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To: Koc@nei.org
Date: 1/15/03 3:30PM
Subject: Advance Comments on NEI 99-03, Revision 1

Kurt,

Attached are the requested comments on NEI 99-03, Revision 1. As previously discussed, the staff will provide our comments in parts. The staff will provide further comments on January 17, and on or before January 24. The attached comments include those on the main body of the document and Appendix C. Additional comments on the main body are not expected, but we may provide additional comments on Appendix C. Please feel free to contact me if you have any questions.

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NRC Staff Comments on NEI 99-03, Revision 1 (Main Body and Appendix C)

Overall issues:

The entire document should have a thorough editorial review.

Instead of the term "Toxic Chemical" use "Hazardous Chemical" throughout the document.

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.

Ultimately replace references to Draft Guides (DG) with references to issued Regulatory Guides.

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.

In the verification process when references are made to flow rates this should be combined with a determination of flow sources.

Appendix AA and BB will not be reviewed.

Comments on the Main Body Text

- §1.1 Change the end of the initial paragraph as follows, “. . . associated with the following aspects of control room habitability.”
- §2.3.1 CR should be defined before its use.
- §3.1 1st paragraph, last sentence, replace the words “may want to” with “should.”
- §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.
- §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.
- §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.”
- §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.
- §3.2.1.1.3 Change the word “licensing” in the 1st bulleted sentence to “licensing and design bases.” 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.
- §3.2.2.1 3rd paragraph, revise to read, “. . . including accidents at adjacent units, on the radiological consequences to the reactor operators.”
- Also, in the 6th bullet, 1st paragraph, revise to read, “This potential limiting DBA must be considered.”

In the 6th bullet, delete the second paragraph.

Make conforming changes in any other applicable location.

- §3.2.3.2 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.
- §3.2.5.2 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.”
- §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.”
- §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.
- §3.3.4.2 Reference only Regulatory Guide 1.187 since it provides the NRC guidance endorsed.
- §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.

§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.

§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.

§4.3 & footnote 1 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.

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.

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.

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.

§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.

§4.3.4.2

Make procedure control a required part of the program.

§4.3.4.3

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.

§4.3.4.4

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.

The CR HVAC engineer needs to be familiar with habitability issue and review each related modification package for impact on CRH.

§4.3.4.7

Add a control to address fire.

§4.3.5

Changes to test and assessment frequency, after sufficient experience, need to be proposed to the NRC staff.

Figure 1

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.

§4.4.1

First paragraph, first sentence, revise to read, ". . . to assure that the plant maintains the. . ."

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 . . .”

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.

Add subparagraph g to address fire.

¶ prior to §4.4.2

The cross-reference to Section 4.3.1 is subject to the comments above on that section.

§5

The staff believes that training is warranted.

Comments on NEI 99-03, Revision 1 Appendix C, System Assessment

- §3.1.1 & 3.1.2 These sections need to address non-CREVs systems that do not traverse the boundary but can impact pressure differentials.
- 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.
- §3.2 This section calls for “justification” for deviations from the licensing basis configuration. This should be stronger, e.g.:
- 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 leakage is bounding for the licensing and design bases configuration that would exist during an accident. This evaluation should be documented with the test results.*
- Reference to §5.2 of Appendix D is in error.
- §3.2.1 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.
- Add the following to the 1st sentence of the 2nd paragraph: “and to verify that the as built systems are consistent with controlled documents.”
- §3.2.3 In the 2nd sentence of the 2nd paragraph the phrase “ the user may consider” should read “the user should consider.”
- §3.3, 1st 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.
- §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.

§3.4.5 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.

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.

§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.

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, 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:."