It is not the purpose of NEI 99-03 to define an acceptable design. The text as written is acceptable.</p>	S

C-8.	§3.4.6	The discussion is acceptable overall. However, the discussion regarding radiation monitor sample lines should not be limited to monitors outside the CRE that draw samples inside the envelope. Some older plants have an operator selectable airborne sampler that allows the operator to select areas outside of the control room for sampling.	Revise the last sentence in Section C.3.4.6 to: "Radiation monitors outside the envelope that draw samples from inside the control room, and radiation monitors inside the control room that draw samples from outside the envelope, can be a source of inleakage if the sample lines leak."	S
C-9.	Table C-1	This table will need to be updated to reflect the clarifications identified above.  Also, it is recommended that the previous text contained in NEI 99-03, Rev. 0, Table H-1, for Control Room Ventilation System Operation (Section 3.3.2) be retained in Table C-1.	Table C-1 will be revised to be consistent with the Section C changes.  An inleakage test is performed to prove that the CR HVAC systems are performing their CRH design functions. This precludes the need to determine that ventilation systems are properly balanced, and the need to determine that ventilation system air flow rates and air sources are as expected.	
C-10.	Table C-1, page C-10	For the section on "Other Ventilation Systems (Section 3.4.2)" and in the column entitled "Determining Inleakage Vulnerability," replace the words, "Determine if other system ducting is routed through the envelope when the control room is isolated. If so:," with "If other system ducting is routed through the envelope:."	Accept. Modify as proposed.	S

**APPENDIX D**

<b>CMT #</b>	<b>PARA. OR SECTION</b>	<b>COMMENT</b>	<b>DISPOSITION</b>	<b>SKIP</b>
D-1.	General	<p>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.</p>	<p>Accept. The document will be reviewed to ensure consistency and will rely upon the details of Appendix D, as appropriate.</p>	S
D-2.	General	<p>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.</p>	<p>The Appendix D text will be made more balanced by modifying Section D.4.3.2 to reflect the strengths and weaknesses of integrated component testing. The rewrite will address the inability of the component test method to detect unsuspected inleakage, or the dependence of the method on the quality of the self-assessment.</p>	

D-3.	General	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.	<p>Section 4.3.4.2 addresses procedure control. Add the following after the first sentence:          “In addition, appropriate post-procedure change testing may be necessary to ensure that safety analyses assumptions remain valid. If it is determined that inleakage testing is necessary, the test should be performed in accordance with Appendix D.”</p> <p>Section 4.3.4.4 addresses design change control. Add the following after the third sentence:          “This testing should be commensurate with the scope of repairs and modifications made. If it is determined that inleakage testing is necessary, the test should be performed in accordance with Appendix D.”</p>	
D-4.	General	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).	<p>The Staff needs to identify the text that represents an interpretation that is inconsistent with GL 91-18.</p> <p>The Task Force believes that NEI 99-03 is not interpreting GL 91-18. The text facilitates CRH Guidance by citing the content of GL 91-18 that applies to CRH.</p>	
D-5.	General	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.	Agreed	

D-6.	§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.	Task Force believes that the guidance states this concern, and requests the Staff to clarify the comment and the specific discrepancy.	S
D-7.	§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.	The Task Force believes that the guidance provided in NEI 99-03 has addressed this issue and proposes to keep the text as written.	
D-8.	§3.2, second	Delete text after the 1st sentence. This text belongs in the discussion regarding component testing.	This text is included for clarity and is not solely associated with component testing. The text will remain.  Revise Section D.3.2 title to be: "Configuration Lineups"	
D-9.	§4.1.b)	The staff agrees that this item 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.	The text is clear that item D4.1.b does not apply to the periodic test – it is for <u>Baseline Test Only</u> .	
D-10.	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).	Agreed. Delete the footnote. It is unnecessary when the qualification is removed.	

