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Your ref: Docket No. 52-006
Our ref: DCP/NRC2397

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Subject: AP1000 Response to Request for Additional Information (SRP 17)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 17. 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:

RAI-SRP17.4-SPLA-04

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 Standardization

/Enclosure

1. Response to Request for Additional Information on SRP Section 17

DD23
NRC

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 17

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Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP17.4-SPLA-04

Revision: 0

Question:

D-RAP ITAAC should provide assurance that the reliability and availability of risk-significant SSCs are consistent with the certified design (subject to deviations and plant-specific features approved in the COL and reflected in the FSAR) by

- concluding that the list of SSCs within the scope of D-RAP is complete and correct
- concluding that the design products for each risk-significant SSC have been prepared correctly (i.e., were subject to adequate controls)
- describing the activities on which these conclusions are based, as well as the other reliability assurance activities providing confidence that at the time of initial fuel loading, the plant will be as described in the FSAR

Please explain how the proposed D-RAP ITAAC would accomplish this, or propose an alternative that provides reasonable assurance that the plant is designed and will be constructed in a manner that is consistent with the key assumptions and risk insights for risk-significant SSCs within the scope of D-RAP.

Westinghouse Response:

Westinghouse recognizes that the purpose of the D-RAP is to provide reliability and availability of risk-significant SSCs consistent with the certified AP1000 design. Responses to documented observations are:

- The list of SSCs included within the scope of the D-RAP is documented in the DCD in Tier 1 Table 3.7-1 and Tier 2 Table 17.4-1. This information reflects the analytical results of the AP1000 Probabilistic Risk Assessment (PRA). Slight discrepancies between the equipment listed in Tier 1 Table 3.7-1 and Tier 2 Table 17.4-1 were discovered. A mark-up of Tier 1 Table 3.7-1 is attached to this RAI response. Any changes to the population of SSCs contained within the D-RAP due to site differences will be documented by the license applicant via the COLA process.
- As documented in the paper "About the D-RAP ITAAC RAI to Westinghouse" from the USNRC:

For safety-related SSCs, licensees rely on 10 CFR Appendix B programs. These form an acceptable basis for concluding that design products reflect the design as described in the FSAR. Analogous assurance (not necessarily as stringent) is required for non-safety related yet risk-significant SSCs.

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Westinghouse concurs that non-safety related risk-significant SSCs are candidates for quality assurance which will provide confidence that the design products reflect the design described in the FSAR. To this end, Westinghouse will apply increased quality assurance to all non-safety risk-significant SSCs identified in DCD Tier 1 Table 3.7-1 and Tier 2 Table 17.4-1. This program will be in accordance with Tier 2 Table 17-1 "Quality Assurance Program Requirements for Structures, Systems, and Components Important to Investment Protection."

- Inspections, tests, and analyses that ensure the AP1000 is constructed in accordance with the certified design will be performed in accordance with system-level acceptance criteria documented in Tier 1 Chapter 2 of the AP1000 DCD. A report will be generated by the site licensing department verifying that all the equipment listed in the DCD Tier 1 Table 3.7-1 has been designed, procured, manufactured, transported, stored (on-site or in-place), and installed in accordance with quality programs.

In compliance with the aforementioned responses, a markup of DCD Tier 1 Table 3.7-1 and Table 3.7-3 is attached to this RAI.

References: None

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Design Control Document (DCD) Revision:

Table 3.7-1 Risk-Significant Components	
Equipment Name	Tag No.
Component Cooling Water System (CCS)	
Component Cooling Water Pumps	CCS-MP-01A/B
Containment System (CNS)	
Containment Vessel	CNS-MV-01
Hydrogen Igniters	VLS-EH-1 through -64
Chemical and Volume Control System (CVS)	
Makeup Pumps	CVS-MP-01A/B
Makeup Pump Suction and Discharge Check Valves	CVS-PL-V113 CVS-PL-V160A/B
Diverse Actuation System (DAS)	
DAS Processor Cabinets and Control Panel (used to provide automatic and manual actuation)	DAS-JD-001 DAS-JD-002 DAS-JD-004 OCS-JC-020
Annex Building UPS Distribution Panels (provide power to DAS)	EDS1-EA-1, EDS1-EA-14, EDS2-EA-1, EDS2-EA-14

