AP1000 Plant Operating Procedures

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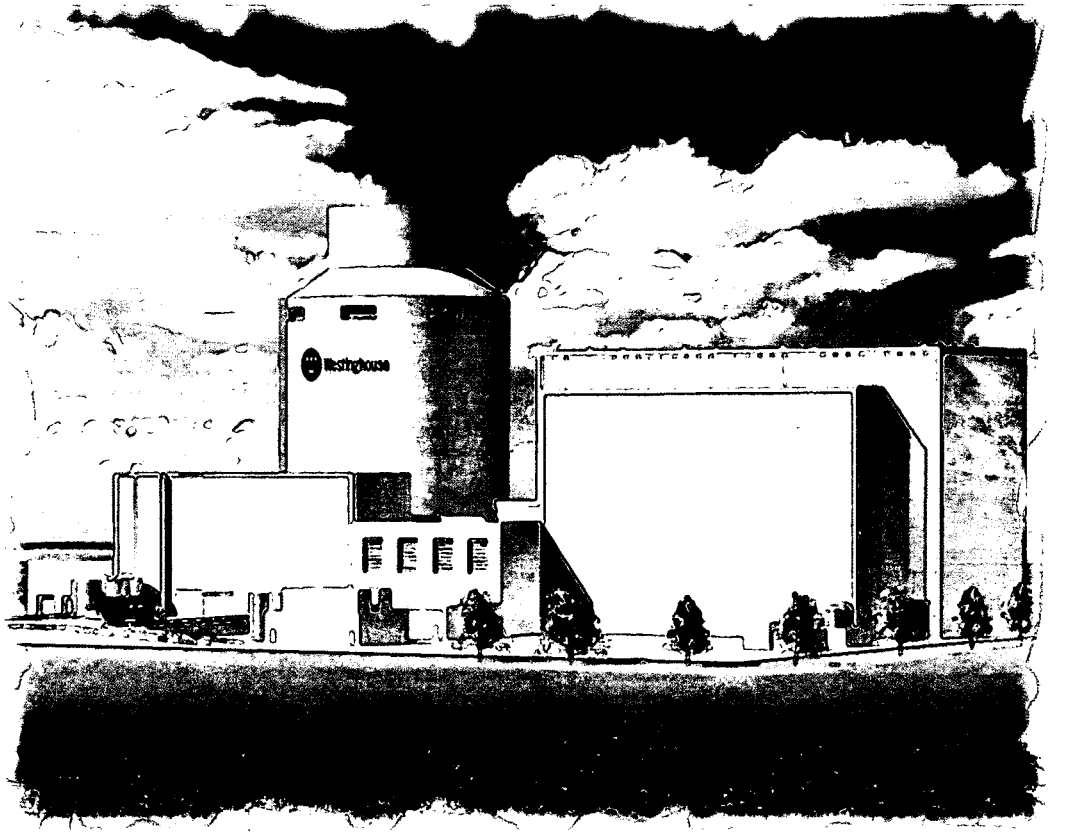

Agenda

- Introductions
- AP1000 Licensing Overview
- Overview of Technical Report 70
- Status of Procedure Efforts
- Writer's Guide
- Public Comments

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Meeting Objectives

- Overview of AP1000 Design Certification Efforts and COL Support Efforts Relevant to Plant Procedures
- Review AP1000 Procedures Status
- Discuss Status of Completion of Procedure Development For Closing COL Information Items (18.9-1 and 13.5-1)
- Develop plan going forward

