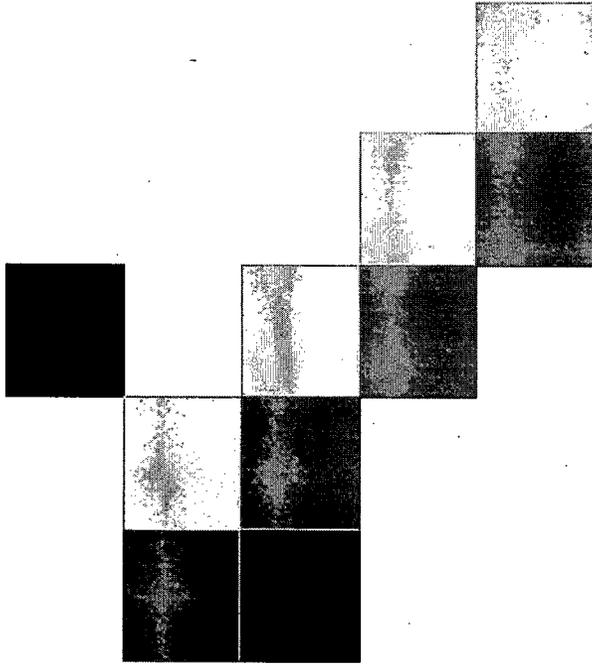


# AP1000-ESBWR Design Centered Work Group

Joint Meeting with NRC Staff

March 22, 2007



# Introductory Remarks



# Agenda

## **March 22, 2007**

10 CFR 52, RG-1.206, SRP status update

NRC

Operational Programs

DCWG

Quality Assurance during COLA development

DCWG

NRC inspection of pre-application activities

NRC

Onsite Environmental Report activities

DCWG

Severe Accident Mitigation Alternatives (SAMA)

DCWG

## **March 23, 2007**

Parallel Review of DCDs and COLA development

DCWG

ITAAC for Design Certification and COLA

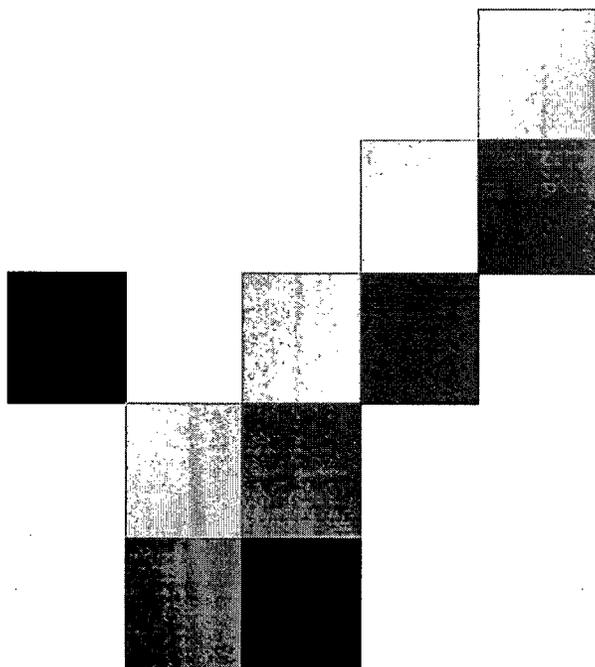
DCWG

Misc followup from February COLA workshop

ALL

Action Item Review

ALL



## **Status Update:**

10 CFR Part 52

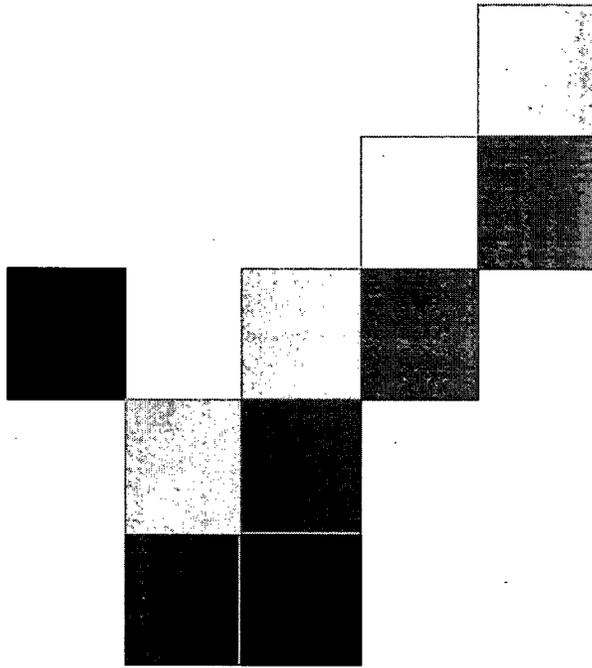
RG-1.206

SRP

NUREG-1555

Other guidance

**NRC Staff**



# AP1000 Operational Programs



# NuStart AP1000 Operational Program Technical Reports (TRs)

- Purpose:
  1. Promote standardization and early interaction with Staff
  2. Address COL Items to “fully describe” Operational Programs
- Scope: Seven SECY-05-0197 programs
- Format: considering NRC feedback



