#### ENCLOSURE 4

#### Westinghouse Non-Proprietary Class 3

AP1000 Calorimetric Power Uncertainty April 26, 2010 Presentation - (Non-Proprietary)

# AP1000 Calorimetric Power Uncertainty

Rockville, MD

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Westinghouse Non-Proprietary Class 3



### Agenda

- Purpose
- Issue Background
- AP1000 Methodology
- AP1000 Conclusion
- AP1000 Plan

#### Purpose

The purpose of this meeting is to facilitate conversation between Westinghouse (WEC) and the NRC concerning the AP1000 1% calorimetric power uncertainty issue.

- Present the AP1000 calorimetric methodology
- Propose a path for issue closure
- Obtain NRC feedback



# **Issue Background**

- Certified AP1000 Design claimed 1% calorimetric power uncertainty
  - Section 6.2, "Containment Systems"
    - DCD, Rev. 15 & NUREG-1793
- AP1000 extended 1% uncertainty to other analyses (DCD Ch. 15) in the amended design certification request
- RAI-SRP15.0-SRSB-02 issued in November 2008 requested a basis for the 1% uncertainty claim



### Issue Background (cont.)

- WEC RAI response submitted in May 2009
  - Created an "Action Required by COL Holder" for submittal and review of plant calorimetric uncertainty in accordance with 10 CFR 50 Appendix K
- Staff requested closure of COL item in January 2010
  - Action Required by COL Applicant
- WEC proposed relocation of plant calorimetric uncertainty documentation into an ITAAC
  - Staff has expressed concern over "level of detail" of the proposed

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# AP1000 Methodology

- AP1000 utilizes two forms of feedwater flow measurement
  - Venturi (consistent with ASME PTC 19.5 requirements)
  - Ultrasonic Flow Meter
- WEC desires to preserve a standard plant concept
  - Future development of suppliers
  - Flexibility in plant-specific procurement activities
- WEC commits to using NRC licensed technologies for main feedwater flow measurement



# AP1000 Methodology (cont.)

- AP1000 Design Certification claims a 1% power uncertainty
- WEC will apply a standard heat balance to the calculation of the AP1000 power uncertainty
  - WEC will submit a bounding power uncertainty topical report for the AP1000 [Action Item – WEC – May 2010]
  - Approach has been approved by NRC at multiple sites

Documents compliance with 10/CER-50 Appendix K

- Every AP1000 will be required to provide plant-specific uncertainty documentation
  - Shall reflect as-built instrumentation parameters

# AP1000 Methodology (cont.)

- Instrumentation inputs to power measurement
  - Steamline pressure
  - Feedwater pressure
  - Feedwater temperature
  - Steam generator blowdown flow
  - Feedwater flow
- Uncertainties assumed in the topical report are bounding and credible for all instrument applications
  - Based on history of NRC approved submittals





# **AP1000** Conclusion

- AP1000 makes a licensing claim of 1% power uncertainty
  - Claim does not affect the safety of the AP1000 design
  - Claim requires applicants to ensure compliance per the licensing basis to support operation
    - Plant-specific as-built uncertainty
- WEC shall document the bounding AP1000 uncertainty methodology
  - Shall be referenced by subsequent applicant submittals



# AP1000 Plan

- WEC to provide generic AP1000 uncertainty topical report
  - To be submitted by May 31, 2010
- Request NRC acceptance review
  - To be completed by June 30, 2010
  - Timeframe consistent with DCD Rev. 18
- DCD revised to reference WEC report
  - ITAAC to reference bounding uncertainty topical report

