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# **US-APWR Design Centered Working Group Meeting with NRC**

**July 1, 2008**



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## **Introductions and Opening Remarks**

**Don Woodlan**

**Manager, Nuclear Regulatory Affairs**

**Luminant**

**David Lange**

**Senior Licensing Manager, CPNPP Units 3 & 4 Project**

**MNES**



## Agenda

- Introductions and Opening Remarks – Don Woodlan**
- Water Supply and Total Dissolved Solids in the Brazos River Basin - Bruce Turner**
- Plant Owners, Operators and Financial Qualifications – Don Woodlan**
- Description of Risk Informed Technical Specifications in DCD and COLA – Etsuro Saji**
- IST Program Description – Addressed during 6/25/08 Mtg.**
- Site Specific ITAAC – David Lange and Koji Shinomiya**
- Summary and Closing – Don Woodlan**



## Meeting Objectives

- Update the NRC on selected US-APWR DCWG topics**
- Obtain NRC comments/feedback**
- Identify emergent issues**



## **US-APWR DCWG**

- Formed in April 2007**
- Current membership – Luminant Power and Mitsubishi Nuclear Energy Systems (MNES)**
- Provided a single response to RIS 2007-08 in May 2007**
- Public meetings with NRC in June and October of 2007 and February and April of 2008**



## **Project Goals (Unchanged)**

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



**COLA Status (through May 31, 2008)**

**Site exploration: 100% complete**  
**FSAR Chapter 2: ~99.3% complete**  
**FSAR (remainder): ~97.5% complete**  
**ER sections: ~95.1% complete**  
**Conceptual engineering: ~88.9% complete**

**Total COLA: ~95.2% complete**



**COLA Submittal Schedule**

**Notified the NRC in writing (TXNB-08020 dated June 20, 2008) that Luminant intends to submit the CPNPP Units 3 and 4 COLA on September 19, 2008**



## **Water Supply and Total Dissolved Solids in the Brazos River Basin**

**Bruce Turner**

**Luminant, Environmental Manager**



## **Water Plan and TDS Challenge**

### **□ Objectives**

- **Background Information**
- **Update NRC regarding water availability and TDS challenge**
  - Modeling
  - Water Acquisition process
- **Obtain feedback regarding how to facilitate NRC review**
  - Discuss / answer NRC questions
- **Plan Going Forward**



## Background

- Lake Granbury is a public water supply, recreational reservoir, and make-up supply to Squaw Creek Reservoir. Lake Granbury is located on the Brazos River
- CPNPP 3 & 4 will draw from Lake Granbury for makeup to the cooling tower system and blow-down from the system will be returned to the lake
- The lake is typically maintained at a constant level, except for periods of severe drought where lake level may be allowed to decrease two to three feet
- Additional evaporative loss associated with the proposed cooling towers will increase the total dissolved solids (TDS) levels in the lake without treatment

