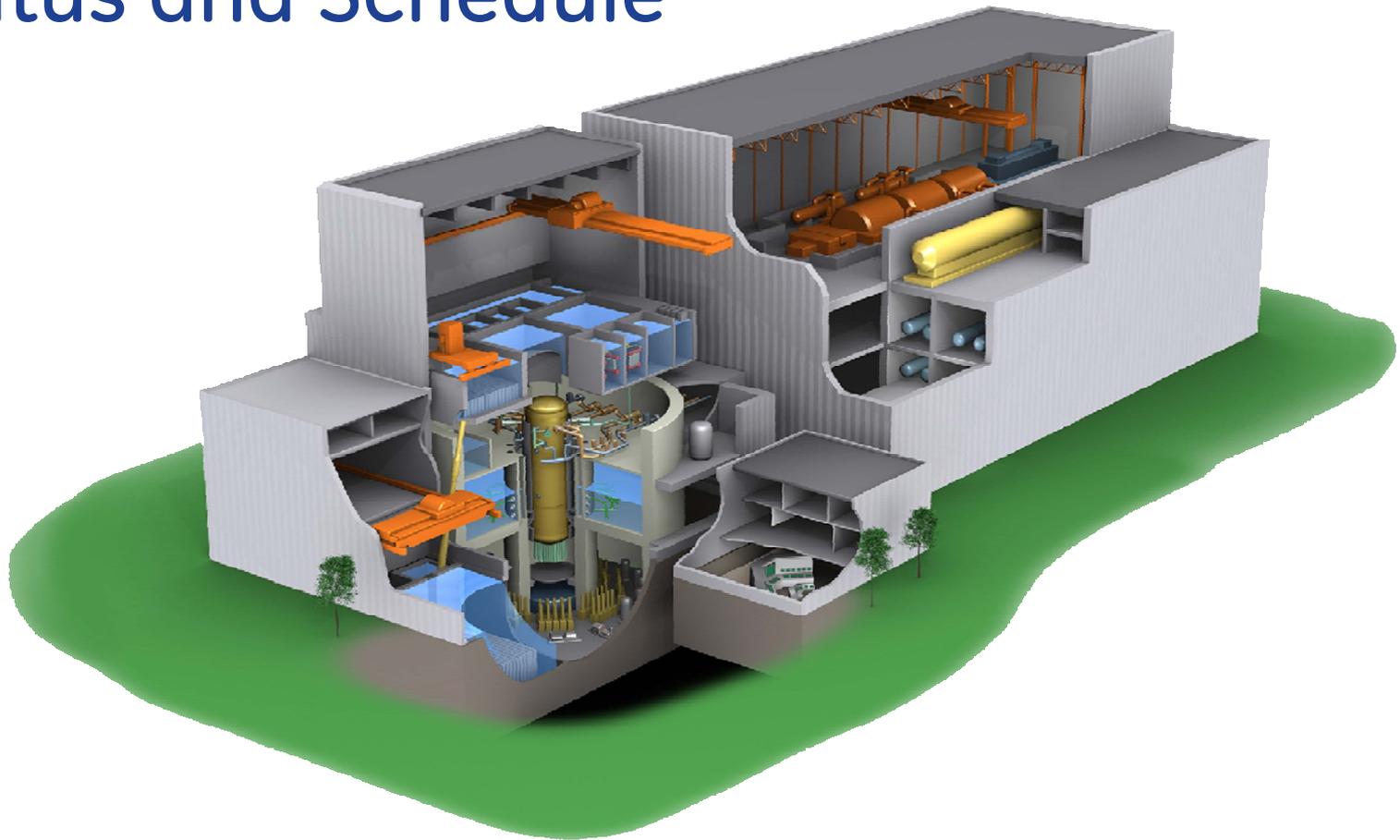


ESBWR Design Certification Status and Schedule



GE imagination at work

October 12, 2006

ESBWR Design Certification

- Introduction and Purpose of Meeting
- Design Certification Status and Schedule
- Status of Specific Design Topics
- Parallel Process for NRC Review of Design Certification and COL Applications



