Enclosure 2 to WLG2013.12-01
Westinghouse "Duke Lee CEUS Seismic Analyses" Presentation
(NON-PROPRIETARY Version)
(103 pages including cover page)

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Duke Lee CEUS Seismic Analyses

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NRC Meeting
December 12, 2013

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Agenda

- Introduction
- High Frequency Seismic Input
- Evaluation Methodology
- General Selection Screening Criteria
- Nuclear Island Modeling approach
- Comparison of CSDRS, HRHF and William S. Lee site-specific Response Spectra
- Comparison of CSDRS, HRHF and William S. Lee site-specific Forces
- Piping Force Comparisons
- Validity of the AP1000 Safety-Related Electrical Equipment Testing for Duke Lee
- Adjacent Structures Assessment

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Introduction

- **The AP1000 DCD defines two spectra that the COL applicant can compare their site GMRS**
  - Certified Seismic Design Response Spectra (CSDRS)
  - Hard Rock High Frequency (HRHF)
- **Design calculations for the majority of the AP1000 equipment are based on the CSDRS**
- **HRHF methodology described in DCD Rev 19 did not require an evaluation of the total plant, but a review of a selected sample of structures and equipment**
- **The seismic design of the selected sample was shown to be governed by CSDRS and not HRHF.**

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Types of Spectra to be discussed

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High Frequency Seismic Input

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High Frequency Seismic Input

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Evaluation Methodology

(as described in DCD Rev 19 Appendix 3I)

- Select representative systems, structures, and components by screening
  - *potentially sensitive to HF input*
  - *in locations where exceedances occurred*
- Acceptability of this sample is considered sufficient to demonstrate that the AP1000 design is controlled by the CSDRS.
- Obtain FRS using a soil structure interaction code
  - *ACS SASSI - incoherence, 25 simulations*
  - *Modified ni20 model that matches closer to more refined models.*
- Perform evaluations of selected equipment
  - *Show CSDRS forces are higher than Duke Lee forces*
  - *Show that the Duke Lee forces are very similar to HRHF*

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General Selection Screening Criteria

to demonstrate acceptability of the AP1000 for the Duke Lee motion

- Equipment exhibits significant modal response within the region of high frequency amplification
- Equipment where a significant portion of the total stress comes from the seismic contribution
- Location in areas of the plant that are susceptible to large HF seismic inputs. component safety function during (SSE) event
- Potential failure modes due to an SSE

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Nuclear Island Modeling approach

- **Introduction**
- **Building Model Updates**
  - Changes due to detailed design: ni10 and ni20
  - Changes to improve building representation: ni20
- **Assessment of Changes:**
  - Establish that the Duke Lee ni20 SASSI model is a conservative representation of nuclear island dynamic behavior by comparing it to the more refined ni10 model (ni10r9 vs. ni20u)
  - Assess how much of a FRS reduction is obtained from the more realistic SASSI ni20 model (ni20r (DCD) vs. ni20u)

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Nuclear Island Modeling approach

Introduction

- The ni10 model was created for the seismic design during the AP1000 hard rock certification
- Due to the limitations of the SASSI program, the ni20 was created to be used only for the soil sites where soil structure interaction was needed to be performed
- The ni20 from the beginning gave a bigger response than the ni10 at frequencies higher than 10 Hz. This was not considered a problem since for a CSDRS type input, hard rock governed at the higher frequencies
- When the incoherent method using SASSI became an acceptable method to evaluate hard rock high frequency, the ni20 with its conservative response (> 10 Hz) had to be used.
- Knowing that Duke Lee had a higher seismic input than HRHF, Westinghouse has made a number of improvements to obtain a more realistic ni20 response.

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Nuclear Island Modeling approach

NI20R to NI20U Building Model Updates

- "Minor" layout and structural changes such as size of wall opening, beam sections, and module updates.
- Equipment mass updates
- Revised upper *Pressurizer* support stiffness
- Incorporation of updated Reactor Vessel and Internals model
- Reactor Pressure Vessel support stiffness
- Various model modifications to better match the seismic response of the more detailed NI10 model
- Removed IRWST water lumped mass elements, and replaced with brick elements for benefits of differential water motion

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Nuclear Island Modeling approach

Incorporation of Detail Design Changes – Auxiliary Building

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Nuclear Island Modeling approach

Incorporation of Detail Design Changes – Auxiliary Building

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Nuclear Island Modeling approach

Incorporation of Detail Design Changes – Auxiliary Building

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Nuclear Island Modeling approach

Incorporation of Detail Design Changes – Major Equipment Mass

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Nuclear Island Modeling approach

