

US-APWR Design Centered Working Group Meeting with NRC

June 19, 2007

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Agenda

- ☐ Introductions and Opening Remarks– Don Woodlan
- ☐ Integrated Project Team – Bobby Bird
- ☐ US-APWR Design Overview – Mike Bennett
- ☐ CPSES 3 & 4 Site Description/Layout – Tim Gilder
- ☐ Project Schedule – Mike Bennett
- ☐ COLA/DC Coordination – Jeff Lietzow
- ☐ Pre-Application Activity – Bob Evans
- ☐ Summary – Mitch Lucas

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Introductions and Opening Remarks

Don Woodlan
Manager, Nuclear Regulatory Affairs
TXU Power

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Opening Remarks

- ☐ **Mitch Lucas (TXU Power)**
Vice President Engineering and Support
- ☐ **Noriyuki Kuwata (MNES)**
Executive Vice President, MNES

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Meeting Objectives

- ☐ Overview of US-APWR DCWG
- ☐ Introduce the CPSES 3&4 Team
- ☐ Describe the CPSES 3&4 Site
- ☐ Describe the COLA plans and schedules and work accomplished to date
- ☐ Discuss potential topics for future DCWG interactions with the NRC
- ☐ Obtain NRC comments/feedback

DCWG Background

- ☐ Joint Industry/NRC understanding (early 2006) that single NRC review of common technical issues benefits both NRC and Industry
- ☐ RIS 2006-06 issued May 2006
 - Documents NRC position on a Design-Centered Review Approach
 - Encouraged standardization to extent feasible
 - Encouraged formation of DCWGs to facilitate approach
 - Requested information concerning standardization

US-APWR DCWG

□ US-APWR formation

- TXU April 17, 2007 letter notified NRC of formation of US-APWR DCWG – Responded to RIS 2006-06
- MNES May 29, 2007 letter confirmed MNES participation in US-APWR DCWG

□ US-APWR provided a single response to RIS 2007-08 for MNES and TXU Power

- Letter TXNB-07005 dated 5/31/2007

Integrated Project Team

Bobby Bird
Director, NuBuild Project
TXU Power

Drivers for TXU NuBuild Project

- ❑ **Safety First with all Decisions**
 - Industrial and nuclear safety
 - Employee concerns program
 - Quality drives safety
- ❑ **Competitive Market**
 - Merchant Plant – not a regulated utility
- ❑ **Energy Act**
 - Production Tax Credits
 - Federal Loan Guarantees
- ❑ **Business Case**
 - Economic Justification (Life of Plant)
 - Demand for Power / Market needs
 - Continuous Improvement

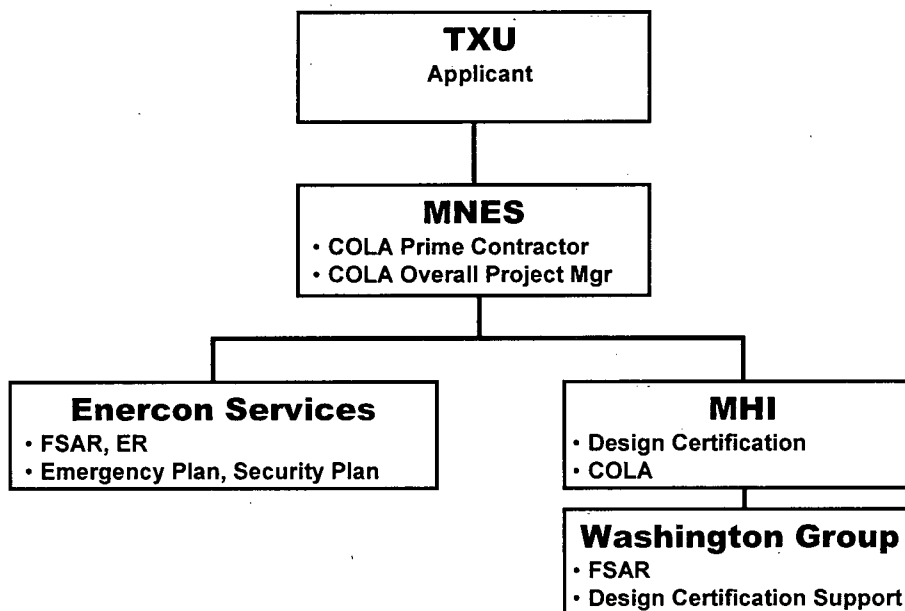
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CPSES Units 3 & 4 Team Members

