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MITSUBISHI NUCLEAR ENERGY SYSTEMS, INC.


Comanche Peak Nuclear Power Plant Units 3 and 4




Opening Remarks, Integrated Hydrology Closure Plan (IHCP)

May 24, 2012


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Agenda

- ❑ Introductions and Opening Remarks (Don Woodlan)
- ❑ Meeting Objectives (Don Woodlan)
- ❑ Background (Don Woodlan)
- ❑ Sequencing of IHCP and ISCP Activities (Don Woodlan)
- ❑ US-APWR Standard Plant Design Update (Don Woodlan)
- ❑ COLA Impact of IHCP (Mory Diané)
- ❑ IHCP Activities Description (Mory Diané)
- ❑ Deliverables (Don Woodlan)
- ❑ Summary and Conclusion (Don Woodlan)



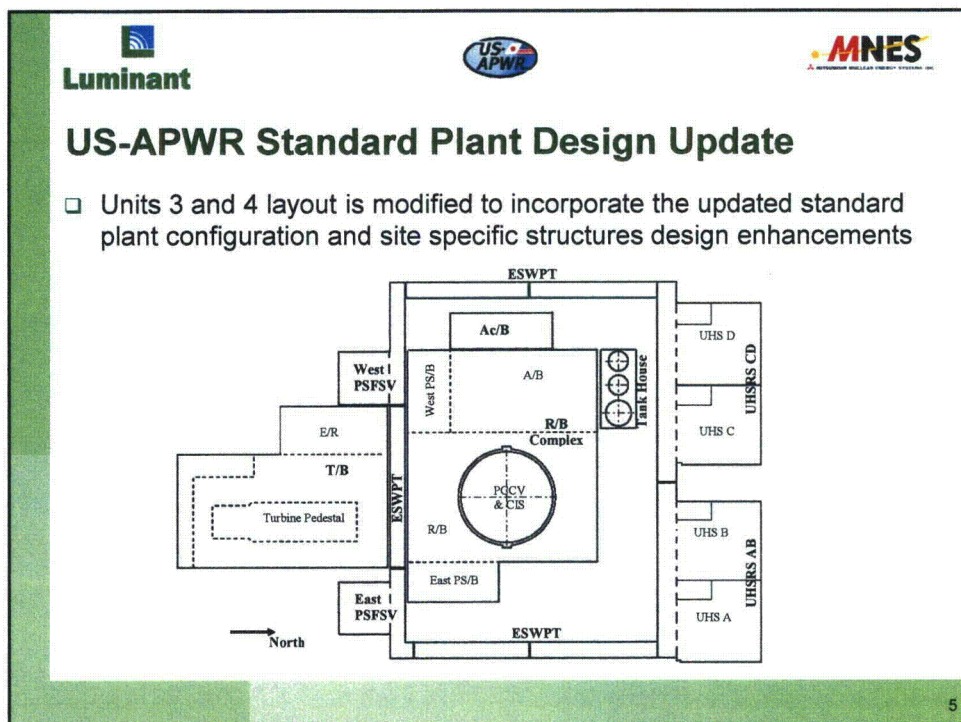
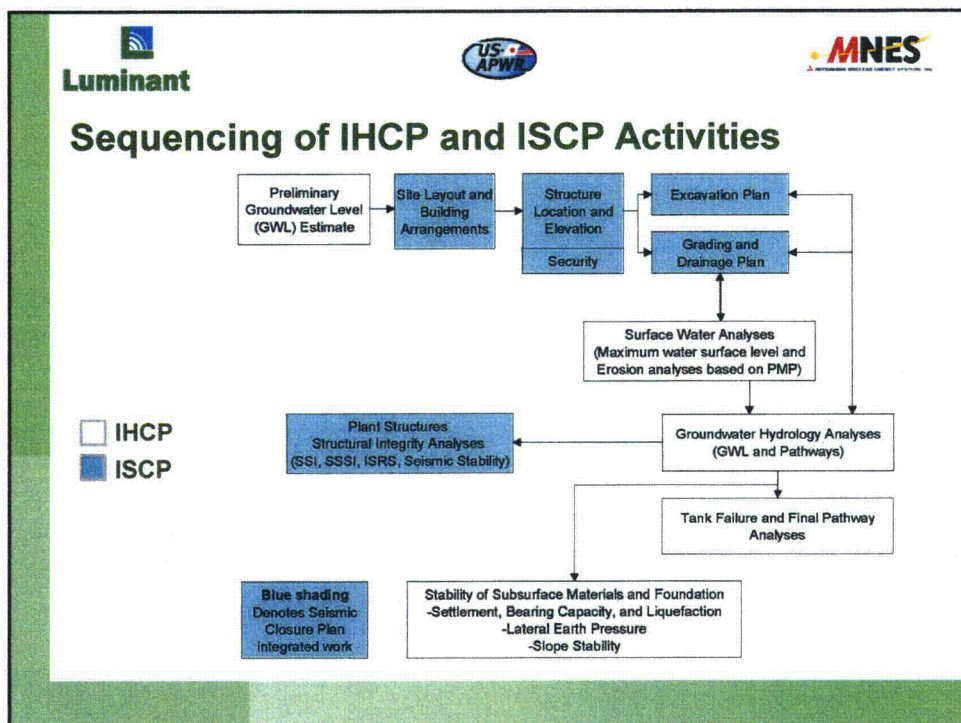
Meeting Objectives

