



Briefing on Digital Instrumentation
and Controls
Update on New Reactors
Update on Digital Research Platform

July 18, 2007

Luis Reyes

Executive Director for Operations

Acronyms

ABWR	Advanced Boiling Water Reactor	NFPA	National Fire Protection Association
ACRS	Advisory Committee on Reactor Safeguards	NMSS	Office of Nuclear Material Safety and Safeguards
APWR	Advanced Pressurized Water Reactor	NRC	Nuclear Regulatory Commission
BWR	Boiling Water Reactor	NRO	Office of New Reactors
COL	Combined License	NRR	Office of Nuclear Reactor Regulation
D3	Diversity and Defense-in-Depth	NSIR	Office of Nuclear Security and Incident Response
DC	Design Certification	NUREG	technical report (<u>N</u> uclear <u>R</u> egulatory Commission)
DOE	Department of Energy	OGC	Office of General Counsel
EIS	Environmental Impact Statement	PRA	Probabilistic Risk Assessment
EPR	Evolutionary Power Reactor	PWR	Pressurized Water Reactor
EPR	Evolutionary Power Reactor	RAI	Request for Additional Information
EPU	Extended Power Uprate	RES	Office of Nuclear Regulatory Research
ESP	Early Site Permit	RG	Regulatory Guide
ESBWR	Economic Simplified Boiling Water Reactor	RIS	Regulatory Issue Summary
FPGA	Field-Programmable Gate Array	SRM	Staff Requirements Memorandum
FPL	Florida Power & Light Company	SRP	Standard Review Plan
FY	Fiscal Year	SWP	Strategic Workforce Planning
GDC	General Design Criteria	TVA	Tennessee Valley Authority
I&C	Instrumentation and Control	TXU	Texas Utilities Energy Corporation
INPO	Institute for Nuclear Power Operations	SER	Safety Evaluation Report
IT	Information Technology	SGI	Safeguards Information
LLTF	Lessons Learned Task Force	TWG	Task Working Group

Agenda

Introduction	L. Reyes
Readiness for New Reactors	W. Borchardt
Digital I&C Research Platform	R. Croteau
Digital I&C Steering Committee	J. Grobe
Diversity and Defense-in-Depth	M. Mayfield
Highly-Integrated Control Room	M. Cunningham
Digital Risk Assessment	M. Cunningham

