PMSTPCOL PEmails

From: Wunder, George
Sent: Tuesday, July 13, 2010 7:55 AM
To: Anand, Raj; Tai, Tom; Govan, Tekia; Foster, Rocky; Joseph, Stacy; Muniz, Adrian
Cc: STPCOL
Subject: FW: Draft ACRS Presentation for 7-14-2010
Attachments: ACRS Presentation 7-14-2010.pdf

Ladies and Gentlemen,

Attacyhed please find the STP draft presentation for tomorrow.

Thanks,

George

From: Chappell, Coley [mailto:ccchappell@STPEGS.COM]
Sent: Monday, July 12, 2010 5:36 PM
To: Wunder, George; Wunder, George
Cc: Joseph, Stacy
Subject: Draft ACRS Presentation for 7-14-2010

George,

Attached is a courtesy copy of the draft STP 3 & 4 presentation to ACRS. It is anticipated that the final presentation will be shortened somewhat due to time constraints, but should not contain any additional substantial information.

Please contact me if you have any questions about the presentation,

Regards,

Coley Chappell

STP Nuclear Operating Company

Licensing STP Units 3 & 4

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Subject: FW: Draft ACRS Presentation for 7-14-2010
Sent Date: 7/13/2010 7:54:30 AM
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From: Wunder, George

Created By: George.Wunder@nrc.gov

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ACRS Presentation 7-14-2010.pdf	522524	

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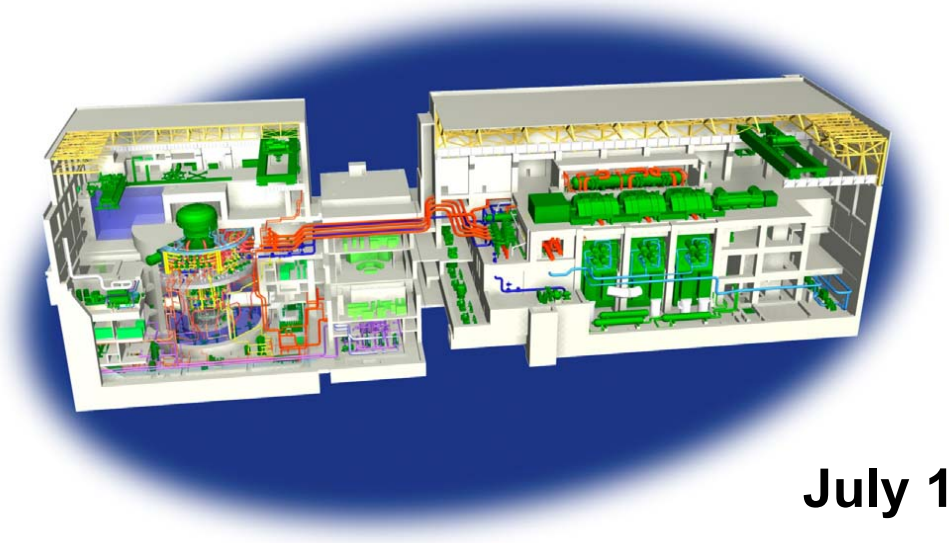
South Texas Project Units 3 & 4
Significant Departures and Supplements

Presentation to
Advisory Committee on Reactor Safeguards



July 14, 2010

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Agenda

- Introduction
- Overview of STP 3 & 4
- Chapter Summaries
  - Significant Departure Information
  - Site-Specific Information
- Conclusion

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Attendees

STPNOC, STP 3 & 4

Scott Head	Regulatory Affairs Manager
Evans Heacock	Engineering Manager
Coley Chappell	Regulatory Affairs

MPR/TANE

Caroline Schlaseman

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Site Characteristics

Near the Gulf of Mexico

- Large site, 12,200 acres
- Main Cooling Reservoir sized for four units, 7000 acres
- Infrastructure in place
  - ✓ Road, rail, barge access
  - ✓ Transmission corridor
- Low population density nearby
- Existing State, County and Site Emergency Plans
- Strong community support

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History of STP 3 & 4 COLA

Sep '07	STP 3&4 COLA submitted referencing Appendix A to 10 CFR 52, U.S. ABWR Design Certification
Nov '07	NRC accepted COLA for docketing (52-012 and 52-013)
Aug '08	STP letter to NRC regarding Due Diligence Report finding Toshiba is qualified as Alternate Vendor
Sep '08	COLA Revision 2 submitted to NRC
Aug '09	NRC completed independent assessment that finds Toshiba Qualified as vendor to supply certified design for ABWR
Sep '09	COLA Revision 3 submitted to NRC NRC completed Safety Review Phase I (RAIs issued)
Mar-Jun	16 of 19 FSAR Chapters from STP 3&4 COLA presented to ABWR Subcommittee of ACRS

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Ch 1 Introduction

Toshiba Vendor Capabilities and ABWR Experience:

- ABWR was developed in Japan, under the cooperation of Toshiba, Hitachi, and GE, and supported by TEPCO and other utilities.
- Toshiba has a complete set of ABWR design documents through the development of the above and actual construction in Japan.