Design Certification Status and Schedule

David Piepmeyer
GE DCD Project Manager



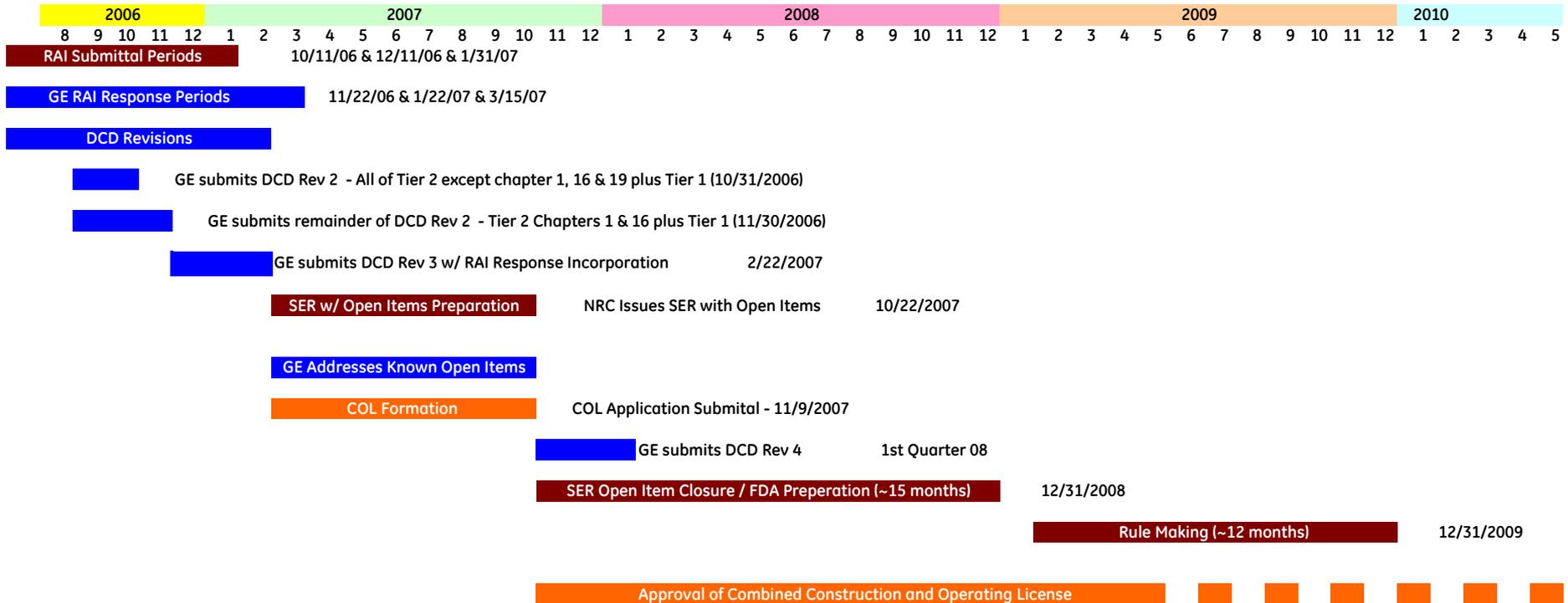
ESBWR Design Certification

Background:

- Extensive pre-application work conducted
- Design Control Document (DCD) Submitted August 2005
- NRC Acceptance Review Resulted in Areas Requiring Additional Information through GE Commitments
- NRC Docketed DCD on December 1, 2005
- DCD Revision 1, March 2006
- Requests for Additional Information (RAI) process underway
- GE member of ESBWR Design-Centered Working Group (DCWG) with Combined License (COL) Applicants



ESBWR Design Certification & COL Timeline



ESBWR RAI Process Status

- As of 10/1/2006:
 - Total RAIs: 2037
 - Formal: 1618
1056 complete, 497 In Process, 65 Supplementals)
 - 20% of in process RAI Responses in Chapter 8 –
(99 total)
 - 18% of in process RAI Responses in Chapter 19 –
(89 total)



