



Industry Review of SRP Chapter 18 BTP 18-1 Draft

Discussion with TWG#5

March 4, 2009

Objective of Discussion

- Provide initial industry comments on draft SRP revision, BTP 18-1 on minimum inventory

Comments

- Normally-used HSIs
 - Footnote 2 (p. 2) indicates these are non-safety
 - Is that part of the definition of “normally-used HSIs”?
 - If so, should this be moved to the main text?
- Definition revolves around loss or degradation of the non-safety, normally-used HSIs
 - Does this mean that all MI HSIs need to be independent of the normally-used HSIs?
 - Does it mean they should be safety-related?

Comments (cont'd)

- Appendix 18A (matrix) includes quite a few alarms
 - Is it intended that plants must provide either a safety-related alarm system to present these, or at least an alarm system that is independent of the normally-used HSIs?
 - If so, this goes well beyond precedence in operating plants
 - Industry had recommended demonstration of high reliability for the main (non-safety) alarm system, rather than two separate systems

Comments (cont'd)

- General criteria for the remote shutdown MI (p. 3) indicate it includes HSIs needed for prompt hot shutdown and “potential capability for subsequent cold shutdown...” (from GDC 19 definition of RSF capability)
- Also, Appendix 18A (matrix) indicates in part 5 that the RSF HSIs need to support cold shutdown
 - Industry considers MI should only be the minimum required for hot shutdown, not cold
 - Definition of MI for RSF indicates MI supports “safe shutdown” – we agree with this
 - Suggest modifying the statement in the general criteria and removing reference to cold shutdown in the matrix

Comments (cont'd)

- Additional comments on Part 5 of the matrix
 - For clarity, the title of Part 5 should be modified to state this is RSF MI
 - Industry considers selectable HSIs to be acceptable for the RSF
 - Controlled evolution, limited to safe shutdown (no accident), procedure-driven

Comments (cont'd)

- Inclusion of RSF HSIs in the MI list could imply that they must be safety-related
 - Is that the intent? Please clarify.
- Matrix includes system-level actuation controls as part of MI, but appears to be silent on component-level controls
 - Does the staff consider component-level controls (in general, beyond those that may be required for credited manual actions) to be part of the MI?
 - Does the staff consider that the component-level controls should be safety-related?

Comments (cont'd)

- SD-SR (spatially dedicated, self revealing) level of accessibility:
 - What does it mean for a performance display to be “self revealing”?
 - Another design option for alarms is the judicious use of “grouped” alarms
- First two rows of the matrix address prompting alarms and “Type A” alarms for credited manual actions
 - What is the difference between the two rows?
 - Use of phrase “Type A alarms” may be confusing
 - Reg. Guide 1.97 defines Type A variables, not alarms

Comments (cont'd)

- In part 1 of the matrix (credited manual actions) performance alarms and displays relate to Reg. Guide 1.97 Type D variables
 - Per the Reg. Guide these can be non-safety – no requirement that they be independent of the normally-used HSIs
- Part 2 of the matrix lists displays of fission product barrier status, safety system performance, and magnitude of releases
 - These are Reg. Guide 1.97 Type C, D and E variables
 - The reg. guide does not require that these be spatially dedicated
 - Also does not require independence or safety-related
 - These should not be in the minimum inventory

Comments (cont'd)

- Part 3 of the matrix lists HSIs needed to comply with BTP 7-19, points 1-3 and point 4 (D3)
 - BTP 7-19 already provides sufficient guidance on D3
 - BTP 7-19 does not require that these HSIs be independent of the normally-used HSIs or that they be safety-related
 - If accessibility requirements are needed, they should be placed in BTP 7-19 or elsewhere in SRP, not in MI
 - Having D3 guidance in two places will cause confusion
 - Ex: alarms on critical safety functions are not required by BTP 7-19 (but they are listed in the matrix)
 - Recommend deleting part 3 of the matrix

Comments (cont'd)

- Process description (p. 3) includes discussion of how generic or design-specific EPGs or plant-specific EOPs were used in developing the MI
 - This should also allow description of how the applicant may have used EPGs or EOPs from predecessor plants
- General comment on accessibility criteria in matrix:
 - Should be limited to time-important actions (not those for which there are hours to get them done) or cases in which accessibility is important to situation awareness

Comments (cont'd)

- Part 4 of matrix addresses actions determined to be risk-important from the PRA
 - We find no requirement for independence of these HSIs
 - The referenced SECY (93-087) does not appear to address HSIs for risk-important actions identified in the PRA

Comments (cont'd)