- ❑ **TXU**
 - Applicant - Organization and Team
- ❑ **Mitsubishi Nuclear Energy Systems (MNES) Inc.**
 - Prime Contractor & Overall Project Management
- ❑ **Mitsubishi Heavy Industries (MHI), Ltd.**
 - Reactor Vendor & Design Certification
- ❑ **Enercon Services, Inc.**
 - Development of FSAR Ch 2, ER, E-Plan, S-Plan
- ❑ **Washington Group International**
 - FSAR, Conceptual Design, DC Support

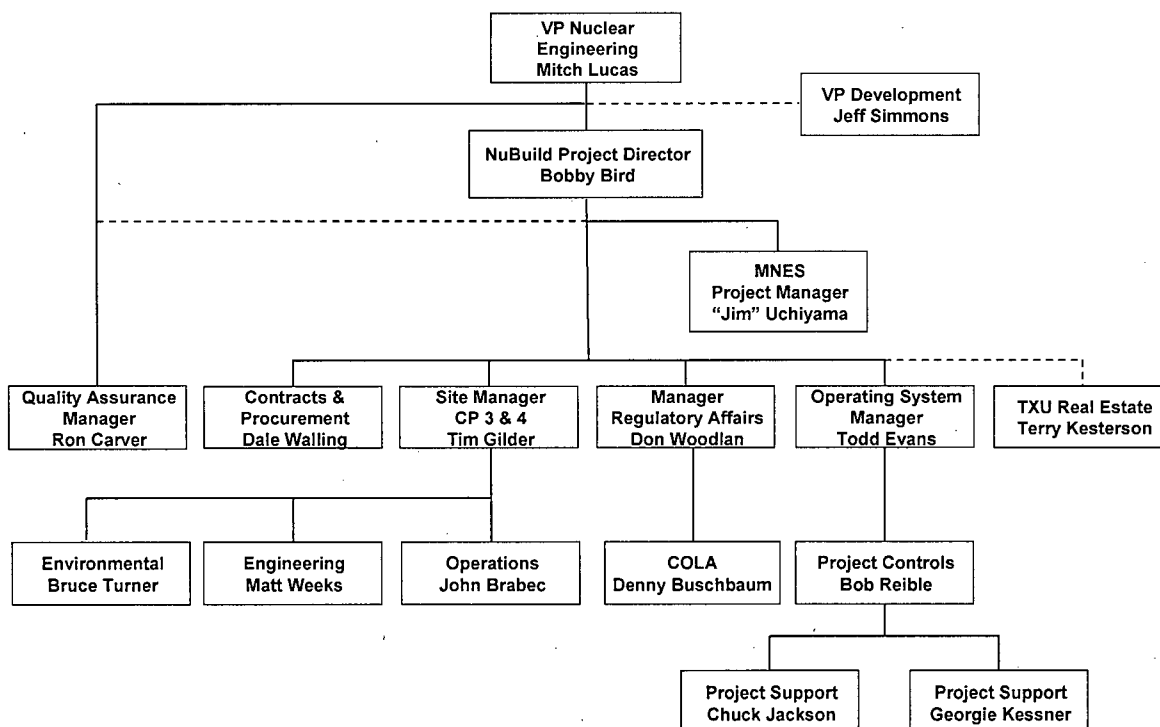
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Integrated Project Team



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TXU NuBuild Organization



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Project Goals

- ❑ Develop and deliver to the NRC a high quality COLA
- ❑ Submit COLA by July 2008
- ❑ Ensure COLA docketing to qualify for PTCs
- ❑ Execute aggressive project schedule by applying “lean” techniques
- ❑ Maximize integration between DC and COLA
- ❑ Provide timely and complete responses to NRC RAIs
- ❑ Develop a business case which provides TXU the best financial alternative to market power to ERCOT

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TXU Nuclear History

- ❑ **Proven track record with CPSES Units 1 & 2**
 - Strong Nuclear Safety Culture
 - High Capacity Factors and Low Forced Outage Rate
 - Replaced Reactor Vessel Head and four Unit 1 steam generators in record 55 days
- ❑ **Industry Involvement**
 - Thermo-Lag Resolution
 - Post 9-11 Security Improvements

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TXU Nuclear History (Cont'd)

☐ **TXU NuBuild Project**

- August 2006 announced 2-6 GW of new nuclear generation
- Early 2007 announced MHI US-APWR as technology
- KKR/TPG offer to purchase TXU
 - Decision to continue CPSES 3 & 4
 - Decision to delay NuBuild greenfield development

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Potential TXU Changes

☐ **Luminant**

- TXU Organization
 - Wholesale/Development/Construction/Generation
- NuBuild organization
- COL Applicant