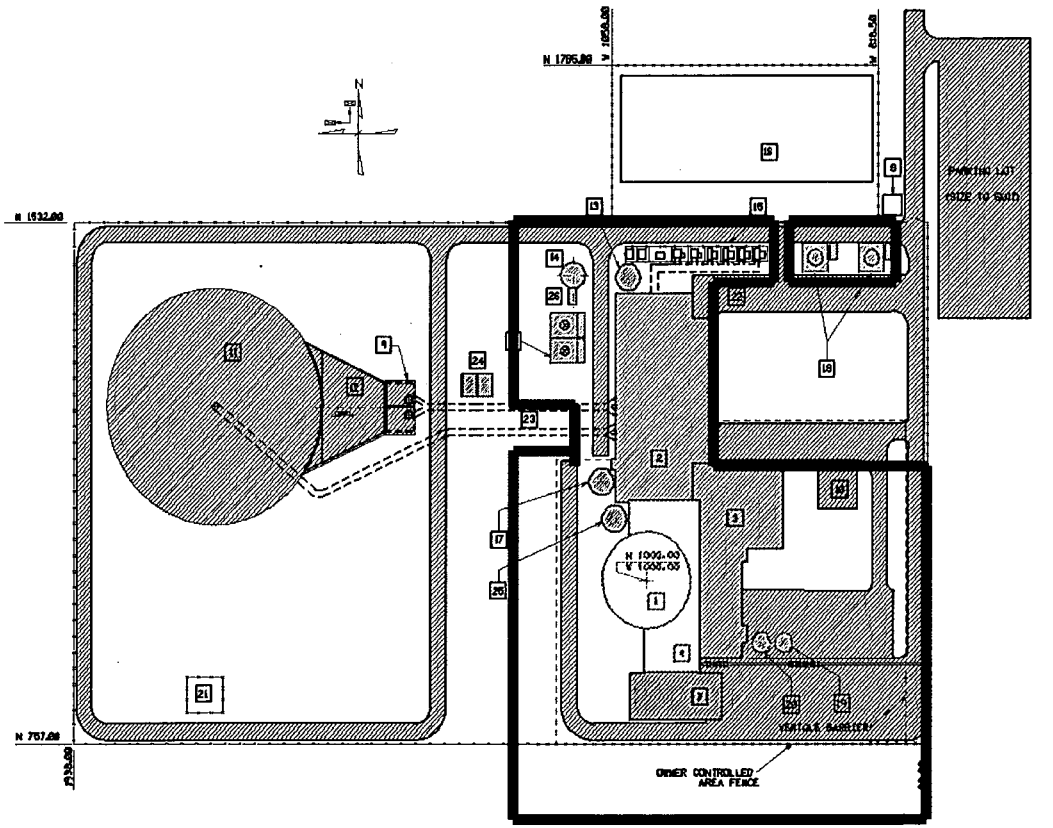
AP1000 Pre-Application Licensing Approach

- Pre-Application activities build on AP1000 Design Certification
- Design Certification was approved December 30, 2005
- Pre-Application activities are active now
- COL Applications are scheduled for Fall 2007 submittal

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)



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Licensing Approach and Activities

- Pre-Application Review
- COL Information Item Closures
- Design Acceptance Criteria Completion
- As-Built Verification and Inspections

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Pre-Application Review

- Westinghouse is preparing reports to address COL information items and other design completion activities in support of expected COL applications.
- Pre-application activities are in support of standardization of AP1000 COL applications.
- Pre-application activities support the NRC Design Centered Review Approach.

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Pre-Application Review

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

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Pre-Application Review

- Submittal of technical reports by Westinghouse to provide standard AP1000 Design information
- NRC Staff Review (Interaction as necessary)
- NRC SER Preparation
- Application to all COL Applications via reference to technical reports and corresponding SERs

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Potential Part 52 Revision

- **Revision of AP1000 Design Certification Rule**
  - Part 52 does not currently provide for revision
  - Substantial industry comments on NOPR for revising Part 52 to permit revision
  - Indication are that revised rule will include mechanism for revision
    - Draft rule language issued
    - Publishing date is "any day now"
- **If revised Part 52 allows, Westinghouse plans to submit a revised DCD in May 2007.**

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COL Information Items Closures

- **NRC Review and approval of technical reports documenting COL information items closure activities will:**
  - Provide one standard approach by COL applicants
  - Require one review by NRC
  - Remove the review of these items from the critical path in application review.
- **Approximately 65 of 100 planned Technical Reports have been submitted**

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Overview of Technical Report 70