STP Due Diligence review was performed:

- STP Concluded Toshiba is qualified to supply the U.S. ABWR.
- Confidence in the ability of the EPC Team to build the Certified ABWR Design and support the STP COLA.
- Project risks and impacts have been addressed and found acceptable.

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Ch 1 Introduction

The STP 3 & 4 COLA:

- Reference-COLA (R-COLA) for the ABWR standard design.
- Incorporates (Part 2) the ABWR DCD, as applicable, by reference without repeating the DCD information.
- Basically identical to the U.S. ABWR Certified Design with a limited number (13) of Tier 1 departures.

Primarily contains two types of new information:

- **Departures from the DCD** – most are suitable for use in subsequent COLAs, some are applicable only to STP 3 & 4.
- **Supplements to the DCD** – to address COL Items, replace conceptual design information, provide information on the site and site-specific systems, organization and programs.

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Tier 1 Departures

- Safety-Related I&C Architecture
- RCIC Water-lubricated Turbine/Pump
- Add Class 1E Power Supply to the 4th Division of I&C
- Add Spent Fuel Pool Cooling Mode to 'A' RHR System
- Elimination of Hydrogen Recombiner
- Elimination of High Radiation MSIV Closure and Scram
- Reactor Internal Pumps (RIP) Motor Casing Cladding
- Re-classification of Radwaste Building to Non-Seismic
- Feedwater Line Break Mitigation
- Control Systems Inputs, Tests, and Hardware
- Breaker/Fuse Coordination and Low Voltage Testing
- Reactor Building Safety-Related DG HVAC Temperature Limit
- Site Parameters

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Tier 2 Departures

Codes, Standards, and Regulatory Guide Edition Changes
STD DEP 1.8-1 (Tier 2*)

- Updates compliance to more current revisions/editions of selected applicable NRC Regulatory Guides and Industry Codes and Standards approved or endorsed by NRC.
- Ensures more recent industry design and construction practices are used, updates requirements in fields that have advanced considerably since certification, and deletes obsolete requirements.

Changes to Tier 2 information are screened/evaluated according to Part 52 Appendix A, Section VIII.B.5, for prior NRC approval.

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Ch 4 Reactor

- Included a departure to clarify the use of equivalent and improved materials based on ABWR operating experience (for the control rod drive mechanisms and reactor internals).
- STP 3&4 COLA does not depart from the certified fuel design.
- COL amendment to be submitted approximately two years prior to fuel load.
  - Westinghouse Topical Reports are being submitted to expand the safety analysis methodology to ABWR design
    - Transient and stability analyses (new)
    - Reload methodology (revised)
    - Transient, LOCA, containment, and control rod blades (supplements)

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Ch 5 RCS and Connected Systems

RCIC Turbine/Pump (STD DEP T1 2.4-3)

- Pump and turbine within same casing, system simplifications removes requirements for:
  - Oil lubrication/oil cooling (totally water lubricated)
  - Startup steam bypass line
  - Shaft seal, barometric condenser, vacuum pump and associated penetration piping or isolation valves
- Meets or exceeds all safety-related performance criteria including start time, flow rate, and low steam pressure operation
- During the initial test program, RCIC start test will be performed to confirm system startup characteristics, and the 8-hour RCIC capability during a SBO event will be demonstrated

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Ch 6 Engineered Safety Features

Revised pressure temperature analysis and pool swell analysis:

- Errors identified in DCD Containment Pressure analysis by GE during COLA Rev. 0 (feedwater flow assumptions, vent loss coefficient, and decay heat)
- Re-performed analysis using Westinghouse codes with DCD licensing basis, results showed good agreement
- Pool swell analysis re-performed due to greater mass-energy release to containment

Adopted state-of-the-art cassette type ECCS suction strainers design:

- Committed to RG 1.82 Rev.3, chemical and downstream effects
- Removed all fibrous insulation and aluminum from the design, and instituted suppression pool cleanliness operational program
- License condition to perform fuel downstream debris test with the fuel to be used in the initial cycle (18 months prior to operation)

