

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

# Category	Section, Page, Line (Commenter)	Comment	Proposed Resolution (Correction, addition, deletion, future phase activity, etc.)
1 Form & Content (6/14/16)	General Comment	<p>Regulatory Issue Summary (RIS) No. RIS 2002-22, endorses a Nuclear Energy Institute (NEI) document for licensing digital upgrades (i.e., NEI 01-01). In 2013, the NRC staff issued a summary of concerns with NEI 01-01. These concerns were with respect to specific issues. Industry proposed addressing some of the concerns by splitting NEI 01-01 into two documents, one addressing technical aspects and the other addressing licensing aspects (i.e., Appendix D); NEI drafted a completely new licensing document (i.e., Appendix D).</p> <p>In creating Appendix D, NEI is treating the two aspects (i.e., technical & licensing) as being disconnected. However both aspects are directly related to each other: Detailed technical analyses, based on accepted methodologies and good engineering practice are performed to answer the eight criteria in 50.59, and specific interpretations of the eight criteria in 50.59 for DI&C that may be endorsed in Appendix D may shape the architecture, concepts, and approach of new technical methods to assess the hazards, likelihoods, and consequences that may be introduced with DI&C. A good example of this issue is there is use of an approach of determining if CCF is “Unlikely” and or “Not Unlikely”) based on a CCF susceptibility analysis of the design</p> <p>Since Appendix D is based on 96-07 and addresses licensing issues, the concerns related to the technical issues expressed by the NRC are not addressed in this proposed format. Furthermore, additional concerns are raised due to the lack of any technical guidance.</p>	<p>In the last paragraph of Concern No. 2, the NRC suggested that technical information separated from the licensing guidance in NEI 01-01.</p> <p>In the public meeting on April 28, 2016, NEI stated that Appendix D would not contain or reference technical guidance; however, it was also identified that a mapping was required to direct users to the appropriate technical guidance. This mapping would not be in Appendix D.</p> <p>NEI should provide a mapping of appropriate technical guidance and associated NRC regulatory guidance that would be used today by licensees to perform the hazard analysis, Coping Analysis, and CCF susceptibility analysis described in Appendix D and what future technical guidance and NRC regulatory guidance does NEI project that is needed to more fully utilize the current approach in Appendix D.</p> <p>NEI should consider using acceptable licensing portions of NEI 01-01 in Appendix D.</p>
2 Previously Expressed Concerns (6/14/16)	General Comment	<p>Compliance with industry standards (as endorsed by Regulatory Guides) can be used, in part, as the basis for the conclusion that a digital system is reliable and dependable. However, the currently endorsed Regulatory Guides (RGs) that pertain to digital systems (i.e., RGs 1.152, 1.168 – 1.173) are specific to Safety Systems. Should these RGs apply to Important-to-Safety (ITS) Systems for the purposes of 10 CFR 50.59? If not, how would a Licensee demonstrate that a digital upgrade to an ITS system was sufficiently dependable (i.e., does not result in more than minimal increase) if the Regulatory Guides do not apply and were not followed? For non-safety related systems, quality guidance exist in Generic Letters (GLs):</p> <ul style="list-style-type: none"> - GL 84-01 (says use General Design Criteria (GDC) 1 for Important to Safety Systems Structures and Components (SSCs)) - GL 85-06 and associated Enclosure 	<p>This issue is related to Concern No. 12 as expressed by the NRC on October 9, 2014.</p> <p>NEI should describe what requirements for Software Quality Assurance measures are required to demonstrate that software associated with Important to Safety Systems Structures and Components (SSCs) is sufficiently dependable. The dependability of software, and the digital system overall, is a key component of the determination that there is not a more than minimal increase in likelihood of an accident or malfunction.</p> <p>NEI should provide guidance that the “more than minimal increase” standard is the same for Safety-related and Important to safety equipment.</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