☐ **Oncor**

- Formerly TXU Electric Delivery
- Transmission/Distribution

☐ **Texas Competitive Electric**

- Formerly TXU Energy
- Retail

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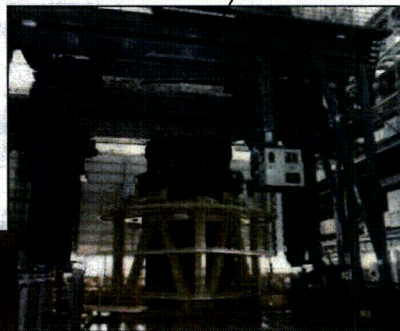
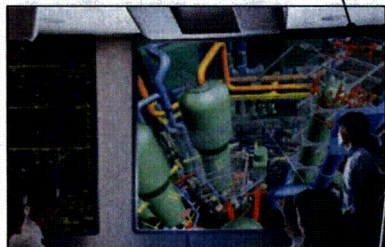
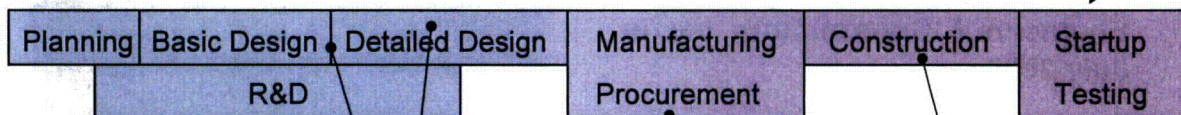
MNES Overview

- ❑ **MNES Incorporated in 2006**
- ❑ **Responsibilities include:**
 - Management & support of MHI/NRC interactions for US-APWR design certification
 - Project Management for US-APWR COLAs
 - Integration of DCD and COLA efforts
- ❑ **Provides infrastructure to support both MHI design certification and US development activities**

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Mitsubishi Heavy Industries, Ltd. Overview

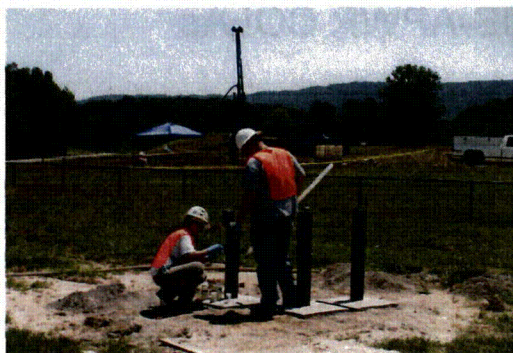
MHI PWR Development, Design, Manufacture & Construction Process



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Enercon Services Overview

- ❑ Approximately 500 nuclear professionals
- ❑ Strengths include project management, engineering, licensing, and environmental



- ❑ Prepared & supported recently approved Grand Gulf ESP
- ❑ Currently developing three other COLAs
- ❑ Team includes William Lettis & Associates Inc. and Fugro West Inc.

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Washington Group International, Inc. Overview

- ❑ Formed by Morrison Knudsen Corp. acquisition of Raytheon Engineers & Constructors, Inc. in July 2000
- ❑ Approximately 25,000 engineering and construction professionals
- ❑ Engineer of record for 38 nuclear units
- ❑ Constructor of record for 21 nuclear units
- ❑ Licensing support for 58 Units
- ❑ Project sites and offices in more than 40 states and over 30 countries