# Format of AP1000 Technical Reports

- INTRODUCTION – COL Items identified
- TECHNICAL BACKGROUND
  - Regulatory, AP1000 DCD, NUREG-1793 Bases
  - Operational Program Implementation
  - Program Summary & Supplemental Information
- REGULATORY IMPACT
- REFERENCES
- DCD IMPACT



# Status of AP1000

## Operational Program TRs

### ■ Containment Leak Rate Test Program

#### □ Closes COL Item 6.2-1

- FSAR §6.2.5 – Option B for COL applicants
- FSAR §6.2.5.1 – Adds Scheduling & Reporting requirements

### ■ Reactor Vessel Material Surveillance

#### □ Closes COL Item 5.3-2

- FSAR §5.3.2.6.3 – Requirements for submittal of capsule withdrawal test results, including date for any needed Tech Spec changes



# Status of AP1000

## Operational Program TRs (continued)

### ■ Equipment Qualification (EQ) Program

#### □ Closes COL Item 3.11-1

#### ■ FSAR §3.11.5 – Revised to address maintenance of EQ files

##### □ EQ files addressed include:

- Design Specs
- EQ Master Equipment List (EQMEL)
- Administrative Procedures

##### □ Equipment design through ITAAC closure phase



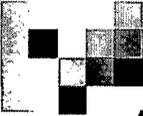
# AP1000 Operational Program TRs: Near-Term Submittals

- Preservice and Inservice Testing (IST)
  - COL Item 3.9-3: Snubber Operability Testing
  - COL Item 3.9-4: Valve Inservice Testing
    - Non-intrusive check valve testing methods
    - Program for valve disassembly and inspection
    - MOV program – excluded from scope of this TR



# AP1000 Operational Program TRs: Near-Term Submittals (continued)

- Preservice and Inservice Inspection (ISI)
  - COL Item 5.2-2: Plant-specific ISI Program
    - Include Reactor Vessel head inspections & Boric Acid inspections
    - Identify Code and Edition
  - COL Item 6.6-1: ISI Program for Class 2 & 3 components
  - COL Item 6.6-2: Controls to preserve accessibility and inspectability



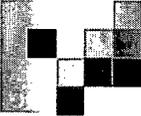
# AP1000 Operational Program TRs: Near-Term Submittals (continued)

- Process and Effluent Monitoring and Sampling
  - COL Item 11.5-2: COL applicant responsible for site-specific and program aspects of this program
  
  - TR Status: On-Hold pending March 28 meeting



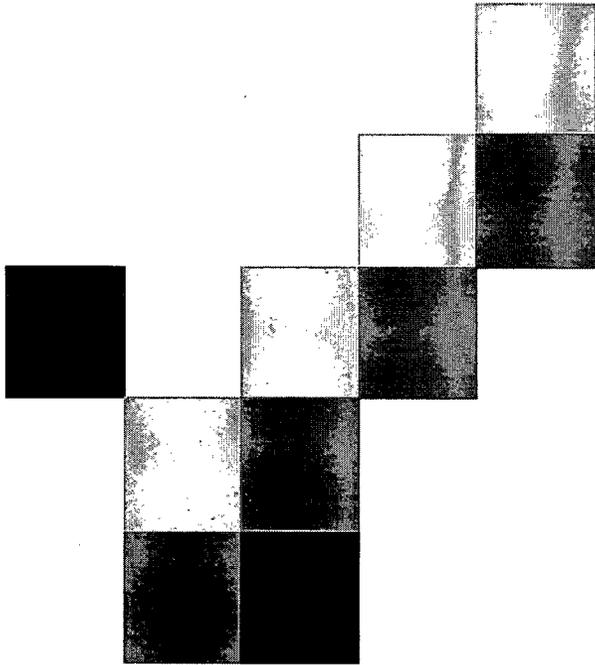
# AP1000 Operational Program Issues

- Motor-Operated Valve (MOV) Program
  - 10 CFR 50.55a(b)(3)(ii) – compliance with ASME OM Code ISTC 4.2 or ISTC 3500
  - Based on lessons learned from 20 years of testing, more appropriate requirements in OMN-1, Rev. 1
  - NRC voted in favor of Rev. 1, but it is not currently endorsed by NRC in §50.55a or RG 1.192
  - Options:
    1. Plan to prepare COL application to Rev. 1 with an Exemption Request
      - Will not include Exemption Request if NRC endorses Rev. 1 prior to COLA submittal
    2. MOV Program based on OMN-1, Rev. 1 in DCD Rev. 16



# AP1000 Operational Program TRs

- NRC feedback needed
  - Technical content on specific programs
  - Level of detail for SECY-05-0197 “fully described”
  - Other feedback



# ESBWR Operational Programs



# ESBWR Operational Programs: Approach

- Consistent with ESBWR DCD Rev 3
- DCWG review, concurrence
  - Goal: Standard product for ESBWR COLAs
- Where applicable, follow AP1000 TR approach for program descriptions
  - Scope
  - Level of detail