ESBWR Design Certification DCD Revisions

- Revision 2 – 10/31/2006 Submittal
 - Updates all chapters of DCD Tier 2 EXCEPT Tier 1 and Tier 2 - Chapters 1, 16, and 19
 - Describes Major Design Changes:
 - Isolation Condenser System (water level change)
 - Electrical System (N minus 2)
 - Incorporates a number of RAI responses
 - Provides additional design information to eliminate certain COL action items
 - Revises Chapter 2, “Site Characteristics”



ESBWR Design Certification DCD Revisions

- Revision 2 – 11/30/2006 Submittal
 - Updates Tier 1 and Tier 2 Chapters 1 and 16
 - Incorporates a number of RAI responses
 - Provides additional design information to eliminate certain COL action items



ESBWR Design Certification DCD Revisions

- Revision 3 – 2/22/2007
 - Serves as revision for NRC Safety Evaluation Report (SER) with Open Items (10/2007)
 - Main purpose: Incorporates responses to NRC RAIs (but will not address all RAI responses)
 - Includes some additional design changes and elimination of COL action items
 - GE will continue to submit information post-Rev. 3 which NRC may address as “confirmatory” open items in 10/2007 SER with Open Items



ESBWR Design Certification DCD Revisions

- Subsequent DCD Revisions
 - Submitted After Issuance of NRC Safety Evaluation with Open Items and initial COL Applications (COLA)
 - Address Resolution of Open Items
 - Subsequent DCD Revisions will be closely coordinated with DCWG and NRC
 - DCD Revision 4/COLA Revision 1 expected first quarter 2008



ESBWR Design Certification COL Action Items

- COL Action Items

- Identifies actions or information that must be addressed in COLA referencing ESBWR DCD
- Identified in various DCD sections
- Listed in Table 1.10-1 of DCD
- GE currently working with ESBWR DCWG to finalize list and prioritize DCD changes to help eliminate need for COL action or information items
 - DCD Revision 3 will include an up-to-date table
 - GE and DCWG will continue to interact with NRC to include additional information in subsequent revisions to eliminate COL action items



ESBWR Design Certification

Finalizing COL Action Item Listing

The COL Action Item (COL AI) Listing in ESBWR DCD revisions will be changing based on six processes:

1. Conversion of COL AIs to Inspection Test Analyses and Acceptance Criteria (ITAAC) (e.g., Chapter 18, Rev. 2)
2. Classification of a COL AI as a “COL Holder Item” to be completed after issuance of COL
3. Elimination of a COL AI by directly including the required information in the DCD (e.g., Chapter 8, Rev. 2)
4. Completing design work which closes a COL AI to be reflected in either DCD or COL (e.g., Chapter 10, Rev. 3)
5. Closing a COL AI by another mechanism such as an LTR (e.g., Initial Core Design)
6. Adding a COL AI in response to an RAI



ESBWR Design Certification Process to Close Open Items

- Known Open Items Process
 - Post DCD Rev. 3 Submittal
 - Known Open Items will include Un-reviewed and Un-incorporated RAIs
 - Closure Process will be coordinated with DCWG and NRC
 - GE will submit information to NRC. Submittals to include mark-ups of DCD pages, as appropriate
 - GE and DCWG will coordinate schedules of submittals with NRC to prioritize and allocate resources for NRC review
 - GE recognizes that NRC may delay its review until after SER with Open Items is issued
 - Resolution of open items will be reflected in 2008 DCD revisions



ESBWR Design Certification COL Application Review Process

- DCD and COLA Revision Coordination Process
 - GE and COL Applicants are Developing Process
 - GE and COL Applicants recognize DCD revision time limitations prior to initiation of Rulemaking Process
 - All DCD/COLA combined revisions will be coordinated with NRC prior to submittal
 - GE and COL Applicants will coordinate with NRC on an ongoing basis



Status of Specific Design Topics

David Hinds

GE ESBWR Engineering Manager



ESBWR Design Certification Design Changes

- Isolation Condenser
 - Design change improves water level response to transients
 - Adds condensate hold up volume in each division of ICS
 - Simplifies actuation logic by allowing removal of level 1.5
 - NRC reviewers briefed on change
 - Input information provided to aid confirmatory analysis
 - DCD Rev. 2 to document design change