Incorporation of Modeling Changes that make the NI20 closer to the NI10

The NI20 model was also updated to obtain a better match between NI10 and NI20:

- Closer match of corresponding the element properties
- Better representation of the orthotropic material properties used in NI10
- Better representation of beam offset properties used in NI10

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Nuclear Island Modeling approach

Incorporation of Modeling Changes that make the NI20 closer to the NI10

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Nuclear Island Modeling approach

Incorporation of Modeling Changes that make the NI20 closer to the NI10

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Nuclear Island Modeling approach

Incorporation of Modeling Changes that make the NI20 closer to the NI10

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Assessment of Model Changes: ni10r9 vs ni20u

FRS Comparison

- Two models are compared:
  - ***NI10r9****- incorporates all of the significant AP1000 detailed design changes*
  - ***NI20u*** *- incorporates all of the significant AP1000 detailed design changes as well as modeling changes incorporated to obtain a closer match to ni10*
- Both models have the same:
  - *Boundary conditions (nodes fixed at 60.5' elevation)*
  - *CSDRS input time history*
- Floor response spectra (FRS) comparison performed at the six critical locations

LEGEND

—⊖— NI10r9 (-asb, or -cis)

- - - - NI20u (Duke Lee)

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Assessment of Model Changes: ni10r9 vs ni20u

Containment internal structures at elevation of reactor vessel support

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Assessment of Model Changes: ni10r9 vs ni20u

Auxiliary building NE corner at elevation 116'-6" – Control Room Floor

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Assessment of Model Changes: ni10r9 vs ni20u

Containment operating floor

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Assessment of Model Changes: ni10r9 vs ni20u

Shield building at fuel building roof

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Assessment of Model Changes: ni10r9 vs ni20u

Steel containment vessel at polar crane support

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Assessment of Model Changes: ni10r9 vs ni20u

Shield building roof

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Assessment of Model Changes: ni10r9 vs ni20u

Summary

- Description of typical changes that have occurred as the AP1000 project finalizes the detail design were described
- The Duke Lee ni20 model incorporates the major detailed design changes that have occurred
- The Duke Lee ni20 model is matches better than past ni20 models to the more refined ni10 model
- The Duke Lee ni20 model is still a conservative representation of the more refined ni10 model

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Assessment of Model Changes: ni20r (DCD) vs ni20u

- Two models are compared:
  - ***NI20r*** *- used to generate the floor response spectra defined in the DCD and used in equipment design*
  - ***NI20u*** *- incorporates all of the significant AP1000 detailed design changes as well as modeling changes incorporated to obtain a closer match to ni10*
- Both models have the same:
  - *subsurface conditions (soil layer depth, V_s, V_p, α)*
  - *HRHF input time history*
  - *SASSI parameters*
- Floor response spectra (FRS) comparison performed at the six critical locations

LEGEND

——— NI20r (DCD)

- - - - NI20u (Duke Lee)

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Assessment of Model Changes: ni20r (DCD) vs ni20u

Containment internal structures at elevation of reactor vessel support

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Assessment of Model Changes: ni20r (DCD) vs ni20u

Auxiliary building NE corner at elevation 116'-6" – Control Room Floor

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Comparison of Response Spectra: HRHF vs Duke Lee

Containment operating floor

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Assessment of Model Changes: ni20r (DCD) vs ni20u

Shield building at fuel building roof

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Assessment of Model Changes: ni20r (DCD) vs ni20u

Steel containment vessel at polar crane support

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Assessment of Model Changes: ni20r (DCD) vs ni20u

Shield building roof

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Assessment of Model Changes: ni20r (DCD) vs ni20u

Summary of Results

- Comparison was performed using the same time history input and same subsurface conditions
- Three of the six critical locations have negligible differences
- The major reductions occur inside containment where the ni20 model now simulates the orthotropic behavior of the Steel Composite modules inside containment

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Comparison of Response Spectra: HRHF vs Duke Lee

Soil profile comparison: Shear wave velocity

- HRHF vs Duke Lee Soil profile
- CSDRS, HRHF (incoherent) and William S. Lee site-specific seismic responses (incoherent) are compared at the six critical locations defined in the DCD.
- Floor response spectra (FRS) with coherent and incoherent considerations at a number of locations in the NI
- Estimate the effect of incoherence
- There are some exceedances, mostly above the 15 Hz region.
- These curves are typical of the plant comparative responses found throughout the plant.