## ESBWR Operational Programs: Approach (continued)

- Other sources of input
  - Existing plant programs
  - NEI templates
  - DG-1145; applicable SRPs, Reg. Guides
- Submittals
  - Do not intend to submit separate topical reports for ESBWR programs if already addressed by AP1000 TRs



# ESBWR Operational Programs: Status

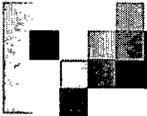
- Most programs in early in development phase
- First drafts this month
- Generic Discussion of Chapter 11 Programs at NRC-NEI TF Meeting (3/28)



# ESBWR Operational Programs: Example

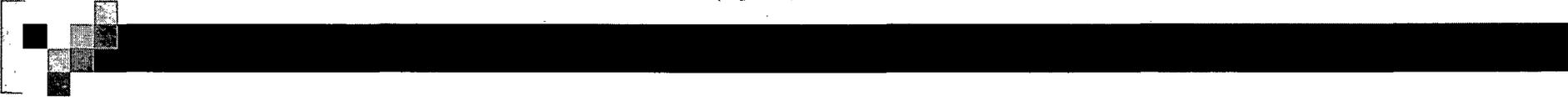
## ■ Fire Protection Program

- Program description in DCD Rev 3, section 9.5.1 (follows RG 1.189)
- Milestone for complete fire protection program to be included in COLA as part of resolution to COL Item 9.5.1.15
- Program implementation milestone addressed in FSAR section 13.4
- Satisfies SECY-05-0197



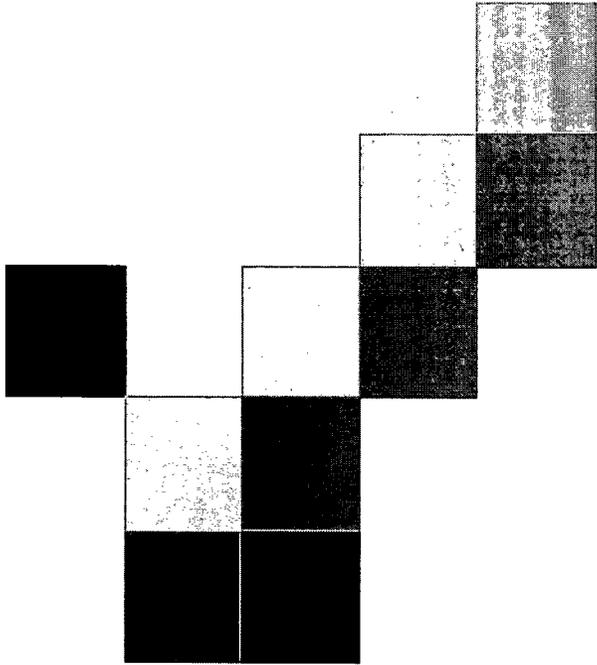
# NEI Operational Programs Status

- NEI 03-12 Security Agreement
- NEI 06-13 Training Agreement
- NEI 06-14 QAs Agreement
- NEI 07-01 EALs In Review
- NEI 07-02 Maint. Rule In Review
- NEI 07-03 Rad. Prot. Mtg  
Scheduled
- NEI #-# Organization Planned



## Section 13.1: Organizational Structure

- DG-1145/RG 1.206 guidance creates standardization and timing concerns for proposed applicants.
- Based on the maturity of industry nuclear organizations currently existing, a functional organizational structure description seems more appropriate for current COL applicants.
- Since this item can be addressed as a standard issue as the industry is proposing, NEI is working to create a draft template (similar to that prepared for 13.2 – Training) for NRC review.

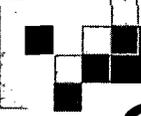


# NuStart QA Plan Overview



# Overview of NuStart QA Plan

- NuStart QA Plan addresses activities performed by NuStart
- Quality-affecting design activities performed by reactor vendor or COLA contractor
- NuStart maintains oversight of the COL application development including proper configuration control and maintaining consistency of information.
  - QA Oversight of COLA Preparation Contractor
  - QA Oversight of Westinghouse Electric Corporation
  - QA Oversight of General Electric



# Overview of NuStart QA Plan (continued)

- QA criteria are applied to provide complete and accurate COL Applications for nuclear power facilities
- NuStart Energy maintains oversight of COL Application development
- NuStart QA criteria based on requirements from 10 CFR Part 50 Appendix B
- Requirements documented in Project Instruction (PI)-009



# Content of NuStart QA Plan

- NuStart QA plan in PI-009
  - Scope limited to COLA-phase activities performed by NuStart
  - Bulk of quality-affecting work conducted by vendors/contractors under their QA Programs
  - Uses NQA-1 1994 in oversight activities