ESBWR Design Certification Design Changes

- **N-2 Logic Change**

- Aligns logic such that, with any division out of service, electrical and I&C systems can still withstand a single failure
- N-2 applies to actuation logic as well as power supplies
- Four divisions were already present – just makes better use of them
- NRC technical reviewers briefed on design change – reviewed drawings
- DCD Chapter 8 Rev. 2 submitted for NRC review
- Design change to be incorporated into remainder of DCD in Rev. 2



ESBWR Design Certification Design Changes

- Fission Product Release Analysis
 - GE and NRC have had ongoing interactions related to this analysis
 - To minimize control room operator dose during a Design Bases Accident
 - Changes under consideration to be finalized as result of dose calculation
 - Impacts on Emergency Breathing Air System capacity and distance between Control Building and Reactor Building



ESBWR Design Certification Design Changes

- Other changes
 - Working to optimize feedwater heater configuration
 - Should not impact NRC technical review
 - Heat cycle optimization
 - Control Room ventilation logic change
 - Minor change to ventilation trip logic
 - Spill-over line location
 - Minor change to elevation
 - RTNSS evaluation in progress, follow up NRC meeting recommended
 - Currently evaluating regulatory exemptions for consideration



ESBWR Design Certification Probabilistic Risk Assessment

- PRA models lag behind design changes
 - PRA Report, Rev. 1, currently under review by NRC
 - Chapter 19, Rev. 1, currently under review by NRC
 - Chapter 19 will be revised to incorporate identified design changes in DCD revision (Rev. 3, ~ 4/2007), with associated topical report updates continuing
 - Will be meeting with NRC on an ongoing basis to facilitate interim review as information is available
 - PRA is a living document



ESBWR Design Certification Human Factors Engineering

- ESBWR HFE Utilized the Design Acceptance Criteria (DAC) Approach
 - Goal is to minimize remaining open DAC
 - All HFE Licensing Topical Reports (LTR) submitted
 - Results summary reports (RSR) planned for closure of areas
 - Plant level RSR – January 2007
 - Functional Requirements Analysis, Allocation of Function, and Task Analysis RSR planned for Sept 2007
 - Will be meeting with NRC on an ongoing basis



ESBWR Design Certification Digital Instrumentation & Control

- I&C Design Utilized DAC Approach
 - Minimizing remaining DAC through DCD revisions and LTR submittals
 - All software management plans submitted to NRC
 - I&C control platform LTRs planned for Dec. 2006



ESBWR Design Certification

- **GE and NRC Interacting on Numerous Design Topics**
 - RAI responses to be incorporated into DCD during the next available revision
 - Audits planned and scheduled
 - Detailed topical meetings
- **GE Dedicated to Successfully Complete Design Review**



Parallel Process for NRC Review of Design Certification and COL Applications

Patricia Campbell, Director
Washington Regulatory Affairs, Nuclear



ESBWR Design Certification Process for Ongoing and Future Activities in Parallel with COL Application Review

- As discussed in 9/20/2006 DCWG meeting with NRC, GE and DCWG are developing a process to coordinate revisions to DCD and COLA following submittal of COLAs
 - GE and DCWG recognize limited time for DCD revisions before NRC Final Design Approval/Final SER and initiation of design certification rulemaking process
 - All DCD/COLA combined revisions will be coordinated with NRC prior to submittal
 - GE and DCWG will coordinate with NRC on an ongoing basis



ESBWR Design Certification Status and Schedule Summary

- NRC Review Currently in Peak Technical Period
- GE Incorporating Design Changes for Incorporation into DCD Revision 3 (02/2007)
- DCD Revision 3 to be used as baseline for NRC SER with Open Items (10/2007)
- No DCD Revisions planned until after COL Applications submitted in November 2007, but GE will continue to submit information to NRC for resolution of SER open items
- GE and DCWG will coordinate ongoing activities during parallel reviews

