

1/27/2010
RDB Rec'd.



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11/27/09

74 FR 62355

January 26, 2010

Mr. Michael T. Lesar
Chief, Rulemaking and Directives Branch (RDB)
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

(2)

Subject: Comments on Proposed Standard Review Plan Appendix 18-A on Guidance for Crediting Manual Operator Actions in Diversity and Defense-in-Depth (D3) Analyses (*Federal Register* of November 27, 2009, 74 FR 62355).

Project Number: 689

Dear Mr. Lesar:

On behalf of the nuclear energy industry, the Nuclear Energy Institute (NEI)¹ submits the attached comments for your consideration as you finalize the subject draft Standard Review Plan Appendix. The Industry appreciates that this proposed Appendix incorporates, with limited modifications, the guidance contained in Section 3 of DI&C-ISG-05, Revision 1, "Highly Integrated Control Rooms—Human Factors Issues." Significant effort was expended by NRC Staff and the Industry to develop the guidance. We thank you for the opportunity to comment and trust you will find these comments helpful.

If you have any questions, please feel free to contact me at (202) 739-8108; jcb@nei.org or Gordon Clefton at (202) 739-8086; gac@nei.org.

Sincerely,

John C. Butler

Attachment

¹ NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

SOVSI Review Complete
Template = ADM-013

E-RIDS = ADM-03
Call = S. Burrows (SAB2)

**Comments on NUREG-0800, SRP, Appendix 18-A,
"Crediting Manual Operator Actions in Diversity and Defense-In-Depth (D3) Analyses"**

| Section of 18-A | Location within Section | Comments |
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| C. Staff Position | First paragraph | <p>The last sentence presents two issues:</p> <ul style="list-style-type: none"> o One is that the statement regarding EOPs prescribes a particular set of implementing procedures without allowing the NUREG-0711 process to determine the most effective vehicle that supports the tasks using the subject architecture. o Second is that the statement specifies that actions should be implemented from the main control room. <p>Specifying the location of performing the action in the MCR may be too limiting for certain situations. The guidance should specify only that analysis and validation of the operator action conclude that it can be completed in the time required, regardless of the location of the action.</p> <p>Further regarding the location of actions, the intent of system-level manual action is to use a minimum number of controls in the MCR without operators activating or controlling equipment at various plant locations (Ref: DI&C-ISG-02, Rev. 2, June 2009, pg. 7). This is a prudent approach that avoids the risks and complexity of coordinating dispatched personnel, and the licensee burden of demonstrating/validating an approach that relies on dispatched personnel at different locations in the plant.</p> <p>By citing the MCR location, NUREG-0800 18-A is consistent with DI&C-ISG-02, which is effectively consistent with Clause 6.2 of IEEE Std 603-1991; however, IEEE Std 603-1991 was not developed expressly for addressing diversity and defense-in-depth. Rather, manual action from the MCR was intended to ensure the operator retained an <u>on-demand, discretionary capability</u> to initiate a safety function, not as a defense against common cause failure (CCF).</p> <p>Furthermore, if the manual action is used to meet a diversity need</p> |

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| | | as part of D3 compliance, then the action can accomplish either the same function as the safety system function that is vulnerable to CCF or a different function <u>that provides adequate protection</u> . Thus, the action can use a non-safety system if the system is of sufficient quality. (Ref: BTP 7-19, Rev. 5, March 2007, Point 3 on page BTP 7-19-4). |
| C. Staff Position | n/a | This does not address digital-to-digital replacements where manual operator action may already have been approved as a diverse backup to automatic functions where the proposed methodology should not apply. |
| C. Staff Position | n/a | This should not require the proposed methodology for a limited (small-scale) digital upgrade to operating plants where manual operator controls, indications, and EOP are not susceptible to CCFs or digital failures modes (i.e., the operator responds the same regardless of whether the failure was to a digital system or an analog/solid state systems). The existing EOP operator action validation and operator training maintenance methodology and administrative controls should still be valid. |
| C. Staff Position | n/a | Guidance should allow immediate actions to CCFs to be skill-based, as dictated by the applicable training procedures. |
| C. Staff Position | n/a | Prompt, reliable, and repeatable performance can be assured with some margin, but the outcome in any given case can never be certain. The guidance must allow for practical limits on the statistical confidence of results. |
| 1.A. Method | Second paragraph | This should clearly state that SRP Appendix 18-A methodology only applies if crediting manual operator actions as a diverse backup to automatic functions to respond to CCF vulnerabilities identified in the D3 Analysis (per the Chapter 15 analysis using realistic assumptions) if the time required is less than 30 minutes per DI&C-ISG-02 in order to be consistent with BTP 7-19 guidance. |
| 1.A. Method | Second paragraph | The third sentence states that the HFE analysis should evaluate the documented sequences of operator actions and clarifies that |