<p>6 Cyber Security (6/14/16)</p>	<p>General Comment</p>	<p>There should be guidance on how cyber security is address with digital modifications. Some feedback we received from a recent modification inspection was that the licensee had not evaluated the cyber security aspects of the digital modification. There is some guidance in NEI 08-09 (Cyber Security Plan for Nuclear Power Reactors) for digital mods.</p> <p>The staff does not evaluate (via a LAR) if a modification meets the criteria of 10 CFR 73.54; however, if a modification is made to meet the requirements of 10 CFR 73.54 then that modification should be screened for adverse impacts under the site's 10 CFR 50.59 process. Guidance Similar to this could be provided in an applicability section (to be added).</p>	<p>This issue is related to Concern No. 4 as expressed by the NRC on October 9, 2014.</p> <p>NEI should provide additional guidance or reference the use of NEI 08-09 when making digital mods.</p>
<p>7 Inconsistent Terminology (6/14/16)</p>	<p>Executive Summary, Page iii</p>	<p>Appendix D appears to define new terms and definitions that deviate from the consensus term and definitions that were endorsed in NEI 01-01. This makes the review challenging. The main body of NEI 01-01 uses industry consensus terms and definitions. In fact, each definition references the origin of the terms used. The same should be done for Appendix D.</p>	<p>NEI should consider using consensus terms and definitions in Appendix D to the extent practical or justify why alternate definitions are needed to support 50.59 analysis.</p>
<p>14 Inconsistent Terminology (6/14/16)</p>	<p>2.1, Definition of CCF</p>	<p>The definition of the term "Common Cause Failure" is not consistent with the industry developed definition due to these issues:</p> <ul style="list-style-type: none"> a) RG 1.153 Rev. 2 endorses IEEE 379-2000 which contains one definition. Also NEI 01-01 used the similar definition from EPRI Equipment Qualification Reference Manual TR-100516 and IEEE 352. b) The referenced standards stipulate there must be a loss of two or more SSCs. The Appendix D definition relates to a time interval where the first failure is detected and subsequent failures are prevented. Does this mean there is not a CCF? Why include this in the definition when consensus standards and the main body of NEI 96-07 require multiple failures for a CCF to occur. c) This definition includes a maintenance activity error as a possible source of a CCF. This type of CCF is one that is considered as part of the single failure analysis of a particular system design and should not be a consideration in the analysis described by Appendix D. The analysis here would address CCF by diversity and defense in depth for example. <p>It is not clear why a different definition for CCF is needed in this document and new definitions for CCF that could be endorsed by NRC in Appendix D in the near term could have implications on the broader review and update of NRC's policy of CCF as described in MP#1 of the integrated action plan.</p>	<p>NEI should use a definition consistent with industry consensus or justify why an enhanced definition is needed here. If necessary apply additional conditions and stipulate the need for them that would explain the need to supplement additional characteristics.</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

<p>16 CCF Unlikely & Not Unlikely (6/14/16)</p>	<p>2.3(1)</p>	<p>Section 2.3(1) defines the term “CCF Unlikely”.</p> <p>NEI 96-07 Section 4.3.5 states: “The possible accidents of a different type are limited to those that are as likely to happen as those previously evaluated in the UFSAR. The accident must be <u>credible in the sense of having been created within the range of assumptions previously considered in the licensing basis (e.g., random single failure, loss of off-site power, etc.)</u>.” [emphasis added]</p> <p>It is understood that two new terms (i.e., “CCF Unlikely” and “CCF not Unlikely”) were created to capture the decision made as a result of applying the emphasized text in the quotation; however, this concept is applied much more frequently in Appendix D and in the body of NEI 96-07.</p> <p>This criteria is problematic for introduction of digital technology to a plant because it may not be clear how Digital CCF postulations are “within the range of assumptions previously considered in the licensing basis.”</p>	<p>NEI should provide some examples how a Digital CCF postulation is “within the range of assumptions previously considered in the licensing basis.”</p>