- ☐ Describe Integrated Hydrology Closure Plan for CPNPP Units 3 and 4
- ☐ Introduce NRC to impacts on the COLA
- ☐ Receive NRC feedback on technical approaches
- ☐ Understand how Luminant can support NRC review



Background

- ☐ Public meeting with Luminant and NRC regarding Hydrology on March 27
- ☐ MHI presented US-APWR Seismic Closure Plan on March 29
- ☐ Luminant submitted ISCP on April 16
- ☐ Luminant submitted IHCP April 27





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COLA Impacts

□ FSAR Subsection 2.4.3

- Revise to reflect common foundation and the new plant layout based on wind wave calculation revision as necessary (revised response to RAI 139 due 12/2012)

□ FSAR Subsection 2.4.2 & 2.4.3

- Revise text, tables and figures for surface hydrology issues resulting from changes to calculations for maximum surface water level, erosion, and wind wave analysis, and to reflect common foundation and the new plant layout (revised response to RAI 139 due 12/2012)

□ FSAR Subsection 2.4.12

- Revise figures, tables, and text to reflect common foundation and the new plant layout increased gaps between structures and/or changes in the grading and drainage plan. FSAR text changes based on GWL and/or path for BAT Failure Analysis (revised response to RAI 147 due 3/2013)



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COLA Impacts (cont.)

□ FSAR Subsection 2.4.13

- Revise figures, tables, and text to reflect common foundation and the new plant layout. FSAR text changes based on GWL and/or path for BAT Failure Analysis. Update tank failure concentration amounts in the fill and Squaw Creek Reservoir (revised response to RAI 145 due 3/2013).

□ FSAR Subsection 2.5.4

- Revise text, tables and figures to reflect common foundation and the new plant layout. Consider impact of new foundation bottom (revised response to RAI 233 due 02/2013)
- Settlement, bearing capacity, liquefaction, lateral earth pressure, and slope stability – update text and tables to reflect new seismic methodology and new plant arrangement (revised response to RAI 233 due 02/2013)

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COLA Impacts (cont.)

☐ FSAR Subsection 2.5.5

- Revise text, tables and figures to reflect common foundation and the new plant layout (revised response to RAI 233 due 02/2013)

☐ ER Section 2.3

- Revise figures, tables, and text to reflect common foundation and the new plant layout to be consistent with FSAR text changes based on GWL and/or path for BAT Failure Analysis (revised response to RAI 147 due 03/2013)
 - No impact to the conclusions provided in the Environmental Report

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IHCP Activities Description

- ☐ Preliminary groundwater level estimate
- ☐ Surface water analysis
 - Maximum surface water level
 - Potential erosion and scouring due to local PMP
- ☐ Groundwater analysis
- ☐ Tank failure and release analysis
- ☐ Stability of subsurface materials and foundation analyses

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Preliminary Groundwater Level Estimate

- ☐ Determine preliminary, bounding groundwater level to finalize site layout, structure location and elevation, grading and drainage plan, excavation plan, and seismic assessment
- ☐ Develop and utilize an initial MODFLOW-type model to confirm this groundwater level is conservative

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Surface Water Analysis

- ☐ Update probable maximum surface water level analysis to reflect plant layout and G&D plan changes
- ☐ Update scour and erosion analysis to reflect plant layout and G&D plan changes
- ☐ Submit supplement to RAI 139; update FSAR 2.4.2 and 2.4.3



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Groundwater Analysis

- ☐ Develop MODFLOW and MODPATH-type models to confirm bounding post-construction groundwater level and flow pathways
- ☐ Define range of fill and cap properties; confirm conservative values used as inputs to model
- ☐ Request to interact with NRC SMEs in August 2012
- ☐ Submit supplement to RAI 147, Question 02.04.12-8; update FSAR 2.4.12



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Tank Failure and Release Analysis

- ☐ Use MODPATH-type model to determine horizontal and vertical groundwater flow paths
- ☐ Use RESRAD to analyze contaminant concentrations
 - If RESRAD identifies leakage into SCR and/or TMF, use appropriate model to project plume and determine concentration at receptor locations
- ☐ Submit supplement to RAI 145, Questions 02.04.13-5, -6, and -7; update FSAR 2.4.13



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Stability of Subsurface Materials and Foundation Analyses

- ❑ Evaluate and revise settlement, bearing capacity, liquefaction, slope stability, and lateral earth pressure analyses to maintain consistency with groundwater level and layout changes
- ❑ Submit supplement to RAI 233; update FSAR 2.5.4 and 2.5.5



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Deliverables

December 2012 - Supplemental response to RAI 139, revised FSAR Subsection 2.4.2, updated grading and drainage figures, revised surface water and erosion potential calculation packages (with associated HEC-RAS input/output files), and updated coincident wind wave analysis

