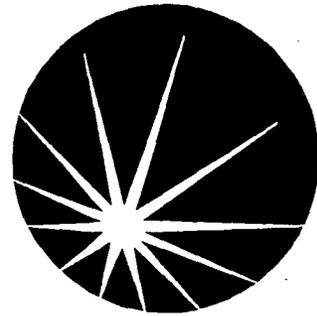


Enclosure 3

***Comanche Peak Steam Electric Station  
Stretch Power Uprate***



**TXU**  
Power

***May 23, 2007***

*Enclosure 2*

## TXU Power Participants



Tim Hope

- Regulatory Performance Manager

James Boatwright

- Engineering Services Manager, Westinghouse-Dallas

Jimmy Seawright

- Consulting Regulatory Affairs Engineer

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- Familiarize NRC reviewers with TXU Power's plans to replace current accident analysis methodologies with standard Westinghouse, NRC-approved, safety analysis methodologies
- Answer questions to facilitate the review process as much as possible

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## CPSES Uprate History

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### UNIT 1

- Fall 2002
  - 1.4% Thermal Uprate – 3411 to 3458 MWt

### UNIT 2

- Fall 1999
  - 1% Thermal Uprate – 3411 to 3445 MWt
- Fall 2001
  - 0.4% Thermal Uprate – 3445 to 3458 MWt

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## Comanche Peak Uprate Team

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- Project team
  - TXU Power
  - Shaw Stone & Webster
  - Westinghouse
  - Siemens
- BOP analyses – Shaw Stone & Webster
- NSSS analyses – Westinghouse
- Turbine / generator analyses & hardware – Siemens

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## Methodology Transition Project Overview



### •Scope of Changes:

- Core design, plant startup, core follow
  - CASMO/SIMULATE → Phoenix/ANC
- Peaking factor measurement and related functions
  - DETECTOR → BEACON-TSM
- Core subchannel evaluations
  - EPRI VIPRE-01 → W-VIPRE
  - Same fuel-type dependent DNB correlations
- Fuel Rod Design – no changes

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## Methodology Transition Project Overview



- Non-LOCA transients and accidents
  - EPRI RETRAN-02 → W-RETRAN-02
  - Supplemented by 1-D kinetics for selected events
- Small Break LOCA
  - ANF-RELAP → NOTRUMP
- Large Break LOCA
  - Siemens' App. K EXEM → ASTRUM
- Containment analysis
  - Standard W LOCA and steam line break mass & energy releases
  - CONTEMPT-LT → GOTHIC
- Reactor Protection System Uncertainty Calculations
  - Adopted only if revision required
  - Differences in Allowable Value Philosophies

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## Project Overview



- CPSES SPU is similar to other recent SPUs
- Maintain plant operations consistent with current practice
- Same fuel design
- Design and operating margin will be protected to assure continued safe and reliable plant operation
- Take advantage of Unit 1 new steam generators

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## NSSS Analyses



- Key NSSS Analysis Input Parameter Changes

	3458 MWt	3612 MWt
<b>Licensed core thermal power</b>		
<b>T-avg</b>		574.2 to 589.2°F
Nominal full power values	U1 584.2°F	U1 585.4°F
	U2 589.2°F	U2 589.2°F
<b>Feedwater temperature</b>		390°F to 450.3°F
Nominal full power values	~ 445°F	U1 450.3 °F
		U2 445.8°F
<b>SG Tube plugging range</b>	U1 0 – 10%	0% to 10%
	U2 0 – 5%	

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### Required Tech Spec Changes – enabling changes



- Standard Westinghouse NRC-approved methodologies:
  - WCAP-14882-P-A, "RETRAN-02 Modeling and Qualification for Westinghouse Pressurized Water Reactor Non-LOCA Safety Analysis," April 1999.
  - WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," August 1985.
  - WCAP-10054-P-A, Addendum 2, Revision 1, "Addendum to the Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code: Safety Injection into the Broken Loop and COSI Condensation Model," July 1997.
  - WCAP-10079-P-A, "NOTRUMP, A Nodal Transient Small Break and General Network Code," August 1985.
  - WCAP-16009-P-A, "Realistic Large-Break LOCA Evaluation Methodology Using the Automated Statistical Treatment of Uncertainty Method (ASTRUM)," January 2005.

