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Your ref: Project Number 740
Our ref: DCP/NRC1871

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Subject: AP1000 Piping Design Acceptance Criteria (DAC) Plan

This letter summarizes the AP1000 piping status and schedule. The purpose of the letter is to provide sufficient information to facilitate NRC staff schedule and review of the AP1000 piping design and analyses to determine technical sufficiency for resolving the Design Acceptance Criteria (DAC). The AP1000 DCD Introduction, Table 1-2, identifies the Piping Design Acceptance Criteria for the AP1000. To successfully resolve the Piping DAC, these criteria must be demonstrated to have been met for a sufficient set of piping design packages and analyses.

Westinghouse has previously submitted Technical Reports (TR-8, APP-GW-GLR-022, LBB Evaluation of As-Designed Piping), (TR-7, APP-GW-GLR-074, Pipe Break Hazards Analysis), (TR-13, APP-GW-GLR-013, Safety Class Piping Design Specifications and Design Reports Summary) for staff review. These documents provided reference to the detailed design and analyses calculations that have been prepared by Westinghouse, and also afforded NRC staff an opportunity to review the packages with the intent of resolving the DAC. On December 18, 2006, Westinghouse met with NRC staff to develop the schedule for the NRC audit and review of the supporting documentation. Although the staff did not actually audit or review any of the available Westinghouse documentation, at the meeting the staff indicated that they were not satisfied with the level of completion established by Westinghouse. Subsequent discussions with the staff have concluded that Westinghouse must prepare a sufficient subset of formal Class 1, 2, and 3 design reports prior to the staff commitment for the audit. This letter provides the scope and schedule for those summary reports.

Westinghouse has prepared piping design and analysis packages for a significant portion of the AP1000 piping. A piping analysis package, as used in this discussion, is based on a set of connected piping runs that go from one anchor to another anchor. This is the standard methodology used to define piping analysis packages. This means that a piping analysis package does not necessarily align, one-for-one with the fluid system packages. For example, the Reactor Coolant System (RCS) fluid system is included in several piping analysis packages based on the structural design. In addition, piping analysis packages may include piping from more than one fluid system.

Westinghouse and its subcontractors have performed a significant amount of piping design and analyses. The priority has been to focus on those lines with the most safety significance (i.e. large Class 1 lines), and has also included some Class 2 and Class 3 lines. The attachment to this letter summarizes those

piping packages that have been prepared to date. The packages are intended to address the criteria in Table 2-1 (DAC table). Westinghouse has not yet prepared the Class 1, 2 and 3 summary design reports. To address that concern, Westinghouse intends to provide two summary reports. The first report will cover the Class 1 lines and the second report will cover both the Class 2 and Class 3 lines. In each report, an individual sheet in the appendix will summarize the results for each of the appropriate safety class analysis packages. As the seismic spectra for the AP1000 that was included in the Design Certification has since evolved to address soil sites. Westinghouse is currently in the process of performing reconciliation with the altered seismic input. The following piping packages will be available for NRC review:

Reactor Coolant Loop
Pressurizer Surge Line
Direct Vessel Injection Line
Automatic Depressurization System Stage 4 Line
Main Steam Line (Class 2 Line)

Westinghouse believes that these lines provide a sufficient sample of piping packages for NRC to review and to conclude that the DAC can be resolved. As part of the overall piping review, the pipe rupture hazard evaluation and the leak-before-break evaluation are also available for review. Although an NRC audit of the LBB evaluation has already been conducted, those calculations form a part of the overall piping evaluation for the lines identified in the sample above and therefore will be included for completeness. The sample represents a significant sample because they are all safety significant, they are all large bore, they are all LBB lines, and they exercise many of the commitments in the piping DAC. The other safety class analysis packages that have been completed based on an earlier revision of the seismic input will also be available for review. These other safety class analysis packages have a variety of layout and support configurations that can be sampled. Even though the seismic and thermal input may not be the latest vintage, these packages still provide reasonable and representative results for many of the remaining safety class lines. In addition, Westinghouse believes that an NRC review of these existing packages in conjunction with the sample packages will enhance the staff's understanding of the AP1000 piping design maturity.

The content of the design reports: Westinghouse will summarize the analysis results that meet the various stress equations in the ASME Code and the piping design specification. The design report will provide results for the highest stress location. Results at other locations will be available in the back-up calculations. Westinghouse will include a checklist to identify where in the design report each of the DAC commitments in Table 1-2 of the DCD Introduction has been addressed (if applicable). Westinghouse will include fatigue analysis results for two lines – the loop piping and the ADS stage 4 line. Westinghouse considers that this is sufficient and appropriate because the methodology is essentially the same for all Class 1 lines. The sample packages include a sufficient number of different geometries for a sufficient number of different transients to substantiate the methodology, which will yield similar results for additional analysis packages. There will be a separate table for each Class 1 analysis package (23 packages) and for each Class 2 and Class 3 analysis packages (101 Class 2 and 45 Class 3 packages) within the two individual design reports. As-procured information for items like valves will not be included in the design reports at this time, so bounding information will be. Future as-built design reports will include any as-procured items or as-built configuration and reconcile the final results as required by the ASME Code. After construction and prior to fuel load, the ASME as-built design reports will be used to satisfy the related ITAAC items for the safety class piping. The P.E. stamp on the design reports generated in the near term ("as-designed" reports) will be limited to a confirmation that the design meets the requirements of the design specification, except that the design does not include deviations due to construction. An additional qualifier on the certification page will define the basis for

the design as the references included in the design report and that the certification covers only the piping analysis packages for which results are provided.

