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Comment On: NRC-2009-0515-0001
Office of New Reactors; Proposed Standard Review Plan Appendix 18-A on Guidance for Crediting Manual
Operator Actions in Diversity and Defense-in-Depth (D3) Analyses

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General Comment

See attached comments on U.S. Nuclear Regulatory Commission NRC-2009-0515; 74 Fed. Reg. 62355 (Nov. 27, 2009)

Attachments

NRC-2009-0515-DRAFT-0002.1: Comment on FR Doc # E9-28376

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Add = S. Burrows (SAB2)

GE Hitachi Nuclear Energy
January 22, 2010
Comments on NUREG-0800, Appendix 18-A,
“Crediting Manual Operator Actions in Diversity and Defense-In-Depth (D3)
Analyses”
Docket ID: NRC-2009-0515; 74 Fed. Reg. 62355 (Nov. 27, 2009)

Section of 18-A	Location within Section	Comments
C. Staff Position	First paragraph	<p>The last sentence (“Manual operator actions for these scenarios should be based upon, and ultimately included within, the Emergency Operating Procedures (EOPs) and executed from the main control room (MCR)”) presents two issues. 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. Second is that the statement specifies that actions should be implemented from the main control room. 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. 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</p>

Section of 18-A	Location within Section	Comments
		<p>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). Furthermore, if the manual action is used to meet a diversity need 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).</p>
1.A. Method	Second paragraph	<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). This comment also applies to the same statement in the second bullet of subsection 1.B.</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>

Section of 18-A	Location within Section	Comments
1.B. Review Criteria	Fourth bullet	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. The guidance should specify only that analysis and validation of 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	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. Consider providing further clarification.
1.B. Review Criteria	Fifth bullet	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." The "maturity of the design" implies that EOPs may not be available during the analysis phase, which is addressed in subsection 1.B. Consider using similar statements regarding the EOPs in the bullets of this subsection.
2.A. Method	Fourth bullet	"Use of control/display mockups" is actually representative of tools rather than methods. Consider whether this subsection should be entitled "Tools and Methods" (this may also apply to subsection 3.A. for consistency).
2.B. Review Criteria	Third bullet	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. 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 and the allowable task time. This margin threshold could be specified in the criterion. Also, performing validation through

Section of 18-A	Location within Section	Comments
		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.
3.A. Method	First paragraph	Third sentence states that operator response times should be measured for "all 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. 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.
3.B. Review Criteria	"Personnel"; Second bullet	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. 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. Considering changing the statement to appropriately address existing operating reactors and new reactors.
3.B. Review Criteria	"Personnel"; Fifth bullet	Review criterion states that all crews are included as part of the ISV. Number of operating crews could vary depending on the plan site. 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 changing in order to be appropriately applied to existing reactors and new reactors.
3.B Review Criteria	"Simulator"	The guidance appropriately refers to ANSI/ANS 3.5 functional and fidelity requirement. It is noted that all possible nuanced failure modes

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		for a specific digital technology platform will not be modeled in a plant training simulator for all CCFs and digital failure modes. However, the guidance appropriately does not state specify "all" in the first sub-bullet.