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Table 3.7-1 (cont.) Risk-Significant Components	
Equipment Name	Tag No.
Rod Drive MG Sets (Field Breakers)	PLS-MG-01A/B
Containment Isolation Valves Controlled by DAS	<u>CVS-PL-V045, -V047</u> <u>VFS-PL-V003, -V004, -V009, -V010</u> <u>WLS-PL-V055, -V057</u>
Main ac Power System (ECS)	
Reactor Coolant Pump Switchgear	ECS-ES-31, -32, -41, -42, -51, -52, -61, -62
Ancillary Diesel Generators	ECS-MS-01, -02
6900 Vac Buses	ECS-ES-1, -2
Main and Startup Feedwater System (FWS)	
Startup Feedwater Pumps	FWS-MP-03A/B
General I&C	
IRWST Level Sensors	PXS-045, -046, -047, -048
RCS Hot Leg Level Sensors	RCS-160A/B
Pressurizer Pressure Sensors	RCS-191A/B/C/D
Pressurizer Level Sensors	RCS-195A/B/C/D
Steam Generator Narrow-Range Level Sensors	SGS-001, -002, -003, -004, -005, -006, -007, -008
Steam Generator Wide-Range Level Sensors	SGS-011, -012, -013, -014, -015, -016, -017, -018
Main Steam Line Pressure Sensors	SGS-030, -031, -032, -033, -034, -035, -036, -037
Main Feedwater Wide-Range Flow Sensors	SGS-050A/C/E, -051A/C/E
Startup Feedwater Flow Sensors	SGS-055A/B, -056A/B
CMT Level Sensors	PXS-011A/B/C/D, -012A/B/C/D, -013A/B/C/D, -014A/B/C/D
Class 1E dc Power and Uninterruptible Power System (IDS)	

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Table 3.7-1 (cont.) Risk-Significant Components	
Equipment Name	Tag No.
125-250 Vdc 24-Hour Batteries	IDSA-DB-1A/B, IDSB-DB-1A/B, IDSC-DB-1A/B, IDSD-DB-1A/B
250 Vdc 24-Hour Battery Chargers	IDSA-DC-1, IDSB-DC-1, IDSC-DC-1, IDSD-DC-1
250 Vdc and 120 Vac Distribution Panels	IDSA-DD-1, IDSA-EA-1/-2, IDSB-DD-1, IDSB-EA-1/-2/-3, IDSC-DD-1, IDSC-EA-1/-2/-3, IDSD-DD-1, IDSD-EA-1/-2
Fused Transfer Switch Boxes	IDSA-DF-1, IDSB-DF-1/-2, IDSC-DF-1/-2, IDSD-DF-1
250 Vdc Motor Control Centers	IDSA-DK-1, IDSB-DK-1, IDSC-DK-1, IDSD-DK-1
250 Vdc 24-Hour Inverters	IDSA-DU-1, IDSB-DU-1, IDSC-DU-1, IDSD-DU-1
Passive Containment Cooling System (PCS)	
Recirculation Pumps	PCS-MP-01A/B
PCCWST Drain Isolation Valves	PCS-PL-V001A/B/C
Plant Control System (PLS)	
PLS Actuation Software and Hardware (used to provide control functions)	Refer to Table 3.7-2
Protection and Monitoring System (PMS)	
PMS Actuation Software (used to provide automatic control functions)	Refer to Tables 2.5.2-2 and 2.5.2-3
PMS Actuation Hardware (used to provide automatic control functions)	Refer to Tables 2.5.2-2 and 2.5.2-3
MCR 1E Displays and System Level Controls	OCS-JC-010, -011
Reactor Trip Switchgear	PMS-JD-RTS A01/02, B01/02, C01/02, D01/02
Passive Core Cooling System (PXS)	
IRWST Vents	PXS-MT-03

