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Digital I&C Licensing Process

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Agenda

- Brief History & Topical Area Overview
- Process Overview
- Tiers of Complexity
- Phases of Process
- Areas of Review
- Path Forward

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Brief History

- Steering Committee Background
  - November 8, 2006, Commission meeting with Industry
    - Identified Licensing Issues with Digital I&C
  - Staff Requirements Memorandum
    - Directed the Staff to work with industry
  - Five technical areas were identified for NPPs
    - Addressed by Interim Staff Guidance

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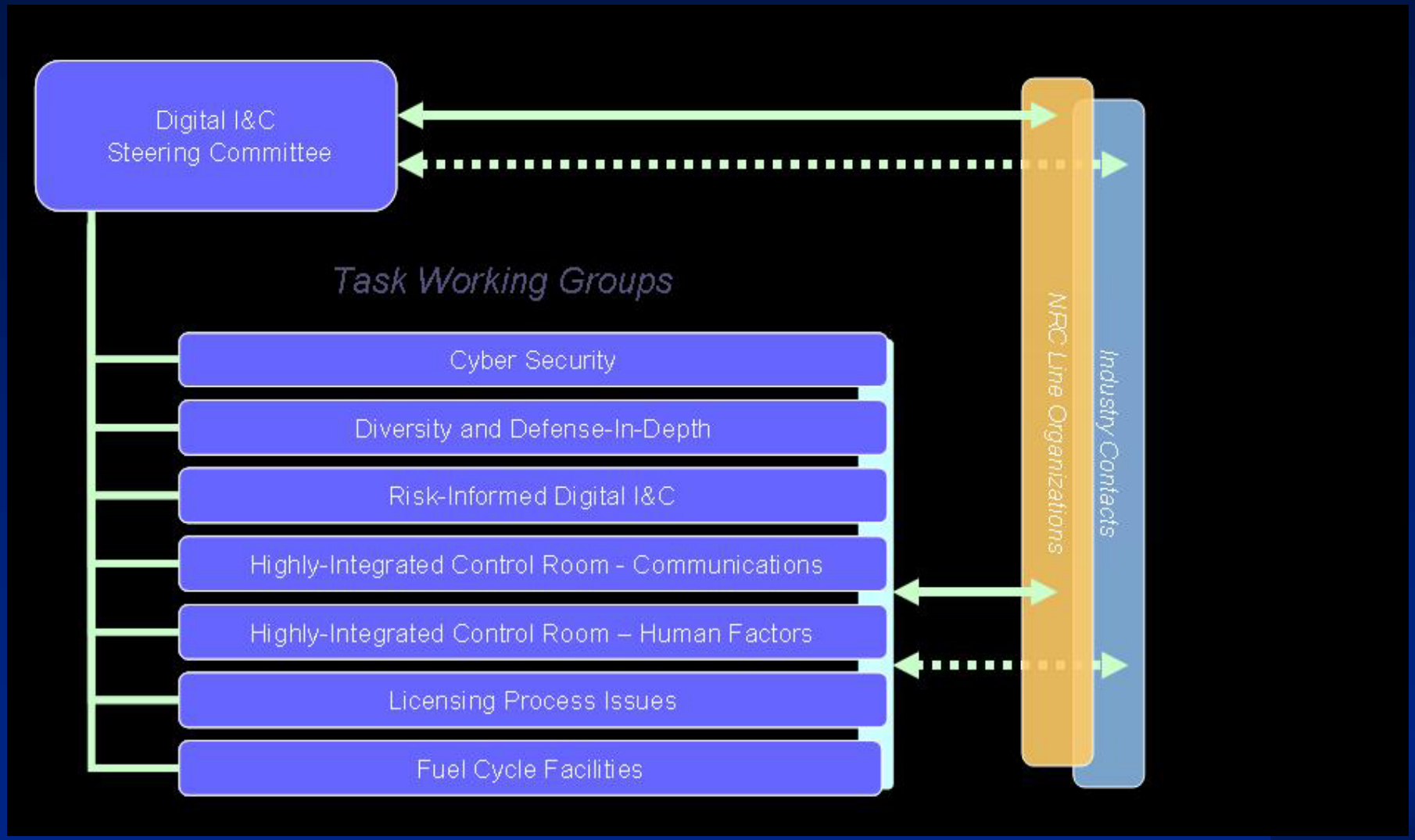
Technical Area Overview



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Status of Digital I&C Products

- ISG-1: Cyber Security - Issued 12/2007
  - Provides clarification on acceptable method within existing NRC and industry cyber security documents for meeting cyber security requirements
  - Provides a cross correlation table between the guidance in RG 1.152, Revision 2, and NEI 04-04, Revision 2
- ISG-2: Diversity and Defense in Depth (D3) - Issued 9/2007
  - Addresses system characteristics that comprise adequate diversity and defense-in-depth,
  - Criteria for crediting the use of operator manual actions as a defensive measure,
  - System level or component level actuation of equipment when manual actuation is used as a defensive measure.
  - Effects and applicability of common cause failures,
  - Echelons of defense and
  - Whether common cause failures are classified as single failures in design basis evaluations.

