

Harmonizing the NRC Digital Action Plan with Industry Imperatives

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Digital Implementation – an urgent priority

- Achieving a clear path forward for digital modernization remains one of the industries most urgent priorities
- Within the nuclear sector, operating experience with NSR digital upgrades paints a clear and compelling picture of the benefits that digital technologies can provide
- Digital is pervasive outside of nuclear and the safety / performance improvements these other sectors have achieved is unarguable
- SR modifications have the capacity to provide similar performance improvements and further improve margins of safety
- Uncertainty and known issues with the regulatory framework have largely halted SR and some NSR digital upgrades across the domestic nuclear industry
- While we share a common goal of safe operations, it is imperative that we work collaboratively to create an environment where plant systems (including SR) can be modernized without excess regulatory or financial risk

Industry Priorities

- Resolving issues related to CCF and the application of 50.59 remain the highest priority
- Once CCF issues are resolved, attention must turn to the technical and regulatory frameworks
 - An urgent need exists to establish a clear, unambiguous “roadmap” for digital implementation
 - There are 2 key elements to this roadmap – One technical and the other regulatory

Aligning the Technical And Regulatory Aspects of Digital Implementation

- Digital technologies will continue to evolve
- “State of the industry” will continue to advance over time – the regulatory framework must recognize that prescriptive or technology-specific requirements are not likely to have the necessary agility - “performance based” and technology-neutral criteria are a more likely success path
- The basic concepts of good design do not change:
 - Safe and Reliable design, consistent with licensing basis
 - Structured development processes
 - High quality hardware and software
 - Comprehensive testing protocols
 - Robust application of Human Factors best practices

Looking Outward

- While the nuclear sector is unique in many respects, we should remain cognizant that performance issues in other industries can have equally far reaching implications:
 - Bhopal
 - Texas City refinery explosion (et al)
 - Deep Water Horizon
 - Aerospace
- Other industries have conquered the digital domain and improved safety – we can and should learn from these sectors to develop and align the technical and regulatory frameworks to maximize safety, efficiency and performance while effectively managing risk

What the industry needs – technical framework

- Most of the issues we seek to resolve are first and foremost technical in nature:
 - Defending against all forms of CCF with an appropriately graded approach based on safety significance
 - Clear alignment on how to properly apply the well vetted concepts of the 50.59 process to digital technology
 - Where necessary, analyses that demonstrates the ability to cope with postulated failures and malfunctions
 - Assuring that DI&C components / platforms meet robust and objective performance requirements
- A clear and efficient technical framework is an enabler for advancing digital technology in the domestic fleet

What the industry needs – regulatory framework

- The regulatory framework should be updated to improve efficiency and focus on basic tenets of sound I&C design principles
 - Performance based
 - Technology neutral
 - Consistent across both legacy and new build plants
- Known issues:
 - ISG-6
 - BTP 7-19
 - IEEE-603/IEEE-7-4.3.2
 - IEEE-1012

NEI Digital Working Group – Active Focus Areas

- **Common Cause Failure Task Force (successor to NEI 01-01)**
 - Based on EPRI research on all forms of CCF and defensive measures that can be used to mitigate the attendant risk.
- **NEI 96-07 Task Force (successor to NEI 01-01)**
 - Appendix D to address 50.59 implications that are unique to digital technology
- **Technical Issues Focus Group**
 - Holistically examine the methods by which the industry implements digital upgrades and identify opportunities to improve execution
- **Regulatory Framework Focus Group**
 - Identify specific issues where the regulatory framework lacks alignment with current best practices (nuclear and non-nuclear)
- **Training and Communications Focus Group**
 - Provide training and communication on new guidance for execution of 50.59 and digital modifications

NRC Digital Action Plan

- While the industry has not had adequate time to fully review and formally comment on the latest iteration of the NRC Digital Action Plan, there are several observations that warrant mention:
 - Industry agrees that issues 1 and 2 are the highest of priorities
 - Several of the “top 5” issues appear to be lower priorities while elements of the “bottom 7” should be considered for elevation
 - In some cases there are enough synergies between issues that they could be efficiently handled as a single issue
 - Some of the concepts contained within the detailed action plans appear to be contradictory to the tenets of SRM-15-0106
 - Given the compressed timeline and the reality that often the same participants are involved in multiple elements of this initiative, a integrated schedule is becoming increasingly urgent

Concepts worth consideration

- Explore opportunities for using independent expertise to validate that basic components and systems are designed and implemented at a level commensurate with safety significance (TUV, CE...) – stated differently, change the agency focus from the O/S and hardware layer and focus on implementation (application software) and consistency with licensing basis
- Examine international standards (IAEA, MDEP...) to identify opportunities for improvement
- Examine the regulatory structures of other federal agencies – FDA, FAA, DOD to identify opportunities for improvement that should be brought into the regulatory framework
- Examine technical methods used by other sectors – pharma, aerospace, petrochemical to identify best practices and opportunities for improvement that should be brought into the technical framework