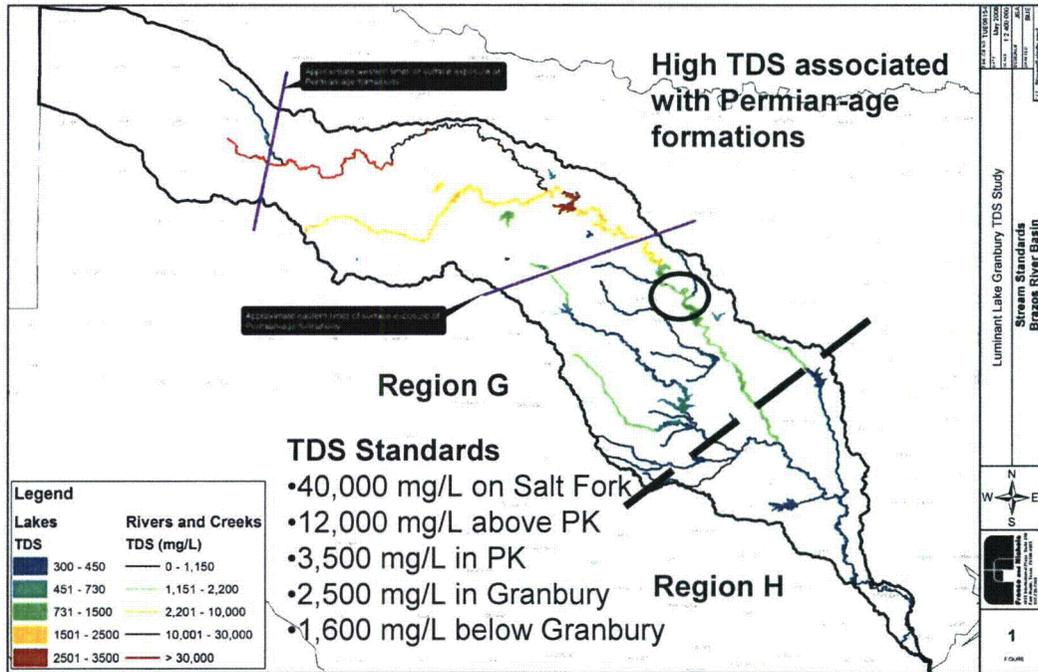


## Background

- The upper Brazos River exhibits elevated dissolved solids and affects Lake Granbury
  - Dissolved solids concentration highly variable
  - Derived from active brine springs in the drainage basin head waters
  - Includes Possum Kingdom Lake and Lake Granbury
- Factors that can influence TDS
  - Low flow conditions (dry/drought)
  - Increases in runoff from salt deposits (stormwater runoff)



# Luminant Sources of TDS



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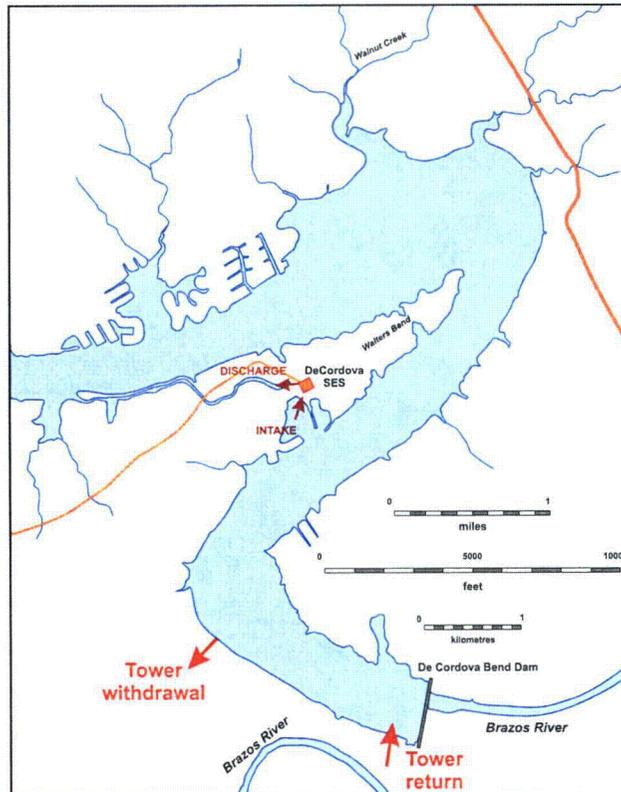
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## Modeling

- Freese and Nichols (F&N) performed a long-term water availability and TDS simulation of Lake Granbury
  - Brazos Water Availability Model (WAM), which is a volume-budget simulation of the entire basin
  - Assessed Lake Granbury total dissolved solids loading
  - F&N defined two scenarios—One without the new units (base case) and one with the new units
    - Both scenarios used the conservative 2060 Region G Water Plan
    - Both scenarios assumed the volume of Lake Granbury in 2060 would be about 70% of that surveyed in 2003 due to siltation buildup



