F-AP-3.2-1 Rev 4

AP1000 DOCUMENT COVER SHEET

TDC: _____ Permanent File: _____

AP1000 DOCUMENT NO.	REVISION	PAGE	ASSIGNED TO	OPEN ITEMS (Y/N)
APP-GW-GLY-003	0	1 of 35	W-Lindgren	N

ALTERNATE DOCUMENT NUMBER: WORK BREAKDOWN #: GW

ORIGINATING ORGANIZATION: Westinghouse Electric Company LLC

TITLE: AP1000 I&C Meeting Licensing Overview

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
CALCULATION/ANALYSIS REFERENCE:	

ELECTRONIC FILENAME	ELECTRONIC FILE FORMAT	ELECTRONIC FILE DESCRIPTION
APP-GW-GLY-003	PDF	EDMS

LEGAL REVIEW T.J. White	SIGNATURE / DATE **(If processing electronic approval select option)** ***Electronically Approved******
PATENT REVIEW M.M. Corletti	SIGNATURE / DATE ***Electronically Approved******

ORIGINATOR(S) Johhn Ewald	SIGNATURE / DATE **(If processing electronic approval select option)** ***Electronically Approved******	
REVIEWER(S)	SIGNATURE / DATE	
	SIGNATURE / DATE	
	SIGNATURE / DATE	
VERIFIER(S) Robert Seelman	SIGNATURE / DATE ***Electronically Approved******	Verification Method: Independent Review

__Plant Applicability__: ☒ All AP1000 plants except: CPP, SMG, HYG, HY1, HY2, SM1, SM2

☐ Only the following plants:

APPLICABILITY REVIEWER** J. A. Speer	SIGNATURE / DATE ***Electronically Approved******
RESPONSIBLE MANAGER* Donald Lindgren	SIGNATURE / DATE ***Electronically Approved******

* Approval of the responsible manager signifies that the document and all required reviews are complete, the appropriate proprietary class has been assigned, electronic file has been provided to the EDMS, and the document is released for use.

****** Electronically approved records are authenticated in the electronic document management system.***

AP1000 I&C Meeting
Licensing Overview

Andrea L. Sterdis, Manager
AP1000 Licensing and Customer Interface

AP1000

AP1000 is.....

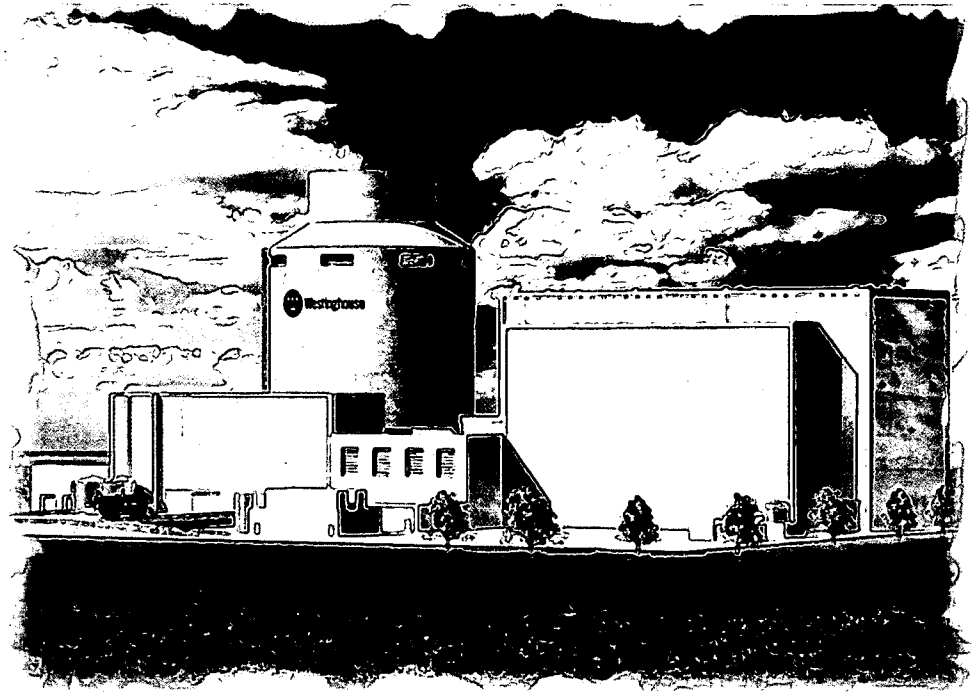
DIFFERENT!!!

