

AP1000DCDFileNPEm Resource

From: Loza, Paul G. [lozapg@westinghouse.com]
Sent: Monday, August 31, 2009 9:36 AM
To: Donnelly, Patrick
Cc: Seelman, Robert J.
Subject: FW: AP1000 - New Draft RAIs - RAI-SRP18-COLP-38 thru -53

Patrick,

I acknowledge receipt for Westinghouse of RAI-SRP18-COLP-38 thru -53.

Thanks,

Paul

From: Donnelly, Patrick [mailto:Patrick.Donnelly@nrc.gov]
Sent: Wednesday, August 26, 2009 11:04 AM
To: Loza, Paul G.; Seelman, Robert J.
Cc: Butler, Rhonda; Hebban, Sudha; McKenna, Eileen
Subject: AP1000 - New Draft RAIs - RAI-SRP18-COLP-38 thru -53

Bob & Paul,

Attached are 16 new draft RAIs on SRP18. Please let me know whether these are accepted or whether a conference call is desired.

These constitute the full review of ISV-320.

Regards-

Patrick

RAI-SRP18-COLP-38 - High level ISV Objectives

Section 4.2 of WCAP-15860 lists high-level objectives of ISV that generally reflect the topics listed in the review criterion. The WCAP indicates that the ISV plan will “specify how the integrated system validation will fulfill these evaluation objectives and that the ISV Plan will include a section to address objectives. The ISV Plan does not include such a section and does not elsewhere specify how the ISV will fulfill the evaluation objectives listed in the WCAP. Please provide this information.

RAI-SRP18-COLP-39 - Crew Variability

Section 4.1.2 of the ISV Plan states that a minimum of four crews will participate in the ISV. However, it is not completely clear that the design will account for human variability (per NUREG-0711, Section 11.4.3.2.3, Criterion 2) because of the way crews are assigned to scenarios, i.e., a scenario may be performed by only two crews. Further, little information is provided as to how the participating utilities will select crews (see RAI - 22, Part 10). Finally, the ISV plan indicates that counterbalanced assignments will be used. However, the counterbalancing scheme is not presented. Please address these issues.

RAI-SRP18-COLP-40 - Measurement Characteristics

The ISV Plan does not address measurement characteristics. It is recognized that most of the measurement characteristics will not be applicable to the many of the measures, but the plan should address those that are applicable. For example, the plan can explain how the questionnaire in Appendix D measures those variables listed on page 6-1 (workload, situation awareness, teamwork, usability, and goal achievement) and why their approach to measuring these variable in this way is a good one. The plan also indicates that the questionnaire will be filled out by both participating operators and observers. But, it is not clear how observers can answer many of the questions presented, e.g., Was there anything about the PMS, PDSP, or SDSP surprising, misleading, or unclear? Please provide this additional information.

RAI-SRP18-COLP-41 - Anthropometrics

WCAP Section 4.8 lists several performance measures in the anthropometric and physiological area that will be evaluated in ISV, but the ISV plan has little treatment of them and indicates that these aspects of performance will be assessed using questionnaire items. They do not appear to be addressed in the observer checklist. Please address.

RAI-SRP18-COLP-42 - ISV test procedures

NUREG-0711 criterion 11.4.3.2.6.2, Test Procedures, provides guidance on the details of ISV test procedures. The ISV Plan does not provide this detail for each scenario. Please address.

RAI-SRP18-COLP-43 - Crew training

NUREG-0711 criterion 11.4.3.2.6.4(2) calls for crew participants to be trained to near asymptotic performance. However, Section 1.3 of the plan indicates that crew training may be "limited." Please address how stable performance will be achieved with limited training.

RAI-SRP18-COLP-44 - Pilot testing

The ISV plan does not discuss the participants in the pilot testing. The ISV crews should not be used for the pilot testing. Please confirm that they will not be used.

RAI-SRP18-COLP-45 - Convergent validity

The ISV plan does not discuss convergent validity as recommended by NUREG-0711, Section 11.4.3.2.7(3). Please provide.

RAI-SRP18-COLP-46 - Margin for error

NUREG-0711 Section 11.4.3.2.7 (5) recommends that there be some allowance for margin of error in validation. In some cases the time criteria for RIHAs do not appear to provide sufficient margin. For example,

- ADN-MAN03 (3 min. estimated time versus 5 min. required time window)
- ATW-MAN03 (0.5 min. estimated time versus 1 min. required time window)
- RHN-MAN04 (6 min. estimated time versus 10 min. required time window).

Please discuss and justify.

RAI-SRP18-COLP-47 - RI Systems

NUREG-0711, Sec. 11.4.1.2.1(2) states that the dominant systems (as measured by the PRA RAW and FV measures) should be represented in the validation scenarios. Please provide specifics to confirm that this is the case (i. e., which systems are considered dominant and in which scenarios they are tested).

RAI-SRP18-COLP-48 - Scenario definition

Section 11.4.3.2.4 of NUREG-0711 provides guidance for scenario definition. Two areas require more information, based on review of the 3 nearly complete scenarios.

1. One item is “the precise specification of what, when and how data are to be collected and stored..” Each scenario currently provides general guidance rather than scenario-specific data (e. g., Section 12.8). Please clarify how and when the scenario-specific data will be specified.
2. One item is “specific criteria for terminating the scenario.” For Scenario E.12 this is given as “The opening of the ... valves to flood the reactor core.” This seems too simplistic, in that perhaps operators may take this action incorrectly very early in the scenario, short-cutting much of the actions that the scenario is testing. What about possible multiple criteria and selecting the later of two of more, as an example?

RAI-SRP18-COLP-49 - Selection of Scenarios

Scenarios selected for validation generally appear to comply with the criteria in WCAP-15860 and NUREG-0711. A few areas appeared to either be missing or the staff could not identify the specific scenario that addressed the below areas:

- OER-identified difficult tasks
 - use of administrative procedures
 - communication between MCR and offsite (e. g., plant management, EOF or NRC)
- situational factors in NUREG-0711 section 11.4.1.2.1 (3)

RAI-SRP18-COLP-50 - Development of ISV scenarios

WCAP-15680 page 4-3 states that the ISV scenarios will be developed by a Multi-disciplinary team. This information is not in the ISV plan. Please confirm that this was the case.

RAI-SRP18-COLP-51 - Inclusion of important tasks

WCAP-15860 section 4.4 states that important tasks from the Task Analysis will be included in ISV. The ISV plan does not mention this area. Were these considered for ISV? Were any selected?

RAI-SRP18-COLP-52 - Simulation of RSW

There is a scenario (E.7) for remote shutdown after a fire in the MCR. However it is not clear what will be the testbed simulation for the remote shutdown workstation (RSW). The descriptions of the simulated RSW in the ISV Sections 1.3, 2.1 and E.7 are not fully descriptive or consistent. Please clarify.

RAI-SRP18-COLP-53 - Simulation of local actions

Section 1.3, Scope, of the ISV states in part that “The use of local control stations may be represented in ISV scenarios, but local control stations are outside the scope of the ISV.” Reasons for this are given in the

proprietary portion of Section 1.3. However, the staff notes that the list of AP1000 RI HAs in Table 3.2-2 of APP-GW-GL-011, WCAP-16555 (NP) includes a local action to close the equipment hatch and personnel airlocks during shutdown. Please address.

Patrick Donnelly

Project Manager

U.S. Nuclear Regulatory Commission

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