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Status of Digital I&C Products

- ISG-3: Review of New Reactor Digital Instrumentation and Control Probabilistic Risk Assessments - Issued 8/2008
  - Provide guidance as to what is needed for digital system modeling in Part 52 licensing
  - Methods for obtaining risk insights and risk informing digital I&C to be addressed as part of on-going research
- ISG-4: Highly Integrated Control Room Communications - Issued 9/2007
  - Communications between digital system
  - Communication between safety divisions
  - Between safety and non-safety I&C
  - Command prioritization between safety and non-safety commands
  - Design of multidivisional control and display stations

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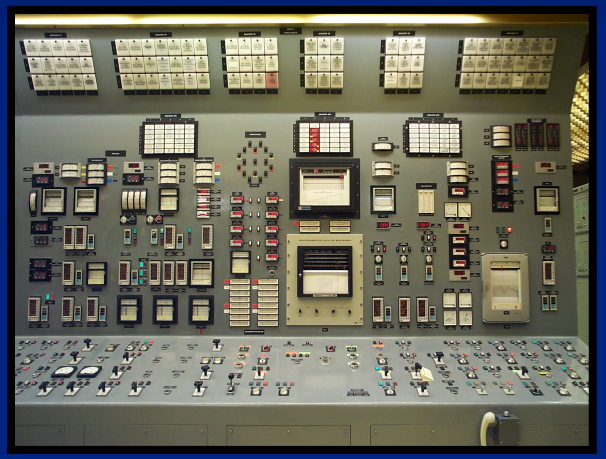
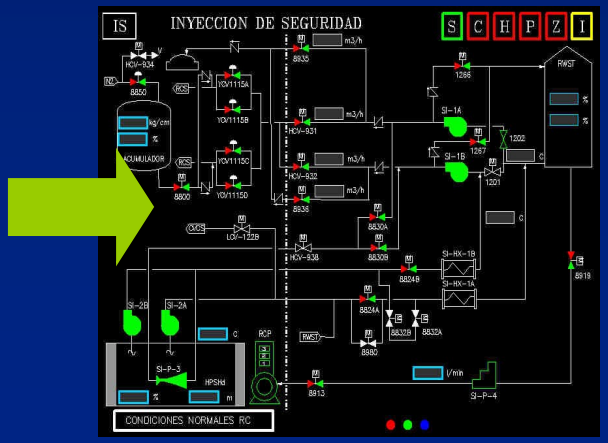
Status of Digital I&C Products

- ISG-5: Highly Integrated Control Room Human Factors - Issued 9/2007 and 11/2008
  - Computerized procedures
  - Minimum inventory
  - Credit for manual operator actions





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Licensing Process Overview

- Purpose of ISG-6
  - Refined licensing process
  - Expectations for documentation
  - Knowledge management
- Lessons learned from recent I&C amendment reviews
  - Wolf Creek
  - Oconee