FORMED FROM A RICH HERITAGE

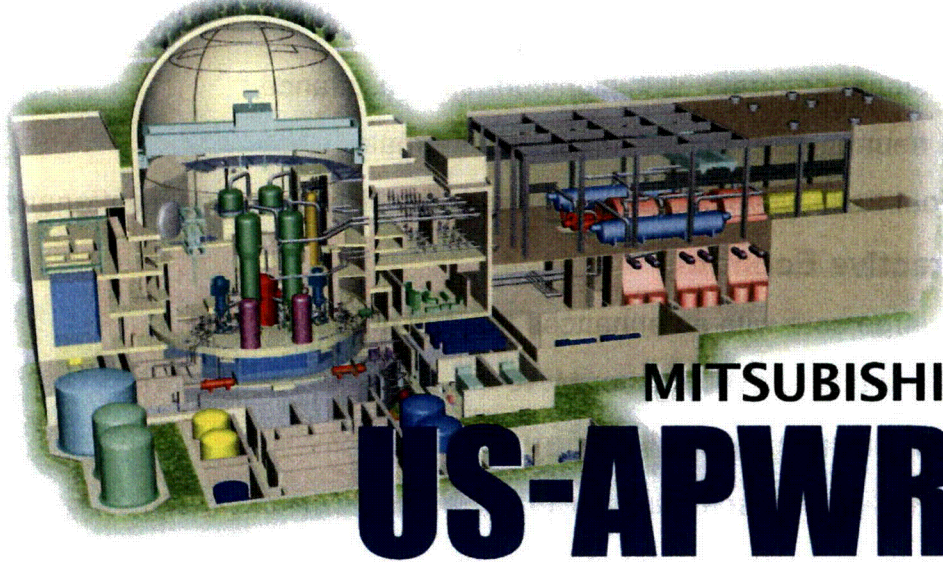
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 LITWIN
 KASLER
 EBASCO
 CATALYTIC
 GIBBS & HILL
 HK FERGUSON
 STEARNS-ROGER
 MORRISON KNUDSEN
 CENTENNIAL ENGINEERING
 WASHINGTON CONSTRUCTION GROUP
 UNITED ENGINEERS & CONSTRUCTORS
 WESTINGHOUSE GOVERNMENT SERVICES
 RAYTHEON ENGINEERS & CONSTRUCTORS



**Washington Group
International**

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US-APWR Design Overview



Michael Bennett, MNES

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US-APWR Design Overview (Cont'd)

- ❑ **Evolutionary (not “Revolutionary”) Design**
 - Similar to standard 4-loop PWR designs currently in operation in the U.S.
 - Based on APWRs currently undergoing licensing in Japan
- ❑ **Enhanced Safety**
 - A four-train safety system for enhanced redundancy
 - An advanced accumulator
 - An in-containment refueling water storage pit

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US-APWR Design Overview (Cont'd)

❑ Enhanced Reliability

- A steam generator with high corrosion resistance
- A neutron reflector with improved internals
- Four train systems provides greater flexibility for online maintenance

❑ Attractive Economy

- A large core with an enhanced thermal efficiency
- Small building volume per MWe

❑ More Environmentally Friendly

- A reduction in spent fuel assemblies per MWh
- Reduced occupational radiation exposure

CPSES 3 & 4 Site Description & Status of Site Characterization

Tim Gilder

CPSES 3 & 4 Site Manager

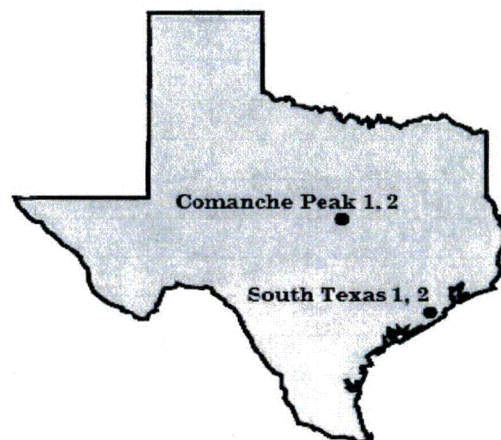
TXU

Comanche Peak Project Overview



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Regional Overview



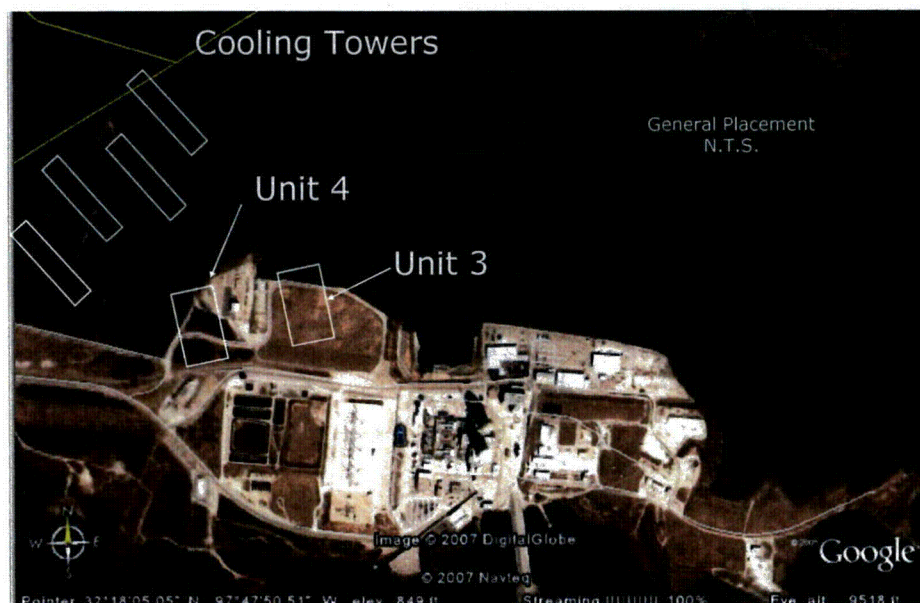
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General Site Information