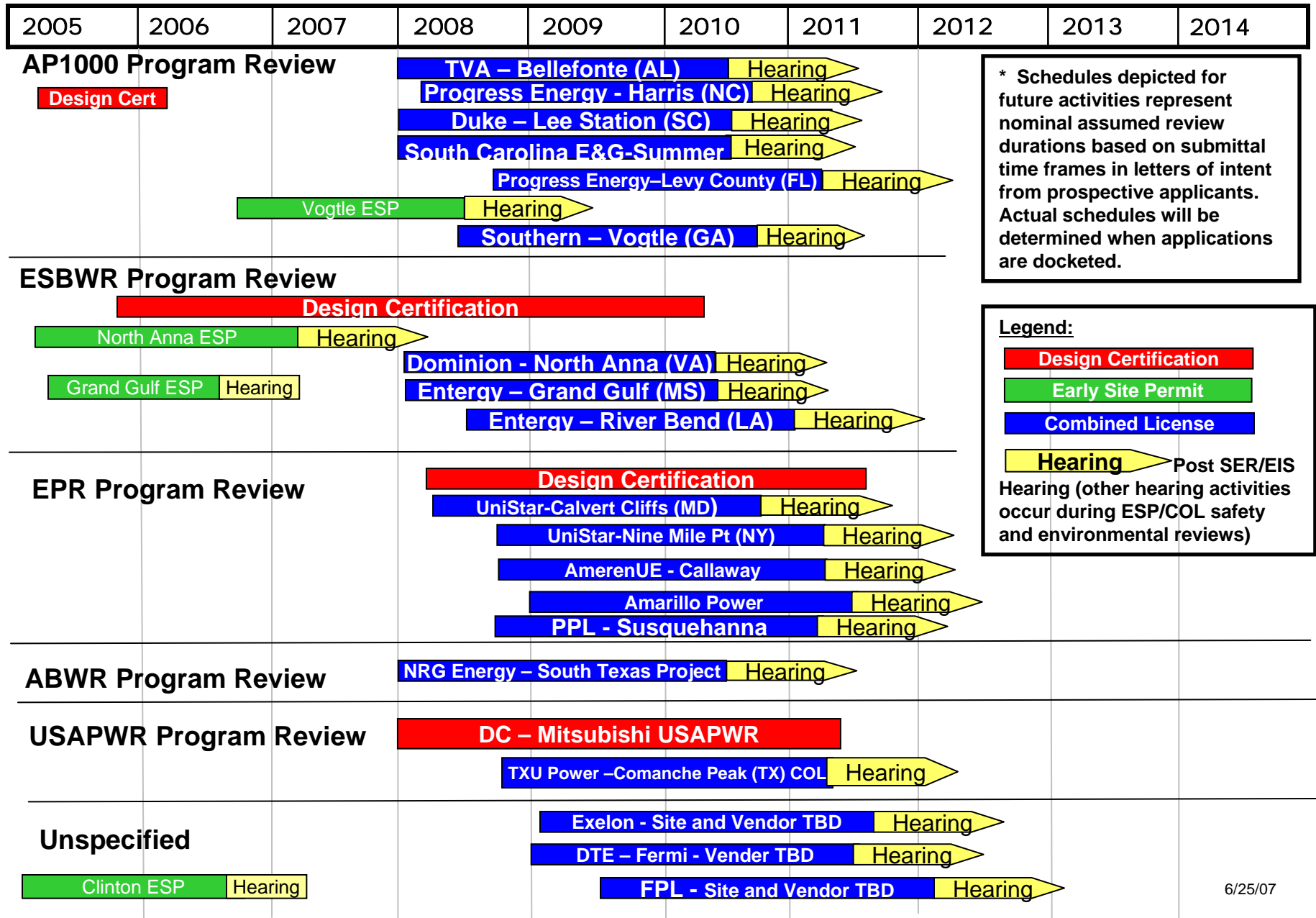


Readiness for New Reactors

William Borchardt
Office of New Reactors

New Reactor Licensing Applications

An estimated schedule by Fiscal Year



* Schedules depicted for future activities represent nominal assumed review durations based on submittal time frames in letters of intent from prospective applicants. Actual schedules will be determined when applications are docketed.

Legend:

- Design Certification
- Early Site Permit
- Combined License
- Hearing

Post SER/EIS Hearing (other hearing activities occur during ESP/COL safety and environmental reviews)

New Reactor Infrastructure

- Approved Rulemakings: Part 52 and Limited Work Authorizations
- Finalized Regulatory Guide 1.206 “Combined License Applications for Nuclear Power Plants”

New Reactor Infrastructure

- Completed final wave of staff transfers from NRR
- Populating Licensing Program Plan
- Developed Combined License application acceptance review guidance

Pre-application Activities

- Pre-Combined License interactions and site visits, and application readiness assessment visits
- Public outreach
- Design Centered Working Group meetings
- International interactions
- Orders imposing safeguards information protection requirements



Research Platform

Rick Croteau
Office of Nuclear Regulatory Research

Test Facility

- Develop a defined set of concepts
 - Input from interested stakeholders
 - Investigating other similar facilities
- Conduct a public workshop
 - September 6 & 7 - technical issues
 - September 11 - non-technical issues
- Prepare Commission paper
 - Results of workshop
 - Recommendations on path forward



Digital Instrumentation and Controls Steering Committee

Jack Grobe
Office of Nuclear Reactor Regulation

Background

- November 8, 2006, Commission briefing
- December 6, 2006, Staff Requirements Memorandum
- January 12, 2007, memorandum established the Digital I&C Steering Committee

Key Challenges

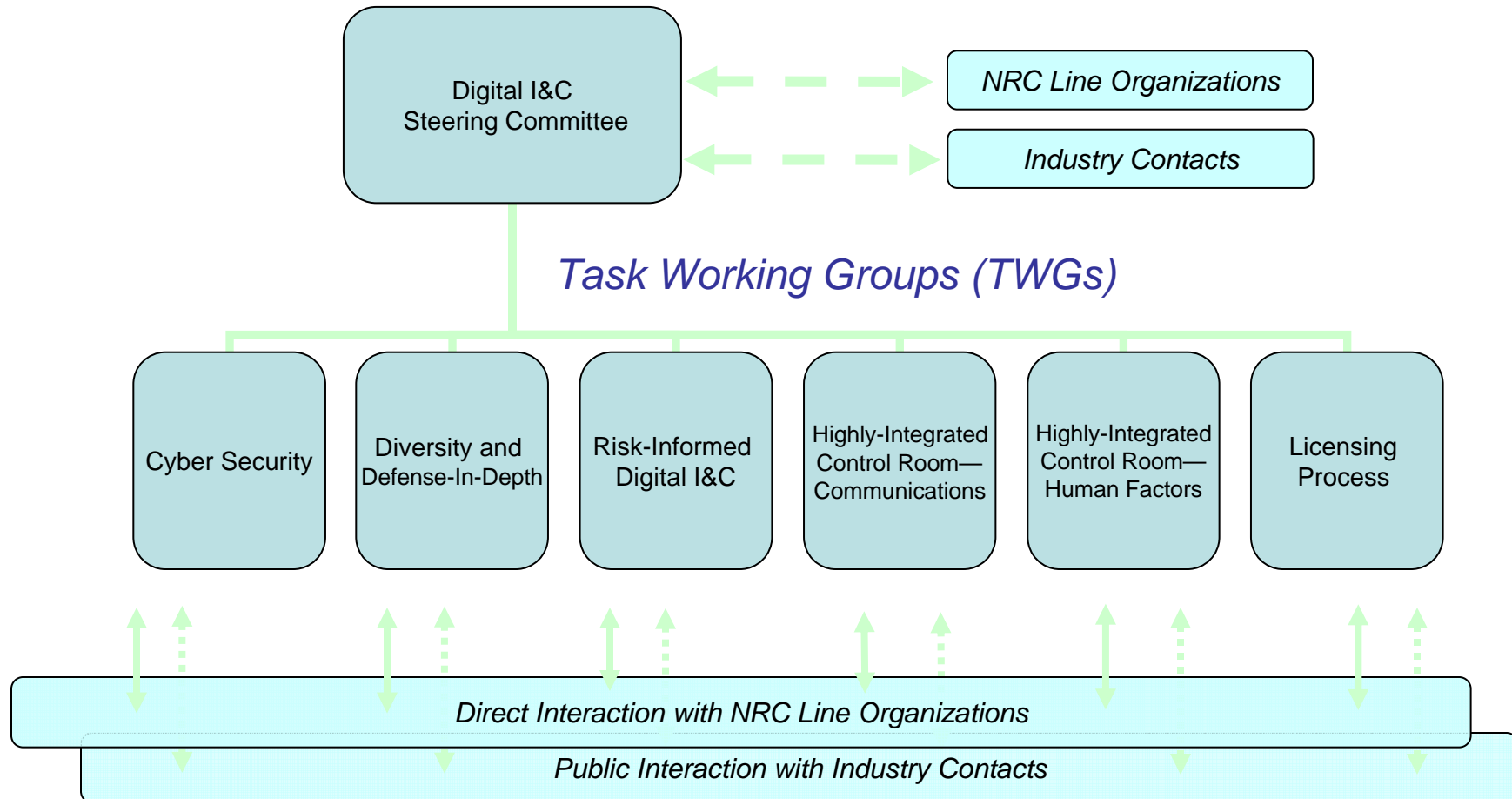
- Assuring predictability through refined Regulatory Guidance
- Anticipating future needs
 - Evolving technology
 - Industry priorities
- Improving stakeholder interactions
- Expanding domestic and international interactions

