Panel on Challenges of Licensing COTS Digital Components

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Challenges of Licensing

- In the US there is very little difference between the review of simple and complex systems
- There are currently no special provisions for devices of limited functionality (other than the smaller set of functions and critical characteristics)
- Regulatory uncertainty in the US has been a challenge
  - What can be done without NRC review (50.59)
  - How to deal with the CCF issues
  - How be more efficient in licensing

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Challenges of Licensing

- NRC RIS 2016-05 "Embedded Digital Devices in Safety Related Systems" discussed many of the concerns that NRC has found with COTS systems used in nuclear applications in the US
  - Needs to ensure adequate quality and reliability requirements for the system
  - Needs to address unique regulatory aspects (CCF)
  - Needs to ensure sufficient procurement planning and material control to identify, review, test, and control systems (standard COTS issues as well as identifying the presents of COTS within larger systems)

Challenges of Licensing

- NRC RIS 2002-22, Supplement 1
  - Focused on lower safety significance I&C systems
  - Clarifies appropriate use of qualitative factors when performing 10 CFR 50.59 evaluations
  - Provides support for dealing with the CCF issues for support systems
- Does not change the fundamental regulatory requirements or the need to do a complete CGD

How Do We Move Forward

- Finishing regulatory improvements
  - Update to CCF guidance
  - Update to 50.59 guidance
  - Update to licensing process guidance
- Revision of CGD guidance to account for IEC 61508 certification
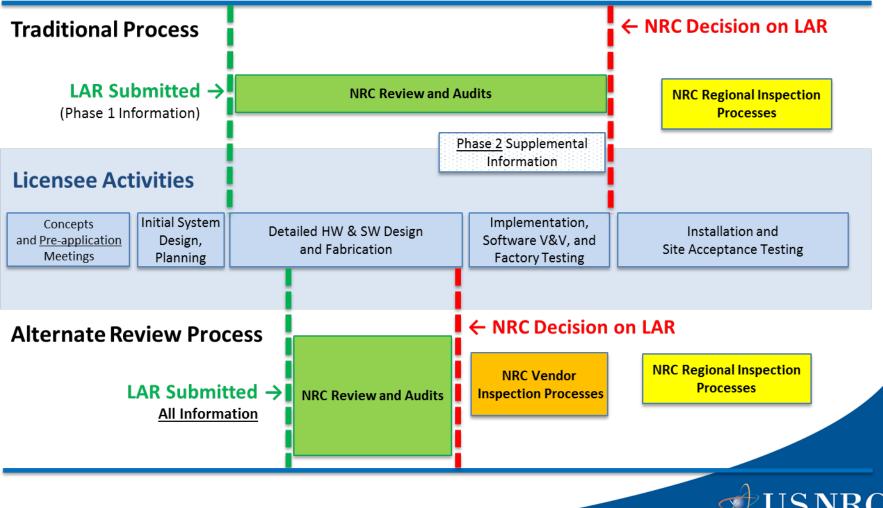- Development and endorsement of guidance on digital devices of limited functionality

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Backup Slide

Licensing Processes Comparison

Timeline *(not to scale)* →

Traditional Process

← **NRC Decision on LAR**

LAR Submitted →
(Phase 1 Information)

NRC Review and Audits

NRC Regional Inspection Processes

Phase 2 Supplemental Information

Licensee Activities

| Concepts and Pre-application Meetings | Initial System Design, Planning | Detailed HW & SW Design and Fabrication | Implementation, Software V&V, and Factory Testing | Installation and Site Acceptance Testing |

Alternate Review Process

← **NRC Decision on LAR**

LAR Submitted →
All Information

NRC Review and Audits

NRC Vendor Inspection Processes

NRC Regional Inspection Processes