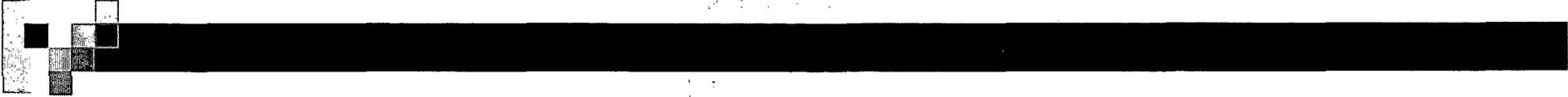
# NuStart QA Plan Criteria

## ■ Audits

- Performed to determine adequacy of and compliance with established procedures and effectiveness of implementation
- Performed with written procedures and check lists by personnel not having direct responsibilities in areas being audited
- Results will be documented by auditing personnel and reviewed by management of area audited
- Documentation includes audit plan, completed checklist, audit team qualifications, audit report, audit findings

## ■ Assessments

- Monitoring processes and activities to assess adequacy, effectiveness and conformance to specified requirements
- Performed by qualified, but not necessarily certified, personnel
- Follows an assessment plan



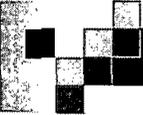
# NuStart QA Plan Criteria (cont'd)

## ■ Corrective Action

- Includes measures for prompt identification and correction of conditions adverse to quality
- Significant conditions adverse to quality require cause determination and action to preclude repetition
- Process follows NQA-1-1994

## ■ QA Records

- Sufficient records maintained to furnish evidence of activities affecting quality
- Records include corrective action documentation, reports of reviews, audits, assessments, or other monitoring of work performance
- Records will be identifiable and retrievable



# NuStart QA Plan Criteria

## ■ Design Control

- NuStart scope includes development of information supporting site suitability
- NuStart does not directly conduct design activities
- Reactor vendors and COL application contractor exercise design control under their QA programs
- COL application contractor responsible for maintaining traceability between their work and information provided by reactor vendors
- NuStart monitors activities for compliance with 10 CFR Part 50 Appendix B
- NuStart uses ASME NQA-1-1994 in reviewing implementation

## ■ Procurement

- Addresses procurement of services for development of COLA
- Procurement documents include applicable regulatory requirements, design bases, regulatory bases, and other requirements necessary to assure adequate quality
- Require QA program consistent with 10 CFR Part 50 Appendix B
- Scope does not include fabrication, construction, or purchase of SSCs



# NuStart QA Plan Criteria (cont'd)

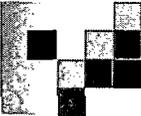
## ■ Sampling, Testing, Data Collection

- Activities have been reviewed/verified by NRC in site visits to both demonstration sites.
- COL application contractor performs site specific design basis activities including sampling, testing, data collection, and supporting engineering calculations and reports
- NuStart monitors activities (e.g., test control, measuring and test equipment, handling, storage, and shipping) for compliance with 10 CFR 50 Appendix B
- NuStart uses ASME NQA-1-1994 in reviewing implementation



# NuStart QA Plan Criteria (cont'd)

- Sampling, Testing, Data Collection (Continued)
  - Activities follow guidance in Regulatory Guides
    - 1.132 (DG-1101), Site Investigations for Foundations of Nuclear Power Plants;
    - 1.138 (DG-1109), Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants;
    - 1.162 Identification and Characterization of Seismic Sources and Determination Safe Shutdown Earthquake Ground Motion; and
    - 1.165 Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion