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### Required Tech Spec Changes – conforming changes



- TS 3.2, "Power Distribution Limits"
  - Adopt standard Westinghouse Relaxed Axial Offset Control (RAOC) methodology
  - Consistent with WCAP-10216-P-A, Revision 1A, "Relaxation of Constant Axial Offset Control FQ Surveillance Technical Specification"
    - Already in TS 5.6.5b
  - Adopt Improved Standard Tech Spec 3.2.1B and 3.2.3B
    - modified for CPSES' N-16 (vs.  $\Delta T$ ) overpower function

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## Balance Of Plant (BOP) Analyses



- **Component Evaluations**
- **System Evaluations**
- **BOP analyses include:**
  - High Energy Line Break Outside Containment
  - Subcompartments
  - Ultimate heat sink
  - Program reviews
  - Electrical systems

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## BOP Uprate Modifications



- **Turbine / Generator (T/G)**
  - New HP turbine
  - New hydrogen cooler for Main Generator
  - T/G digital control & voltage regulator setpoint changes
- **Electrical**
  - Upgrade isophase bus duct cooling
- **Feedwater / Heater Drains**
  - Upgrade Heater Drain pump capacity
- **Turbine Plant Cooling Water (TPCW)**
  - Upgrade exciter air cooling capacity
- **Instrumentation (I&C)**
  - BOP setpoints & scaling changes
  - Plant Computer changes

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### Required Tech Spec Changes – cycle-specific applications



#### •TS 3.3.1 & TS 3.3.2, RTS Instrumentation & ESFAS Instrumentation

- Power Range Neutron Flux - High & - Low
  - Allowable Value (Tech Specs) & Nominal Trip Setpoint (TS Bases)
- Overtemperature / Overpower N-16
  - Allowable Value (Tech Specs) & Nominal Trip Setpoint (TS Bases)
- Steam Generator Water Level - Low-low & - High-High
  - Allowable Value (Tech Specs)

#### •TS 3.4.10

- Revise pressurizer safety valve set pressure and as-found tolerance from 2485 psig  $\pm 1\%$  to 2460 psig  $+1\%$ ,  $-3\%$ 
  - As found tolerance change also implements corrective action identified in LER 2-05-003

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### Other Related Licensing Actions



#### •LOCA Evaluation Models

- To be submitted for NRC review per 10CFR50.46 and SER requirements
- ASTRUM Large Break Evaluation Model
- NOTRUMP Small Break Evaluation Model

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## Anticipated License Amendment Requests

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### Operating license

- Rated Thermal Power

### Technical Specifications

- Rated Thermal Power definition (TS 1.1)
- COLR (TS 5.6.5b administrative changes)

### Other cycle specific changes addressed through Methodology Transition

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## Active and Planned Licensing Activities

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### Uprate LAR assumes prior implementation of the following LARs:

- Transition methodology & associated cycle specific changes (TXX-07063)
- Turbine valve testing interval (TXX-07081)

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**Summary**

TXU Power will adopt standard Westinghouse safety analysis methodologies beginning with Unit 2 Cycle 11 in the spring of 2008 followed closely by Unit 1 Cycle 14 in the fall of 2008

All methodologies have been previously approved by the NRC for application at the Comanche Peak class of plants

All methodologies are being applied in accordance with the NRC's Safety Evaluation Reports on the methodologies

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**Summary**

Enabling Tech Spec changes were submitted for NRC review in April 2007

Conforming Tech Spec changes for BEACON and RAOC were submitted in April 2007

SBLOCA and ASTRUM Evaluation Models to be submitted in July 2007

First application of cycle-specific analyses are on-going; expected to bound future cycles

Cycle-specific Tech Spec changes to be submitted no later than September 2007

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