- **APP-GW-GLR-040, Plant Operations, Surveillance, and Maintenance Procedures**

Status of Procedure Efforts

Status of AP1000 Procedure Efforts
Development Process and Writer's Guidelines

- **The process for Normal, Abnormal and Emergency Operating Procedures (NOPs, AOPs, EOPs) development and review is as follows:**
- **The NOP/AOP/EOPs are developed in accordance with the applicable writer's guidelines (APP-GW-GJP-100 for NOPs, APP-GW-GJP-200 for Two-Column Format Procedures)**
- **Each Procedure Receives the following reviews:**
  - ✓ Technical Writer's Review
  - ✓ Technical Lead Review/Verification
  - ✓ Review by Industry Subject Matter Experts at Nu Start
  - ✓ Responsible Manager's Approval
- **Nu Start has provided reviews on the AP1000 Writer's Guidelines and the Standardized Procedures that have been developed to support previous efforts.**

Status of AP1000 Procedure Efforts

24 System NOPs Completed to Support Previous Efforts

NOP Procedure Title:	AP1000 Procedure Number:
Blowdown System (BDS) NOP	APP-BDS-GJP-101
Component Cooling Water System (CCS) NOP	APP-CCS-GJP-101
Condensate System (CDS) NOP	APP-CDS-GJP-101
Chemical and Volume Control System (CVS) NOP	APP-CVS-GJP-101
Circulating Water System (CWS) NOP	APP-CWS-GJP-101
Diverse Actuation System (DAS) NOP	APP-DAS-GJP-101
Feedwater System (FWS) NOP	APP-FWS-GJP-101
Heater Drain System (HDS) NOP	APP-HDS-GJP-101
Class 1E 125V DC System (IDS) NOP	APP-IDS-GJP-101
Class 1E 120/280V AC System (IDS) NOP	APP-IDS-GJP-102
Main Steam System (MSS) NOP	APP-MSS-GJP-101
Main Turbine System (MTS) NOP	APP-MTS-GJP-101

Status of AP1000 Procedure Efforts

24 System NOPs Completed to Support Previous Efforts

NOP Procedure Title:	AP1000 Procedure Number:
Passive Containment Cooling System (PCS) NOP	APP-PCS-GJP-101
Passive Core Cooling System (PXS) NOP	APP-PXS-GJP-101
Reactor Coolant System (RCS) NOP	APP-RCS-GJP-101
Radiation Monitoring System (RMS) NOP	APP-RMS-GJP-101
Normal Residual Heat Removal System (RNS) NOP	APP-RNS-GJP-101
Spent Fuel Pool Cooling System (SFS) NOP	APP-SFS-GJP-101
Steam Generator System (SGS) NOP	APP-SGS-GJP-101
Service Water System (SWS) NOP	APP-SWS-GJP-101
Main C.R. Emerg. Habitability System (VES) NOP	APP-VES-GJP-101
Containment Air Filtration System (VFS) NOP	APP-VFS-GJP-101
Liquid Radwaste System (WLS) NOP	APP-WLS-GJP-101
Onsite Standby Power System (ZOS) NOP	APP-ZOS-GJP-101

Status of AP1000 Procedure Efforts

12 General/1 Surveillance Procedure Completed to Support Previous Efforts

General Operating Procedure/ST Procedure Title:	AP1000 Procedure Number:
Normal Operation at 100% Power	APP-GW-GJP-101
Plant Shutdown and Cooldown from Mode 1 to Mode 3	APP-GW-GJP-102
Plant Cooldown from Mode 3 to Cold Shutdown	APP-GW-GJP-103
Plant Cooldown from Mode 5 to Refueling Mode	APP-GW-GJP-104
Plant Heatup - from Refueling Mode to Mode 5	APP-GW-GJP-105
Plant Heatup – Mode 5 to Mode 4	APP-GW-GJP-106
Plant Heatup – Mode 4 to Mode 3	APP-GW-GJP-107
Plant Startup – Mode 3 to 2% Power	APP-GW-GJP-108
Plant Power Escalation from 2% to 100% Power	APP-GW-GJP-109
Secondary Plant Heatup and Startup	APP-GW-GJP-110
Inverse Count Rate Plot Procedure	APP-GW-GJP-111
Critical Rod Position/Boron Concentration Calculation	APP-GW-GJP-112
ADS Valve Testing During Mode 5 (Surveillance Test	APP-RCS-GJP-801

