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From: Mazza, Jan
Sent: Thursday, April 10, 2014 6:57 AM
To: cposlusny@babcock.com; Vytlacil, Gordon M (gmvytlacil@generationmpower.com)
Cc: Starefos, Joelle
Subject: Feedback for V&V call today
Attachments: mPower VV Draft feedback (2).docx

The feedback on the V&V Report is attached. Please let me know if you still want to have the call today or reschedule.

Thanks,

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Staff comments on MPower V&V Implementation Plan

1. Page 6, Section 1.2 – If an "Important Human Action" is initiated from a local control station, will it be included in the V&V program?
2. Page 7, Section 1.2 last paragraph – Comment: We credit emergency plan drills as providing validation of HFE design.
3. Page 7, Section 2 – Comment: Criteria 50.34(f)(2)(iii) is the primary regulation we cite.
4. Page 8, section 3.1 – the first section marked proprietary looks like a summary of 0711. What makes it proprietary? (Same with sections 3.2, 3.2.2.4, 3.2.2.5 and other places in the procedure)
5. Page 12, Figure 1 – 0711 rev3 indicates "important human actions" vice risk important human action should be an input to the OCS. I see from your slides at our last meeting that this will be addressed in the next rev. No further comments on rev2/rev3 differences will be made.
6. Page 13, last bullet – This appears to be a sample within a sample. 0711 suggests one sample as defined in the first bullet.
7. Page 14, Section 3.2.1 – Section is talking about the OCS but 1st paragraph is referring to scenario selection. It is not clear why scenario selection is being discussed. (Section 3.2.3 similar comment)
8. Page 16 – NUREG-0711 Criterion 11.4.1.1(2) provides a list of procedures to address. The list of procedures does not include Chemistry or Radiochemical Procedures as indicated in the review criterion.
9. Page 18, Section 3.2.3 – text refers to task and scenario selection process. Then second bullet refers to scenarios. It is not clear why scenarios are being discussed in the section that establishes the OCS sample.
10. Page 18 – NUREG-0711 Criterion 11.4.1.1(3) addresses fatigue. The text on the bottom of page states fatigue and circadian rhythm are addressed by the Fitness for Duty program. This position works for circadian rhythm but not fatigue. It is unclear how the implementation plan addresses fatigue caused by repetitive motions, continuous monitoring tasks, perceptual fatigue, etc.
11. Page 19, Section 3.2.5(2) – "The listing of PRA/HRA risk-important human actions and the event sequences in which they are brought to the attention of PRA/HRA analysts is identified." I understand how and why the weighting is done but I don't understand how scenarios are developed from the OCS.
12. Page 19, Section 3.2.5 – It is not clear that the diverse elements of the OCS are being included in the scenarios. Could the weighting criteria that prioritize the OCS potentially eliminate elements of the OCS from scenarios?
13. Page 22, item 4 – "Additionally, the selection process ensures that each of the situational factors known to challenge human performance is included in at least one task or scenario." What part of the selection process ensures this? The text continues to state that tasks and scenarios are evaluated. Are scenarios actually being evaluated? It appears that tasks are being evaluated to ensure the most significant are included in future scenarios.
14. Page 24, Section 3.3 – Doesn't appear to address the entire scope of criterion 11.4.2.1(2)

15. Page 25, Section 3.4 – The following questions are applicable to the material in sections 3.4 and 3.5.
    - The words ensure, assure, evaluate and consists of are used. They are providing a redundant description of what is being done without explaining how it is being done.
    - A list of resources representing the final design is provided but it is unclear when each is being used. For example, when is a part task simulator used rather than a full scope simulator? Are the design drawings being used as sources for design requirements or are the drawings being verified? Does a mock up have the same pedigree as the design drawings and why would it be acceptable to verify requirements on a mock up? Are the computer generated displays coming from the VDU the operators would use or from a separate computer? In summary, the verification activities verify the final design incorporates requirements but it is unclear how some of the resources being used represent that final design.
    - The preparation phase mentions the development of detailed evaluation plans. What is included in these plans? Specific, quantitative descriptions are needed of how the evaluations will be done.
    - Preparation activities include: "Identifying the system tasks and scenarios to be evaluated, and the evaluation criteria." Is this a different sample than what has already been made available via the [ ]?
    - Task support verification preparation activity states, "Preparing task grouping data-gathering tools based upon HSI task grouping design criteria." What are these tools?
    - In the evaluation phase the following statement is made, "...results are documented in a traceable manner and in accordance with applicable document control procedures." What constitutes a "traceable manner?" What is the applicable documentation (Quality Assurance Plan perhaps)?
    - In the task support evaluation section (page 27) there is a list of things the task support verification ensures. The first paragraph of section 3.4 starts by listing the things the task support verification process ensures. The two lists are different but I assume complimentary. This adds to the list of what the verification does and increases the delta between the descriptions of what and how. It also adds complexity to the staff review when we have to recognize and understand this kind of "overlap." The opinion I'm reaching is that sections 3.4 and 3.5 are written at more of a programmatic level (Objectives, What will be done, Commitment to regulatory guidance) than at the Implementation level. There are Implementation level elements but they are incomplete particularly in describing how evaluations will actually be done.
    - Page 28, Section 3.5 states what the Design Verification will ensure. This is basically the same list contained in the first section in 3.4 and includes words stating that HSI capabilities and features are consistent with task analyses results. It is not clear why this is a function of design verification when this is the focus of the task support verification.
    - Page 29 contains the following bullet, "Limit paradigm shifts to that ensure that HSI arrangement reflects consistent use of style guides and HFE guidelines." There are either words missing or I don't understand the concept.

