Digital I&C Strategy

NEI DI&C Working Group

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Overarching Principles

- Incorporate defined boundaries
- Apply risk-informed insights
- Leverage robust design processes
- Capitalize on international operational experience and standards

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Discussion topics

- Identify desired outcomes
- Identify barriers to progress
- Propose solutions to overcome barriers
- Summary

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What does the end look like?

- Utilities successfully design, develop, implement, and license digital upgrades to protection and control systems to support plant modernization and improve plant safety and reliability

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Barrier #1 – Common Cause Failure (CCF)

- BTP 7-19 guidance has evolved over the years and expanded the scope of the SRM-SECY-93-087 policy

- Concerns with SRM-SECY-93-087:
  - Deterministic solutions to mitigate the potential for CCF
  - Outdated and not aligned with current DI&C technology

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Solution #1 - CCF

- Revise BTP 7-19 to be consistent with the concepts and scope of CCF treatment as described in Revision 4, a more risk-informed and graded approach
- Develop a Digital I&C Policy that reflects a more risk-informed and graded approach to safety
- Employ concepts from the EPRI Digital Engineering Guide, which leverages principles from International Electrotechnical Commission (IEC) Standards

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Solution #1 – Potential Solutions to CCF

	Safety Related (Protection)	Safety Related (Non-Protection)	Non-Safety Related
Short Term Industry Guidance	Standardized Digital Design Process EPRI Technical Guidance	Standardized Digital Design Process EPRI Technical Guidance RIS 2002-22 Supp. 1	Standardized Digital Design Process EPRI Technical Guidance RIS 2002-22 Supp. 1
Short Term NRC Review Guidance	BTP 7-19, Revision 4 Concepts	RIS 2002-22 Supp. 1	No Changes Needed
Long Term Industry Guidance	Standardized Digital Design Process NEI YY-XX link to EPRI Technical Guidance	Standardized Digital Design Process NEI YY-XX link to EPRI Technical Guidance	Standardized Digital Design Process NEI YY-XX link to EPRI Technical Guidance
Long Term NRC Review Guidance	Approval of NEI YY-XX Develop DI&C Commission Policy	Content of RIS 2002-22, Supp. 1 Captured as Durable Guidance	No Changes Needed

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Barrier #2 – Software Development Standards and Guidance

- Software development standards for safety-related SSCs are not commensurate with safety and not aligned with current technology
- BTP 7-14 Guidance does not follow a graded and risk-informed approach

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Solution #2 - Software Development Standards and Guidance

- Consider guidance from international standards associated with safety-related software development
- Revise BTP 7-14 to follow a graded and risk-informed approach that is flexible (i.e., not constrained to prescriptive adherence)
- Leverage digital I&C operating experience from the international nuclear community (e.g., Électricité de France)

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Barrier #3 – I&C System Architecture Development

- Chapter 7 of the Standard Review Plan (SRP) has fragmented and incomplete review guidance for I&C system architectures

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Solution #3 - I&C System Architecture Development

- Consider international guidance related to the design and development of I&C system architectures
- Employ concepts from the EPRI Digital Engineering Guide (DEG)

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Barrier #4 – Limited Functionality I&C Devices

- Insufficient guidance on limited functionality I&C devices

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Solution #4 - Limited Functionality I&C Devices

- Consider international guidance associated with limited functionality I&C devices

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Summary

- Strategy is outcome oriented
- Proposed solutions overcome barriers
- Leverage international successes in DI&C
- Alignment with NRC initiatives and principles

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