D-11.	§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.	No change needed. Section 4.1 addresses prerequisites to testing. There is no need to perform an assessment as a prerequisite to retesting. Assessments will be performed every 3 years after a retest.	S
D-12.	Note before §4.2	Add: "All plant should verify system flow rates and sources."	FURTHER EXPLANATION NEEDED FROM STAFF WITH RESPECT TO SOURCES.	
D-13.	§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."	This is addressed in Comment # C-2.	
D-14.	§4.2, last	The last sentence should be clarified.	Delete the last sentence of Section D.4.2  Additional editorial fix: In first sentence after bullet D.4.2.c, delete the word "licensees".	S
D-15.	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.	Agree to review the document for consistency, and to provide cross-references to the more detailed descriptions. It may be possible that the main body of NEI 99-03 needs to refer the user to more detailed discussions in the Appendices.	S
D-16.	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.	Footnote 5 will be retained. The need, or lack of need, for separate testing modes must be justified by the licensee.	S

D-17.	§4.3, short	<p>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 to 3.3 of this document identifies attributes of acceptable test methods.”</p> <p>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.</p> <p>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.”</p>	<p>Accept. Rewrite last sentence as: “Acceptable standards are addressed in Appendix D, Section 3.”</p> <p>The text states that “the method that provides inleakage results with the least uncertainty is another consideration.” No changes are needed.</p> <p>Per Comment D-2, Appendix D is being revised to address the pros and cons of different testing methods. No additional changes are necessary.</p>	S
D-18.	§4.3, short	<p>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:</p> <p>“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.”</p>	<p>The comment is appropriate. The bases for testing should be documented. Text being added to Appendix C per the response to Comment C2 addresses this concern. The added text is:</p> <p>“This justification should include an evaluation to demonstrate with reasonable assurance that the measured inleakage is bounding for the licensing and design bases configuration that would exist during an accident. This evaluation should be documented with the test results.”</p>	S

D-19.	§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.	The Appendix D text will be made more balanced by modifying Section D.4.3.2 to reflect the strengths and weaknesses of integrated component testing. The rewrite will address the inability of the component test method to detect unsuspected inleakage, or the dependence of the method on the quality of the self-assessment.	S
D-20.	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.	Per the vendors that perform ASTM E741 testing, verbatim compliance with ASTM E741 is not possible, nor has it been done for testing completed to date. Footnote 6 notes that exceptions are necessary. Therefore, footnote 6 is required.  Editorial: Change 5.3.1.1 to 4.3.1.1	S
D-21.	§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.	A vendor of tracer gas testing identified this limitation. This bullet exists to define a limitation that is applicable to those licensees with a multizone control room design.	
D-22.	§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.	Agreed. The last sentence of the third bullet will be deleted.	

D-23.	§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.	<p>Agreed. Delete the last bullet in Section 4.3.1 (before Section 4.3.1.1)</p> <p>Add the following text as a new paragraph to the end of Appendix D, Section 4.2:  “Effects of the environment on the test results should be considered. Performing the test to minimize environmental influence is recommended. The test instruction should contain guidance on environmental effects. For example, the test should not be performed if there is a strong consistent wind (&gt; 15 mph) and the control room envelope is significantly exposed to the outside environment. The lower the wind speed, the more accurate the test results. In addition, the test should consider seasonal and daily temperature differences and their impact on pressure differential.”</p> <p>In addition, remove the phrase “additional information” from the first paragraph following item c in Section D.4.2.</p>	S
D-24.	§4.3.1.1, E741 exceptions	This section should be deleted. See the comment for Appendix D, Footnote 6.	A vendor of tracer gas testing identified these exceptions which are routinely used in testing performed to date. It is essential that these exceptions remain in the text so that licensees implementing the E741 test can properly plan and execute the testing. No changes to this section are planned.	S
D-25.	§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.	The last sentence of the third paragraph in Section D4.3.2 will be revised to: “A peer reviewer from the benchmarked plant should be used to strengthen the assessment team and provide assurance of the implementation of a similar assessment per Appendix C.”	