LEGEND

———	CSDRS
———	HRHF
- - - -	Duke Lee

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Comparison of Response Spectra: HRHF vs Duke Lee

Soil profile comparison: Shear wave velocity

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Comparison of Response Spectra: HRHF vs Duke Lee

Containment internal structures at elevation of reactor vessel support

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Comparison of Response Spectra: HRHF vs Duke Lee

Auxiliary building NE corner at elevation 116'-6" – Control Room Floor

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Comparison of Response Spectra: HRHF vs Duke Lee

Containment operating floor

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Comparison of Response Spectra: HRHF vs Duke Lee

Shield building at fuel building roof

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Comparison of Response Spectra: HRHF vs Duke Lee

Steel containment vessel at polar crane support

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Comparison of Response Spectra: HRHF vs Duke Lee

Shield building roof

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Comparison of Response Spectra: Coherent vs Incoherent

- Estimate the effect of incoherence
- CSDRS and William S. Lee site-specific seismic responses (coherent and incoherent) are compared.
- Floor response spectra (FRS) with coherent and incoherent considerations at a number of locations in the NI
- There are some exceedances, mostly above the 15 Hz region.
- These curves are typical of the plant comparative responses found throughout the plant.

LEGEND

———	CSDRS
- - - -	DL Coherent
———	DL Incoherent

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Comparison of Response Spectra: Coherent vs Incoherent

Auxiliary Shield Building (ASB) Spectra at Elevation 327.4

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Comparison of Response Spectra: Coherent vs Incoherent

Containment Operating Floor Spectra – East Side (Elevation 134.25')

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Comparison of Response Spectra: Coherent vs Incoherent

Containment Operating Floor Spectra – West Side (Elevation 134.25')

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Comparison of Response Spectra: Coherent vs Incoherent

ASB at Northeast Corner (Elevation 134.5')

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Comparison of Response Spectra: Coherent vs Incoherent

ASB at Fuel Building Roof (Elevation 179.56')

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Comparison of Response Spectra: Coherent vs Incoherent

Floor Response Spectra (FRS) Nodes – West Wall at Elevation 180'

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Comparison of Response Spectra: Coherent vs Incoherent

Reactor Coolant Pump

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Comparison of Response Spectra: Coherent vs Incoherent

Seismic Response Spectra for South Side of Shield Building

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Comparison of Response Spectra: HRHF vs Duke Lee

Summary of Results

- **Incoherent FRS results are lower than coherent especially at the higher frequencies**
- **Duke Lee Soil profile is softer then the HRHF soil profile at the top 50 feet**
- **Duke Lee FRS (incoherent) is in general significantly lower than CSDRS, and higher than HRHF, at frequencies less than 10 Hz**
- **Duke Lee FRS (incoherent) is in general higher than CSDRS, and lower than HRHF, at frequencies higher than 15 Hz**
- **Duke Lee FRS for the six critical locations and for other locations is bounded by either CSDRS or HRHF with limited exceptions**
- **Therefore, for all equipment a selected sample would demonstrate acceptability**

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Comparison of Forces: CSDRS, HRHF and Duke Lee

- Auxiliary building
- Shield Building
- Containment Internal Structures (CIS)
- Major Equipment Supports
- RC Loop Nozzles

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Comparison of Forces: CSDRS vs Duke Lee

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Comparison of Forces: CSDRS vs Duke Lee

Shield Building RC/SC connection region

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Comparison of Forces: CSDRS vs Duke Lee

Shield Building Wall

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Comparison of Forces: CSDRS vs Duke Lee

Refueling Wall

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Comparison of Forces: CSDRS vs Duke Lee

South West Steam Generator Wall

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Comparison of Forces: CSDRS vs Duke Lee

CA02 Wall

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Comparison of Forces: CSDRS vs Duke Lee

RPV Supports

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Comparison of Forces: CSDRS vs Duke Lee

SG Supports

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Comparison of Forces: CSDRS vs Duke Lee

RCL Nozzles

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Comparison of Forces: HRHF vs Duke Lee

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Comparison of Forces: HRHF vs Duke Lee

CA02

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Comparison of Forces: HRHF vs Duke Lee

Shield Building RC/SC connection region

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Comparison of Forces: HRHF vs Duke Lee

Shield Building Wall

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Comparison of Forces: HRHF vs Duke Lee

Refueling Wall

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Comparison of Forces: HRHF vs Duke Lee

South West Steam Generator Wall

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Comparison of Forces: HRHF vs Duke Lee

CA02 Wall

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Comparison of Forces

Summary

- **Duke Lee site specific building forces are enveloped by the generic CSDRS envelope building forces**
- **Duke Lee site specific equipment support forces are enveloped by the generic CSDRS envelope equipment support forces**
- **Duke Lee site specific forces are for the most part larger than the HRHF forces**