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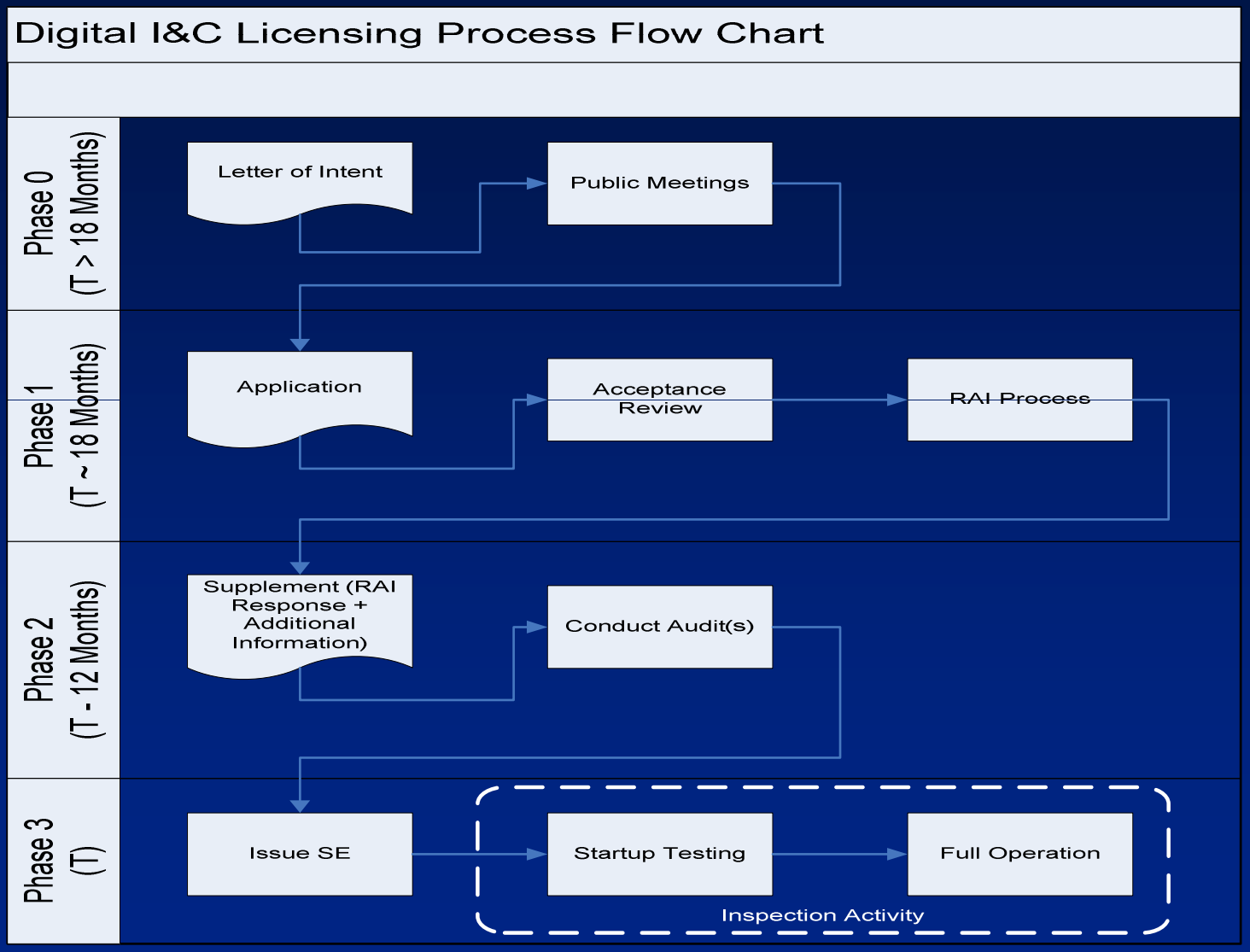
Process Overview



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Tiers of Review

- Each Tier corresponds to an expected review complexity:
  - Tier 1: Previously approved system, no deviations from topical report, review to focus on plant specific aspects, least review effort expected.
  - Tier 2: Previously approved system, with deviations, moderate review effort expected.
  - Tier 3: Totally new system, extensive review effort expected. Thorough review of all technical areas.

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Pre-Application (Phase 0)

- Encourage discussion of significant topics (defense-in-depth & diversity, variances from guidance, unique or complex aspects, etc.)
- Document meeting summaries
  - Can provide initial assessments and understanding of system concepts
  - Will document aspects that are important to the NRC staff decision
- Phase 0 ends with submittal of an LAR

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Initial Application (Phase 1)

- Staff will perform acceptance review in accordance with NRR Office Instruction, LIC-109
- Allowances are made for promised information
  - Appropriate to align staff review with system development lifecycle
- Staff can use RAI process to communicate those areas where the staff has no further questions
- Phase 1 ends when licensee submits, and the staff has reviewed, all planning information
  - May overlap with Phase 2

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Continued Review & Audit (Phase 2)

- Staff will continue the in-depth review
- Staff will perform audit(s) of licensee design development process implementation
- Phase 2 ends with the conclusion of the NRC staff review

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Implementation & Inspection (Phase 3)

- Phase 3 begins with the issuance of the amendment and associated Safety Evaluation.
- Licensee implements upgrade
  - Installation of system
  - Amending of Technical Specifications
  - Procedure changes
  - UFSAR update
- Licensee will conduct startup testing
- Inspection of activities is governed by IP-52003, “Digital Instrumentation and Control Modification Inspection”

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Draft Review Areas

- Working List of Review Areas
  - Defense-in-depth & Diversity
  - Hardware Architecture
  - Hardware Design Process and Quality Control
  - Communications
  - Software Design Process
  - System, Hardware, Software, and Methodology Modifications
  - Technical Specifications
  - IEEE 603 Compliance
  - IEEE 7-4.3.2 Compliance
  - Software Architecture
  - Cyber Security
  - System Qualifications

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Format of ISG-6

- Introduction
- Purpose
- Licensing Process
  - Process Overview
  - Pre-Application Meetings
  - Initial Application
  - Continued Review and Audit
  - Implementation and Inspection
  - Review Areas
    - Scope of Review
    - Information to be Provided
    - Regulatory Evaluation
    - Technical Evaluation
    - Conclusion
- Appendices (Example Formats)

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Path Forward

- Monthly Public Meetings
- Monthly conference calls on status
- Full Draft of ISG for Public Comment
  - Fall 2009
- ISG-6 Issued
  - End of 2009
- **Pilot application encouraged**

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Questions??