D-26.	§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."	This bullet is addressed by the content of the second and third paragraphs of Section D.4.3.2 with its requirement that the nominal inleakage value from integrated component testing accounts for no less than 95 percent of the nominal inleakage test result from the tracer gas testing. No text changes are necessary.	
D-27.	§4.3.2, "Step 1", 3rd ¶	Reference to §5.2 should be a reference to §4.2.  Also, ". . . temperature differences . . ." should read ". . . temperature, seasonal and daily temperature differences	Agreed. Reference will cite Section D.4.2.  Seasonal and daily temperature differences are applicable to all test methods. This is addressed in Section D.4.2 with the note added per the resolution of Comment D-23. With this change per Comment D-23, no additional changes are needed to Section D.4.3.2.	
D-28.	§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.	The Appendix D text will be made more balanced by modifying Section D.4.3.2 to reflect the strengths and weaknesses of integrated component testing. The rewrite will address the inability of the component test method to detect unsuspected inleakage, or the dependence of the method on the quality of the self-assessment.	S
D-29.	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.	Revise the first sentence as: The total inleakage value is established by summing the results from the individual leakage location tests."  The second paragraph of Section 4.3.2 requires that the nominal inleakage value from integrated component testing accounts for no less than 95 percent of the nominal inleakage test result from the tracer gas testing.	S

D-30.	§4.3.2, third	<p>To the criteria for similar design and operation, emphasize that this includes design and operation of spaces and ventilation systems external to the CRE.</p> <p>Also, the staff believes that each application of benchmarking is a change in methodology that must be approved by the NRC staff.</p>	<p>Step 1 of the integrated component test methodology requires establishing differential pressure measurements with respect to all adjacent areas. This minimizes the differences in design of adjacent areas.</p> <p>Per Section D.4.3.3, it is expected that each licensee will provide sufficient justification for their use of an alternate test method with any submittal related to unfiltered inleakage testing.</p>	
D-31.	§4.3.2, first bulleted list	<p>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.</p>	<p>Accept. Delete the last bullet in the first set of bullets at the top of page D-7.</p>	

D-32.	§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.	<p>Delete the first bullet from the second bulleted list.</p> <p>Replace the final sentence introducing the second bulleted list with the following:</p> <p>“The prerequisite for an integrated component test is the need for the CRE to be maintained at positive pressure with respect to all adjacent spaces. The following are control room design features that should be evaluated when determining whether it is feasible to perform an integrated component test. Although all of these features improve the ability to correlate results to a tracer gas test, these features are not prerequisites.”</p> <p>As an example, the second bullet is not true of PVNGS Unit 2, yet they successfully correlated the results of an integrated component test to the results of a tracer gas test.</p>	S
D-33.	§4.3.2, “Step 1,” second	<p>(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.</p> <p>(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.</p>	<p>Agreed. It is believed that the methodology for performing an integrated component test addresses concerns 1 and 2.</p> <p>The prerequisite for an integrated component test is the need for the CRE to be maintained at positive pressure with respect to all adjacent spaces. With these pressure differential measurements it is not necessary to perform any additional evaluation.</p>	

D-34.	§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.	Appendix C address an assessment of the system, not the baseline testing.  No change needed. Section 4.1 addresses prerequisites to testing. There is no need to perform an assessment as a prerequisite to retesting. Assessments will be performed every 3 years after a retest.	
D-35.	§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 inleakage for the specific application . . ." This is an important caveat.	ACCEPT. Agree to review the document for consistency, and to provide cross-references to the more detailed descriptions.	
D-36.	§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.	Per Section D.4.3.3, it is expected that each licensee will provide sufficient justification for their use of an alternate test method with any submittal related to unfiltered inleakage testing.  Revise the second paragraph. Change the phrase "allow a knowledgeable reviewer" to "allow a NRC Staff review"	S
D-37.	§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.	Agreed. A change will be made to refer to Section D.4.3.2.	