<p>18 CCF Unlikely & Not Unlikely (6/14/16)</p>	<p>Section 2.3(1)&(2)</p>	<p>“CCF Unlikely” and “CCF Not Unlikely” are “Technical Conclusions” defined in this licensing document (The term NEI 96-07 uses is “<i>credible common mode failure</i>.”).</p> <p>NEI 96-07 Section 4.3.2 states: “if failures were previously postulated on a train level because the trains were independent, a proposed activity that introduces a cross-tie or <i>credible common mode failure</i> (e.g., as a result of an analog to digital upgrade) should be evaluated further to see whether the likelihood of malfunction has been <u>increased</u>.”</p> <p>NEI 96-07 Section 4.3.6 states: “An example of a change that would create the possibility for a malfunction with a different result is a substantial modification or upgrade to control station alarms, controls, or displays that are associated with SSCs important to safety that creates a new or common cause failure that is not bounded by previous analyses or evaluations.</p> <p>... if failures were previously postulated on a train level because the trains were independent, a proposed activity that introduces a cross-tie or <i>credible common mode failure</i> (e.g., as a result of an analog to digital upgrade) should be evaluated further to see whether new outcomes have been <u>introduced</u>.”</p> <p>By focusing on “CCF Unlikely” and “CCF Not Unlikely” as a key LICENSING concern, one becomes less focused on the adequacy of the diversity and defense in depth aspects of the I&C systems that is provided in the FSAR. The last sentence of GDC 22 emphasizes the diversity aspects of the design.</p>	<p>The D3 analysis for CCF should always be implemented for RTS and ESFAS with the exception of sufficiently simple and deterministic performance based devices.</p> <p>NEI should compare and contrast the two terms (i.e., “CCF Unlikely” and “CCF Not Unlikely”) used in Appendix D with the three levels (i.e., 0, 1, & 2) used in the EPRI document.</p> <p>What other guidance document uses these two terms?</p> <p>NEI should consider using the term “credible CCF” which is consistent with the terminology used in NEI 96-07.</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

<p>19 Internal Consistency HIS Inconsistent Terminology Consistency w/ NEI 96-07 (6/14/16)</p>	<p>2.3(2)</p>	<p>Section 2.3(2) defines the term “CCF Not Unlikely”: “Obtained from the CCF Susceptibility Analysis, a technical conclusion of "CCF not unlikely" is equivalent to a licensing condition of credible and/or <u>as likely to happen as those malfunctions described in the UFSAR.</u>” NEI 96-07 Section 4.3.5 states: “The possible accidents of a different type are limited to those that are <u>as likely to happen as those previously evaluated in the UFSAR.</u>” By using these two statements, one can conclude that a determination of CCF Not Unlikely would require a LAR. However, examples 2, 3, 5, & 6 reach a conclusion of “CCF Not Unlikely” and do not require a LAR under Questions 5 because: 2 A digital recorder cannot cause an accident. However, this example neglects how bad information can cause a problem through inappropriate operator Action. 3, 5 A Safety System mitigate accidents; therefore cannot cause an accidents of a different type. However, this rational is based on a different meaning of the term “accident” than is defined in NEI 96-07 Section 4.3.1. 6 Even though a SW CCF is Not Unlikely, a bounding assessment is used to support that there are no new types of accidents; however, bounding assessments are the subject of Question 6 not 5.</p>	<p>NEI should ensure the proposed guidance and examples are consistent with 96-07, or justify the need to use alternate criteria and guidance for DI&C.</p>
<p>21 Consistency w/ NEI 96-07 Inconsistent Terminology (6/14/16)</p>	<p>2.10, “Layers of Design”</p>	<p>During the April 28, 2016, public meeting on Appendix D, NEI explained that the term “Layers of Design” was necessary because it was a licensing concept and different than the design concept of “defense-in-depth.” However the term “Layers of Design” is not used in NEI 96-07;</p>	<p>NEI should expand the definition of this term to explain how this term is different than defense in depth and why it is needed. NEI should also include an explanation how this term relates to the concepts in NEI 96-07 in which this term is not used.</p>