Westinghouse

AP1000

Differences

- Simple
- Passive
- Standard
- Design Certified

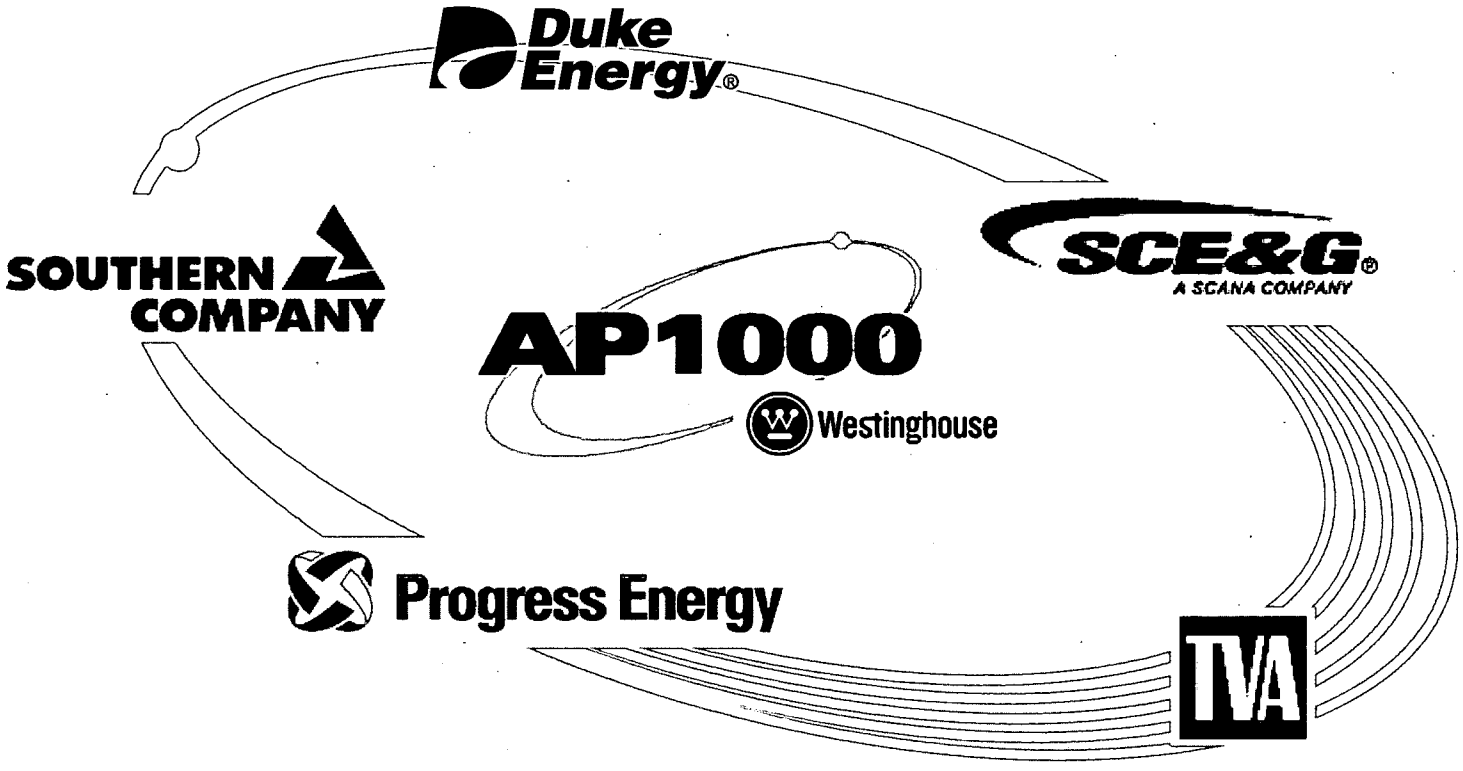


Westinghouse

AP1000 Pre-Application Licensing Approach

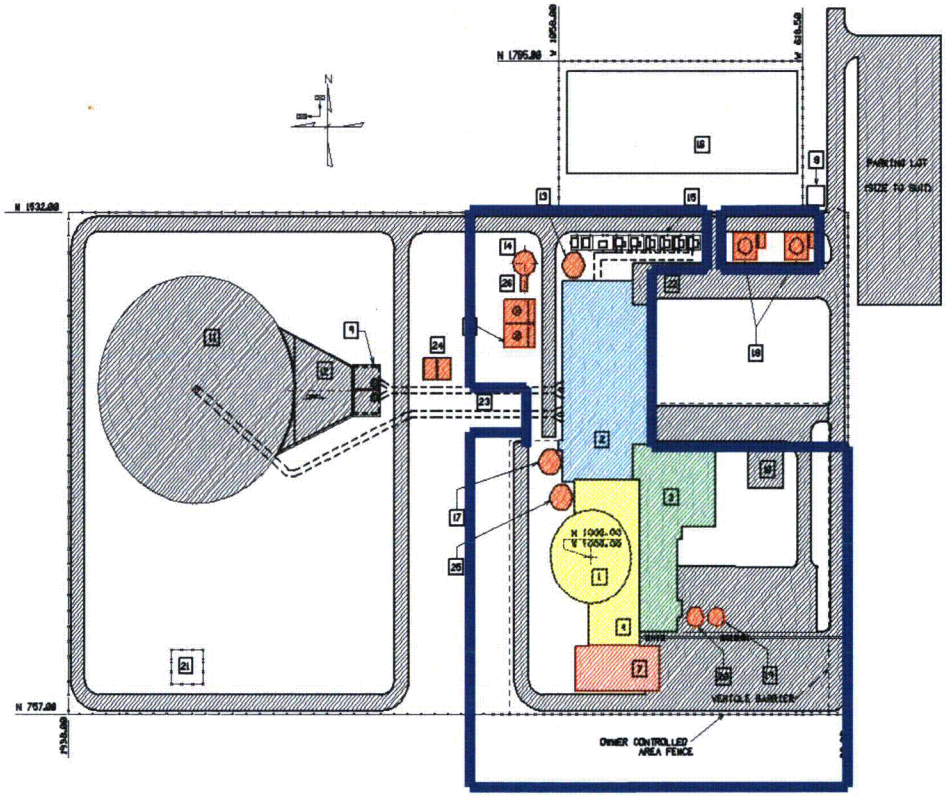
- Pre-Application activities built on AP1000 Design Certification
- Design Certification was approved December 30, 2005
- Pre-Application activities (Technical Reports) through Design Certification Amendment Application
- Docketing letter received January 18, 2008
- Bellefonte COL application docketed January 18, 2008
- Lee COL application submitted
- Remaining COL Applications are expected throughout 2008 and into 2009

AP1000 DCWG Team



What's In the Certified Scope? (DCD Fig. 1.2-2)

- The AP1000 Design Certification includes more scope than the traditional NSSS
- Only areas not included in the standard design scope and certification scope are the site specific aspects (e.g. circulating water and switchyard design)



Slide 6

AP1000

Licensing Approach and Activities

- Pre-Application Technical Report Reviews
- COL Information Item Closures
- DAC Completion
- As-Built Verification and Inspections

Westinghouse

Technical Report Reviews

- The technical reports document COL information item closure activities
- A limited number of design changes are documented in technical reports
- AP1000 DCWG review and oversight of technical report preparation and other pre-application activities promote standardization of AP1000 COL applications.

