

Digital Working Group - Technical Issues Focus Group

Building A Clear Path Forward For DI&C

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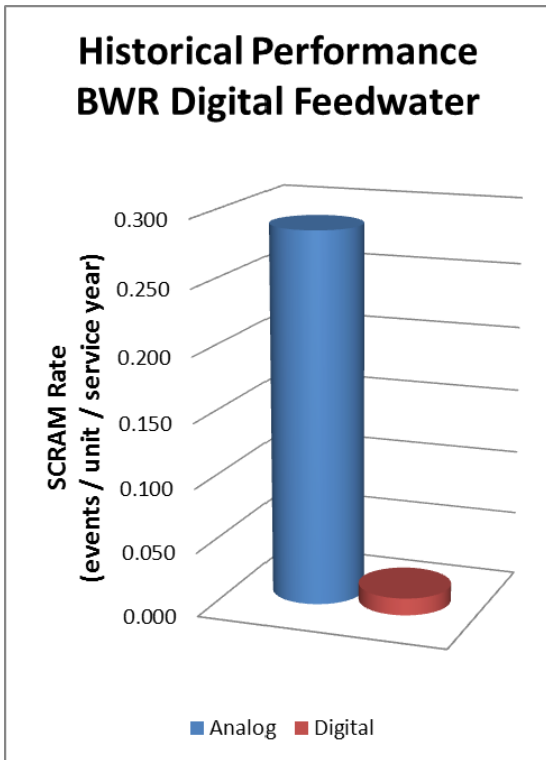


Industry Perspective

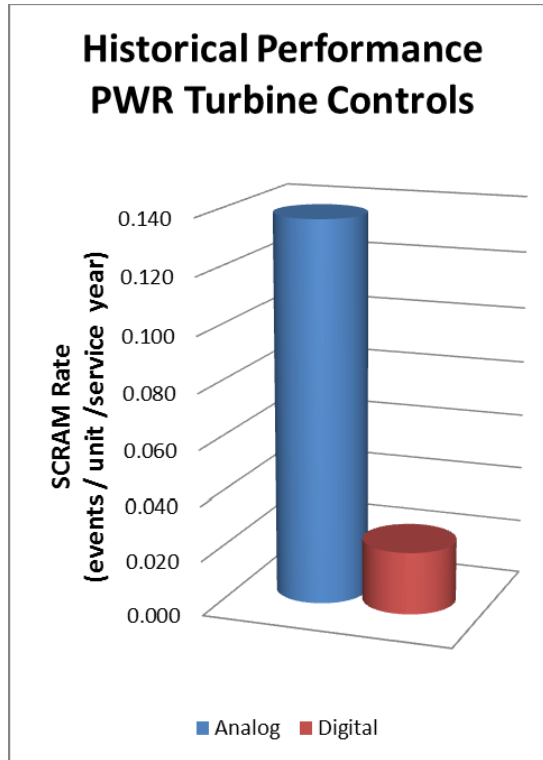
- Our shared goal is safe and reliable operation – digital technology is a key enabler for increasing margins of safety and reducing initiating events
- Modernization is essential to address three industry imperatives:
 - Reduction of initiating events
 - Improving equipment reliability
 - Managing component obsolescence
- The industry needs a clear, unambiguous, graded and stable framework to make forward progress on digital modernization – this includes both the technical and regulatory aspects
- The *TECHNICAL* framework and *REGULATORY* framework must be aligned
- Tangential issues risk unintended consequences:
 - Cyber Security (10 CFR 73.54 / RIS 2014-XX)
 - Redefining “digital” (RIS 2013-XX)
 - Conflagration of SR, ITS and NSR concepts and methods