<p>22 Consistency w/ NEI 96-07 (6/14/16) Inconsistent Terminology (5/31/16)</p>	<p>2.11, “Variety”</p>	<p>During the April 28, 2016, public meeting on Appendix D, NEI explained that the term “Variety” was necessary because it was a licensing concept and different than the design concept of “diversity.” However the term “Variety” is not used in NEI 96-07; therefore, in this respect Appendix D is not consistent with NEI 96-07. When used in conjunction with another NEW term, “layers of design,” it is not clear what is meant (i.e., “variety and/or layers of design”). How does this concept (i.e., variety and layers of design) differ from diversity and defense-in-depth?</p>	<p>NEI should: (1) expand the definition of this term to include an explanation of how this term is different than diversity and why it is needed. (2) include an explanation how this term relates to the concepts in NEI 96-07 where this term is not used. (3) explain meaning of the phrase “variety and/or layers of design.”</p>
<p>27 HSI (6/14/16)</p>	<p>Section 3</p>	<p>It is not clear how the screening process deals with errors of cognitive that arise from changes to Human System Interface (HSI) / I&C (such as confusion in operators caused by bottlenecks /delays that occasionally occur in from digitally processed signals). Section 3.2.2.2 deals with properties of the physical interface related to human factors, but there is no such section that deals with cognitive errors.</p>	<p>NEI should clarify how the screening process looks for potential cognitive issues and/or add a section that addresses this issue.</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

		<p>Section 3.2 “Process” refers to the main body Section 3.11 of NEI 96-07. The examples in this document used to consider the human factors associated with changes to HSI do not span the breadth of human factors issues that may occur as a result of analog-to-digital or digital-to-digital upgrades.</p>	
<p>29 Internal Consistency</p> <p>Consistency w/ Other Guidance</p> <p>Consistency w/ NEI 96-07</p> <p>Adverse Change (6/14/16)</p>	<p>Section 3.1, Page 12</p>	<p>The Screening Introduction paragraph states: <u>“The introduction of software or digital hardware, in and of itself, does not cause the proposed activity to be adverse (i.e., “screen in”).” [emphasis added]</u></p> <p>This statement is not consistent with:</p> <ul style="list-style-type: none"> - Page 50 which states: “Digital systems are typically prone to failure modes caused by electromagnetic or radiofrequency interference (EMI/RFI).” - RG 1.180 which states: “Existing I&C equipment in nuclear power plants is currently being replaced with computer based digital I&C systems or advanced analog systems. However, these technologies may exhibit greater vulnerability to the nuclear power plant EMI/RFI environment than existing I&C systems.” <p>Furthermore NEI 96-07 states: “The screening process is not concerned with the magnitude of adverse effects that are identified. Any change that adversely affects a UFSAR-described design function, method of performing or controlling design functions, or evaluation that demonstrates that intended design functions will be accomplished is screened in. The magnitude of the adverse effect (e.g., is the minimal increase standard met?) is the focus of the 10 CFR 50.59 evaluation process.”</p> <p>Either a conservative “adverse” assumption should be made, or screening guidance should be provided to determine if new equipment exhibits a greater vulnerability to the nuclear power plant EMI/RFI environment than existing I&C systems.</p>	<p>NEI should provide additional guidance to address this concern.</p> <p>NEI should provide guidance on the typical ways that analog and digital equipment are different and which ones are potentially adverse (e.g., EMI/RFI per page 50 or RG 1.180).</p>
<p>30 Consistency w/ NEI 96-07</p> <p>Adverse Change (6/14/16)</p>	<p>Section 3.1, Example 3.1, Page No. 12</p>	<p>There appear to be differences between NEI 96-07 and proposed Appendix D guidance on the some specific topics, and it is not clear which set of guidance would govern evaluation of a DI&C upgrade.</p> <p>For example: Appendix D Section 3.1 and Specifically Example 3.1 states that a change from analog technology to digital technology is not a fundamental change to how a function is performed, and therefore not inherently adverse. However, NEI 96-07 Section 4.3.2 states: “if failures were previously postulated on a train level because the trains were independent, a proposed activity that introduces a cross-tie or credible common mode failure (e.g., as a result of an analog to digital upgrade) should be evaluated further to see whether the likelihood of malfunction has been increased.”</p> <p>This implies that changing more than one redundancy to digital is adverse and requires a 50.59 evaluation. Does one interpret these two sections as conflicting, or</p>	<p>NEI should resolve inconsistencies.</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