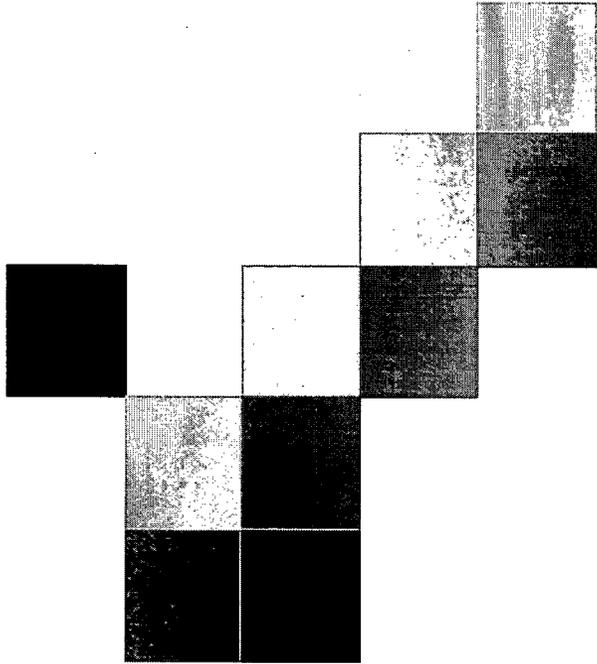


# QA Content in COL Application

- COLA FSAR Chapter 17

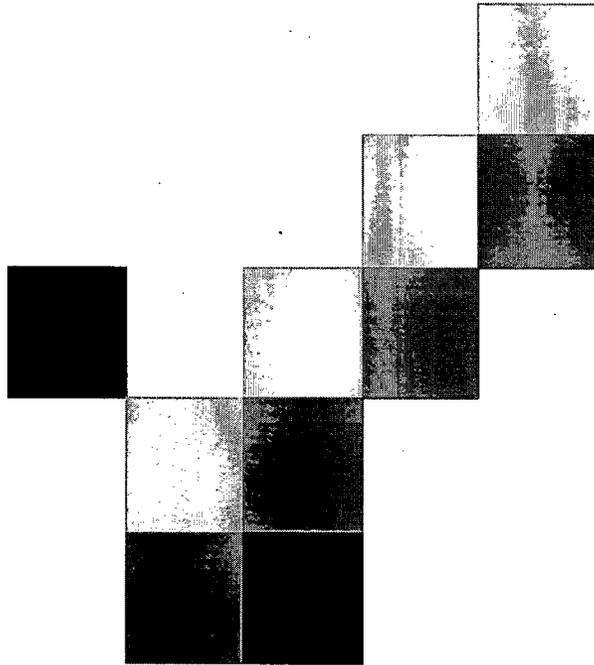
- Will Use NEI 06-14 standard QAPD template
- Commits to full-scope QA program for licensee during construction, startup, and operations
- Consistent with NRC revision of NUREG-0800

- Description of QA Controls for COLA Preparation

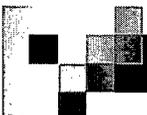


# NRC Inspection of Pre-Application Activities

NRC Staff



# Onsite Environmental Report Activities



# NRC Environmental Report Pre-Application Site Visits

- Idealized, Compressed, and Truncated Process
- Non-ESP Sites
  - First visit – familiarization
  - Second visit – review of draft information
  - Third visit – public meeting
- ESP Sites



# Pre-Application Site Visits

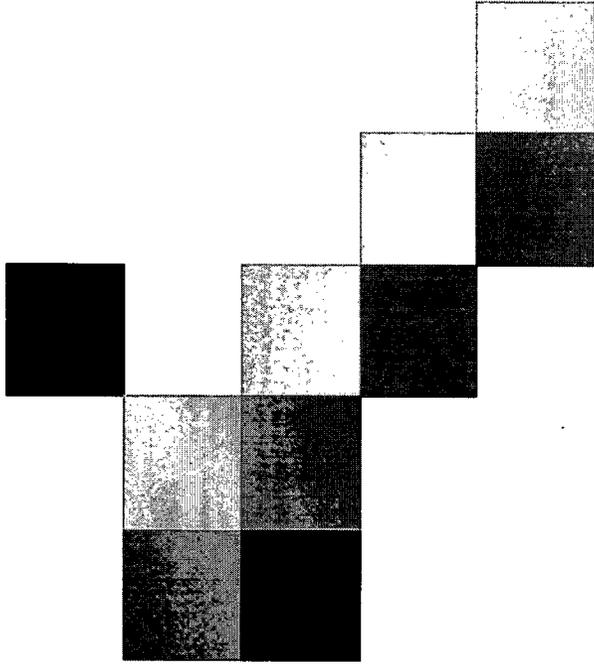
## Non-ESP Sites

### ■ First Visit Agenda

- Site Familiarization
- Site Selection Process
- Overview of Environmental Report
- Status of Environmental Monitoring
- Introduction to State and Local Regulators

### ■ Schedule

- |                                      |            |
|--------------------------------------|------------|
| <input type="checkbox"/> April 16-17 | Summer     |
| <input type="checkbox"/> April 19-20 | Bellefonte |
| <input type="checkbox"/> May 07-08   | Harris     |
| <input type="checkbox"/> May 10-11   | Lee        |



# Bellefonte Status



# Status of Bellefonte ER Activities

## ■ Field Activities

### Groundwater Monitoring

- Gauging: 10 out of 12 months complete
- Water quality: 4 out of 4 quarters complete

### Surface Water Monitoring

- Water quality: 4 out of 4 quarters complete



# Status of Bellefonte ER Activities

## ■ Field Activities (continued)

### □ Wildlife

#### ■ Terrestrial

- 4 seasons of survey data collected
- T/E plant habitat survey complete

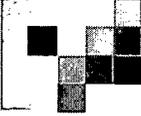
#### ■ Aquatic

- Mussel survey to be conducted in April

□ T/E Species Review – complete

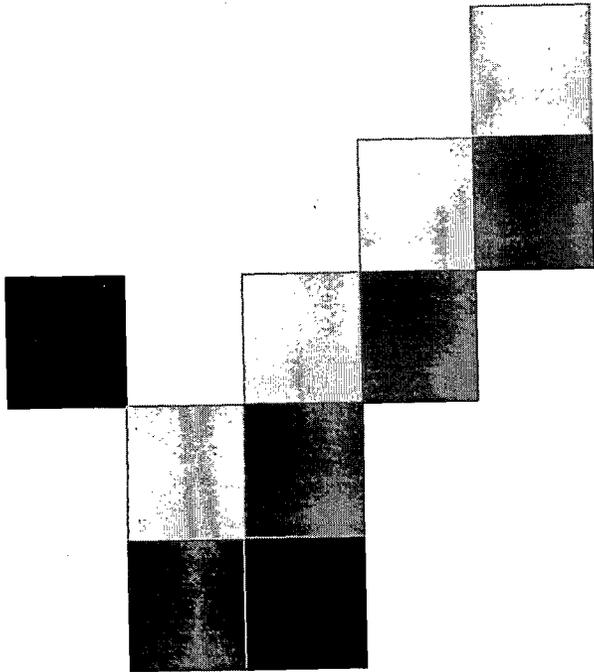
□ Bathymetric Surveys – complete

□ Thermal Plume Analysis – in progress



# Status of Bellefonte ER Activities

- Field Activities (continued)
  - Archeological survey (Phase 1)
    - Survey complete
    - Consultation with SHPO complete
  - Meteorology
    - 10 out of 12 months of data collection complete