February 2013 - Supplemental response to RAI 233, revised FSAR Subsection 2.5.4 and 2.5.5, and updated settlement and bearing capacity, stability of slopes, and lateral earth pressure analyses

March 2013 - Supplemental response to RAI 145, revised FSAR Subsection 2.4.13, and input/output files to RESRAD model

March 2013 - Supplemental response to RAI 147, revised FSAR Subsection 2.4.12, and associated input/output files



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Summary

- ❑ Quantitative surface water and groundwater modeling will be completed and will include:
 - Documentation of input and output files used for the calculations
 - Completion of sensitivity analyses to demonstrate the reasonableness of the results
 - Documentation of the limitations of the models and assumptions made
- ❑ The updated analyses will provide new soil parameters to be used as input to FSAR Sections 3.7 and 3.8 stability analyses
- ❑ Luminant does not anticipate revising any RAI responses other than RAIs 139, 145, 147, 233
 - Luminant will address any NRC staff concerns if the NRC feels the response to a specific RAI might need to be clarified



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Conclusion

- ❑ IHCP activities are focused on ensuring that all Hydrology Open Items are satisfactorily addressed
- ❑ A list of affected basis documents and their completion dates is being created and Luminant plans to provide the list to the NRC
- ❑ Planned periodic interactions with NRC throughout the IHCP process will provide opportunities for feedback on Open Item closure
- ❑ Intent is to supplement information needed by NRC for successful SER
- ❑ Luminant will keep the NRC informed of changes and updates to the IHCP schedule



Back-Up ACRONYMS + ABBREVIATIONS



ACRONYMS + ABBREVIATIONS

Acronym/Abbreviation	Definition
A/B	Auxiliary Building
Ac/B	Access Control Building
	Advanced Computer Software-System for Analysis of Soil
ACS-SASSI	Structure Interaction
BAT	Boric Acid Tank
BE	best estimate
CAV	cumulative absolute velocity
CEUS	Central and Eastern United States
CIS	Containment Internal Structure
COLA	combined license application
CPNPP	Comanche Peak Nuclear Power Plant
CSDRS	certified seismic design response spectra
DCD	Design Control Document
DOE	Department of Energy
ECL	effluent concentration limit
E/R	Electrical Room
EPRI-SOG	Electric Power Research Institute Seismicity Owners Group
ER	Environmental Report
ESW	Essential Service Water
ESWPT	Essential Service Water Pipe Tunnel
FDN	foundation
FE	finite element
FIRS	foundation input response spectra
FSAR	Final Safety Analysis Report
G&D plan	grading and drainage plan



ACRONYMS + ABBREVIATIONS

Acronym/Abbreviation	Definition
GMPE	ground motion prediction equation
GMRS	ground motion response spectra
GWL	groundwater level
HAE	high assurance evaluation
HB	high bound
HVAC	heating, ventilating, and air conditioning
IBR	incorporated by reference
IHCP	Integrated Hydrology Closure Plan
ISCP	Integrated Seismic Closure Plan
ISRS	in-structure response spectra
LB	lower bound
LMSM	lumped mass stick model
MCR	Main Control Room
MESE	Mesozoic and younger extended crust
MSM	modified subtraction method
NEI	Nuclear Energy Institute
NMESE	non-Mesozoic and younger crust
NMSZ	New Madrid Seismic Zone
PBSRS	Performance Based Surface Response Spectra
PCCV	Pre-stressed Concrete Containment Vessel
PEZ	Paleozoic Extended Zone
PMP	Probable Maximum Precipitation
PRA	Probabilistic Risk Assessment
PS/B	Power Source Buildings



ACRONYMS + ABBREVIATIONS

Acronym/Abbreviation	Definition
PSFSV	Power Source Fuel Storage Vault
PSHA	Probabilistic Seismic Hazard Analysis
RAI	Response to Additional Information
R/B	Reactor Building
RCG	Rough Creek Graben
RGR	Rio Grande Rift
RLME	Repeated Large Magnitude Earthquake
RR	Reelfoot Rift
RVT	random vibration theory
SCOR	soil column outcrop response
SCP	strain-compatible profiles
SCR	Squaw Creek Reservoir
SCSR	soil column surface response
SDOF	single degree of freedom
SER	safety evaluation report
SMA	seismic margin analysis
SRPA	seismic probabilistic risk assessment
SRSS	square root of sums of squares
SSC	seismic source characterization
SSC	structures, systems, and components
SSE	safe shutdown earthquake
SSHAC	Senior Seismic Hazard Analysis Committee
SSI	soil structure interaction
SSSI	structure soil structure interaction



ACRONYMS + ABBREVIATIONS

Acronym/Abbreviation	Definition
TB	Turbine Building
TMF	Twin Mountain Formation
UB	upper bound
UHRS	uniform hazard response spectra
UHS	Ultimate Heat Sink
UHSRS	Ultimate Heat Sink Related Structure
US-APWR	United States Advanced Pressurized-Water Reactor
UTR	Update Tracking Report
V&V	verification and validation