Revision 16 Process

- DCD Revision 16 (Design Certification Amendment Application) submitted May 29, 2007
- Incorporate Technical Report DCD Markups into an Overall Revision
- COL Information Items and Design Changes included in Revision 16 to Facilitate Standardization
- Editorial/Consistency Changes
  - Tier 2, no safety-impact
  - Tier 1 and Tier 2* covered in a TR to provide regulatory justification
- Technical Reports Primarily used to Provide Technical and Regulatory Justification
- 10 CFR 52 in effect September 27, 2007
- NRC Docket Letter issued January 18, 2008

AP1000

Design Acceptance Criteria

- For design certification, the requirements of 10 CFR Part 52 apply in addition to those of 10 CFR Part 50.
- Part 52 requires a level of design detail beyond a simple commitment to conformance with the existing requirements.
- 10 CFR 52.47(b)(1) also states that "this rule must provide an essentially complete nuclear power plant design except for site-specific elements.."

Design Acceptance Criteria

- 10 CFR 52.47(a)(2) specifies the following:
  - The application must contain a level of design information sufficient to enable the Commission to judge the applicant's proposed means of assuring that construction conforms to the design and to reach a final conclusion on all safety questions associated with the design before the certification is granted. The information submitted for a design certification must include performance requirements and design information sufficiently detailed to permit the preparation of acceptance and inspection requirements by the NRC, and procurement specifications and construction and installation specifications by an applicant. The Commission will require, prior to design certification, that information normally contained in certain procurement specifications and construction and installation specifications be completed and available for audit if such information is necessary for the Commission to make its safety determination.

Design Acceptance Criteria

- For AP1000, Design Certification did not include completed design in three areas
  - Piping
  - I&C
  - Human Factors
- SECY-02-0059 defines acceptability of DAC during Design Certification review for all 3 areas
- DAC approach defined as a possible substitute for required design details (but should be limited)
- DAC enables the staff to make a final safety determination, subject only to satisfactory design implementation and verification by the COL applicant, through appropriate use of ITAAC.
- The staff defined DAC as a set of prescribed limits, parameters, procedures, and attributes upon which the NRC relies, in a limited number of technical areas, in making a final safety determination to support a design certification.
- The acceptance criteria for DAC become the acceptance criteria for ITAAC, which are part of the design certification and referred to as Tier 1, Material (or Tier 1, Information).

Design Acceptance Criteria

- For AP1000, all 3 DAC areas are being addressed through the implementation of detailed design

AP1000

Design ITAAC

- Protection and Safety Monitoring I&C DAC
  - — Design Certification included trips, ESF actuations and minimum inventory for dedicated indication and control
  - — Design Certification included the certification of the five phase design and implementation process
    - Conceptual (project definition) phase
    - System definition phase
    - Hardware and software design and implementation
    - System integration and test phase
    - Installation phase (including final V&V)

AP1000

Design ITAAC

- Protection and Safety Monitoring I&C DAC
  - A report exists and concludes that the process defines the organizational responsibilities, activities, and configuration management controls for the following:
    a) Establishment of plans and methodologies.
    b) Specification of functional requirements.
    c) Documentation and review of hardware and software.
    d) Performance of system tests and the documentation of system test results.
    e) Performance of installation tests and inspections.

Westinghouse

AP1000

Design ITAAC

- Protection and Safety Monitoring I&C (cont'd)
  - Conceptual (project definition) phase
    - Planning and programmatic documents provided to NRC for their inspection October 2006
  - System definition phase underway; Revisions to Functional Diagrams in process
    - Functional Design completion sufficient to close (11b)
  - Hardware and Software design planned and scheduled
    - Sufficient progress should allow this DAC to be closed in the same time frame as the COL reviews
  - Remaining 2 acceptance criteria (11d) and (11e) require equipment to be procured and installed; Replace with As-Built ITAAC, Not DAC