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Table 3.7-1 (cont.) Risk-Significant Components	
Equipment Name	Tag No.
IRWST Screens	PXS-MY-Y01A/B
Containment Recirculation Screens	PXS-MY-Y02A/B
CMT Discharge Isolation Valves	PXS-PL-V014A/B, -V015A/B
CMT Discharge Check Valves	PXS-PL-V016A/B, -V017A/B
Accumulator Discharge Check Valves	PXS-PL-V028A/B, -V029A/B
PRHR HX Control Valves	PXS-PL-V108A/B
Containment Recirculation Squib Valves	PXS-PL-V118A/B, -V120A/B
IRWST Injection Check Valves	PXS-PL-V122A/B, -V124A/B
IRWST Injection Squib Valves	PXS-PL-V123A/B, -V125A/B
IRWST Gutter Bypass Isolation Valves	PXS-PL-V130A/B
Reactor Coolant System (RCS)	
ADS Stage 1/2/3 Valves (MOVs)	RCS-PL-V001A/B, -V011A/B RCS-PL-V002A/B, -V012A/B RCS-PL-V003A/B, -V013A/B
ADS Stage 4 Valves (Squibs)	RCS-PL-V004A/B/C/D
Pressurizer Safety Valves	RCS-PL-V005A/B
Reactor Vessel Insulation Water Inlet and Steam Vent Devices	RCS-MN-01
Reactor Cavity Doorway Damper	
Fuel Assemblies	157 assemblies with tag numbers beginning with RXS-FA
Normal Residual Heat Removal System (RNS)	
Residual Heat Removal Pumps	RNS-MP-01A/B
RNS Motor-Operated Valves	RNS-PL-V011, -V022, -V023, -V055
RNS Stop Check Valves RNS Check Valves	RNS-PL-V015A/B RNS-PL-V017A/B
RNS Check Valves	RNS-PL-V007A/B, -V013, -V056

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Table 3.7-1 (cont.) Risk-Significant Components	
Equipment Name	Tag No.
Spent Fuel Cooling System (SFS)	
Spent Fuel Cooling Pumps	SFS-MP-01A/B
Steam Generator System (SGS)	
Main Steam Safety Valves	SGS-PL-V030A/B, -V031A/B, -V032A/B, -V033A/B, -V034A/B, -V035A/B
Main Steam Line Isolation Valves	SGS-PL-V040A/B
Main Feedwater Isolation Valves	SGS-PL-V057A/B
Service Water System (SWS)	
Service Water Cooling Tower Fans	SWS-MA-01A/B
Service Water Pumps	SWS-MP-01A/B
Nuclear Island Nonradioactive Ventilation System (VBS)	
MCR Ancillary Fans	VBS-MA-10A/B
I&C Room B/C Ancillary Fans	VBS-MA-11, -12
Chilled Water System (VWS)	
Air Cooled Chiller Pumps	VWS-MP-02, -03
Air Cooled Chillers	VWS-MS-02, -03
Onsite Standby Power System (ZOS)	
Engine Room Exhaust Fans	VZS-MY-V01A/B, -V02A/B
Onsite Diesel Generators	ZOS-MS-05A/B

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Table 3.7-3 Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The D-RAP provides reasonable assurance that the design of risk-significant SSCs is consistent with their risk analysis assumptions.	<p>Inspection will be performed for the existence of a report which establishes the estimated reliability of as-built risk-significant SSCs.</p> <p><u>Inspection will be performed for the existence of a report which establishes that the as-built risk-significant SSCs are supplied and installed as described in the certified design.</u></p>	<p>A report exists and concludes that the estimated reliability of each as-built component identified in Table 3.7-1 is at least equal to the assumed reliability and that industry experience including operations, maintenance, and monitoring activities were assessed in estimating the reliability of these SSCs.</p> <p>For an as-built component with reliability less than the assumed reliability, an evaluation shall show that the net effect of as-built component reliabilities does not reduce the overall reliability. Or, an evaluation shall show that there is not a significant adverse effect on the core melt frequency or the large release frequency in the PRA applicable to the plant.</p> <p><u>A report documents that safety-related components identified in Table 3.7-1 have been designed, procured, manufactured, transported, stored, and installed in accordance with a 10 CFR 50 Appendix B compliant quality program.</u></p> <p><u>A report documents that non-safety related components identified in Table 3.7-1 have been designed, procured, manufactured, transported, stored, and installed in accordance with a program which satisfies quality assurance requirements for SSCs important to investment protection.</u></p>



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PRA Revision:

None

Technical Report (TR) Revision:

None