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Ch 7 Instrumentation & Control Systems

- STP 3 & 4 COLA incorporates by reference the functionality and logic of the ABWR DCD I&C systems and components.
- Departures were taken to incorporate advancements in technology and provide clarifications:
  - Updated I&C architecture, *e.g.*, replaced obsolete multiplexer communication technology with current technology.
  - Simplification of Safety System Logic and Control (SSLC) design by separation into Reactor Trip Isolation System (RTIS), Neutron Monitoring System (NMS), and ESF Logic and Control System (ELCS).
  - Nomenclature changes improve standardization – equipment descriptions changed to functional descriptions
    - *e.g.*, Trip Logic Unit (TLU) to Trip Logic Function (TLF)

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Ch 7 Instrumentation & Control Systems

- **Diversity and Defense-in-Depth (D3)** design is incorporated by reference from ABWR DCD and diverse features have been retained, including:
  - Manual reactor scram
  - HPCF C diverse manual is hard wired
  - Diverse display of specific process parameters
- Diverse hard wired controls go directly to controlled components.
- Platform hardware/software will implement licensing basis requirements as inspected through ITAAC/DAC process.

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Ch 8 Electric Power

Plant Medium Voltage Electrical System Design (STD DEP 8.3-1)

- Changed to a dual system to better accommodate motor driven feed pumps and other large loads, and to be consistent with typical US practice:
  - Power Generation (PG) bus increased from 6.9 to 13.8 kV
  - Plant Investment Protection (PIP) bus and Class 1E safety bus reduced from 6.9 to 4.16 kV
- Capacity of onsite power sources increased to accommodate increased site loads, *e.g.*, RSW Pumps, HECW, CRHA HVAC:
  - Emergency Diesel Generators (EDG) capacity increased from 5000 kW (6.9 kV) to 7200 kW (4.16 kV)
  - Combustion turbine generator (CTG) capacity increased from 9 MWe to a minimum of 20 MWe

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Ch 8 Electric Power

Plant Medium Voltage Electrical System Design (STD DEP 8.3-1)

- CTG maximum start time increased from 2 minutes to less than 10 minutes
  - Remains within RG 1.155 limits for Station Blackout (SBO) alternate AC source
  - Unit CTGs can be aligned to support the other Unit
- Second 100% capacity Reserve Auxiliary Transformer (RAT) added for increased flexibility.

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Ch 10 Steam and Power Conv. System

Turbine Generator, Main Steam and other Steam and Power Conversion System features:

- Total of fifteen departures involving Toshiba turbine and controls including overspeed protection, changes for reliability, availability and/or efficiency, mono-block rotors, clean gland steam, bulk hydrogen storage, clarifications and consistency changes.
- Added ITAAC for turbine trip diversity in response to RAI.
- Additional changes to support departures on digital I&C, Turbine Building structure, feedwater line break mitigation, and Off-gas cooling water.

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Ch 11 Radioactive Waste Management

No fundamentally new equipment or processes – uses current technology with modular components and reduced complexity.

- **Liquid Radwaste Process Equipment** (STD DEP 11.2-1) – Added tanks for liquid segregation and recycle, and back-washable filters to reduce solid waste generation; removed high-maintenance/ high-dose equipment wherever possible, *e.g.*, Concentrators (Evaporators)
- **Gaseous Waste Management System** (STD DEP 11.3-1) – Uses recombiner train design with proven operation experience
- **Radioactive Solid Waste Update** (STD DEP 11.4-1) – Eliminated drumming process and propagation of radwaste, removed Incinerator and Compactor, provides for segregation of resin for re-use where possible, uses High Integrity Containers for offsite disposal

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Ch 12 Radiation Protection

- Incorporation of Industry Template for Radiation Protection Program Design and Implementation
- Design and program/operational improvements to ensure worker dose is ALARA
- Compliance with 10 CFR 20.1406
  - All piping containing contaminated fluids is in tunnels
  - No direct buried pipe
- Incorporation of industry template NEI-08-08A, Life Cycle Minimization of Contamination

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Ch 13 Conduct of Operations

- Emergency Plan – Modified existing STP 1 & 2 plan for four units
- Operations Training Department – Staffed and developing material and content, building on existing programs:
  - Boiling Water Reactor Training Center (BTC)
  - Tokyo Electric Power Company (K6/7)
  - Tai Power (Lungmen)
  - U.S. Domestic Fleet
  - Experienced Training Staff
- Upcoming milestones:
  - 2011 – INPO Initial Accreditation expected
  - 2012 – Operator training classes start
  - 2013 – Simulator ready for training (January)