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Piping Force Comparison

- **In the AP1000 project, piping is being designed for both the CSDRS and HRHF**
- **Three piping packages are compared to determine the adequacy of the design for Duke Lee**
  - ADS 4th Stage East Compartment:
  - Surge Line:
  - SFS from Aux. Area 4 SCV to Aux. Area 6 Pumps
- **Maximum piping stresses and support forces were compared**

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ADS 4th Stage East Compartment (RCS-PLR-030)

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Class 1:Ten Highest Pipe Stress points: HRHF vs Duke Lee CEUS & CSDRS vs Duke Lee CEUS

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HRHF and Duke Lee-CEUS **CSDRS and Duke Lee-CEUS**

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Surge Line (RCS-PLR-040)

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Class 1:Ten Highest Pipe Stress points: HRHF vs Duke Lee CEUS & CSDRS vs Duke Lee CEUS

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HRHF and Duke Lee-CEUS

CSDRS and Duke Lee-CEUS

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SFS from Auxiliary Building Area 4 SCV to Auxiliary Building Area 6 SFS Pumps (SFS-PLR-350)

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Class 2:Ten Highest Pipe Stress points: HRHF vs Duke Lee CEUS & CSDRS vs Duke Lee CEUS

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HRHF and Duke Lee-CEUS

CSDRS and Duke Lee-CEUS

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Support load Comparisons

-**ADS 4th Stage East Compartment**: Duke Lee CEUS support loads are enveloped by both CSDRS and HRHF at all supports

-**Surge Line**: Duke Lee CEUS support loads are enveloped by both CSDRS and HRHF at all supports

-**SFS from Aux. Area 4 SCV to Aux. Area 6 Pumps**: Duke Lee CEUS support loads are enveloped by both CSDRS and HRHF at all supports

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Piping Analyses

- The AP1000 piping is designed to both CSDRS and HRHF
- Westinghouse believes that this designed can be demonstrated to be adequate without having to perform analyses for all of the piping packages for Duke Lee

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Validity of the Ap1000 Safety-Related Electrical Equipment Testing for Duke Lee

- For equipment that exhibits dominant natural frequencies which coincide with the peak spectral acceleration of the high frequency required response spectra (RRS) requires additional evaluation to verify acceptability.
- High frequency seismic testing has been conducted as a supplemental test to low frequency seismic excitation for equipment sensitive to high frequency
- The required response spectra used for the high frequency susceptible equipment was an envelop of CSDRS and HRHF
- The Duke Lee Spectra is compared at several AP1000 RRS locations

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Validity of the Ap1000 Safety-Related Electrical Equipment Testing for Duke Lee

- **Enveloped FRS Curve Comparisons: CSDRS & HRHF vs 1.3 x Duke-CEUS**
  - Enveloped elevations: ASB99'-ASB180', ASB Shield Wall EL. 230'-EL. 327', and CIS99'-CIS160'
  - CSDRS & HRHF curves from Seismic FRS Envelopes (APP-1000-S2C-181) were increased by 30%, thus Duke-CEUS was also multiplied by 1.3 factor
  - Duke-CEUS spectra is less or within 10% of the AP1000 RRS
- **TRS, RRS, and Duke-CEUS Comparison**
  - The comparisons used the same node envelopes
  - Multiplication factors differ per equipment elevation, thus the same multiplication factors used on RRS were used on corresponding Duke-CEUS comparison
  - Duke-CEUS spectra will be shown to be less than the AP1000 TRS

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Duke-CEUS Slight Exceedance (Shield Wall EL. 230'-267')

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Duke-CEUS Slight Exceedance (Shield Wall EL. 230'-289')

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Duke-CEUS Fully Enveloped (ASB-99')

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Duke-CEUS Fully Enveloped (CIS-134')

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PMS Cabinet (Horizontal Direction)

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PMS Cabinet (Vertical Direction)

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NIS SR Auxiliary Panels (Horizontal Direction)

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NIS SR Auxiliary Panels (Vertical Direction)

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NIS IR Auxiliary Panels (Horizontal Direction)

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NIS IR Auxiliary Panels (Vertical Direction)

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MCR/RSR Transfer Panel (Horizontal Direction)

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MCR/RSR Transfer Panel (Vertical Direction)

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Summary of Results

- The SASSI model used for Duke Lee Seismic incorporates changes that have occurred due to detail design modifications
- The SASSI model used for Duke Lee Seismic analysis is a more realistic yet still conservative representation of the nuclear island dynamic behavior
- The words used to describe the nuclear island seismic models in the DCD are applicable to the ni20 Duke Lee model
- FRS comparisons have been performed that show the conservatism of the Duke Lee model and the level of improvement obtained from the ni20 (DCD) model
- Duke Lee FRS is comparable to the HRHF FRS
- Duke Lee FRS for the six critical locations and for other locations is bounded by either CSDRS or HRHF with limited exceptions