		<p>complementary (e.g., that a single digital upgrade is not inherently adverse, but updating multiple redundancies is)? Furthermore it is not clear how Example 3.1 should be compared to NEI 96-07 Section 4.2.1.2 Example 3.</p> <p>What is the role of the examples in Appendix D? Do the examples illustrate guidance provided in the body of the document, or do they provide additional guidance for the user of Appendix D to consider?</p>	
<p>31 Consistency w/ NEI 96-07 Adverse Change (6/14/16)</p>	<p>Section 3.1, Page 12</p>	<p>NEI 96-07 Section 4.2.1.2, “Screening of Changes to <u>Procedures</u> [emphasis added] as described in the UFSAR,” states (page no. 36) that fundamental changes should screen in. Since Section 3.1 of Appendix D extends the application of the term “fundamental change” from being applied to Procedures and Human System Interface (HSI) (in NEI 96-07) to being applicable to equipment changes; therefore, it should provide guidance and criteria for determining what constitutes a “fundamental change,” to equipment. The guidance provided (in Section 3.1) is:</p> <p>(1) “a proposed activity involving a digital modification does not necessarily involve a <u>fundamental change</u> in how a design function is performed.” Note: This quotation implies that in some cases a proposed activity involving a digital modification does involve a fundamental change in how a design function is performed; however, no <u>digital</u> examples or criteria are included to reach this conclusion.</p> <p>(2) Example 3-1. Note: Page 50 states: “Digital systems are typically prone to failure modes caused by electromagnetic or radiofrequency interference (EMI/RFI).” Why is this not considered a fundamental change? More appropriately, when does a proposed activity involving a digital modification involve an adverse change to a design function described in the UFSAR?</p> <p>Note: The screening in Example 5.4 makes a finding of “adverse” based on the fact that identical software is used in both redundancies. Should this example be generalized so that anytime multiple redundancies (or trains) are replaced with digital equipment, the modification should screen in? Furthermore, Example 5.4 (Under the evaluation against Criteria 2) references an evaluation of the EMI/FRI susceptibility analysis; why is this not done as part of the screening, rather than as part of the evaluation?</p> <p>It is not clear why NEI 96-07 Section 4.3.2, Example No. 2 on page No 47 was not used or referenced to make the same point as the idea “not a fundamental change.”</p>	<p>NEI should resolve internal inconsistency between Section 3.1 & Page 50.</p> <p>NEI should propose criteria that can be used to determine if an adverse change exists (regarding technology changes).</p> <p>For example, an analog to digital conversion of a non-SR control system may not be adverse. However, an analog to digital conversion of more than one redundancy in a safety system that performs a protective action (or is required for the performance of a protective action, i.e., is a required support system) is adverse (i.e., see Example 5.4).</p> <p>NEI should add a specific reference to Example 5.4 in Section 3.1.</p> <p>There needs to be discussion about the appropriate level of quality applied to the design and incorporated into the licensee’s licensing/design bases. For example, with licensee acceptance and application of appropriate quality standards there is no fundamental differences in the analog and digital designs.</p>
<p>32 Consistency w/ NEI 96-07 (6/14/16)</p>	<p>Section 3.1, Page 12, Example 3-1</p>	<p>This example is intended to demonstrate that simply changing from analog to digital does not “fundamentally alter (change) the existing means of performing or</p>	<p>NEI should add words in the example to focus the screening on the characteristics of the new equipment, for example, a paragraph could be added that states</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