- ☐ Located in Somervell County in north central Texas
- ☐ Squaw Creek Reservoir (~3,272 acres) originally established for station cooling
- ☐ Approximately 30 miles southwest of Fort Worth, TX
- ☐ 4.5 miles NNW of Glen Rose, TX
- ☐ Total site acreage approximately 8,000 acres
- ☐ NG and crude oil pipelines cross owner controlled area southwest of plant site(s)
- ☐ Strong community support

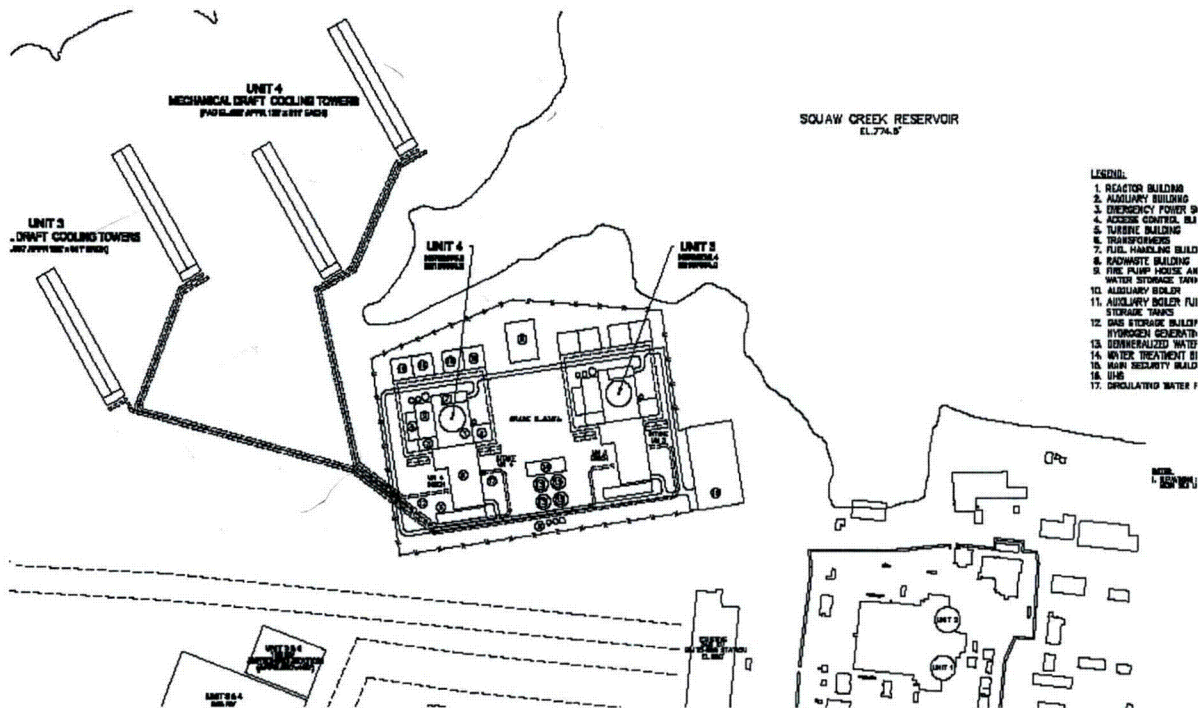
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Conceptual Layout



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Preliminary Plot Plan



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Plant site: Early 1950 vs. Today

Early 1950



Today



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Early Site Work – Environmental and Geotech

- ❑ **Enercon – Contracted for COLA development services**
 - Site Exploration/Geotechnical investigation completed April 2007
 - GW Monitoring wells complete and in monitoring phase
 - William Lettis & Associates, Inc & Fugro Consultants, Inc.
- ❑ **Environmental Report and FSAR development**
- ❑ **Preliminary Site Conceptual Layout**

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Work to Date

- ❑ **Phases of Geotechnical Site Exploration**
 - Deep borings for geo-hazard screening and seismic velocity surveys
 - Optimization of plant footprints based on screening
 - Multiple footprint specific borings initially
 - US-APWR footprint specific borings
 - Test pits, sample collection, geo-mapping, site seismic velocity profiling, subsurface stratigraphy, bedrock determination, lateral and vertical fill extent
 - MNES Ancillary Safety related structure (e.g. EP building, UHS Cooling Towers, etc.) footprint borings
 - Installation of groundwater monitoring wells
 - All work completed between October 2006 and April 2007

