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Your ref: Docket No. 52-006  
Our ref: DCP\_NRC\_002891

May 25, 2010

Subject: AP1000 Response to Request for Additional Information (SRP 18)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 18. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in this response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Enclosure 1 provides the response for the following RAI(s):

RAI-SRP18-COLP-52 R2

Questions or requests for additional information related to the content and preparation of this response should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Robert Sisk'.

Robert Sisk, Manager  
Licensing and Customer Interface  
Regulatory Affairs and Strategy

/Enclosure

1. Response to Request for Additional Information on SRP Section 18

DO63  
NPO

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 18

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-SRP18-COLP-52  
Revision: 2

### **Question:**

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.

### **Westinghouse Response:**

The ISV Plan, Rev C (to be issued by 31<sup>st</sup> January 2010), will include a clear description of the simulated Remote Shutdown Workstation (RSW) facility and the means to represent the evacuation of the MCR and the relocation of the operators to the Remote Shutdown Room. In the ISV Plan, Rev B, the associated scenario description states that, "A fire will be simulated in the MCR, which will require the evacuation of the MCR. The operators expected to trip the reactor and transfer control to the remote shutdown panel. A plant shutdown and cooldown will then be performed using the remote shutdown panel [i.e., workstation]."

To the extent practical, the RSW capabilities will be represented and validated utilizing the Facility. The MCR includes all features and capabilities of the RSW, and the RSW will be represented by using the subset of MCR resources that comprise the RSW resources. This will be achieved by utilizing a section of the RO console comprising two non-safety dual-headed monitor workstations, a mock-up of the RSW panel switches and representative communication facilities.

The Wall Panel Information System, safety displays, access to the switches that are not provided at the RSW, and the DAS panel will not be available. The ISV facility equipment in excess of the RSW complement will be made clearly unavailable during remote shutdown activities, for example, by deenergizing display monitors, and by physically covering panels and switches. The changeover to this temporary configuration will be performed while the crew is 'evacuating' the MCR, transferring control to the RSW, and 'relocating' to the Remote Shutdown Room. The transfer-of-control switches outside the simulated MCR will be represented by a static mockup.

### **Question Rev 1:**

One aspect of the ISV of the RSW is that it will include a "mock-up of the RSW panel switches." DCD section 7.4.3.1.1 states that the RSW includes dedicated non-safety controls that provide the minimum inventory of controls listed in Table 18.12.2-1. These would appear to be the same dedicated controls that are in the MCR and hence in the simulator. Why are these

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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simulator controls not used for this scenario rather than an additional mock-up that may not be functional?

### ***Westinghouse Response Rev 1:***

The statement that the RSW controls are the same as the dedicated controls in the MCR provided via the Primary Dedicated Safety Panel (PDSP) and hence in the simulator is largely correct in terms of control functionality. However, there are two differences; the main one being that the RSW possesses a single switch for each control function that needs to be actuated (in conjunction with a soft control action via the DCIS or a local plant control action), whereas the PDSP possesses two switches for each control function that need to be actuated simultaneously. Another difference is that the PDSP possesses some control functions that are not applicable during an evacuation of the MCR to the Remote Shutdown Room. For example, the 'DAS Enable' and 'MCR Isolation' control functions are not required at the RSW. This results in the RSW having fewer switches and it is a smaller panel.

The design of the RSW is compatible with the PDSP in terms of labeling conventions, switch type and general arrangement. However, it is considered necessary to provide a mock-up of the RSW. The alternative would be to use the PDSP with the switches that are not included on the RSW 'blanked off' in some manner. It is considered that this would be insufficient in terms of assessing the human factors adequacy of the RSW design.

### ***Question Rev 2:***

Evaluation based on W response letter dated 2/2/10 and review of 320, Rev. C: The response acceptably explained the reason for this approach. However, it is still not fully clear in the documents, what will be done to reconfigure the MCR to represent the RSW. This could be described in either 320 or 321. Open

### ***Westinghouse Response Rev 2:***

The Engineering Development Simulator (EDS) will not be reconfigured to represent the Remote Shutdown Room (RSR). Instead, use will be made of a nearby separate room. This will enable the ISV participants to actually evacuate the EDS and relocate to the mock-up RSR. The benefit of this approach is that the RSW panel will not clutter the EDS and take up space, plus it will enable the RSW and VDU-based workstations to be setup and ready to run, and it will not be necessary to go through the process of turning off all the non-RSR monitors and covering the panels in the EDS.

The mock-up of the RSR will consist of two dual-headed VDU-based workstations placed on a table, plus the RSW panel providing the control switches. The part of RSW panel mock-up that provides the actual switches will be a replica of the final design in terms of the type of switches, layout, spacing and labeling. The actual panel/cabinet will not be identical to the RSW; it will be

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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smaller and lighter to enable it to be easily moved. However, the placement, height and angle of the part of the panel housing the switches, will be the same as in the actual RSW design. The table with the VDU-based workstations and the mock-up panel will be arranged in a configuration that is representative of the final design of the console to be provided in the RSR.

The RSR VDU-based workstations and the RSW switches will be connected to the simulator. Therefore the switches will be functional and the RSR VDU-based workstations will have the same functionality as the non-safety control system workstations in the MCR; as would be the case in the actual plant.

The room that will be used to house the RSW mock-up is a different size and shape to the actual RSR. However, this is judged to be acceptable for ISV as the design of room itself does not required to be validated via ISV; although it will be assessed as part of Design Verification (APP-OCS-GEH-120, "AP1000 Human Factors Engineering Design Verification Plan", Reference 1).

In addition to the RSR and RSW, there will also be a mock-up of the Transfer of Control panel. The control switches on this panel function to isolate the control capabilities from the MCR and to transfer the applicable control capabilities to the RSR. The panel mock-up will be a replica of the final design in terms of switches, layout, spacing and labeling, although the overall panel dimensions may not be identical to the final panel design (i.e., it may be smaller and lighter). The Transfer of Control panel will be connected to the simulator; thereby the switches will be functional. In the actual plant, the Transfer of Control panel will be located on route from the MCR to the RSR. For ISV, it will be located in the corridor between the EDS and the room housing the RWS mock-up. As the panel in the actual plant will be wall-mounted, the mock-up will fixed at an appropriate height to a moveable stand.

This information has been included in the ISV Plan, Rev D, Section 2.1, 'Physical Scope and Fidelity'.

### References:

1. APP-OCS-GEH-120, "AP1000 Human Factors Engineering Design Verification Plan," Westinghouse Electric Company LLC.

### Design Control Document (DCD) Revision:

None.

### PRA Revision:

None.

# **AP1000 TECHNICAL REPORT REVIEW**

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**Technical Report (TR) Revision:**

None.