		<p>controlling” a design function, is not inherently adverse, and therefore, does not inherently screen in (for evaluation). Note: NEI 96-07 Section 4.2.1.2 states: “For purposes of 10 CFR 50.59 screening, changes that fundamentally alter (replace) the existing means of performing or controlling design functions should be conservatively treated as adverse and screened in.” A licensee could understand this example as making the implicit argument that if there is no “fundamental” change, then it screens out; however, the adverse question must also be answered. NEI 96-07 also states: “Consistent with historical practice, changes affecting SSCs or functions not described in the UFSAR must be screened for their effects (so-called "indirect effects") on UFSAR-described design functions. A 10 CFR 50.59 evaluation is required when such changes adversely affect a UFSAR-described design function...” The SECOND relevant screening question is whether this change has an adverse effect.</p> <p>It is not possible to just change from analog to digital (an abstraction). Rather the two types of equipment will inherently have different properties, characteristics or failure modes; these differences should be considered in the screening for adverse impacts. (e.g., See IN 2007-15, IN 2010-10, IN 2016-01)</p> <p>Effectively NEI is proposing using a concept that was proposed under the NEI 96-07 section for “Procedures as Described in the UFSAR” and applying it to “Changes to the Facility as Described in the UFSAR.” It is not necessary to discuss whether an analog to digital conversion is a fundamental change or not. The only real question that should be the focus is whether the change is adverse (assuming of course it is a change to a SSC that performs a design function).</p>	<p>the new digital equipment is at least as good as the old analog equipment in all relevant ways (e.g., See NEI 96-07 Section 4.3.2, Example No. 2).</p> <p>NEI should add a paragraph to the end of Example 3-1 to direct the performance of an “adversity” determination.</p>
<p>34 Coping and Susceptibility Analysis (6/14/16)</p>	<p>Section 3.2.1, Page 14</p>	<p>The process described in Section 4 of NEI 96-07, has the following steps: 4.1, Determine the Applicability of 10 CFR 50.59 4.2 Screen by determining adversity of the change (or fundamental alterations) 4.3 Evaluate using the eight 10 CFR 50.59 questions</p> <p>Appendix D addresses Screening in Section 3 and has the following aspects: 3.1 “Fundamental” Change evaluation 3.2.1.2 Component Combinations 3.2.1.3 Coping Analysis</p>	<p>NEI should explain why is the guidance for a Coping Analysis not better placed under the 10 CFR 50.59 evaluation questions (as opposed to being screening guidance)?</p>
<p>52 Form & Content (6/14/16)</p>	<p>Section 3.2.1.4</p>	<p>This section states that “the following tools may be used” when discussing the level of Software Quality Assurance (SQA) that shows that software is dependable. The language used would allow the Licensee considerable discretion in the level of SQA implemented for a digital modification and may make it difficult for an inspector to</p>	<p>In the public meeting on April 28, 2016, NEI stated that Appendix D would not contain or reference technical guidance; however, it was also identified that a mapping was required to direct users to the</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

		<p>communicate to the Licensee that the level of SQA is inappropriate for the application. This section lacks criteria and examples.</p> <p>It is expected that any NRC endorsement of Appendix D in a RG would include at a minimum a statement to the effect of: "In those areas where the NRC has provided guidance, acceptable technical methods consists of NRC guidance, NRC endorsed standards, or other NRC endorsed guidance, otherwise an LAR is required."</p> <p>It is hard to understand how Appendix D can be approved without the appropriate technical criteria being identified.</p>	<p>appropriate technical guidance. Furthermore during the April 28 public meeting, NEI stated they would provide (separately) a mapping from Appendix D to appropriate technical criteria.</p>
<p>56 HSI (6/14/16)</p>	<p>Section 3.2.2.2, Page 21</p>	<p>This section states "The digital aspect is concerned with the interaction itself, not how the physical component is operated and controlled." It is not clear what is meant by "operated and controlled" in this context. This section is focusing on the interaction between the human and the machine. It does not make sense to separate the control function for manually controlled operations when discussing the man machine interface.</p>	<p>NEI should revise and clarify what is meant by this statement.</p>