## Results

- The WAM analysis supports the availability of water for CPNPP Units 3 & 4
- F&N determined that the cooling towers scenario raises TDS about 400 mg/L on average above the Base Scenario
  - Exceed WQS approx. 14% of time (without treatment)
- January 2008—Dr. George H. Ward (University of Texas) Report
  - Validation and refinement of F&N model
    - Addressed Lake Granbury's particular geometry
    - Nature of its hydrology (i.e. flowing lake)
    - Estimated TDS concentrations in the downstream 10 mile segment of the reservoir will average about 130 mg/L higher than the F & N model (530 mg/L)
      - Exceed WQS approx. 19% of time (without treatment)
- Additional F&N assessments show Base Scenario exceeds WQS under certain ambient conditions



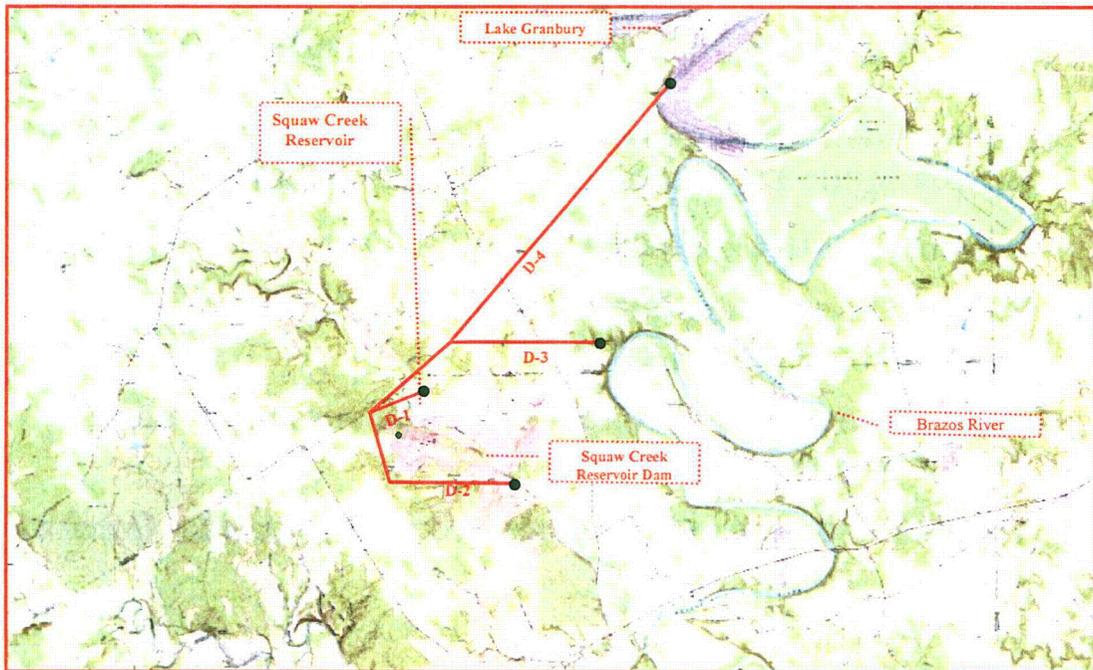
## **Water Plan and Water Quality Permitting**

- Water availability via a Regional Water Plan Amendment and System Operation Permit is a separate process from water quality permitting
- Water plan amendment requires a TDS loading analysis (F&N,HDR) and availability modeling (F&N, HDR)
- Water quality discharge limits are uncertain pending issuance of a TCEQ wastewater permit



## **Other Considerations**

- Alternate cooling tower design (e.g. hybrid, dry cooling)
- Model input refinement
- Alternate blow-down outfall location
  - Discharge to Squaw Creek Reservoir
  - Discharge to Squaw Creek below the dam
  - Discharge to Possum Kingdom
  - Dual discharge to Lake Granbury and the Brazos River



Comanche Peak Units 3 & 4 Outfall Options

## Texas Commission on Environmental Quality (TCEQ)

- Recent TCEQ development
  - The draft 2008 303(d) list identifies Lake Granbury as impaired for chlorides
  - The chloride standard for Lake Granbury 1,000 mg/L
    - 2005 - Results from samples were 1,082 mg/L
  - The TDS standard for Lake Granbury is 2,500 mg/L
    - 2005 - Results from samples were 2,024 mg/L