AP1000

Design ITAAC Closure Process

- The same for all DAC
  - Vendor completes sufficient design
  - Interaction with staff to confirm "sufficient"
  - Technical Reports submitted for NRC review; detailed design documentation available for staff inspection/audit
  - Acceptable staff reasonable assurance conclusion reached
  - DAC items are closed
    - Design Certification Amendment
      - Revision of Tier 1 information to delete the ITAAC

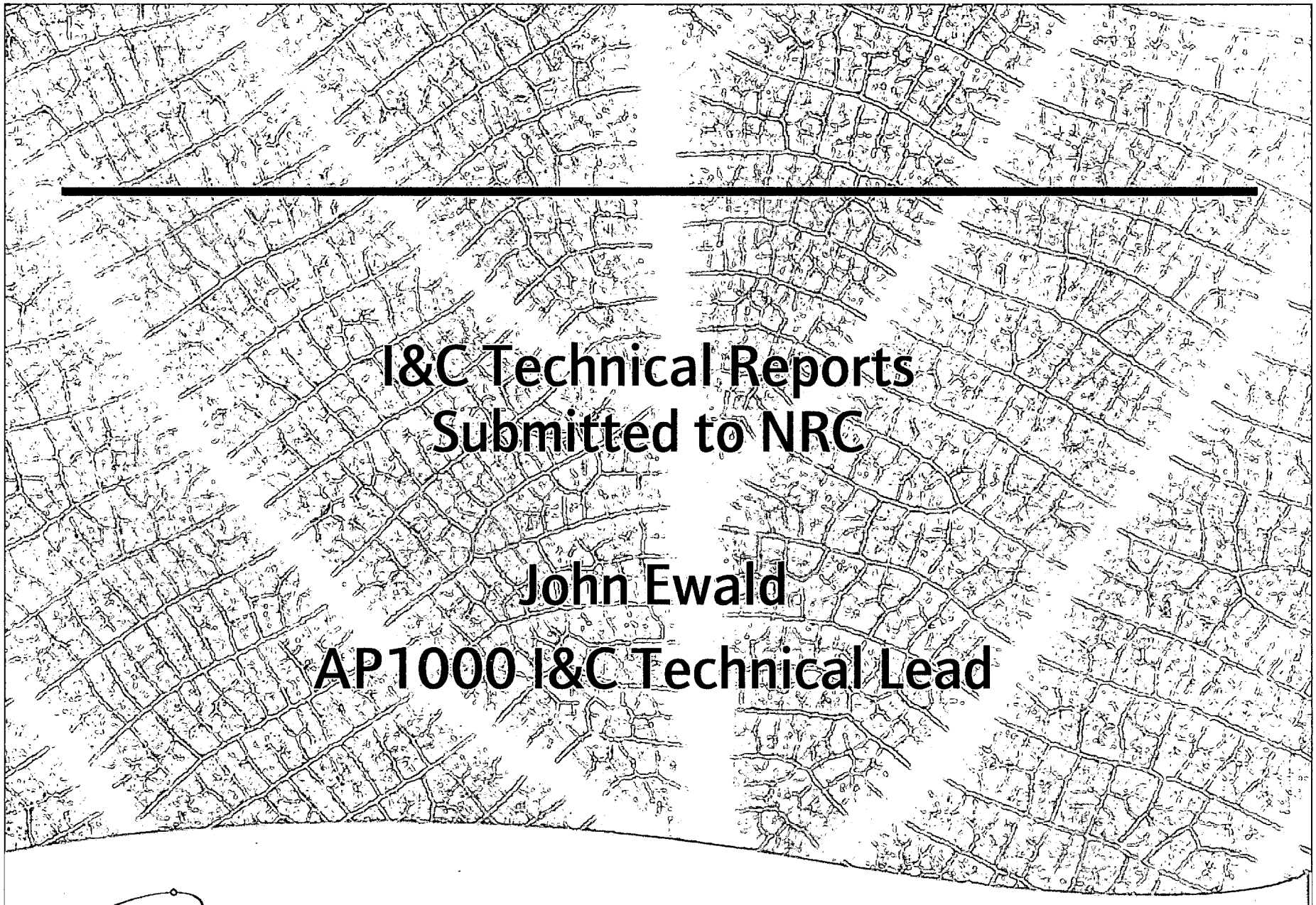
      or
    - Individual SERs
      - Each COLA references the TR(s) and the associated SER