- Page 30, the statement is made, "Control room/panel design drawings are used to verify that the HSIs required for the task being evaluated are depicted on the design drawings and that the design is in keeping with HFE, regulatory, and style guide requirements." Usually the design drawings are used as a source for requirements. Do you really intend on verifying the drawings are complete rather than just verifying the HSIs match the drawing?

16. Page 33, first paragraph states, "The ISV process develops scenarios that incorporate the tasks and scenarios selected in the operational condition sampling process." What is the difference between the scenarios developed as part of the OCS process and the scenarios being developed as part of ISV?
17. Page 35, Section 3.6.1 – The first bullet of test bed attributes contains the clause, "...control room features in close proximity to the HSIs being evaluated." The third bullet omits the phrase, "All HSIs should be available" that is used in the acceptance criterion. Will all HSIs be available in the full scope simulator?
18. Page 34, Section 3.6 uses the term, scenario administration team. Page 35, Section 3.6.2 uses the term, ISV scenario presentation team. Page 51, Section 3.6.5.3 uses the term, ISV administrative team and ISV presentation team. Are these all referring to the same team? From context I assume they are but the titling should be clarified so staff assumptions are not required.

    Similarly on page 34 and other places the terms administrative packages, scenario packages, scenario administrative packages are used. Page 35 uses the term, presentation documentation. Page 47, Section 3.6.5.2 uses the terms Integrated System Validation Process Administration Documents, ISV process administration documents, Scenario document packages, and then finally on page 49, ISV process test procedures. From the discussion in section 3.6.5.2 these terms appear to address two different documents, again another staff assumption.

    While this titling is not substantive in terms of verifying acceptance criteria are met, it creates substantial confusion, complexity and often unnecessary RAIs until the reviewer figures out that different names are being used for the same thing. The document should be reviewed in its entirety for this type of problem.

19. Page 36, Section 3.56.2 states "...biometric information is gathered and documented." It is not clear from the IP what information will be collected or how this biometric information will be used to as part of the test plan. Specifically what biometric information will be gathered and how will it be used?
20. 0711 criterion 11.4.3.4(3) includes maximum levels. Where is this addressed?
21. The tech report seems to repeat lists on the same subject but the lists are different. For example pages 36-37 lists the contents of scenario documentation packages. Scripted communications is not addressed. Then again on pages 48-49 the contents of the scenario document packages are listed but now include scripted communications. I did not try to identify all differences between the two lists nor did I determine whether multiple lists with different information was a generic problem but I'd recommend that your reviews do this.

22. Pages 37-38, Section 3.6.4.1 (Brian's comment) The list of Performance Measurement Characteristics contain the elements included in NUREG-0711 criterion 11.4.3.5.2, however it is not clear specifically when or how these characteristics will be applied. Additional detail is required so that it is clear when and how these characteristics will be applied. (Paul's comment) The intent is not just to define each characteristic but to take the measurements being used and explain the characteristics applicable to that measure.
23. Page 39 of the IP indicates that the [ ] analysis is used as a pass/fail criterion. This may be a reasonable technique, however it is unclear if this method is ever likely to provide a condition where the ISV could fail. Engineering margin is used to prevent the system from achieving conditions that would challenge [ ] limits. If the [ ] limits are impossible (or near impossible) to achieve because safety systems will mitigate all predictable human error then these limits may not ever be possible to fail the ISV.

    Please explain the sensitivity of this method and likelihood that it will produce useable results given engineering margin designed into safety systems is meant to prevent the operator from ever violating [ ] design limits.