## **Regional Water Plan Amendment**

- Amendment package prepared by HDR and submitted to Brazos Region G Planning Group – April 29, 2008
- Region G Public Hearing – June 4, 2008
- Region G considers public comments then votes on amendment – July 9, 2008
- Region G submits water plan amendment request to TWDB- August 2008
- TWDB takes final action on amendment request – October 2008



## **Regional Water Plan Amendment**

- Increase steam-electric demands for Somervell County
- New supply from BRA system diverted from Lake Granbury
  - 27,447 ac-ft /yr – Existing unassigned contracts
  - 76,270 ac-ft /yr – BRA System Operation Supply
  - 103,717 ac-ft /yr – Total make-up (Units 3 & 4)
  - 42,100 ac-ft /yr – Water return to Lake Granbury



## **Water Plan Amendment Summary**

- Initial interaction with the BRA – October 2006
- Initiated water availability modeling (F&N) – January 2007
  - Modeled 12 different scenarios
- Completed water availability modeling – July 2007
- Scenario to return water to Lake Granbury selected to minimize impact to lake level
- Model confirmed sufficient water is available, pending BRA System Operation Permit (SOP)
  - Will not impact existing water users in the Brazos River Drainage Basin



## **Water Plan Amendment Summary**

- Environmental/cultural impacts negligible
  - Flow changes minimal
  - Salinity and temperature effects minimal- will be regulated by TCEQ and others
  - Salinity increases in Lake Granbury will be minimized through TCEQ issued TPDES discharge permit, which is anticipated to dictate some level of treatment for cooling tower blow-down
  - No species or cultural resources of concern



## **TCEQ System Operation Permit**

- Draft TCEQ SOP issue to BRA – July 2008**
- Public Hearing Process – ~ 1 - 2 years**
- TCEQ issues final SOP**
- Appeals process, if appealed**
- Luminant signs contract for 76,270 ac-ft /yr – After any appeals are exhausted (timeframe-TBD)**



## **Plan Going Forward**

- TCEQ identify preliminary target effluent limits
- Continued model refinement and optimization of TDS treatment strategy
  - Cost, schedule, constructability, confirm suitability
- CPNPP permit strategy includes interaction, input, and participation with the TCEQ
- Identify, with reasonable assurance, what effluent limits will be imposed
  - Needed to clarify design objectives
- At time of COLA submittal, the FSAR & Environmental Report will reflect approach and treatment conceptual design, as well as environmental assessment based on current information
  - The uncertainty of specific discharge limits currently hinder ability to define treatment details to the level of preference



## Overall Summary

- **Water is available**
  - Acquisition plan underway
  - Water plan being amended and SOP in process
    - No opposition encountered during public hearing
  - No impact to existing water users
- **Discharge permit working**
  - Working with TCEQ for preliminary discharge limits
  - Treatment optimization (conceptual design) progressing
  - Treatment conceptual engineering, Rev. 0 issued
  - Will refine as discharge permit progresses



## Plant Owners, Operator and Financial Qualifications

**Don Woodlan**



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## **Energy Future Holdings Corporation Structure**

- ❑ **Structure the same as at the time of the merger**
  
- ❑ **Energy Future Holdings Company (EFH) is the parent company**
  - formally TXU Corp
  - Governance by Board of Directors
  
- ❑ **Competitive and regulated businesses**
  - Oncor Electric Delivery (Regulated)
  - Texas Competitive Electric Holdings (Competitive)
    - TXU Energy (Retail)
    - Luminant (Generation, Development, Construction, Wholesale Marketing)

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## **Description of Risk Informed Technical Specifications in DCD and COLA**

**Etsuro Saji**

**Engineering Manager, Safety and Licensing Integration Group  
Mitsubishi Heavy Industries, Ltd.**

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## Contents

- ❑ Objective
- ❑ Background
- ❑ Basic Idea
- ❑ Description in DCD Rev.1 and COLA
- ❑ Summary



## Objective

- ❑ To explain the suitability of Risk-Informed Technical Specifications Initiatives 4b and 5b for DCD and COLA
  - Initiative 4b: Risk-Managed Technical Specifications (RMTS)
    - This program allows Completion Time (CT) to be flexibly determined on site by a licensee using PRA result based on the real time plant configuration.
  - Initiative 5b: Surveillance Frequency Control Program (SFCP)
    - This program relocates Surveillance Frequencies (SF) to licensee control using PRA and operating experience.