- Is the addition of BTP 18-1 the only revision planned for SRP Ch. 18 related to MI?
- What is the staff's intent regarding applicability of MI to operating plants?
 - Should the same accessibility criteria be applied?
- In general criteria for MI, item A (p. 2) discusses “credited manual actions”
 - Suggest changing to “those manual actions credited in the plant's safety analysis...”
 - Will avoid confusion with item C, which is D3 credited actions

Comments (cont'd)

- In general criteria, item D refers to actions determined to be risk-important from the PRA
 - Items A and C cover all credited manual actions for accident mitigation and safe shutdown, whether risk significant or not – this item should cover any other actions that are risk-important
 - Suggest modifying the wording to something like “perform manual actions, not already addressed in items A and C above, that are determined to be risk-important...”

Comments (cont'd)

- Two inconsistencies were noted in the description of the design certification process related to MI:
 - In the list of information to be included in Tier 2*, items A and B both refer to “the NRC-approved process”
 - What is the intent here?
 - Change “NRC-approved process” to “the process described in Tier 1”?
 - An ITAAC is called for, describing that the process “approved by the NRC in the Design Control Rule (DCR)...” was applied, giving a report of results, etc.
 - Yet the process has already been completed at the DCD stage, since results (lists) must be provided in Tier 2*
 - Again, what is the intent here?

Comments (cont'd)

- The section on COL applicants indicates they should provide, in their application, a description of how they determined the applicability of the MI contained in the certified DCD to their plant, and the basis for any site-specific differences
 - The process for COL applications to reference the DCD or describe changes from the DCD for MI is no different than for any other part of the certified design
 - Recommend that this section be deleted



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Questions?



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BTP 18-1: Definition of Minimum Inventory

- BTP definition of minimum inventories for main control room (MCR) and remote shutdown facility (RSF):

“The MCR minimum inventory is that set of MCR alarms, controls, and displays (i.e., the HSIs) needed by operators to bring the reactor to a safe shutdown condition and maintain it in a safe shutdown condition when there is a loss or degradation of normally-used HSIs.”

“The RSF minimum inventory is that set of remote shutdown (RSF) HSIs needed by operators upon MCR evacuation for prompt hot shutdown of the reactor, to maintain the unit in a safe condition during hot shutdown, and for the potential capability of subsequent cold shutdown of the reactor.”

Definitions (cont'd)

- Definition of MCR MI centered around loss of the “normally-used HSIs,” defined as:
“...non-safety, computer-driven alarms, controls, and displays...operators normally use to control and monitor the plant from the MCR.”
- Does not say “selectable” in defining the normally-used HSIs
- Does not use the SECY 92-053 word “fixed” in defining the MI
 - But some form of spatial dedication is specified for nearly all types of HSIs identified as MI

Key issues for minimum inventory

- What HSIs are to be included in the MI?
- What design criteria apply to the MI HSIs?
- Applicable to operating as well as new plants?
- When in the certification/licensing process must the MI information be provided, and in which documents?
 - Will there be sufficient information available to do this?

BTP 18-1: What HSIs are part of the MI?

- Appendix 18A gives matrix listing types of HSIs supporting 5 function/task categories:
 - Credited manual actions
 - Monitoring safety functions, accident monitoring displays and automatic success paths
 - Includes system-level actuation controls but no component-level controls
 - Manual actions credited in D3 evaluation
 - Risk-important manual actions per plant-specific PRA
 - Manual actions for remote shutdown at RSF

BTP 18-1: What design criteria apply to MI?

- Although not explicitly stated, it can be assumed from the MI definition that all of the MI HSIs need to be independent of the normally-used HSIs (i.e., not subject to the same failures)
- No other hardware/software design criteria are provided
 - No information on level of qualification, QA, or V&V to be applied
- Accessibility criteria are specified in three levels, all spatially dedicated (SD):
 - SD-CV (continuously visible)
 - SD-SR (self-revealing)
 - SD-OSA (one-step accessible)

Accessibility criteria

- See comparison to our latest Table 4-1

BTP 18-1: Applicability

- As written, BTP is applicable to new plant designs only
- No indication as to whether the same type of process and same accessibility criteria would apply for operating plants

BTP 18-1: When and in what documents?

- Description of the process for developing the MI is to be in Tier 1
 - Also ITAAC showing process was followed, as-built HSIs show correct implementation
- Minimum inventory lists for MCR and RSF to be provided in Tier 2*
 - Recommended format provided for the lists
- COL applicants to provide description of how the MI lists in the DCD were applied to site-specific minimum inventories, basis for any differences, and demonstration that process was followed and MI correctly implemented
- Operating plants are not addressed