The adequacy of the AP1000 design at the Duke Lee site can be demonstrated by using the methodology described in DCD appendix 3I

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Summary of Results

- CSDRS Forces envelop Duke Lee Forces for the following:
  - Auxiliary Building
  - Shield Building
  - Containment Internal Structures
  - Reactor Coolant Loop
  - Steel Containment Vessel
  - Pressurizer
- *CSDRS RCL Forces envelop Duke Lee RCL Forces*
- *The AP1000 testing can be shown to be adequate for Duke Lee*
- *Since AP1000 piping is being already being designed for both CSDRS and Duke Lee, and the Duke Lee spectra is in general lower than HRHF at the higher frequencies, there is no need to reanalyzed all of the piping packages for Duke Lee*

The adequacy of the AP1000 design at the Duke Lee site can be demonstrated by using the methodology described in DCD appendix 3I for all equipment

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Adjacent Structures SSI Analysis

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Duke CEUS SCII Preliminary SSI

The purpose of Duke Lee Site-Specific SCII analysis:

- Update adjacent structures SSI analysis for SCII Annex and Turbine 1st Bay buildings, Duke Lee site conditions and 2012/2013 seismic input including:
  - 2012 Seismic Source Characterization (NUREG-2115) and 2013 Ground Motion Model (GMM), PBSRS envelope and corresponding matched time histories; and
  - Strain compatible soil properties (velocity and damping) for backfill material with a 40-foot backfill thickness consistent with DCD.

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Duke CEUS SCII Preliminary SSI

Typical 2D East-West SASSI Embedded Model – NI and Annex Building

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Duke CEUS SCII Preliminary SSI

Typical 2D North-South SASSI Embedded Model – NI and Turbine Building

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Duke CEUS SCII Preliminary SSI

Duke Lee SCII 2D SSI analyses are ongoing and it is anticipated that the:

- Duke Lee Annex and Turbine 1st Bay FRS will be enveloped by the corresponding AP1000 SCII FRS envelop.
- Duke Lee Annex and Turbine 1st Bay forces and moments at the base are enveloped by the AP1000 SCII CSDRS forces and moments.
- Relative displacements between Duke Lee NI and Annex and Turbine 1st Bay buildings, at base and top of structure, will be less than DCD 2-inch and 4-inch gaps, respectively.

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Enclosure 3 to WLG2013.12-01
Westinghouse Application Letter CAW-13-3836
And Affidavit
(7 pages including cover page)

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Project letter: DCP_WLG_000018

Our ref: CAW-13-3836

December 12, 2013

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: **Transmittal of AP1000 Turkey Point Site Specific Seismic Evaluation Report (Proprietary and Non-Proprietary)**

The proprietary information for which withholding is being requested in the above-referenced letter is further identified in the affidavit signed by Westinghouse Electric Company LLC. The affidavit accompanying this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and address with specificity the considerations listed in paragraph (b) (4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by **Duke Lee.**

Correspondence with respect to the proprietary aspects of this application for withholding or the accompanying affidavit should reference CAW-13-3836 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania 16066.

Very truly yours,

Robert B. Sisk
Program Manager Korea/UAE

CAW-13-3836
December 12, 2013

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

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COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared **Robert B. Sisk**, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Robert B. Sisk
Program Manager Korea/UAE

Sworn to and subscribed
before me this 12th day
of December 2013.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Linda J. Bugle, Notary Public
City of Pittsburgh, Allegheny County
My Commission Expires June 18, 2017
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Notary Public

(1) I am Program Manager Korea/UAE, Westinghouse Electric Company, LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component

may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390; it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld from within the "**Duke Lee CEUs Seismic Analyses**" presentation (Proprietary) (DCP_WLG_000018), for submittal to the Commission, being transmitted by Duke Lee letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with Transmittal of the **Duke Lee CEUs Seismic Analyses presentation**, and may be used only for that purpose.

The information requested to be withheld reveals details of the AP1000 design; timing and content of procurement; sequence and method of construction; and timing and content of inspection and testing. This information was developed and continues to be developed by Westinghouse. The information is part of that which enables Westinghouse to manufacture and deliver products to utilities based on proprietary designs.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar commercial power reactors without commensurate expenses.

The information requested to be withheld is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

Enclosure 4 to WLG2013.12-01
Proprietary Information Notice and Copyright Notice
(2 pages including cover page)

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.