## Background (1)

- DCD. Rev.0 for US-APWR
  - Adopted RMTS to four-train systems (9 LCOs)
- COLA for Comanche Peak Units 3 and 4
  - Extends the number of LCOs to which the RMTS are applied (9 LCOs → 20 LCOs)
  - Adopts SFCP
- To be reflected to DCD Rev. 1
  - Except Ultimate Heat Sink

• LCO: Limiting Condition for Operation



## Background (2)

- NRC's concern
  - How can the PRA model qualified for RMTS be prepared in the DC and COLA phase?
  - (No serious concern for SFCP)
- MHI's thoughts
  - Continues to develop the PRA model as design and construction proceeds in the real plant
  - NEI 06-09\*\* says "The purpose of this report is to provide specific guidance on how to implement RMTS programs at existing and planned nuclear power stations."

\*\* Guidelines for RMTS approved by the NRC



### Basic Idea

- Clarify that RMTS and SFCP are the choice of COL applicant
  - DCD Tech. Specs. provide the framework of RMTS and SFCP and the adoption of each program is specified as COL item
  - Actual programs which include the PRA model qualified for these program as well as the station procedures will be established by the COL applicant who intends to implement them.
- The COL applicant who adopts RMTS and/or SFCP needs to assure the establishment of these programs in the ITAAC



### Description in DCD Rev.1

- Section 16.1.1 Introduction to Technical Specifications
  - 16.1.1.2 Technical Specification Content
    - (6) The Framework for Risk-Informed Technical Specifications
      - “The US-APWR Technical Specifications provide the framework for Risk-Managed Technical Specifications (RMTS) and Surveillance Frequency Control Program (SFCP), ...”
      - “The COL applicant who intends to implement RMTS needs to assure the establishment of the CRMP\* ... in the ITAAC.”
      - “... the COL applicant who intends to implement SFCP needs to assure the establishment of this program in the ITAAC...”

\* CRMP: Configuration Risk Management Program



### Description in CP-3/4 COLA

□ Section 16.1.1 Introduction to Technical Specifications

▪ 16.1.1.2 Technical Specification Content

– (6) Adoption of Risk-Informed Technical Specifications

- “The Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4 adopt Risk-Managed Technical Specifications (RMTS) and Surveillance Frequency Control Program (SFCP), ...”
- “The CPNPP will assure the establishment of the CRMP ... in the ITAAC.”
- “... the CPNPP will assure the establishment of this program in the ITAAC...”



### Description in DCD Rev.1: RMTS in Tech. Specs. (1)

□ Section 1.3 Completion Time

▪ EXAMPLE 1.3-8 Risk-Informed Completion Time

**ACTIONS**

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required component inoperable.	A.1 Restore required component to OPERABLE status.	72 hours
	<u>OR</u> A.2 Apply the requirements of Specifications 5.5.18	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 4.	12 hours



## Description in DCD Rev.1: RMTS in Tech. Specs. (2)

### □ Section 1.3 Completion Time

#### ■ EXAMPLE 1.3-8 Risk-Informed Completion Time

- "When Condition A is entered, either Required Action A.1 or A.2 shall be done within 72 hours."
- "Required Action A.2 can be taken only on the condition that the Configuration Risk Management Program (CRMP) specified in Administrative Control Section 5.5.18 is established."

### □ Section 3

- RMTS applied to 19 SSCs\* using the format of Example 1.3-8
- (20 SSCs including UHS for COLA)

\*SSCs: Structures, Systems, and Components



## Description in DCD Rev.1: RMTS in Tech. Specs. (3)

### □ Section 5.5.18 Configuration Risk Management Program

a. When entering into this specification, the following actions shall be taken in accordance with NEI 06-09 (Revision 0), "Risk-Managed Technical Specifications (RMTS) Guidelines."