<p>68 Form & Content (6/14/16)</p>	<p>4.1 & 4.2</p>	<p>In response to 10 CFR 50.59 Questions No. 1 & 2, NEI 96-07 states (see NEI 96-07 Section 4.3.1 & 4.3.2):</p> <p>'Although this criterion allows minimal increases, licensees must still meet applicable regulatory requirements and other acceptance criteria to which they are committed (such as contained in regulatory guides and nationally recognized industry consensus standards, e.g., the ASME B&PV Code and IEEE standards). Further, <u>departures from the design, fabrication, construction, testing and performance standards as outlined in the General Design Criteria (Appendix A to Part 50) are not compatible with a "no more than minimal increase" standard.</u>'</p> <p>This criteria is applicable to both the frequency of accidents and the likelihood of malfunctions, in part, because it is consistent with the NRC's position on Defense-in-Depth as summarized in NUREG/KM-0009. That is, a system that could cause, prevent, or mitigate an accident should be designed, implemented and operated in accordance with pre-established criteria that is applicable to each system and its associated safety significance. It is a little ambiguous, from a strictly literal interpretation perspective, how to implement this guidance for PDC plants.</p>	<p>NEI should state that meeting current RGs is one acceptable means of meeting this quotation for both GDC and PDC plants (and NEI 01-01 Issue No. 12).</p> <p>Explanation</p> <p>The NRC has identified certain standards as acceptable for meeting the GDCs; in other areas the NRC has not established any standards applicable to that topical areas. In those areas where the NRC has NOT established any standards, then it is up to the inspector to determine if the standard chosen is acceptable. The inspector may choose to ask for HQ assistance. In those areas where the NRC HAS established specific standards to meet specific GDC criteria, meeting these standards is one acceptable way of meeting this paragraph. Proposed alternative will be evaluated on a case by case basis, by the inspector. (See 10CFR50.54(jj) & GDC 1)</p>

Sample DRAFT Comments on NEI 96-07, Appendix D, Draft Rev. 0

<p>89 CCF Unlikely & Not Unlikely (6/14/16)</p>	<p>Section 5.4, Example 3 Page 51</p> <p>The same conceptual issues exists with: Section 5.3, Example 2, Section 5.6, Example 5, Section 5.7, Example 6.</p>	<p>In the "EVALUATION" Section, the response to "Criterion 2" was "No," even though SW CCF was determined to be <u>not unlikely</u>. The additional rational provided states:</p> <p>"because the software was developed in accordance with a defined process, and complies with the applicable industry standards and regulatory guidance, an increase in the likelihood of a malfunction previously evaluated in the UFSAR is not discernible (but is attributable to the proposed activity).</p> <p>Therefore, since an increase in the likelihood of a malfunction is not discernible, there is not more than a minimal increase in the likelihood of a malfunction of an SSC important to safety previously evaluated in the UFSAR due to a software-related CCF."</p> <p>The associated guidance is in Section 4.2 which states: "for the CCF Not Unlikely conclusion, an increase in the likelihood of the malfunction occurring may or may not be "discernible" (refer to the "discernible and attributable" discussion in Section 4.3.2 of the main body of NEI 96-07)." This example and guidance emphasizes three levels of likelihood:</p> <ol style="list-style-type: none"> (1) CCF Unlikely (as determined by the susceptibility analysis); or (2) CCF Not Unlikely, and either (3) Not Discernable (as determined by the SW Quality analysis), or (4) Discernable <p>This guidance is similar to guidance in NEI 01-01 which was the subject of one of the concerns expressed by the NRC (i.e., elimination of consideration of SW CCF due to a software quality review). One problem with this guidance was that licensees interpreted it to mean that a CCF Coping Analysis was not necessary; the evaluation against question (vi) should reference a Coping Analysis.</p> <p>Section 2.3(2) states: "a technical conclusion of "CCF not unlikely" is equivalent to a licensing condition of credible and/or as likely to happen as those malfunctions described in the UFSAR." Based on this definition, one could argue that if a CCF was as likely as a single failure, then that CCF should be analyzed using conservative design bases methods and criteria, not best estimate methods.</p> <p>What guidance is being used to support the rational in these examples?</p>	<p>NEI should provide a more complete discernibility analysis in this example (or in the associated guidance).