    (Paul's comment — [ ] pass/fail limits are OK provided there are good performance measures that compliment them. Good performance measures will ensure improvements in the HFE design are recognized even thought the engineering margins protected against scenario failure)

24. Page 40, Section 3.6.4.2(1) – time to complete an operator action can also be a pass/fail criteria if the accident analysis credits manual actions. Are other factors from the list in acceptance criterion 11.4.3.5.1(2) considered?
25. Page 41 Section 3.6.4.2(1), last paragraph – The IP discusses using "average test participant crew response" to compare to PRA/HRA results. Use of the average crew response means that it is possible for multiple crews to exceed these PRA/HRA limits with below average performance as long as there is an outlier with exceptional performance to create an acceptable average value. Please explain why using average crew response is a conservative strategy.
26. Page 43 of the IP discusses using a "randomly selected" time for Situational Awareness testing. What is the reasoning behind using a random selection strategy and how is it preferable to other methods (such as targeting the queries during specific operating events or at times when workload is expected to be high)? How is the random testing prevented from interfering with critical performance activities?

    It is also not clear if the Situational Awareness queries will be directed to the team or to individuals.

    Within the second paragraph of this section it states, "During data analysis after ISV scenario completion, operators' perceptions about a situation are compared to the reality of the situation at the time the situation awareness questions are asked." How is this done?

27. Page 44 – The first full paragraph states, "Cognitive workload for each ISV task or sequence of tasks is measured using the NASA-TLX tool." We would interpret this to mean every ISV task or task sequence is being evaluated. This seems unnecessary. Are there actually criteria being applied that limit the cognitive workload analysis to a subset of tasks? Is "pair comparisons" being used?
28. Page 46, Section 3.6.5 – Next to last paragraph says, "After the administrative packages for the full array of scenarios to be conducted are developed, the scenarios are organized in the order in which they are to be conducted and presented to the appropriate crews." How do you determine the "appropriate" crews?
29. Page 49, first bullet – The statement is made, "Automatic collection by videotaping and recording of plant parameters and manual HSI manipulations is used to the maximum extent possible." What is meant by maximum extent possible?
30. Page 49 – "Data Collection Methods" has a bulleted list of different types of data to collect, but it does not say how, when, or why one would do so.

    As an aside, 0711 revision 3 is suggesting completed scenarios and supporting procedures as part of the DCD submittal. If these procedures are available then the process descriptions can be more general. We are also being more critical on the use of DAC and expect to see an explanation of how rapidly changing technology and/or the availability of construction/procurement information impacts the completion of the HFE design. If use of DAC is not approved then areas that currently are reviewed at the Implementation level would be reviewed at the final results level and design products would need to be submitted.
31. Page 50, Controlling Bias – The third paragraph states,[

    ] I couldn't find this direction in the sections that described how to construct scenarios. Because tasks/scenarios are weighted by risk it seems that including desirable outcomes could potentially be excluded.

    The first dashed paragraph on this page says,[

    ]

    Doesn't this imply a bias toward omitting desirable outcomes? This does not seem like a bias that impacts the ISV as it ensures worst case scenarios are evaluated but the words don't seem to acknowledge the actual condition.

32. Page 52, convergent validity – The plan provides examples of convergent validity but who decides what data needs to be compared to determine convergence? How is this decision made?
33. Page 54, Margin of Error between Results and Reality – ISV limitations are listed. It appears to be a subset of the limitations that might exist. How is the complete set arrived at?
34. Page 55, Section 3.6.7 – The first paragraph states, "The integrated HSI cannot be found acceptable with any unresolved and retested failed pass/fail performance

measures." Is it just "and" or "and/or"? Are there specific retest requirements associated with one crew of three failing a scenario? Are there any minimum retest requirements for a failed pass/fail performance measure? Would you consider using unresolved or untested Priority 1 HEDs rather than pass/fail criteria as the criterion for the acceptable integrated HSI?

35. Page 58, Section 3.7.1 and 3.7.2 – Again names are inconsistent. HED tracking database, HFE issue tracking system and corrective action system appear to be used interchangeably although the last paragraph on this page makes it clear that the corrective action database is different. But in doing so the last paragraph indicates, "When an HED is identified, it is recorded in both the HED tracking database and the corrective action system." This seems contrary to what is said in section 3.7, last bullet ("Those HEDs that cannot be closed through the HFE process are entered into the B&W corrective action process for tracking and resolution.") The subsequent directions indicate that most of the work is conducted via corrective action process.
36. Page 59, item 2 – How is this HED analysis accomplished? Currently the guidance just describes what is done. We typically receive a description of how HEDs are trended.
37. Page 62, item 6 – The statement is made, "HEDs not resolved during HFE V&V remain open in the issue tracking system and are either resolved or evaluated for plant operations impact prior to plant operation." This appears to be inconsistent with the priority definitions. Priority 1s by definition have a high impact on operations and in our opinion need to be resolved/retested prior to calling the ISV complete. Pri 2's by definition have to be resolved before startup.
38. Page 63, Section 4 – See 0711 revision 3, section 11.3 for documentation needed.