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| | | <p>sequence is "based on task analysis, vendor-provided generic technical guidelines for emergency operating procedure development, or plant-specific EOPs, depending on the maturity of the design." The evaluation would necessitate task analysis regardless of the state of design development. To remove ambiguity and avoid confusion, the discussion should include only those items necessary for analysis and should not provide examples of inputs that may be available (e.g., EOPs).</p> <p>Alternatively, if the statement is intended to address both new and operating plants, consider replacing the statement with: "The basis of the documented sequences of operator actions can be task analysis, vendor-provided generic technical guidelines for emergency operating procedure development, or plant-specific EOPs, depending on the maturity of the design."</p> |
| 1.B. Review Criteria | Second bullet | <p>The third sentence states that the HFE analysis should evaluate the documented sequences of operator actions and clarifies that sequence is "based on task analysis, vendor-provided generic technical guidelines for emergency operating procedure development, or plant-specific EOPs, depending on the maturity of the design." The evaluation would necessitate task analysis regardless of the state of design development. To remove ambiguity and avoid confusion, the discussion should include only those items necessary for analysis and should not provide examples of inputs that may be available (e.g., EOPs).</p> <p>Alternatively, if the statement is intended to address both new and operating plants, consider replacing the statement with: "The basis of the documented sequences of operator actions can be task analysis, vendor-provided generic technical guidelines for emergency operating procedure development, or plant-specific EOPs, depending on the maturity of the design."</p> |
| 1.B. Review Criteria | Fourth bullet | <p>The review criterion specifies actions using only alarms, controls, and displays in the main control room. Specifying the location of actions may be too limiting in some instances.</p> <p>The guidance should specify only that analysis and validation of</p> |

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| | | an action conclude that it can be completed in the time required (see similar comments on "C. Staff Position"). |
| 1.B. Review Criteria | Fourth bullet | <p>The review criterion refers to a "Failure Modes and Effects Analysis." It is unclear whether this refers to the D3 analysis per the guidance of BTP 7-19 or and an additional analysis to be reviewed against the criteria of Appendix 18-A.</p> <p>Consider providing further clarification.</p> |
| 1.B. Review Criteria | Fifth bullet | <p>The text refers to "applicable steps in the symptom/function-based EOPs." This seems to contradict the second bullet of the same section (and text in Section 1.A), which refer to "plant-specific EOPs, depending on the maturity of the design."</p> <p>The "maturity of the design" implies that EOPs may not be available during the analysis phase, which is addressed in subsection 1.B.</p> <p>Consider using similar statements regarding the EOPs in the bullets of this subsection.</p> |
| 1.B. Review Criteria | Fifth bullet | Actions outside the MCR should be allowed beyond 30 minutes. |
| 2.A. Method | Fourth bullet | <p>"Use of control/display mockups" is actually representative of tools rather than methods.</p> <p>Consider whether this subsection should be entitled "Tools and Methods" (this may also apply to subsection 3.A. for consistency).</p> |
| 2.B. Review Criteria | Third bullet | <p>The review criterion specifies that a preliminary validation use two or more methods. With the analysis and a validation using diverse methods and independent personnel, specifying two or more validation methods is excessive.</p> <p>This is further supported by the stipulation that testing is also performed during Integrated System Validation (ISV). Additional testing may be warranted on a case-by-case basis when there are concerns with the margins between the time required for a task</p> |

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| | | <p>and the allowable task time. This margin threshold could be specified in the criterion.</p> <p>Also, performing validation through two or more methods is not always industrially practical in terms of technical justification or need and may be onerous with respect to budget or schedule needs.</p> |
| 3.A. Method | First paragraph | <p>Third sentence states that operator response times should be measured for "<u>all</u> licensed operating crews". The number of operating crews could vary, depending on the plant. For Integrated System Validation as part of a 10 CFR 52 process, the operating crews would not be licensed.</p> <p>The Integrated System Validation should include the personnel, the number of crews, and other testing aspects specified by the validation plan developed using the guidance of NUREG-0711.</p> |
| 3.B Review Criteria | "Simulator" | <p>The guidance appropriately refers to ANSI/ANS 3.5 functional and fidelity requirement. It is noted that all possible failure modes for a specific digital technology platform will not be modeled in a plant training simulator for all CCFs and digital failure modes.</p> <p>The guidance appropriately does not state specify "all" in the first sub-bullet of the first bullet.</p> |
| 3.B. Review Criteria | "Personnel" ; Second bullet | <p>Review criterion states that actions to be performed by licensed operators are validated using individuals holding a current operating license for the unit on which the actions are to be credited. For ISV performed as part of a 10 CFR Part 52 licensed plant process, the operating crews performing the evaluation may not be licensed on the unit when the ISV is performed.</p> <p>The ISV should include the personnel, the number of crews, and other testing aspects specified by the validation plan developed using the guidance of NUREG-0711. Consider changing the statement to appropriately address existing operating reactors and new reactors.</p> |

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| 3.B. Review Criteria | "Personnel" ; Fifth bullet | <p>Review criterion states that <u>all</u> crews are included as part of the ISV. Number of operating crews could vary depending on the plant site.</p> <p>The Integrated System Validation should include the personnel, the number of crews, and other testing aspects specified by the validation plan developed using the guidance of NUREG-0711. The text needs to be changed in order to be appropriately applied to existing reactors and new reactors.</p> |
| 3.B. Review Criteria | Operational Conditions | <p>The operational conditions stated should only require event simulations for the ISV for postulated CCF and digital failure modes where manual operator action is being credited to address specific vulnerabilities identified in the D3 verses a "range of representative CCF and digital failure modes".</p> |
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