Digital I&C

Future Workload

- Operating reactor modifications
- Design Certification
- Combined License
- Fuel-cycle facilities

Steering Committee



Structure of Project Plan

- Defined problem statements under each Task Working Group
- Developing Interim Staff Guidance (near-term)
- Interactive effort with industry
- Revise Regulatory Guides and industry standards (long-term)

Stakeholder Interactions

- Conducted 30 public meetings with the industry since November 2006
 - 5 Public Steering Committee meetings
 - 25 Public Task Working Group meetings
- ACRS interactions
- Expanded domestic and international interactions



Diversity and Defense-in-Depth

Michael Mayfield
Office of New Reactors

Diversity and Defense-in-Depth

- Common-cause failures are credible
- Current guidance has been successfully used
- Staff is working to improve existing guidance

Diversity and Defense-in-Depth

- Seven key issues being addressed:
 - Adequate diversity
 - Operator action
 - Component vs. system level actuation
 - Effects of common-cause failures
 - Common cause failure applicability
 - Echelons of defense
 - Single failure

Diversity and Defense-in-Depth

- Development of Interim Staff Guidance is well underway
 - Acceptable diversity and defense-in-depth criteria
 - Criteria on remaining issues under internal review

Diversity and Defense-in-Depth

- Path forward
 - Issuance of Interim Staff Guidance
 - Continued interaction with industry
 - Update Regulatory Guides and Standard Review Plan



Highly Integrated Control Room—Communications and Risk Assessment

Mark Cunningham
Office of Nuclear Reactor Regulation

Highly-Integrated Control Room—Communications

- Communications issues
 - Between safety divisions
 - Between safety and nonsafety equipment
- Staff is working to improve guidance

Highly-Integrated Control Room—Communications

- Four key technical areas
 - Inter-divisional communications
 - Command prioritization
 - Multi-divisional control/display stations
 - Network configuration

Highly-Integrated Control Room—Communications

- Improved guidance on schedule
 - Inter-divisional communications
 - Command prioritization

Highly-Integrated Control Room—Communications

- Continuing interactions
 - Multi-divisional workstations
 - Non-safety workstations for safety indication and control
 - Network configuration

Highly-Integrated Control Room—Communications

- Path forward
 - Issuance of Interim Staff Guidance
 - Continued public interaction with industry
 - Update Regulatory Guides and Standard Review Plan

Digital Risk Assessment

- Expanding Use
 - Risk insights in design certifications
 - Risk-informing regulatory practices
- Staff is working to develop guidance

Digital Risk Assessment

- Risk insights
 - Information sources
 - Industry white papers
 - NRC research
 - Operating experience
- Path forward
 - Continued public interactions with industry
 - Develop Interim Staff Guidance

Digital Risk Assessment

- Risk-informing regulatory practices
 - State of technology
- Path Forward
 - Continued public interactions with industry
 - Develop guidance

Summary

- Steering committee is functioning effectively
- Project plan is in place
- Interim Staff Guidance is being developed
- Stakeholder interactions
- Strong industry support
- Staff is on-schedule to complete near-term deliverables