

Example of Information on Minimum Inventory HSIs to be Provided as Part of the Tier 2* Information for New Plant Designs

The NRC Staff requires that certain information be provided on the minimum inventory human-system interfaces (HSIs)¹ as part of new plant design certification. As used here, the minimum inventory HSIs are those that are required *in addition to* the nonsafety, selectable² HSIs normally used to monitor and control the plant. Thus the minimum inventory HSIs include:

- Those HSIs that will be implemented using safety-related equipment
- Those HSIs that are spatially dedicated and continuously visible (SDCV) versus selectable
- Additional independent HSIs needed to accommodate the plant's chosen concept of operations for situations in which the normally-used HSIs have failed or are degraded.

The industry recommends that new plant designers provide with the Tier 1 information a summary or overview of the process that will be used to define the minimum inventory HSIs. The industry further recommends that in Tier 2* the applicant will provide a list of categories of HSIs that will be part of the minimum inventory. A detailed list of the actual controls, displays and alarms (individual instruments) would be available only after the process described in Tier 1 has been completed and the specific HSIs within the categories specified in Tier 2* have been identified.

The list on the next page provides an example of the type of information that would be provided in Tier 2*. Categories of minimum inventory HSIs are identified. The applicant would identify the specific variables, instruments, controls and alarms later as part of the detailed design process as described in Tier 1. Note that the list of categories shown here is intended only as an example to illustrate the type of information that would be provided. For additional information on the selection of minimum inventory HSIs and their design requirements, the Staff is referred to EPRI 1015089, the topical report on minimum inventory (still in progress). An interim draft of this report was sent to the Staff in December of 2007.

Table 4-1 of the topical report and the accompanying text in Section 4 provide more detail on the different categories of minimum inventory HSIs. For convenience, an updated copy of Table 4-1 is provided as an attachment to this document.

The industry's intent is to continue working with the Staff to reach consensus on the process and criteria by which the minimum inventory HSIs will be selected, ultimately submitting the topical report to NRC for review and approval. The industry also hopes to reach a consensus with NRC on the information that needs to be provided with Tier 1 and Tier 2* documentation, as discussed here. It is expected that the consensus approach would be incorporated into the planned update of NUREG-0800 to reflect the Interim Staff Guidance (ISG) on minimum inventory.

¹ As used in this document, the term "human-system interface" refers to controls, displays and alarms used by the operators to monitor and control the plant.

² As used in this document, "selectable" means the operator must take some action in order to access the HSI (e.g., by using a menu system or navigating through a display hierarchy to bring up a needed information display or soft control screen).

Example List of Minimum Inventory HSI Categories to be Provided for a New Plant Design as Part of Tier 2*

Ref. to
Section of
Table 4-1
EPRI
1015089

Minimum Inventory HSIs (Controls, Displays, Alarms)

Minimum set of HSIs that will be implemented as safety-related (SR):

Prompting indications (Reg. Guide 1.97 Type A), controls and immediate feedback indications for credited manual actions 1

Controls for manual system-level actuation of safety systems 2

Minimum set of HSIs that will be safety-related but are candidates for a graded approach to qualification, particularly regarding software QA/V&V (SR*):

Prompting alarms for credited manual actions 1

Primary indications of performance for credited manual actions 1

Indications of the status of critical safety functions and fission product barriers (Reg. Guide 1.97 Types B and C) 2

Prompting indications, controls and immediate feedback indications, and performance indications for carrying out preferred manual safety success paths 3

Minimum set of HSIs that will be spatially dedicated, continuously visible (SDCV):

Prompting indications (at least one channel – Reg. Guide 1.97 Type A), prompting alarms, controls and immediate feedback indications, and primary performance alarms for credited manual actions 1

At least one of the redundant indications of the status of critical safety functions (Reg. Guide 1.97 Type B) 2

Alarms indicating challenges to critical safety functions, fission product barriers and safety system performance 2

High-level summary indications and alarms for safety system actuation status 2

Controls for manual system-level actuation of safety systems 2

Prompting alarms for manual actions credited in the D3 evaluation per BTP 7-19 Points 1-3 2

Safety function indications and controls for system-level actuations credited for satisfying Point 4 of BTP 7-19 2

Performance alarms for preferred manual safety success paths 3

Performance alarms for preferred manual non-safety success paths 4

Other post-accident monitoring alarms (Reg. Guide 1.97 Type E) 5

System-level indications and alarms on safety system availability (Reg. Guide 1.47) 6

Safety parameter indications (SPDS) – these may also be one-step accessible 7

Alarms on safety parameters and other alarms needed for prompting pre-emptive safety actions (SPDS) 7

Independent safety parameter alarms and alarms for preemptive safety actions provided to allow limited continued operation with degraded normal HSIs 8