1. Within the completion time of the referencing specification determine that the plant configuration is acceptable beyond the completion time,

AND

2. Calculate the Risk-Informed Completion Time (RICT),

AND

3. Restore required subsystems or components to operable status within the RICT or 30 days, whichever is less.

OR

Take the ACTIONS required in the referencing specification for the required action and associated completion time not met.

b. The RICT shall be recalculated whenever plant configuration change occurs within 12 hours from the configuration change.



## Description in DCD Rev.1: RMTS in Tech. Specs. (4)

### Section 5.5.18 Configuration Risk Management Program

c. [COL applicant who intends to implement RMTS is responsible for satisfying all of the requirements specified in NEI 06-09 including, but not limited to the following;:

1. Establishment of the station procedure of the CRMP process with specifying the station functional organizations and personnel responsible for each action of CRMP implementation,
2. Training of responsible personnel,
3. Preparation of a PRA model to meet the technical adequacy requirement of NEI 06-09,
4. Preparation of an appropriate CRM tool. ]



## Description in CP-3/4 COLA: RMTS in Tech. Specs.

### Section 5.5.18 Configuration Risk Management Program

c. To implement CRMP, the requirements specified in NEI 06-09 shall be met including, but not limited to the following;:

1. Establishment of the station procedure of the CRMP process with specifying the station functional organizations and personnel responsible for each action of CRMP implementation,
2. Training of responsible personnel,
3. Preparation of a PRA model to meet the technical adequacy requirement of NEI 06-09,
4. Preparation of an appropriate CRM tool.



### **Description in DCD Rev.1: SFCP in Tech. Specs. (1)**

- Followed TSTF-425 Rev.2**
- Time based Surveillance Frequency for each Surveillance Requirement is described as follows (example):**
  - **ex. [ xx hours OR In accordance with Surveillance Frequency Control Program ]**
- Definition of SFCP is provided in the Administrative Control Section**



### **Description in DCD Rev.1: SFCP in Tech. Specs. (2)**

- Section 5.5.19 Surveillance Frequency Control Program (SFCP)**

**This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.**

- a. **The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program**
- b. **Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.**
- c. **The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.**



### Description in CP-3/4 COLA: SFCP in Tech. Specs.

- Replaced Bracketed Surveillance Frequencies in DCD with the following:
  - “In accordance with Surveillance Frequency Control Program”
  - Remove the brackets and the deterministic values from DCD
- The deterministic values of Surveillance Frequencies will be stored in the list of Frequencies
  - The list of Frequencies will be prepared as a part of CP-3/4 SFCP
  - The deterministic values can be retrieved from DCD



### Summary

- Clarified in DCD that RMTS and SFCP are the choice of COL applicant
  - DCD Tech. Specs. provide the framework for RMTS and SFCP (= include the descriptions necessary to implement RMTS and SFCP)
  - Specified as COL items
- The establishment of the actual programs of RMTS and SFCP will be assured in the ITAAC
  - Acceptance criteria: meet requirements of NEI Guidelines (NEI 06-09 for RMTS, NEI 04-10 for SFCP)
  - PRA model, station procedure, etc. are to be tested



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## **IST Program Description**

**Addressed during June 25, 2008, Meeting**

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## **Site Specific ITAAC**

**David Lange, Senior Licensing Manager**

**Koji Shinomiya, Engineer**

**Mitsubishi Nuclear Energy Systems, Inc.**

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## Overview of Site Specific ITAAC

### Content of COL Application Document

- Part 00 - Cover Letter
- Part 01 - General and Administrative Information
- Part 02 - FSAR → Site Specific ITAAC
- Part 03 - Environmental Report
- Part 04 - Technical Specifications → Tech Spec ITAAC
- Part 05 - Emergency Plan → Emergency Plan ITAAC
- Part 06 - LWA Request (N/A)
- Part 07 - Generic DCD Departure Report
- Part 08 - Safeguards and Security Plan → Security ITAAC
- Part 09 - Proprietary and SUNSI (N/A)
- Part 10 - ITTAC and ITTAC Closure



