

Updated Schedule for Stress Analysis

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Design Completion Approach



➤ DAC (Design ITTAC) for the components, piping and fuel assemblies are planned to be resolved during the design certification review process by:

✓ Technical reports:

- Will contain analyses results and other information that supplement the information already provided in the DCD
- Will close DAC (Design ITAAC) for representative ASME Class CS, Class 1 and Class 2 components and piping, Fuel assemblies and RCC (Rod Control Cluster)

✓ NRC Audit:

- Review of activities and documents related to detailed design
- Will close DAC (Design ITAAC) for remaining designated components and piping



Updated Schedule



Original Schedule:

- ✓ Submittal of Technical Report for representative examples of components, piping and fuel system in June 2009
- ✓ Audit for remaining in September 2009
- ✓ NRC Phase 2, draft SER for Chapters 3 and 4 completed by February and January 2010, respectively.

Updated Schedule:

- ✓ Submittal of Technical Report for ASME Class CS, Class 1 and Class 2 components, piping and fuel system in March 2009
- √ NRC audits can also begin in March 2009
- ✓ An additional TR for "Summary of Seismic and Accident Load Condition for Primary Components and Piping Design" will be provided in January 2009 to inform the NRC in advance of the analysis conditions to be used in the stress analyses



Submittal Plan for Stress Analysis Technical CAPWA Reports and Stress Analysis Completion



Contents Original Schedule T/R 6/2009 T/R 6/2009 T/R 6/2009 T/R 6/2009 ASME Class 1 Reactor Coolant Pump ASME Class 1 CRDM Stress Analyses Audit 9/2009 Audit 9/2009 Audit 9/2009 RCL Branch Piping Pressurizer Surge Line Piping ASME Class 2 Accumulator ASME Class 2 Fuel system Fuel system Fuel system Fuel assemblies and RCC Structure response analysis under seismic sounder seismic seismic sounder seismic sounder seismic sounder seismic sounder seismic sounder seismic seismic seismic sounder seismic seismic seismic sounder seismic seismi						-	
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Outline of Technical Reports (1/5) (Input for Stress Analysis)



Summary of Design Transient (01/2009)

Outline of Technical Report	Related DCD Section/Subsection
Design transients considered in the design of ASME Class 1 components for the US-APWR.	
➤ Assumption of design transients analysis, such as fluid system pressure, temperature, flow transients, and frequency for Class 1 component fatigue analysis and stress analysis.	3.9
Conservative estimates of the magnitude and frequency of the temperature and pressure variation resulting from various events assumed in plant operation	



Outline of Technical Reports (2/5) (Input for Stress Analysis)



Summary of Seismic and Accident Load Conditions for Primary Components and Piping Design (01/2009)

Outline of Technical Report	Related DCD Section/Subsection
Seismic and accident load conditions (Service Level C and D) used in the stress analysis for the primary component and piping design for the US-APWR	3.9



Outline of Technical Reports (3/5) (Stress Analysis Report)



RV, RI, CRDM, SG, Pzr, RCP (Class 1) and Acc (Class 2): Summary of Stress Analysis Results (03/2009)

Outline of Technical Report	Related DCD Section/Subsection
> ASME Code stress analysis results for the RV, CRDM, SG, Pzr, RCP (Class 1), RI (Class CS), and Acc (Class 2) of the US-APWR	3.9
Structural, thermal and fatigue analyses results for components	

RV: Reactor Vessel

CRDM: Control Rod Drive Mechanism

SG: Steam Generator

RCP: Reactor Coolant Pump

RI: Reactor Internal ACC: Accumulator



Outline of Technical Reports (4/5) (Stress Analysis Report)



RCL Line and M/S Line: Summary of Stress Analysis Results (03/2009)

Outline of Technical Report	Related DCD Section/Subsection
➤ Reactor Coolant Loops line (including Pressurizer surge line): ASME Code Class 1 stress analysis results, with environmental fatigue effect and thermal stratification effect, and Leak-Before-Break (LBB) evaluation	3.12
Main Steam line: ASME Code Class 2 stress analysis results with water hammer effect and Leak-Before- Break (LBB) evaluation	



Outline of Technical Reports (5/5) (Stress Analysis Report)



Evaluation Results of Structural Response Analysis of US-APWR Fuel System under Seismic and LOCA Conditions (03/2009)

Outline of Technical Report	Related DCD Section/Subsection
➤ This technical report will evaluate the structural response of the US-SPWR fuel system under seismic and LOCA conditions.	
The report will:	
Demonstrate that the grid spacer deformation is insignificant.	4.2
Verify that the stresses for the RCC guide thimbles, nozzles, and fuel cladding are less than the allowable limit (ASME Sec. III, S.R.P.).	
Examine and demonstrate no buckling of RCC guide thimbles against axial load.	



Summary



- Stress analysis reports and related information for audit, originally planned for June and September 2009 respectively, will now both be available in March 2009.
- => A review schedule 6 months shorter should be attainable for Chapters 3 and 4.