Exelon Operating Experience – Tangible Performance Improvements

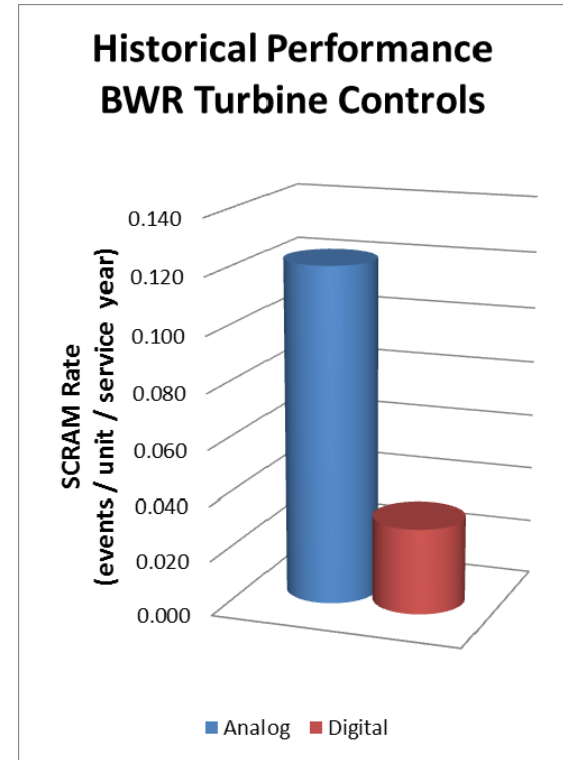
- Exelon began installing digital upgrades in the early 90's beginning with the feedwater systems at Dresden, LaSalle, Quad Cities and Limerick
- Turbine controls were upgraded beginning in 2004 at Byron, Braidwood, Dresden, LaSalle, Quad Cities and Limerick and continue across the balance of the fleet
- 488 “unit years” of operating experience conclusively demonstrates a significant reduction in initiating events
- Exelon continues to implement targeted non-safety related system upgrades across the fleet - not likely to modernize safety related systems