Status of AP1000 Procedure Efforts

23 EOPs Completed to Support Previous Efforts

EOP/Background Document Procedure Title:	AP1000 Procedure Number:
E-0 Reactor Trip or Safety Injection	APP-GW-GJP-201, APP-GW-GJR-201
E-1 Loss of Reactor or Secondary Coolant	APP-GW-GJP-202, APP-GW-GJR-202
E-2 Faulted SG Isolation	APP-GW-GJP-203, APP-GW-GJR-203
E-3 SG Tube Rupture	APP-GW-GJP-204, APP-GW-GJR-204
ECA-1.1 LOCA Outside Containment	APP-GW-GJP-205, APP-GW-GJR-205
ES-0.1 Reactor Trip Response	APP-GW-GJP-206, APP-GW-GJR-206
ES-0.2 Natural Circulation Cooldown	APP-GW-GJP-207, APP-GW-GJR-207
ES-1.1 Passive Safety System Termination	APP-GW-GJP-208, APP-GW-GJR-208
ES-1.2 Post LOCA Cooldown & Depressurization	APP-GW-GJP-209, APP-GW-GJR-209
FR-C.1 Response to Inadequate Core Cooling	APP-GW-GJP-210, APP-GW-GJR-210
FR-C.2 Response to Degraded Core Cooling	APP-GW-GJP-211, APP-GW-GJR-211
FR-C.3 Response to Saturated Core Cooling	APP-GW-GJP-212, APP-GW-GJR-212

Status of AP1000 Procedure Efforts

23 EOPs Completed to Support Previous Efforts

EOP/Background Document Procedure Title:	AP1000 Procedure Number:
FR-H.1 Response to Loss of Heat Sink	APP-GW-GJP-213, APP-GW-GJR-213
FR-H.2 Response to SG Overpressure	APP-GW-GJP-214, APP-GW-GJR-214
FR-H.3 Response to SG High Level	APP-GW-GJP-215, APP-GW-GJR-215
FR-H.4 Response to Loss of Normal Steam Release Capabilities	APP-GW-GJP-216, APP-GW-GJR-216
FR-H.2 Response to SG Overpressure	APP-GW-GJP-214, APP-GW-GJR-214
FR-H.3 Response to SG High Level	APP-GW-GJP-215, APP-GW-GJR-215
FR-H.4 Response to Loss of Normal Steam Release Capabilities	APP-GW-GJP-216, APP-GW-GJR-216
FR-H.5 Response to SG Low Level	APP-GW-GJP-217, APP-GW-GJR-217
FR-I.1 Response to High Pressurizer Level	APP-GW-GJP-218. APP-GW-GJR-218
FR-I.2 Response to Low Pressurizer Level	APP-GW-GJP-219, APP-GW-GJR-219
FR-I.3 Response to Voids in Reactor Vessel	APP-GW-GJP-220, APP-GW-GJR-220
SDP-1 Response to Loss of RCS Inventory During Shutdown	APP-GW-GJP-231, APP-GW-GJR-231
SDP-2 Response to Loss of RNS During Shutdown	APP-GW-GJP-232, APP-GW-GJR-232
SDP-3 Response to Hi Containment Rad. During Shutdown	APP-GW-GJP-233, APP-GW-GJR-233

Status of AP1000 Procedure Efforts

11 AOPs Completed to Support Previous Efforts

AOP Procedure Title:	AP1000 Procedure Number:
Rapid Plant Shutdown	APP-GW-GJP-301
Emergency Boration	APP-GW-GJP-302
Acts of Nature	APP-GW-GJP-303
Steam Generator Tube Leak	APP-GW-GJP-304
Fire Response Emergency	APP-GW-GJP-305
High Radiation	APP-GW-GJP-315
Condensate System Malfunctions	APP-GW-GJP-318
CVS Leak	APP-GW-GJP-319
Feedwater System Malfunctions	APP-GW-GJP-326
Startup Feedwater System Malfunctions	APP-GW-GJP-327
Reactor Coolant System High Activity	APP-GW-GJP-341