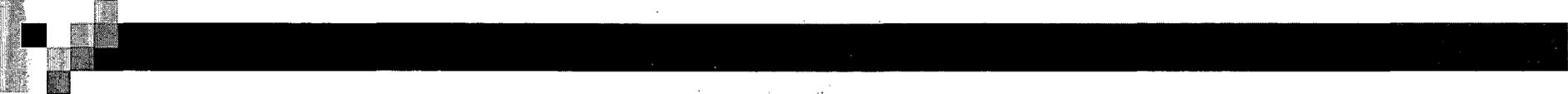


# Grand Gulf Status



# GGNS ER Field Activities, Update

- Groundwater Characterization
  - Nine months of groundwater gauging data were collected as of March 2007
  - Field permeability analysis (pump test) performed October 2006
- Mississippi River, Thermal Plume Analysis
  - Bathymetric survey of Mississippi River in intake/discharge area performed October 2006
  - MS River temperature and flow data collected October 2006



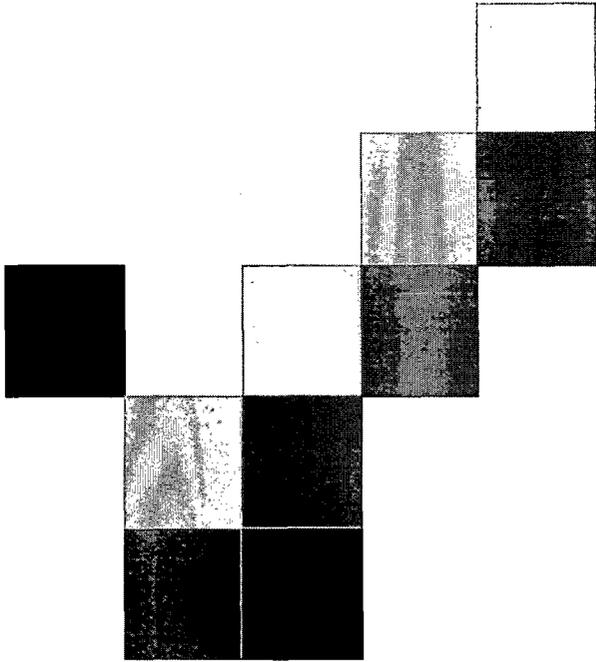
# GGNS ER Field Activities (cont'd)

## ■ Ecological Survey Work

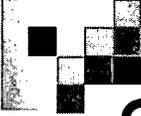
- Fat pocketbook mussel survey performed at proposed intake location November 2006
- Rare plant survey performed September 2006
- Bald eagle and brown bear habitat surveys performed December 2006

## ■ Wetland delineation scheduled for late March/early April 2007

## ■ Archeological site survey scheduled for April 2007

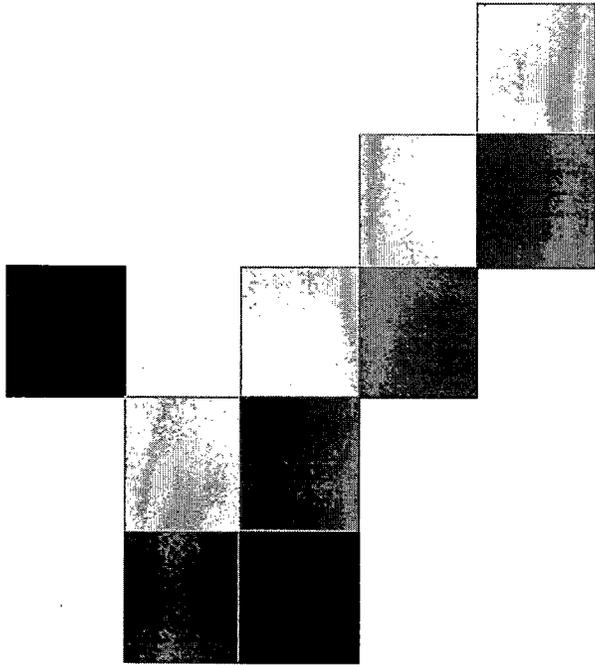


# North Anna Status



# Summary of North Anna 3 Environmental Site Audit Visit

- March 9, 2007
- Subjects covered during visit
- Issues identified:
  - New but not significant
  - ESRP compliance
- Future plans