D-38.	§4.4.2.1, 1 <sup>st</sup> 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 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.</p> <p>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.</p>	Disagree with the comment. The guidance is technically justifiable.	S
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D-39.	§4.4.2.1, 2 <sup>nd</sup> list	<p>Sufficient guidance is not provided on the performance of the <math>\Delta P</math> measurement and some of the guidance which is provided is erroneous.</p> <p>There is a need to know the location of ventilation systems which serve, traverse or are located in adjacent areas.</p> <p>The guidance to measure the pressure relative to all adjacent areas is probably not specific enough.</p> <p>The areas which need to be measured probably are most readily identified by using a drawing in conjunction with a walkdown.</p> <p>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.</p> <p>Pressures also need to be measured behind false walls.</p>	<p>Disagree. The guidance is detailed. The Task Force is unaware of any erroneous guidance.</p> <p>Appendix C identifies the need to identify adjacent areas and ventilation systems that can impact CRH with unfiltered inleakage.</p> <p>The Task Force believes that the guidance is detailed and specific.</p> <p>Revise the first bullet to begin: “Use drawings supplemented with walkdowns to identify all....”</p> <p>The second, third and last bullets require pressure differential measurements with respect to adjacent areas.</p> <p>Revise the third bullet to read: “... above dropped ceilings, below raised floors, and behind false walls are measured.”</p>	
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D-40.	§4.4.2.1, last bullet, 2 <sup>nd</sup> list	<p>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.</p> <p>§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.</p> <p>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.</p>	<p>Revise the first sentence of the last bullet in the second bulleted list to be:</p> <p>“If a licensing requirement exists that the CRE be at a positive pressure with respect to adjacent areas, and if it is discovered that adjacent area(s) are at a higher pressure than the pressure inside the CRE, then the licensee’s corrective action program requires that actions be taken to reduce the pressure in the adjacent area(s). An integrated component test cannot be performed without maintaining a positive pressure differential with respect to all adjacent areas.”</p>	
D-41.	§4.4.2.3.A, Footnote 10	<p>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.</p>	<p>To be reviewed and changed, if needed.</p>	

D-42.	§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.	As stated in Section D.4.2.2 (at the top of page D-12), all components identified in the Appendix C vulnerability assessment shall be tested.	S
D-43.	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?	Delete footnote 11.	
D-44.	§4.4.2.4	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.  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.	Change paragraph numbering from 4.4.2.4 to 4.4.3.  The basis for choosing 100 cfm as a breakpoint is not understood. The need for any breakpoint is not substantiated.  The guidance provided in NEI 99-03 Appendix D ensures that the testing is performed in a quality manner that minimizes uncertainties and that the sources of uncertainty values are understood.	S
D-45.	Table D-1, footnotes	There are several unqualified references to “standards.” These references omit the caveat included in §3.3, i.e., “The industry standard must be relevant to the determination of inleakage for the specific application.”	Staff needs to clarify specific issues so that they may be properly dispositioned.  Correct typo in ASME vs. ANSI N510.	S
D-46.	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.	Staff needs to clarify specific issues so that they may be properly dispositioned.	

D-47.	Table D-2, Electr. conduits	<p>There is no technical basis for excluding conduits. Also, this item should be expanded to address cable trays.</p> <p>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 <math>\Delta P</math> may originate from air inleakage sources which are unidentified. Consequently, the <math>\Delta P</math> measurement is only beneficial if you know the sources of pressurization flow.</p>	Table D-2 will be deleted, including its referencing within the text.	
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## **Possible Comment Groupings**

Adjacent Spaces – 5, 12, 13, C-1, C-3, D-6, D-30

Component Testing – D-8, D-29, D-32, D-32, D-34, D-39, D-40, D-42

Baseline Test – D-9, D-11, D-16

ASME E741 – D-20, D-21, D-22, D-24, D-26