Status of AP1000 Procedure Efforts

- **Status of Normal Operating Procedures – System Operating Procedures:**
  - 24 Procedures completed. Approximately 90 systems have been identified as part of the Certified Design.
  - Approximately 66 total System Operating Procedures remaining to be developed, of which only approximately 8 are necessary to support Design Finalization activities.
- **Status of Normal Operating Procedures – General Operating Procedures**
  - 12 Procedures completed. This is the total, currently identified population.
  - Further evaluation will determine if any additional need to be developed during Design Finalization activities.
- **Status of Surveillance Procedures**
  - 1 Procedure completed out of an identified population of approximately 200.
  - Approximately 199 Surveillance Procedures remaining to be developed. Population to be finalized during Design Finalization
- **Status of Emergency Operating Procedures**
  - 23 Procedures and their corresponding Background Documents developed out of an identified population of approximately 37.
  - Approximately 14 Emergency Operating Procedures and their corresponding Background Documents remain to be developed.

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Status of AP1000 Procedure Efforts

- **Status of Abnormal Operating Procedures**
  - 11 Procedures completed, out of an identified population of approximately 46. No AOP Background Documents are currently developed.
  - Approximately 35 Abnormal Operating Procedures and 46 AOP Background Documents remain to be developed.
- **Overall Status of Operations Procedure Effort:**
  - 70 Total Operating Procedures (NOP, EOP, AOP) Developed – Approximately 80 Remaining to be developed
  - 1 Surveillance Testing Procedure Developed – approximately 199 remaining to be developed
- **Sufficient Procedures have been developed to facilitate NRC's review to support a reasonable assurance assessment with respect to the Procedures program.**

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Status of AP1000 Procedure Efforts

- **Status of Writer's Guidelines**
  - APP-GW-GJP-100, AP1000 Normal Operating Procedures (NOP) Writer's Guideline, Revision F has been developed and approved.
  - In addition, APP-GW-GJP-100 Revision F has been reviewed by all five NuStart utilities and has been accepted with their comments incorporated.
  - APP-GW-GJP-200, AP1000 Writer's Guideline For Two Column Procedures, Revision B has been developed and approved.
  - In addition, APP-GW-GJP-200 Revision A has been reviewed by NuStart and their comments incorporated into Revision B. Revision B has been reviewed by all five NuStart utilities and their comments are currently in the process of being incorporated into Revision C.
- **Standards and Guidance Incorporated into the Writer's Guidelines Include:**
  - INPO Good Practice 06-002, Human Performance Tools for Workers
  - NEI AP-907-005, "Procedure Writer's Manual"
  - NUREG-0899, Guidelines for the Preparation of Emergency Operating Procedure
  - NUREG-1358, Lessons Learned from the Special Inspection Program for Emergency Operating Procedures
  - NUREG-1358, Supplement 1, Lessons Learned from the Special Inspection Program for Emergency Operating Procedures

Status of AP1000 Procedure Efforts

- **Status of the Computerized Procedure System (CPS) for AP1000**
  - Westinghouse and The Builder's Group are collaborating on determining the acceptable subset of Procedures to be entered into CPS.
  - Currently, the Emergency and Abnormal Operating Procedures are selected to be entered into the CPS.
  - It is important to note that none of the procedures which are part of the CPS provide any type of "automatic" actions or operations of the AP1000.
  - The CPS is an Operator-paced system of electronic procedure enhancement which allows the operator to maintain a higher level of oversight of control room actions, rather than being "equipment operators".
- **Status of Standardization of Procedures in the AP1000 Design:**
  - The AP1000 Writer's Guidelines are part of the Standard Design of the AP1000
  - Procedures developed by the AP1000 Writer's Guidelines, currently being developed an approved by Westinghouse in collaboration with the NuStart utilities through The Builder's Group are delivered to the Combined Operating Licensees as part of the AP1000 Standardized design.

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What are We Proposing?