Design Certification Amendment Review Schedule

AP1000

• P1 Preliminary Safety evaluation report and requests for additional information (RAIs)	July 2008
• P2 SER with open items	December 2008
• P3 ACRS review SER with open items	March 2009
• P4 Advanced SER with no open items	June 2009
• P5 ACRS review SER with no open items	September 2009
• P6 Final SER with no open items issues	October 2009
• Rulemaking complete	October 2010

NRC "Need Dates" to support this Schedule and resolve DAC?



I&C Technical Reports Submitted to NRC

John Ewald

AP1000 I&C Technical Lead

I&C Technical Reports Submitted

- TR-28 – Setpoint Calculations
  - Submitted May 2006
  - Discussed with NRC October 2006
  - Requests for Additional Information (RAIs) received May 2007
  - RAI Responses sent June 2007
- TR-39 – I&C Design Changes
  - Submitted May 2006
  - Discussed with NRC October 2006
  - RAI responses submitted February 2007
  - Additional responses sent June 2007
  - Revision 1 planned following resolution of RAIs
- TR-42 – Resolution of Generic Open Items and Plant-Specific Action Items
  - Submitted May 2006
  - Discussed with NRC October 2006
  - RAI response combined with TR-88 and sent May 2007

I&C Technical Reports Submitted

- TR-43 – FMEA/SHA
  - Submitted June 2006
  - Discussed with NRC October 2006
  - RAIs received end of March 2007
  - RAI response sent May 2007

- TR-80 – DCD Chapter 7 Amendment
  - Submitted October 2007

- TR-88 – Data Communications
  - This subject was discussed with the NRC on October 2006 and earlier in this meeting
  - Submitted December 2006
  - RAIs received end of March 2007
  - RAI response sent in May 2007

I&C Technical Reports Submitted

- TR-89 – Protection System Architecture
  - This subject was discussed with the NRC on October 2006 and earlier in this meeting
  - Submitted February 2007
  - No RAIs received to date
- TR-97 – Diverse Actuation System (DAS) changes
  - Submitted March 2007
  - RAIs received August 2007
  - RAI response sent in September 2007
- TR-104 – Cyber-Security
  - Submitted May 2007

TR-42 Overview

- **TR-42, APP-GW-GLR-017, "Resolution of Common Q NRC Items"**
  - Dispositions 14 Plant Specific Action Items (PSAIs)
  - Dispositions 10 Generic Open Items (GOIs)
    - This includes:
      - Sufficient Information to Close (for AP1000) GOI 7.8, "Loop Controllers" (Control of Safety System Components)
      - Sufficient Information to Close (for AP1000) GOI 7.9, "Separation of Signals" (Safety/Non-safety Communication)

TR-88 Overview

- **TR-88, APP-GW-GLR-065, "AP1000 I&C Data Communication and Manual Control Safety Systems and Components"**
  - Provides Clarification and Amplification to Support NRC Review of
    - Control of Safety System Components
    - Safety/Non-safety Communication
  - Provides Information on the Component Interface Module (CIM)
    - Presented in TR-88 in lieu of the "Common Q revision" promised by TR-42

Conclusion

TR-88 provides clarification and amplification of TR-42, relating to control of safety system components and to safety/non-safety communication.

Provides the CIM information, which TR-42 promised in a "Common Q revision."

There are no design changes between TR-42 and TR-88 under the current revision.

A revision to TR-88 for the change from hardwired to serial interfaces will be submitted in April 2008, along with changes to any other Impacted reports.