Westinghouse will complete these tasks by the end of July. Westinghouse proposes to schedule an NRC audit of these design reports and their supporting documentation at the Monroeville offices during the week of August 13.

Westinghouse welcomes the opportunity to further discuss these topics as needed to support NRC schedule and review.

Very truly yours,

D. F. Hutchings for

A. Sterdis, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Attachment

1. "List of AP1000 Piping Analysis Packages

cc:	S. Bloom	-	U.S. NRC	1A
	S. Coffin	-	U.S. NRC	1A
	G. Curtis	-	TVA	1A
	P. Grendys	-	Westinghouse	1A
	P. Hastings	-	Duke Power	1A
	C. Ionescu	-	Progress Energy	1A
	D. Lindgren	-	Westinghouse	1A
	A. Monroe	-	SCANA	1A
	M. Moran	-	Florida Power & Light	1A
	C. Pierce	-	Southern Company	1A
	E. Schmiech	-	Westinghouse	1A
	G. Zinke	-	NuStart/Entergy	1A

ATTACHMENT 1

"List of AP1000 Piping Analysis Packages"

Analysis Package Description	System Designator	Analysis Report	Class
Direct Vessel Injection Line A	PXS	APP-PXS-PLR-010	1
Direct Vessel Injection Line B	PXS	APP-PXS-PLR-020	1
ADS 4th Stage West and PRHR Supply	PXS	APP-PXS-PLR-030	1
Passive RHR Return Line	PXS	APP-PXS-PLR-040	1
CMT 2A Supply Line	PXS	APP-PXS-PLR-050	1
CMT 2B Supply Line	PXS	APP-PXS-PLR-060	1
PSADS System (Lower Tier/Upper Tier)	RCS	APP-RCS-PLR-010	1
ADS 4th Stage East	RCS	APP-RCS-PLR-030	1
Pressurizer Surge Line	RCS	APP-RCS-PLR-040	1
Reactor Coolant Loop Piping	RCS	APP-RCS-PLR-050	1
Normal RHR Suction Line	RNS	APP-RNS-PLR-010	1
Spent Resin from Cont. Pen.	CVS	APP-CVS-PLR-520	2
From SCV Pen. to CVS-12A0007	CVS	APP-CVS-PLR-530	2
Hydrogen Supply from CVS-12A0022	CVS	APP-CVS-PLR-700	2
HX Inlet and Outlet between P19 & P20	RNS	APP-RNS-PLR-170	2
Main Steam Line A	SGS	APP-SGS-PLR-030	2
Main Steam Line B	SGS	APP-SGS-PLR-040	2
Blowdown Line B from Cont. Pen. to TB	SGS	APP-SGS-PLR-090	2
Blowdown Line A from Cont. Pen. to TB	SGS	APP-SGS-PLR-100	2
From SCV Pen. to VFS-12A2004	VFS	APP-VFS-PLR-010	2
From Cont. Pen. to past Valve V010	VFS	APP-VFS-PLR-030	2
From Cont. Pen. to past Valve V024	WLS	APP-WLS-PLR-520	2
Supply to Distribution Bucket (Embed)	PCS	APP-PCS-PLR-050	3
Recirculation Line inside PCS Tank	PCS	APP-PCS-PLR-060	3
Recirculation Line inside PCS Tank	PCS	APP-PCS-PLR-070	3
PCS Room 12306 (Auxiliary Building)	PCS	APP-PCS-PLR-100	3
Overflow inside PCS Tank	PCS	APP-PCS-PLR-200	3
Vent Line inside PCS Tank	PCS	APP-PCS-PLR-210	3
Room 12701 PCS Tank Vent	PCS	APP-PCS-PLR-220	3
Vent Line inside PCS Tank	PCS	APP-PCS-PLR-230	3
Room 12701 PCS Tank Vent	PCS	APP-PCS-PLR-240	3
Discharge Line inside PCS Tank	PCS	APP-PCS-PLR-250	3
Discharge Line inside PCS Tank	PCS	APP-PCS-PLR-270	3
Discharge Line inside PCS Tank	PCS	APP-PCS-PLR-290	3
Instrumentation Line	PCS	APP-PCS-PLR-300	3
Instrumentation Line	PCS	APP-PCS-PLR-310	3
Overflow Line from PCS Tank	PCS	APP-PCS-PLR-410	3
Supply to Distribution Bucket	PCS	APP-PCS-PLR-420	3
Auxiliary Supply to Distribution Bucket	PCS	APP-PCS-PLR-430	3
From RNS-12A2037 to Spent Fuel Pool	RNS	APP-RNS-PLR-100	3