</p> <p>It is understood that Appendix D is not intended to provide technical guidance, but in this case, an explanation of why a likely CCF does not result in more than a minimal increase in system failure probability is needed. That is, a CCF that is as likely as a single failure (i.e., a system failure with the same probability as a train failure), does result in more than a minimal increase above two independent single failures (the previous system failure criteria). (To say it in numbers: 0.01 is not discernible from $0.01 \times 0.01 = 0.0001$?) Basically, the definition of the term "CCF Not Unlikely" means that for any redundant safety system, CCF is always discernible, because the likelihood of system failure change categories (see Section 4.3.1 of the main body of NEI 96-07 for analogous reasoning).</p> <p>The conclusion inferred from this example and associated guidance is: "If a digital system is developed in accordance with a defined process, and complies with the applicable industry standards and regulatory guidance, then an increase in the likelihood of a malfunction previously evaluated in the UFSAR is not discernible." If this is the intended general conclusion, then this should be provided as guidance in Appendix D Section 4.2, not embedded in examples.</p>
<p>94 Form & Content (6/14/16)</p>	<p>5.8, Screening Response No. "2" Page 90</p>	<p>In the public meeting on April 28, 2016, NEI stated that Appendix D would not contain or reference technical guidance; however, this example seems to contain technical guidance:</p> <p>"No portion of the proposed activity involves how individuals interact with the new digital devices or the information presented by the new devices. The same information will be available with the new devices and the information will be</p>	<p>NEI should clarify in all examples in a manner demonstrated by this comment.</p>

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		<p>used in the same manner. Since no HSI aspects are included in this change, no adverse impacts are possible.”</p> <p>This example includes a technical rationale for why there is no impact on HSI, however, if the example stated:</p> <p>“As part of the design process, an HSI analysis was performed for the new design and shows the new design has no adverse HSI impacts; therefore ...”</p> <p>Then it would not contain technical information.</p> <p>One of the responsibilities of the operators is to understand how the equipment works and what the indications mean. As stated in the example, the modification has an adverse change on how a function is performed. The identification provided to the operator are now that the valve was commanded to a particular position rather than the actual position of the valves. TMI is a good example of a potential impact that this type of information confusion can produce.</p> <p>Also, this example does not address potentially adverse impact on compliance with regulatory concepts, for example, IEEE 279-1971 states:</p> <p>“4.8 Derivation of System Inputs. To the extent feasible and practical, protection system inputs shall be derived from signals that are direct measures of the desired variables.”</p> <p>Admittedly, AMSAC is not a Protection System but 10 CFR 50.62 seems to imply it needs to use the same inputs.</p>	
<p>95 Form & Content (6/14/16)</p>	<p>5.8, “Criterion 5” Page 92</p>	<p>In the public meeting on April 28, 2016, NEI stated that Appendix D would not contain or reference technical guidance; however, this example seems to contain technical guidance:</p> <p>“No new hardware is installed as part of the proposed activity. Therefore, consideration of a hardware-related CCF is not necessary. Without a credible new accident initiator, a new accident cannot be created due to a hardware-related CCF. Therefore, since a new accident cannot be created, it is not possible to create an accident of a different type than previously evaluated in the UFSAR due to a hardware-related CCF.</p> <p>Should a software-related CCF occur that causes AMSAC to actuate when it should not have, a turbine trip will be initiated. However, the Loss of Load event (initiated from a turbine trip) is an accident that has been previously evaluated in the UFSAR. Therefore, it is not possible to create an accident of a different type than previously evaluated in the UFSAR due to a software-related CCF.”</p> <p>This example includes incorrect technical rationale for why there are no new accidents of a different type. Does this example illustrate guidance provided in the body of the document, or does it provide additional guidance?</p>	<p>NEI should clarify.</p>