AP1000 DCD
Chapter 7 Amendment
TR-80

John Ewald
AP1000 I&C Technical Lead

DCD Chapter 7 Amendment (TR-80)

- Why did we need TR-80?
  - Numerous changes to match current best design practices were identified via design efforts.
- Intent of TR-80
  - Provide one consolidated compilation of proposed changes to DCD Chapter 7.
- Format of TR-80
  - Similar format to previous TRs
  - DCPs that changed Chapter 7 were referenced
  - Revision 16 changes to Chapter 7 described and justified
  - Post Revision 16 changes to Chapter 7 (errata and additional DCPs) described and justified
  - Some of the changes affected DCD chapters other than Chapter 7
  - A complete Chapter 7 was provided as an Appendix

DCD Chapter 7 Amendment (TR-80)

- TR-134
  - — Documents all post Revision 16 DCD markups (including Chapter 7 from TR-80)

- Schedule
  - — Submitted October 2007

- Previously transmitted Chapter 7 changes:
  - – TR-28 – Setpoint Calculations
    - Satisfies COL Item 7.1-1
    - Discussed with NRC October 4, 2006
    - RAI Responses sent June 2007
  - – TR-39 – Instrumentation & Control (I&C) Design Changes
    - Refined functional details
    - Discussed with NRC October 4, 2006
    - 17 RAI Responses sent February 2007
    - Additional Responses sent June 2007

DCD Chapter 7 Amendment (TR-80)

- TR-42 – Resolution of Generic Open Items and Plant-Specific Action Items
  - Satisfies COL Item 7.1-2
  - Discussed with NRC October 4, 2006
  - RAI Responses sent May 2007
- TR-43 – Failure Modes and Effect Analysis/Software Hazards Analysis (FMEA/SHA)
  - Satisfies COL Item 7.2-1
  - Discussed with NRC October 4, 2006
  - RAI Responses sent May 2007

DCD Chapter 7 Amendment (TR-80)

- Additional Chapter 7 changes include:
  - Remove references to Eagle platform
    - Common Q is the platform chosen for implementation.
    - Revise/delete figures to match Common Q implementation.
    - Remove design detail from Chapter 7 and replace with references to TR-89.
  - Elimination of Protection and Safety Monitoring System (PMS) control room multiplexer
    - Multiplexer is part of Eagle design.
    - Adds complexity for Common Q.
    - System-level actuations to a "lower level" in PMS
  - Diverse Actuation System (DAS) changes (TR-97)
    - Moves DAS squib valve controller to "dirty side" of Auxiliary Building to aid in response to a large fire.
    - Adds remote indication in "dirty" Auxiliary Building.
    - Removes references to "microprocessor" for automatic DAS (Tier 1 change).

DCD Chapter 7 Amendment (TR-80)

- Additional Chapter 7 changes include:
  - Plant Control System (PLS) logic changes
    - Revise PLS to match PMS changes
    - Match current Mechanical Shim (MSHIM) (gray rod control) design
    - Improve control system performance
    - Correct errors in terminology (e.g., signal selector not used for binary signals)
  - Cyber-security
    - Reference to cyber-security report (TR-104) will be added to Chapter 7

DCD Chapter 7 Amendment (TR-80)

- Additional Chapter 7 changes include:
  - Reference Common Q Software Program Manual and Westinghouse procedures for process description.
    - Update Common Q references to current version
    - Delete reference to WCAP-15927
  - Additional PMS logic changes
  - Revise words implying that Remote Shutdown Workstation (RSW) meets single-failure criterion.
  - Correct DCD Tables 7.5-7 and 7.5-9
    - MCR "dampers" were changed to "valves"

Design Certification Amendment Purpose

- Incorporate Design Changes
- Resolve COL Information Items for all COL applicants referencing AP1000 Design Certification
- Partially Resolve Design Acceptance Criteria
- Present detailed Architecture and Communication design information for NRC review

AP1000™

Objective is for NRC SER to Acceptably Address these Items