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Ch 14 Initial Test Program

- Site-specific Preoperational and Startup Test Specifications, containing testing objectives and acceptance criteria, will be provided to the NRC at least 6 months prior to the start of the Initial Test Program (COM 14.2-2).
- The approved pre-operational test procedures will be available for NRC review approximately 60 days prior to their intended use but no later than 60 days prior to fuel loading (COM 14.2-3).
- The approved startup test procedures will be available for NRC review approximately 60 days prior to fuel loading (COM 14.2-4).
- The Startup Administrative Manual has been submitted, and delineates the processes that will be used to administer the Initial Test Program.
- All ITAAC (Tier 1 and site-specific) must be completed prior to Initial Fuel Load (approximately 939 ITAAC per unit)

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Ch 15 Accident and Analysis

- No departures based in Chapter 15, no departure from fuel, only minor descriptive changes due to departures in other chapters
- Supplemental Section 15.1S
  - Concluded that there were no design differences that could impact the STP 3 & 4 accident analysis
- Supplemental Subsection 15.6.5S
  - Addressed differences due to site-specific X/Q values
  - Provides site-specific doses, results within acceptance criteria

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Ch 16 Technical Specifications

- All departures affecting Technical Specifications and Bases require prior NRC approval:
  - **6** Tier 1 departures, and **9** Tier 2 design-related departures
  - Remainder supplement, correct, clarify information or provide consistency in Technical Specifications and/or Bases, revise the administrative controls section, or are editorial in nature.
- All bracketed items were completed (COL Item 16.1) in accordance with one of the three available options identified in ISG-08:
  - Plant-specific information – Most items
  - Bounding value – One item (LPRMs per division)
  - Reference to a program using an NRC-approved methodology
    - Instrument Setpoint Methodology
    - RCS Pressure and Temperature Limits Methodology

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Ch 16 Technical Specifications

Upgrade: Post COL

- Incorporate approximately one-hundred applicable TSTFs, including risk-informed TSTFs, to fully conform with Rev 3.1 of NUREG-1433 and NUREG-1434
- Risk Managed TS (RMTS), including RITSTF Initiative 4b (Completion Times), using NEI 06-09, “Risk-Managed Technical Specifications (RMTS) Guidelines” and TSTF-505 (if approved)
- Plant-specific PRA to support risk-informed initiatives intended to be complete prior to COL issuance, except for external events, fire and seismic to be completed prior to Fuel Load (50.71(h))
  - ASME PRA Standard, RG 1.200 and Peer Review

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Ch 17 Quality Assurance

Design Reliability Assurance Program

- Tier 1 ITAAC Table 3.6 – Inspections of the Reliability Assurance Program will include (among other ITAAC) a verification of the List of Risk Significant Systems, Structures and Components.
- The PRA input to D-RAP is included in FSAR Tables 19K-1, 19K-2 and 19K-4.
- To address subcommittee concerns with post-COL completion of the list of Risk Significant SSCs, STPNOC revised the response to RAI 17.4-9 (Revision 2 submitted 5/19/2010) to add the following commitment (COM 17.4-1) :
  - The expert panel will complete all of the expert panel system reviews, provide a list of the set of D-RAP SSCs, and have the program elements in place to control future activities by the third quarter of 2011.

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Ch 18 Human Factors Engineering

- No changes to HFE design acceptance criteria and associated Tier 1 ITAAC Table 3.1, and no departures from the approved human-system interface (HSI) design implementation process.
- Provides HSI design goals and bases, including main control room standard design features and technologies, and the Remote Shutdown System.
- STP 3 & 4 will:
  - Comply with Tier 2* requirements (Appendix 18E) for the approved ABWR DCD HFE program to fully comply with design acceptance criteria.
  - Consider the good HFE practices of NUREG-0711 Rev 2 as appropriate.

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Ch 19 Probabilistic Risk Assessment

- The PRA for the ABWR was developed as part of the original Certification effort in the late 1980s and early 1990s.
- The Certification PRA is a Level 2 Internal Events PRA with generic consequence evaluations.
  - Fire Hazards Analysis (FIVE), Seismic Margins Assessment, and Shutdown screening analysis included.
- The PRA has been updated, while maintaining the original format, to reflect site conditions, COL License Items and selected departures.
- The updated PRA is bound by the results of the original PRA.

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Questions and Comments

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