# Severe Accident Mitigation Alternatives (SAMA)



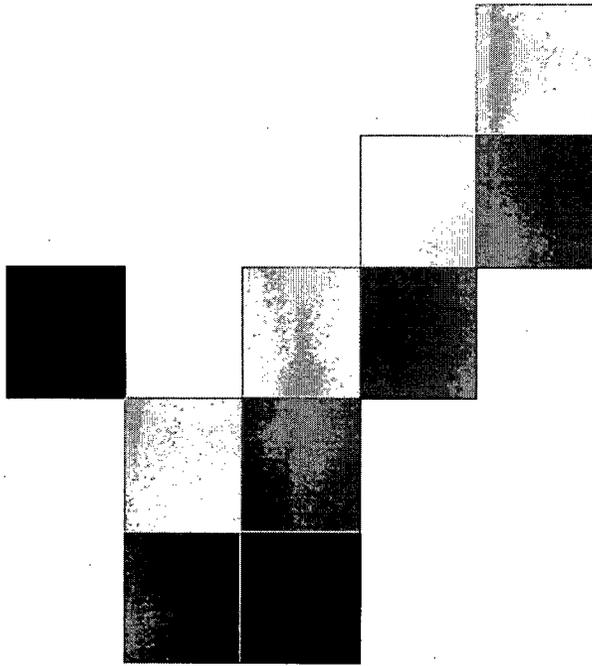
# Issue: COLA ER Content and Level of Detail - SAMA

## ■ Sources reviewed

- NUREG-1555 Environmental Standard Review Plan Chapter 7
- AP1000 FSER 19.4
- ESBWR RAI Response dated 2/12/2007
- Southern's ESP Application Rev 1 dated 11/13/2006

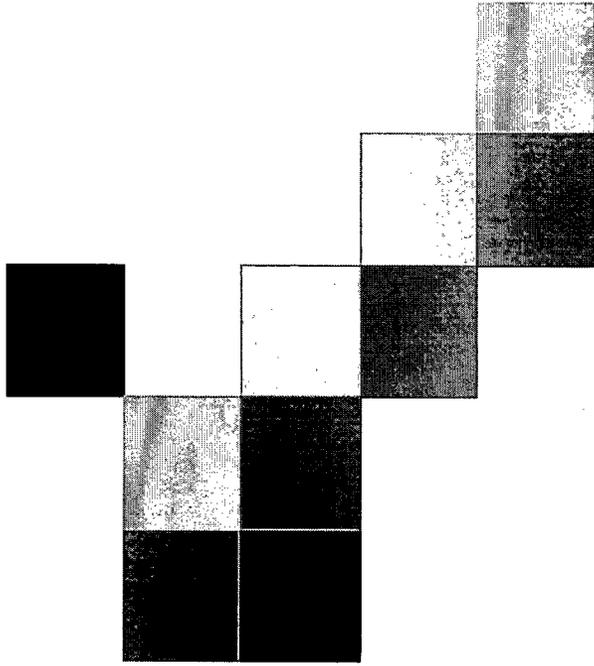
## ■ COLA Content

- SAMDA
  - Comparison of site to DC analysis assumptions (e.g. population and meteorological data)
  - No further analysis of design alternatives if bounded
- SAMA (procedural considerations)
  - Presumes acceptable Southern ESP approach
  - Need input from NRC on Review Plan & Criteria