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Environmental Report

- ☐ **TXU Permit Review**
- ☐ **Leadership Program Leverage**
- ☐ **Groundwater Monitoring ongoing**
- ☐ **Water/sediment sampling SCR**
- ☐ **Ecological Surveys (ongoing quarterly):**
 - Fish, vegetation, benthic organisms, plankton at SCR and Lake Granbury
 - Wetlands survey
 - Terrestrial team surveyed surrounding area and reservoir
 - ROW walkdowns planned for this month

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Environmental Report (Cont'd)

- ☐ **Texas Historical Commission**
 - Favorable ruling that no additional cultural resource surveys needed. Only needed if new land disturbances are planned
 - Socioeconomic and demographic information catalogued
- ☐ **SCR and Lake Granbury Bathymetric studies ongoing**
- ☐ **Client reviews of drafted sections 2.0, 2.1, and 2.2 underway**

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Ongoing Interactions with Local, State & Federal Agencies

- ❑ Texas Parks and Wildlife Department
- ❑ U.S. Fish and Wildlife Service
- ❑ Tribal Groups
- ❑ County Judges
- ❑ County Fire Marshall
- ❑ Texas Department of Health Services
- ❑ Texas Department of Public Safety
- ❑ Texas Department of Transportation
- ❑ Texas Historical Commission
- ❑ Brazos River Authority
- ❑ Texas Commission on Environmental Quality
- ❑ U.S. Army Corps of Engineers

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Wildlife



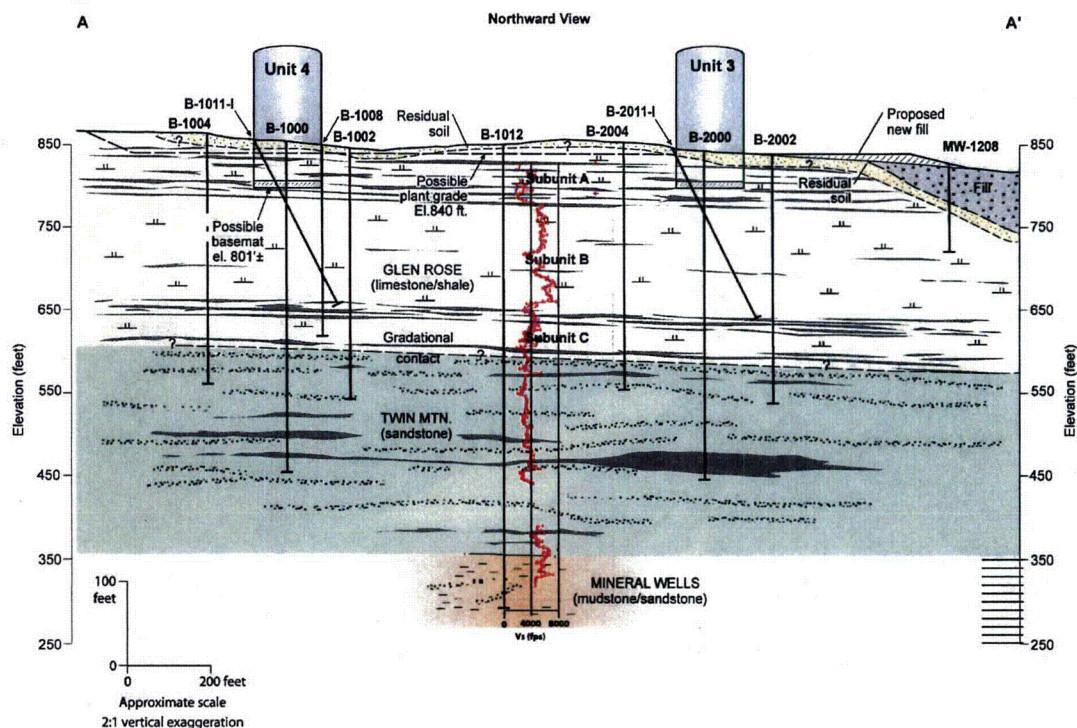
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Threatened or Endangered Species



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Simple Cross Section underneath New Units



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Access to Boring Locations



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Relationship to CPSES Units 1 & 2



