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Your ref: Docket No. 52-006  
Our ref: DCP/NRC2342

January 8, 2009

Subject: AP1000 Response to Request for Additional Information (SRP 7)

Westinghouse is submitting response to the NRC request for additional information (RAI) on SRP Section 7. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in the 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:

RAI-SRP7.3-ICE-02 Rev 1

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  
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/Enclosure

1. Response to Request for Additional Information on SRP Section 7

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 7

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-SRP7.3-ICE-02  
Revision: 1

### **Question:**

Provide additional detail of the manual control scheme of the PMS Engineered Safety Features Actuation System (ESFAS) function as described in WCAP 16675-P.

Per WCAP 16675-P, the manual system level actuation uses all automatic PMS components with the exception of the Bistable Processor Logic device. Regulatory Position Point 4 in Regulatory Guide 1.62, "Manual Initiation of Protective Actions," reads, "*The amount of equipment common to both manual and automatic initiation should be kept to a minimum.*" Furthermore, Section 6.2.1 of IEEE Standard 603-1991 reads, "*The means provided [for manual initiation of a safety system] shall... **depend on the operation of a minimum of equipment consistent with the constraints of [Section] 5.6.1 [Independence].***" It is currently difficult for the NRC staff to see how the manual actuation of the ESFAS functions meets this criteria.

### **Westinghouse Response:**

Revision 1: Added attached sketch depicting the ESF actuation path and the correlation between a conventional SSPS system and the PMS. The attached sketch depicts the correlation, showing the Level 1, 2, and 3 functionality.

Revision 0: Within a division of the PMS, the only parts involved in manual ESF system level actuation are the switch itself, the Local Coincidence Logic (LCL), Integrated Logic Processor (ILP) and Component Interface Module (CIM).

Manual ESF system level actuation is initiated by the operator from the Main Control Room (MCR) via dedicated switches located on the Primary Dedicated Safety Panel (PDSP) and Secondary Dedicated Safety Panel (SDSP), or from the Remote Shutdown Room (RSR) via dedicated switches located on the RSR panel. In each PMS division, the signal from the switch is connected to the LCL subrack where it is converted into a redundant ESF system level actuation command. In the LCL, the manual ESF system level actuation command is "ORed" with the automatic determination of ESF system level actuation from the ESF coincidence logic. The ESF system level actuation command from the OR function is sent to the ILP via a High Speed Link (HSL). The ILP performs the component fan-out function which converts the ESF system level command into individual actuation signals to the various Component Interface Modules (CIMs). The CIM outputs are directly connected to the actuated component.

The approach for AP1000 PMS is analogous to the manual ESF system level actuation in a conventional Westinghouse plant. In a conventional Westinghouse plant, the manual ESF system-level actuation is initiated by the operator from the MCR via dedicated switches located on the Main Control Board. The signal from each switch is connected to the Solid State

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Protection System (SSPS). The signal enters the SSPS downstream of the 2oo4 coincidence logic and block control, and upstream of the Master Relay. The Master Relays within the SSPS latch the system-level actuations. The output contacts of the Master Relays perform the fan-out of the system-level actuations to the individual component-level Slave Relays. Comparing AP1000 PMS to a conventional Westinghouse manual ESF system level actuation scheme, the LCL is equivalent to the SSPS 2oo4 coincidence logic, block control, and the latch function of the Master Relay; the fan-out of the High Speed Links to the ILPs and the fan-out from the ILPs to the CIMs are equivalent to the fan-out function of the Master Relay; and the CIM is equivalent to the Slave Relay interface to the field component.

In summary, the "minimum of equipment" criterion in IEEE-603-1991, Sections 5.6.1 and 6.2.1 involves two areas: (1) minimum signal path from manual switch to actuated component, and (2) minimum amount of actuated equipment. The information above describes how the manual ESF actuation function is implemented in the AP1000 PMS. Compliance with the minimum signal path criterion is achieved because the design involves the minimum signal path for manual actuation of ESF functions from the MCR. If the manual ESF system level command from the MCR enters the ILP downstream of the LCL, then it would have to be hardwired to every ILP chassis in each division (2 to 8 ILP chassis). This approach would result in undue wiring complexity and cable separation issues.

Compliance with the minimum amount of actuated equipment is achieved because only the fluid system components (valves, breakers, etc) necessary to achieve the desired ESF result are actuated. No additional ESF components are actuated.

The AP1000 PMS combines the manual system actuations with the automatic system actuations in a manner analogous to that used in the operating fleet.

**Design Control Document (DCD) Revision:**

None

**PRA Revision:**

None

**Technical Report (TR) Revision:**

None

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