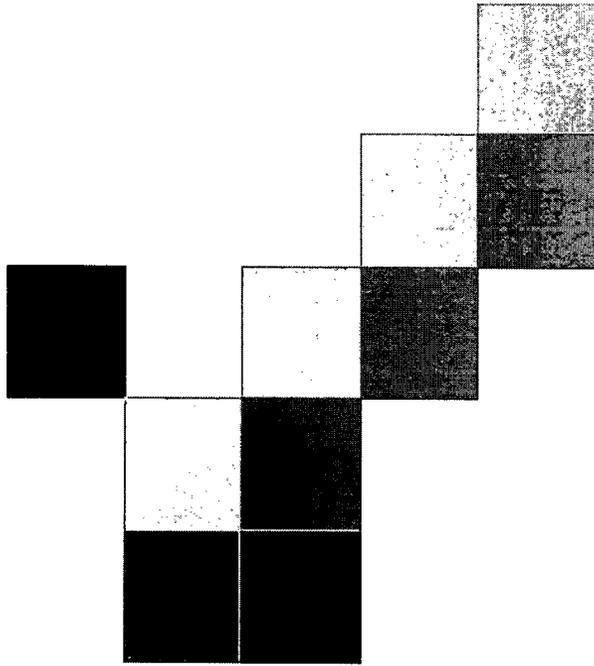


# AP1000-ESBWR Design Centered Work Group

Joint Meeting with NRC Staff  
March 23, 2007



# Introductory Remarks



# Parallel Review of DCDs and COLA Development



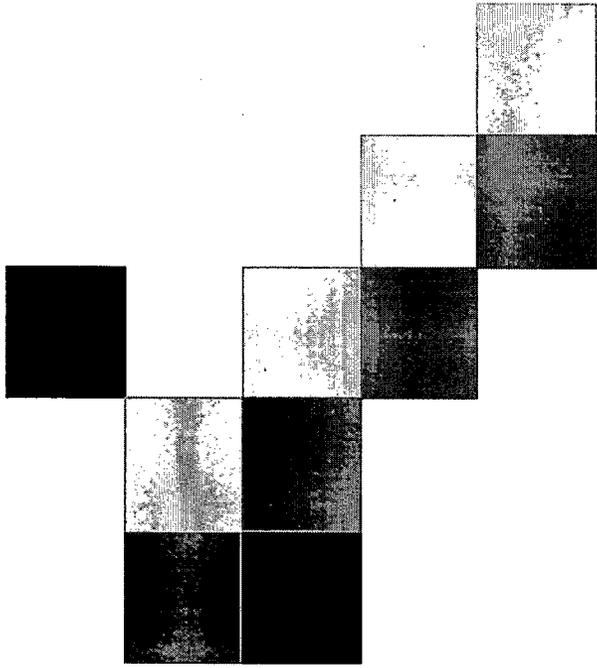
# ESBWR DCD/COLA Integration Effort

- GE-Dominion-NuStart, Close, Collaborative Effort
- COLA (November 2007) will reference latest DCD revision (that is, Rev 4)
- DCD Review
  - GE-NRC ongoing activity to resolve outstanding DCD review open issues
  - DCD Rev 4 changes being developed by GE



# ESBWR DCD/COLA Integration, Cont'd

- DCD Rev 4 Content Review
- DCD Rev 4 Submittal Schedule, Considerations
  - COLA content development, review, finalization
  - NEI-NRC Electronic Submittal Subgroup Activities
  - DCD Rev 4 submittal schedule to be jointly set by GE and COL applicants, consulting with NRC



# ITAAC for Design Certification and COLA



# ITAAC: COLA and Design Certification

## ■ COL Application

### □ Results to-date:

- Emergency Planning
- Security
- Interface Requirements
- Process for Other Possible Items

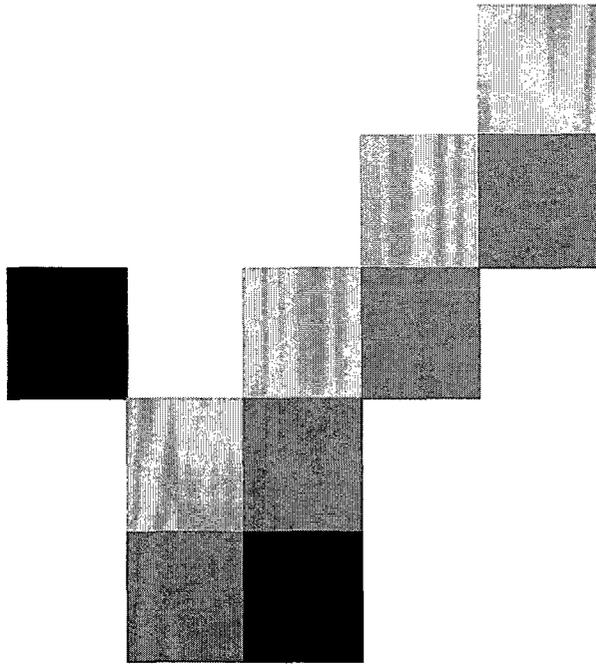
### □ Part 10

- Not in FSAR
- Identified in Tables similar to DCD Tier 1 Tables
- Will also include:
  - Any necessary design descriptions
    - Derived from FSAR, EP, and Security Plan
  - OR reference to FSAR, EP, SP descriptions

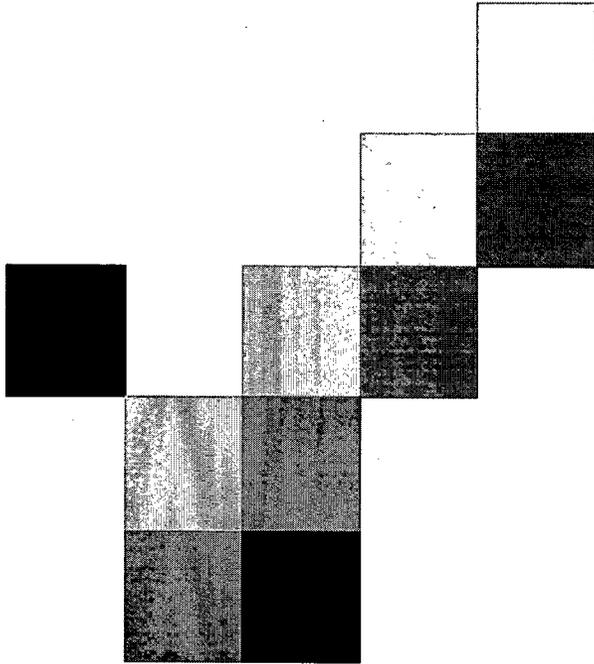


# ITAAC: COLA and Design Certification

- Design Certification
  - Clearly identified in Tier 1 Tables
  - DAC Scope
    - Instrumentation and Controls
    - Human Factors Engineering
    - Piping
    - Other



# February COLA Workshop Followup Items Review Actions List



# Action Item Review