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Core Boring Inventory



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NRC Site Interactions

- ☐ Site Visit to Observe COL pre-application "Subsurface Investigation Activities"
- ☐ December 12-13, 2006
- ☐ Region II Inspection with NRO
- ☐ C. Julian (Region II), J. Starefos, C. Munson, S. Gonzales and W. Wang from NRO
- ☐ No Issues Identified
- ☐ NRC Environmental Pre-application visit ~ July, 2007

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Other Site Activities

- ☐ Expansion of existing Intake Structure at Lake Granbury to accommodate new cooling tower flows
- ☐ Expansion of existing easements between reservoirs for makeup and return pipelines
- ☐ Working with ONCOR and ERCOT for Transmission /Grid/Switchyard/Corridor Interfaces
- ☐ Water Rights

Project Schedules

Michael Bennett
Licensing Manager
MNES

US-APWR/CPSES Units 3&4 Schedules Overview

- ☐ **The US-APWR Design Certification application scheduled to be submitted in December 2007**
- ☐ **The CPSES Units 3&4 COLA (R-COLA) scheduled for submittal in July 2008**
- ☐ **MNES has developed an integrated project plan and schedule that supports these submittal dates**

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CPSES Units 3&4 COLA Project Schedule Overview

- ☐ **TXU is well into site characterization**
 - Geotechnical exploration program complete
 - Site environmental characterization in progress
 - Data from current plant operations provides strong base for COL application
- ☐ **Operating Plant enhances basis for COL application**
 - Existing plant's emergency plan
 - Existing plant's meteorological data

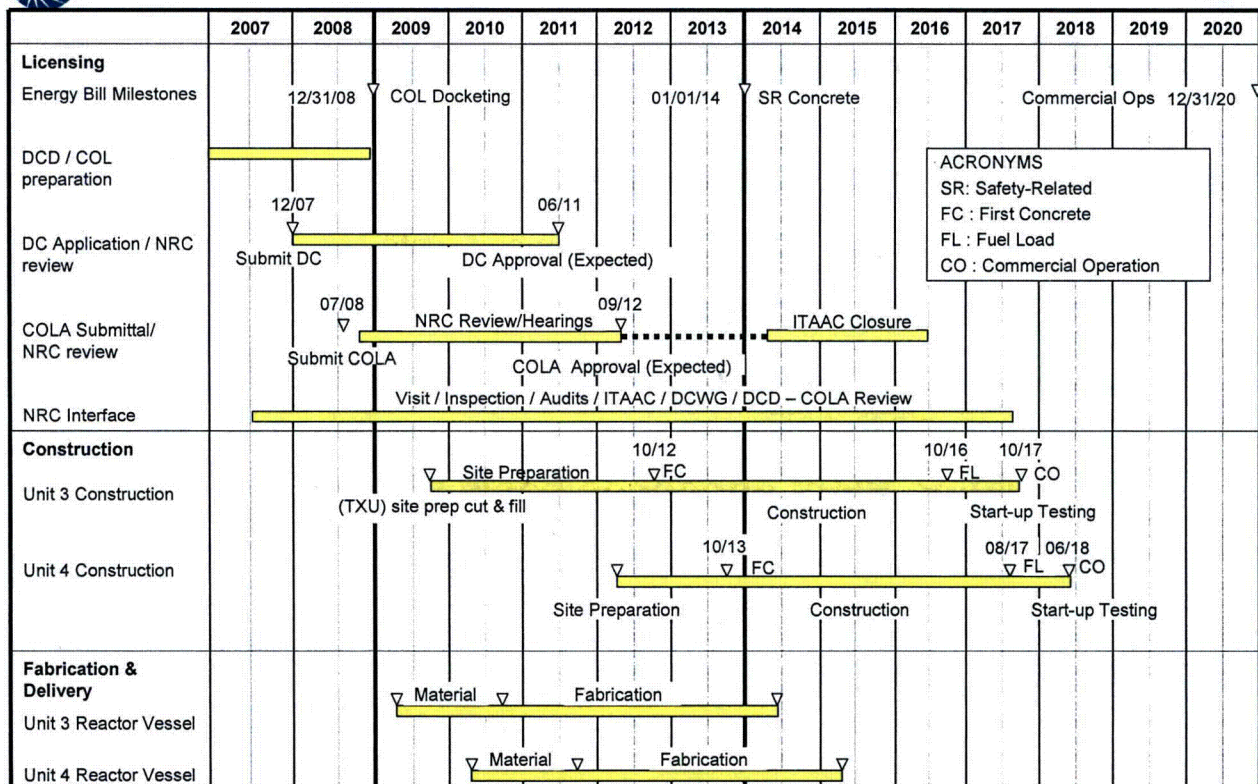
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CPSES Units 3&4 COLA Project Schedule Overview (Cont'd)