## Site Specific ITAAC from FSAR

- Site-specific ITAACs are to be identified in “FSAR” and listed in “COLA Part 10”**
  - ITAAC for Ultimate Heat Sink (UHS) , and Essential Service Water System (ESWS) (: Portions outside the scope of the certified design)
  - ITAAC for UHS Essential Service Water (ESW) Pump House Ventilation System
  - ITAAC for other structures such as:
    - UHS related structures (Cooling tower enclosure, ESW pump houses, UHS basin)
    - Essential service water pipe tunnel
    - Power source fuel storage vault
  - Backfill ITAAC : Follow the developing NEI guidance
- Format: based on DCD Tier 1 ITAAC format**



## Technical Specification ITAAC

- **Technical Specification ITAAC is to be identified in “COLA Part 2, FSAR Chapter 16” and listed in “COLA Part 10”**
  - ITAAC for Risk-Managed Technical Specification (RMTS) and Surveillance Frequency Control Program (SFCP)
  - Acceptance criteria: requirements of NEI Guidelines (NEI 06-09 for RMTS, NEI 04-10 for SFCP)
  - Note) Introduction of Technical Specifications for CPNPP 3 and 4 described in COLA Part 2 FSAR Chapter 16. Complete Technical Specifications to be presented in COLA Part 4.



## Security ITAAC

- **DCD Rev. 0 Tier 1: Six security-related ITAACs identified**
- **Current status for DCD Rev. 1:**
  - MHI will soon decide how to update the security-related ITAACs based on NEI New Plant Security Task Force group activities.
- **General background and status:**
  - Industry developed 13 ITAACs
  - NRC developed 16 ITAACs (NUREG 0800)
  - Industry has revised and presented 16 ITAACs to NRC
    - Recently submitted GEH ESBWR DCD Rev. 5, Tier 1 contains the industry-revised 16 ITAACs
    - Ongoing NRC and industry discussion on industry-revised 16 ITAACs



## Security ITAAC (Cont.)

- **General background and status**
  - **Industry-revised 16 ITAAC**
    - General agreement on 15 of the 16 industry-revised ITAACs
- **Will follow Industry and NRC security task force working groups and appropriately update security ITAACs**



## Emergency Plan ITAAC

- **19 Emergency Plan ITAACs will be identified in “COLA part 10”**
- **Based on RG 1.206 (Using template specified in SECY 05-0197)**
- **Similar to other COLAs, such as Bellefonte, Lee, Grand Gulf and North Anna submittals**



## Summary of Site Specific ITAAC

- Approach similar to other vendor COLAs
- Site specific ITAAC will follow regulatory and industry guidance
- Site-specific ITAAC will be included in COLA Part 10



## Summary and Conclusion

**Don Woodlan**  
**Manager, Nuclear Regulatory Affairs**  
**Luminant**



## Today's Topics

- Water Supply and Total Dissolved Solids in the Brazos River Basin**
- Plant Owners, Operators and Financial Qualifications**
- Description of Risk Informed Technical Specifications in DCD and COLA**
- Site Specific ITAAC**



## Future Interactions and Public Meetings

- DCD/COLA schedule**
- Emergent technical items**
- Ongoing periodic conference calls**
- QA audits**
- Environmental audits**
- CPNPP orientation and technical meeting(s)**
- ACRS presentations**
- Environmental scoping meeting**
- ASLB Public Sessions**



### **Emphasis – Facilitate the NRC Review**

- Submit a complete, high quality COLA**
- Conform with RGs/SRPs**
- Meetings to keep NRC updated & obtain feedback**
- Keep the DCD and COLA aligned – minimize departures**
- Prepare to support NRC’s review including timely and complete responses to RAIs**



### **Closing Remarks**

- 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 Luminant business needs**
- NuBuild communication with the NRC**



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## Questions and Comments