95% SCRAM rate reduction

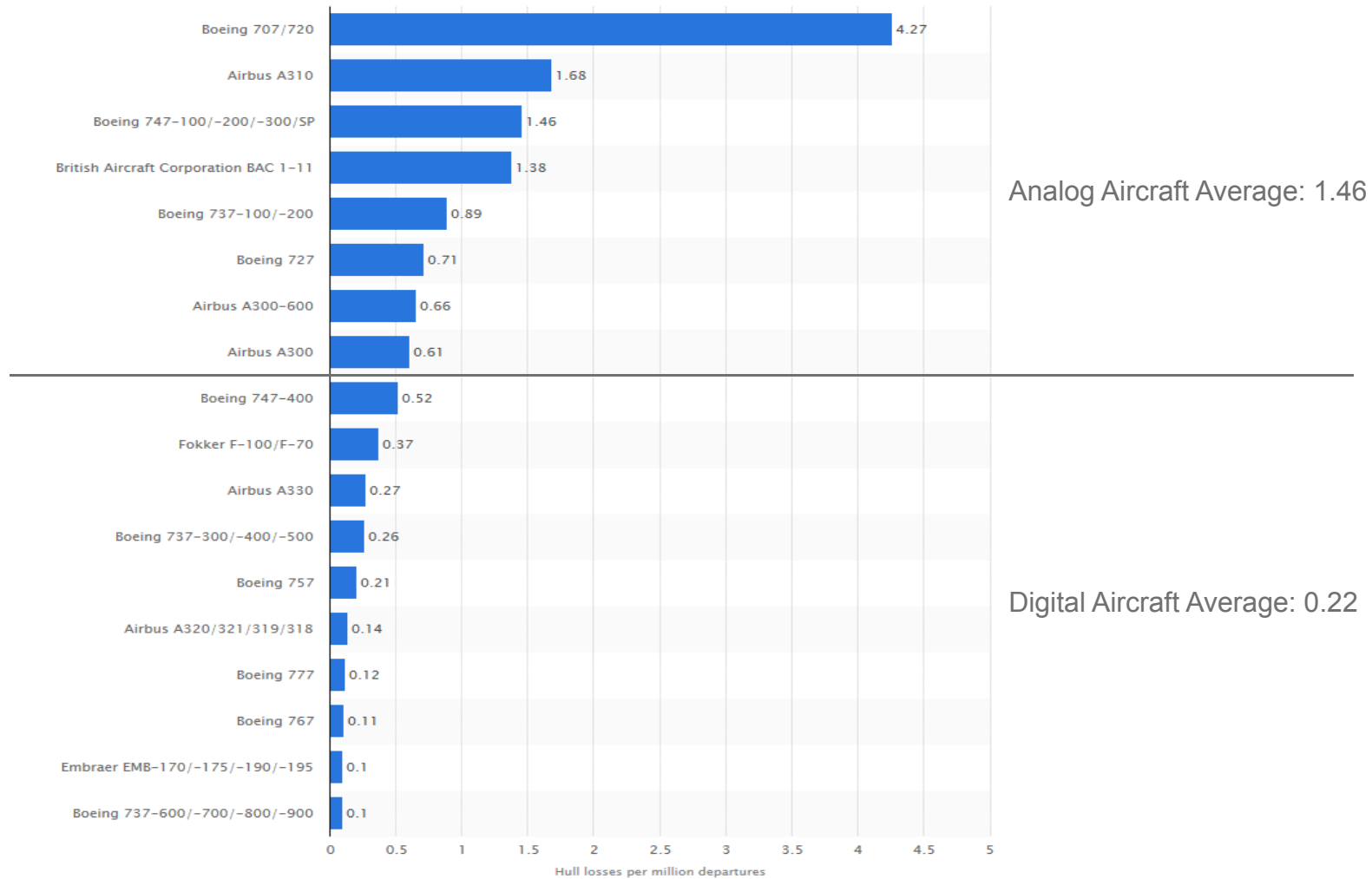


83% SCRAM rate reduction



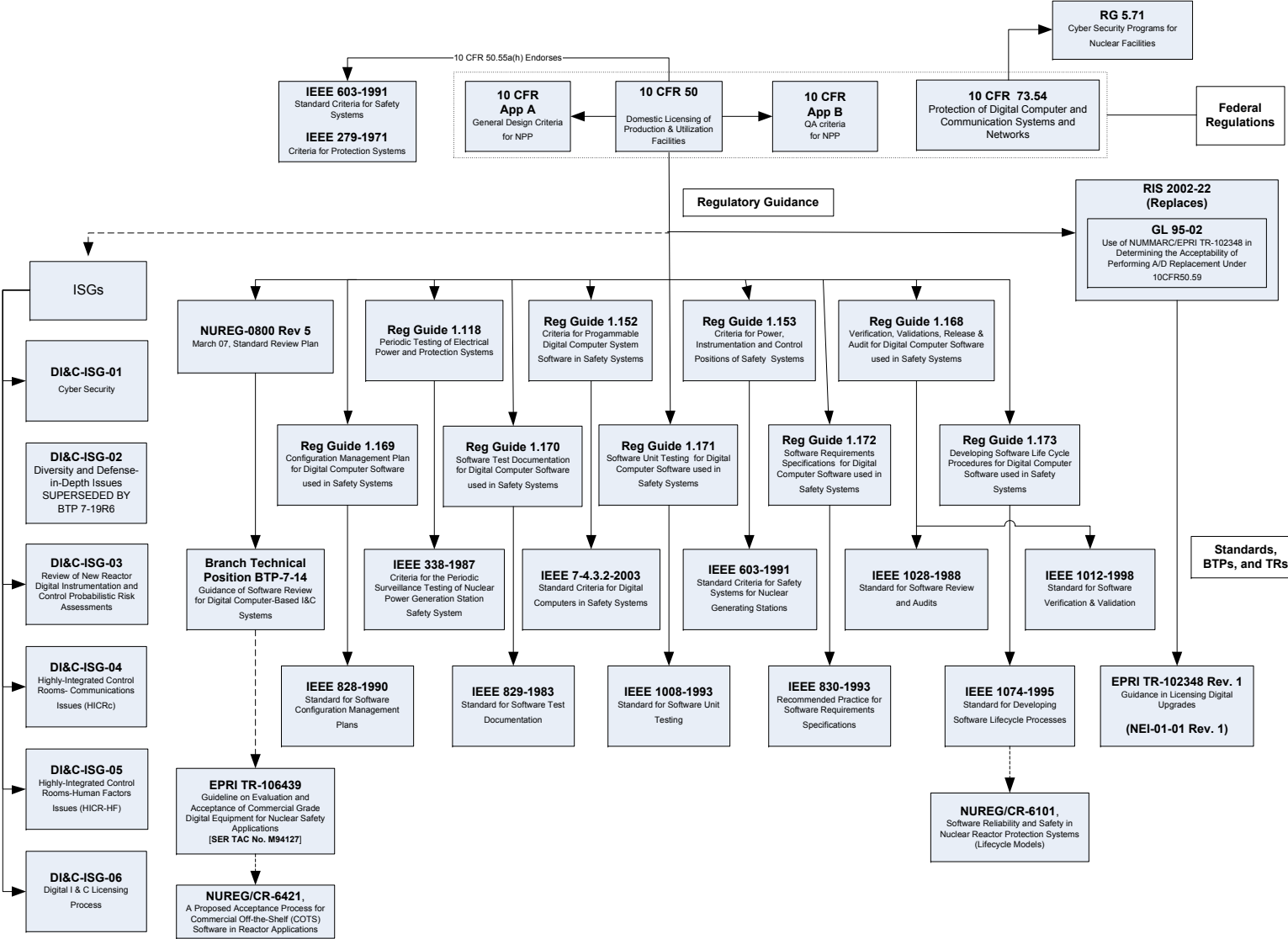
74% SCRAM rate reduction

Looking Outside Nuclear – Commercial Aviation



While not the only contributor to improved safety performance, “digital” aircraft hull losses average 15% that of analog aircraft

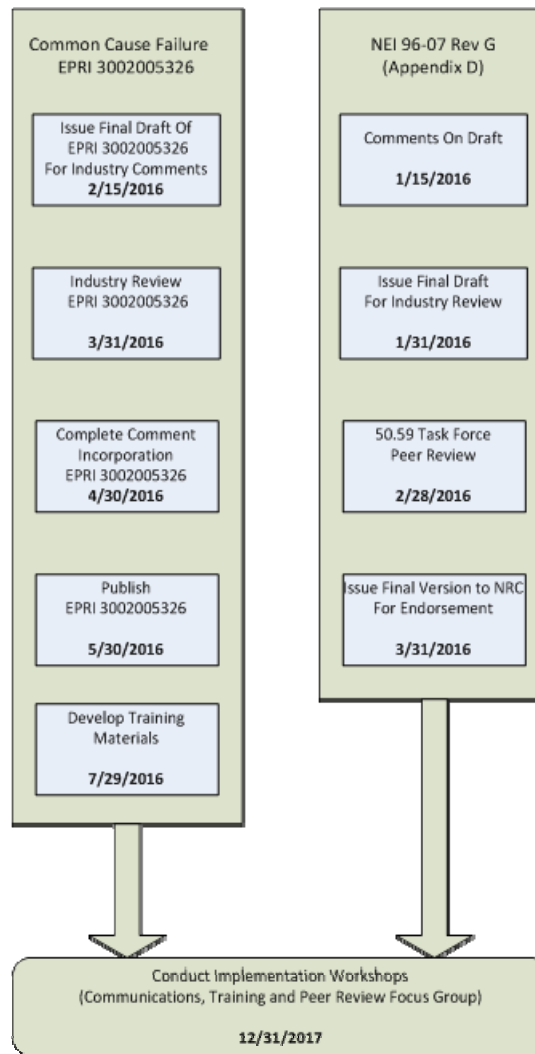
Existing Regulatory Framework



Digital Working Group – Technical Issues Focus Group (TIFG)

- The Technical Issues Focus Group (TIFG) creates an opportunity for industry subject-matter experts, existing NEI Task Forces and NRC staff to reach consensus solutions to key technical issues in the application of digital instrumentation and controls (DI&C)
- Resolving these issues is the key enabler for the industry to modernize their facilities using best available technologies
- The Technical Issues Focus Group targets 4 Topical Areas:
 - Methodologies for the management of Common Cause Failure (CCF)
 - Improving execution of 10 CFR 50.59 for digital modifications
 - Develop NRC / Industry consensus methodologies for the design, testing and implementation of digital upgrades – recommendation is to efficiently build on best practices and existing standards to the extent possible (i.e. EPRI 3002002989, ISG-4 et-al)
 - Align the *TECHNICAL and REGULATORY* frameworks

Workflow – Management of CCF and Application of 50.59



How Do We Achieve Our Shared Goal?

- Complete EPRI 3002005326 comment resolution
- Complete NEI 96-07, Appendix D comment resolution
- Deliver NEI 96-07 Appendix D to staff for review and endorsement
- The agency and industry must work together to develop consensus solutions to key technical issues – the Digital Working Group is an ideal vehicle for this work
- Simplify and align the regulatory framework with the consensus technical solutions
- Leverage existing methodologies, codes and standards from the nuclear sector as well as methods from sectors that have already conquered these issues:
 - Naval Reactors (NAVSEA 08)
 - Aerospace
 - Pharma...