□ MNES and TXU are working closely to assure aggressive schedules are met

- Closely monitoring work of other DCWGs
 - Applying lessons learned
 - Adopting prior standards developed (e.g., COLA format)
- Applying lessons learned from Vogtle ESP
- Actively participating in industry generic efforts (NEI QA Task Force, NEI Security Task Force, NEI Seismic Issues Task Force, etc.)
- Planning periodic DCWG meetings with NRC

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COLA/DC Coordination

Jeff Lietzow

Director

Washington Group International

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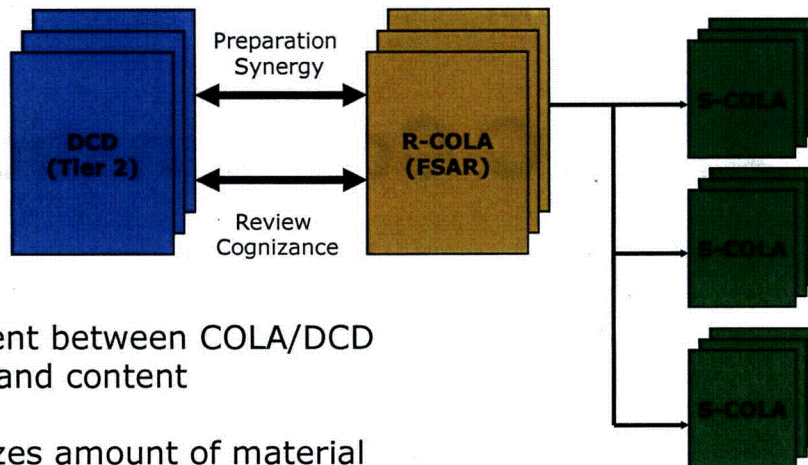
COLA/DCD Coordination

US-APWR Design Control Document (DCD) being prepared such that it will:

- ☐ Be consistent with format and content guidance given in Regulatory Guide 1.206
- ☐ Result in seamless transition into R-COLA (and S-COLAs)
- ☐ Maximize standardization
- ☐ Accommodate parallel NRC COLA/DCD Review

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Parallel COLA/DCD Review Approach



- ☐ Alignment between COLA/DCD format and content
- ☐ Maximizes amount of material approved generically as part of certified design
- ☐ Efficient use of NRC review resources

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COLA/DCD CONCURRENT PREPARATION

- ☐ Provides advantages
 - A higher level of integration between the COLA and DCD texts can be achieved
 - Minimizes COL information items
 - Substantial NRC staff coordination
 - Minimize DCD departures
- ☐ Presents logistical challenges
 - Changes to DCD need to be properly reflected in a timely manner in the COLA as necessary
- ☐ Objective is to optimize the coordination between the DCD and R-COLA to enable an effective and efficient NRC review of the "Reference" COLA

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Pre-Application Activity

Bob Evans
Vice President
Enercon Services, Inc.

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Pre-Application Activity Objectives

- ☐ **Timely & efficient communications with NRC**
- ☐ **Early identification and resolution of issues**
 - Discuss & obtain NRC feedback on site-specific issues
- ☐ **Support aggressive schedule**

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DCWG & Industry Involvement

- ☐ **Lessons learned from other DCWGs**
 - Early approach for standardization
 - COLA format/DCD incorporation by reference methodology consistent with industry approach
 - Monitoring other industry approaches with parallel DC/COLA development
- ☐ **Active participation in industry generic activities, e.g.,**
 - NPOC
 - NPWG
 - NEI COL Task Force
 - NEI QA Task Force
 - NEI Security Task Force, etc.

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Planned Pre-Application NRC Interactions

- ☐ **Pre-Application Topical Reports**
- ☐ **Pre-Application Meetings – Potential Topics**
 - Technical Specifications
 - Environmental site visits
 - QAP
 - EP/Security
 - Seismic approach
 - Parallel review process for COLA and DCD
 - State interfaces
 - Transmission corridor issues

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Summary

Mitch Lucas

Vice President Nuclear Engineering and Support

TXU Power, NuBuild

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Summary and Conclusions

- ☐ **Safety Focus driven by High Quality**
- ☐ **Environmental Stewardship**
- ☐ **Community involvement**
- ☐ **Continuous Improvement and Learning Organization**
- ☐ **ERCOT Market Growth and ERCOT Reserve Margin**
- ☐ **Strong Team to meet TXU business needs**
- ☐ **NuBuild communication with the NRC**

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Questions?

Comments?

Feedback?