- **Two COL Information Items Related to Procedure Development**
  - COL Information Item 18.9-1
  - COL Information Item 13.5-1
- **Proposal is that sufficient work has been done to completely close 18.9-1 and to partially close 13.5-1**

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COL Information Item 18.9-1

- **Proposed Markup of the DCD Subsequent to NRC acceptance of TR 70:**
- **Revise Section 18.9.1 to read as follows:**
- **18.9.1 Combined License Information**
- The Combined License information requested in this subsection has been addressed in APP-GW-GLR-040, (Reference 2), and the applicable changes are incorporated into the DCD. No additional work is required by the Combined Operating License Applicant to address the aspects of the Combined License information requested in this subsection. The work that has been completed is summarized in the following paragraph:

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COL Information Item 18.9-1

- The process to manage the development, review and approval of AP1000 Normal Operating, Abnormal Operating, Emergency Operating, Refueling and outage planning, Alarm response, Administrative, Maintenance, Inspection, Test and Surveillance Procedures as well as the procedures which address the operation of post-72 hour equipment is delineated in APP-GW-GLR-040. In addition, APP-GW-GLR-040 submitted the Writer's Guidelines for Normal Operating and Two-Column Format Procedures for NRC review. Reference 2 identifies the procedures needed to successfully complete the AP1000 HFE program. Reference 2 also explains that these procedures either already have been or will be completed to support the corresponding HFE activities that require these procedures.

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COL Information Item 18.9-1

- **The following words represent the original Combined Operating License Information Item commitment, which has been addressed as discussed above:**
  - *See Section 13.5 for a discussion of the responsibility for procedure development.*
- **Add the following Reference to Sections 13.5.1 and 18.9.2 as follows**
  - References:
    2. APP-GW-GLR-040, "Plant Operations, Surveillance, and Maintenance Procedures" Revision 1

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COL Information Item 13.5-1

- Proposed Markup of the DCD Subsequent to NRC acceptance of TR 70:
- Revise Section 13.5.1 to read as follows:
- The Combined License information requested in this subsection has been partially addressed in APP-GW-GLR-040, Revision 1 (Reference 10), and the applicable changes are incorporated into the DCD. No additional work is required by the Combined Operating License Applicant to address the aspects of the Combined License information requested in this subsection as delineated in the following paragraph:
- The process to manage the development, review and approval of AP1000 Normal Operating, Abnormal Operating, Emergency Operating, Refueling and outage planning, Alarm response, Administrative, Maintenance, Inspection, Test and Surveillance Procedures as well as the procedures which address the operation of post-72 hour equipment is delineated in APP-GW-GLR-040, Revision 1. In addition, APP-GW-GLR-040 submitted to the NRC the Writer's Guidelines for Normal Operating and Two-Column Format Procedures, APP-GW-GJP-100 and APP-GW-GJP-200 respectively.

COL Information Item 13.5-1

- **The Combined Operating License Applicant will address Operational and Maintenance Programmatic issues, as well as training and other issues which have been tied to COL Information Item 13.5-1 in the AP1000 licensing process.**
- **The following words represent the original Combined Operating License Information Item commitment:**
- **Combined License applicants referencing the AP1000 certified design will address plant procedures including the following:**
  - Normal operation
  - Abnormal operation
  - Emergency operation
  - Refueling and outage planning
  - Alarm response
  - Maintenance, inspection, test and surveillance
  - Administrative
  - Operation of post-72 hour equipment
- **References: APP-GW-GLR-040, Plant Operations Maintenance and Surveillance Procedures, Revision 1**

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COL Information Item 13.5-1

- Procedure development (NOPs, AOPs, and EOPs) as well as process and Writer's Guide Development are sufficient to reach reasonable assurance conclusion for 13.5-1 for NOPs, AOPs and EOPs
- Final procedure completion is expected prior to beginning operator crew training or earlier.

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COLA 13.5 and DCD 13.5

- The Design-Centered Working Group is currently reviewing the draft Revision 16 DCD Section 13.5 as well as the draft COLA FSAR 13.5
- Content of "total package" fairly well understood
- Discussion is underway to determine what content is appropriate for the DCD versus the COLA FSAR
- Programmatic and Applicant-Specific aspects likely to remain in COLA FSAR 13.5

COLA 13.5 Table of Contents

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Plan Going Forward

- **NRC to review available materials**
  - Writer's Guidelines
  - Procedures
  - TR 70 and Revision 1 to TR 70
- **NRC to determine that the existing work is sufficient to reach reasonable assurance conclusion for closing 18.9-1 and partially closing 13.5-1**