

Digital I&C Path Forward: Action Plan for Improving Regulatory Efficiency

Status Briefing for 01-20-2016 NEI/NRC DI&C Meeting

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Agenda

- Status of Action Plan Development
- Near-Term Action Items & Deliverables
- Mid- and Long-Term Action Items
- Coordination of Efforts
- Proposed Schedule for Conducting Public Stakeholder Interactions

Status of Action Plan Development

- Draft Plan Currently Includes:
 - Statements of Challenges for Resolution
 - Supplemental Information
 - Proposed Action Steps
 - Outcomes Expected
- Under Development:
 - Detailed Schedules, Milestones & Stakeholder Interactions
 - Assignment of Staff Resources
 - Outline of Research Activities needed to support Technical Bases
- Incorporation of Relevant Direction from the Commission

Near-Term Activities

- NRC Evaluation and Potential Endorsement of Updated Industry Guidance for DI&C 10CFR 50.59 Modifications
- Development of Guidance for Content and Schedule of DI&C Application Material Submittals
- Re-evaluation of NRC Policy on CCF due to Software Error; & Update of Appropriate Policy and Guidance Documents
- Incorporation by Reference of IEEE 603-2009 into 10 CFR 50.55a—(Pending Commission SRM Instructions)
- Early Development Stage Evaluation of Cyber Security Aspects of Control Systems

Near-Term Activities

NRC Assistance in Updating Industry Guidance for DI&C 10 CFR 50.59 Modifications

Guidance for the 50.59 screening and evaluation of digital I&C systems is ambiguous and weak in some areas, contributing to several licensees improperly performing 50.59 analyses for modifications of I&C systems using digital technology. Greater clarity in the implementing guidance is needed.

Action Plan Steps

NRC Evaluation and Potential Endorsement of Updated Industry Guidance for DI&C 10CFR 50.59 Modifications

Action	
3.1	Review/comment on NEI draft 50.59 guidance in Appendix D, NEI 96-07
3.2	Identify potential impact on NRC policy/guidance documents
3.3	Modify NRC guidance (if required)
3.4	Coordinate/modify guidance based on resolution of Issue on Potential CCF due to software error, as appropriate

Content and Schedule of DI&C Application Submittals

The level of technical detail submitted in license applications, license amendments, and licensing topical reports, as well as the timing and sequence of the technical information expected to be submitted for NRC evaluation during the review cycle should be reassessed and improved.

Action Plan Steps

Content and Schedule of DI&C Application Submittals

Action	
1.1	Identify and define lessons learned from the use of Enclosure B to ISG-06, and refine the matrix of information to be submitted for each tier and phase of the licensing review process. Prepare a revised document submittal schedule for license amendment requests.
1.2	Summarize recommendations arising out of Diablo Canyon pilot plant effort. Prepare Lessons Learned Report outlining findings. Identify whether FAT Report findings are required to make licensing decision, or whether a periodic staff “safety findings status letter” can provide safety decision status. Meet with stakeholders to discuss arguments for and against the use of a periodic “safety findings status letter”.
1.3	Propose modifications to industry/staff guidance for Part 52 submittals to highlight the need to provide new reactor design information and analysis at a level that is commensurate with the design level where NRC requirements are fulfilled.
1.4	Identify differences and gaps between Part 50 and Part 52 processes, and potential improvements that can be made to existing licensing processes based on licensing experience to date..
1.5	Update Chapter 7 of the Standard Review Plan—NUREG-0800 (SRP), either through text changes, subchapter additions, or new branch technical positions, to contain the information submittal schedules for each type of DI&C system to be evaluated.

Evaluation of NRC Policy on Software CCF

The current regulatory treatment and acceptance criteria dealing with the potential for common cause failure due to software error in the analysis of digital I&C systems has been problematic for licensees. The proper application of the screening criteria for “simple systems” in BTP 7-19 regarding 100% testability, and the lack of a graded approach based on safety significance, places a high burden for demonstrating adequate software and hardware development processes have been employed—especially for systems containing localized embedded digital I&C components.

Action Plan Steps

Evaluation of NRC Policy on Software CCF

Action	
2.1	Evaluate existing CCF policy and prepare/issue a Technical Basis Paper. Determine whether risk insight/graded approach is appropriate.
2.2	Coordinate the identification of appropriate licensing efforts for CCF with those of industry stakeholders
2.3	Prepare SECY paper identifying proposed action to modify or affirm existing CCF Policy.
2.4	Receive Commission's direction identifying appropriate policy actions.
2.5	Prepare a Rule and/or regulatory guidance, and commensurate staff review guidance.

Near-Term Activities

Incorporate by Reference IEEE 603-2009

The industry consensus standard currently incorporated by reference (IBR) in 10 CFR 50.55a, IEEE Std 603-1991, does not address certain design concepts that the introduction of newer technologies makes possible. IEEE Std 603-1991 does not include criteria for design concepts such as data communications, integration of systems via shared resources, consolidation of functions, and systems self-diagnostics. In addition, some applicants and licensees have expressed interest in licensing systems to newer standards.

Near-Term Activities

Early-Development Stage Evaluation of Cyber Security Aspects of Proposed DI&C Designs

The consideration of cyber security early in the design process can help licensees and applicants to avoid unsecurable designs and reduce regulatory uncertainty. However, the NRC cyber security code at 73.54 is programmatic and does not provide a process for NRC to review cyber security design information during licensing reviews. Absent a timely evaluation against cyber security criteria during the development phase, concerns remain that cyber vulnerabilities potentially introduced during the development process could adversely impact safety.

Action Plan Steps

Early-Development Stage Evaluation of Cyber Security Aspects of Proposed DI&C Designs

Action	
9.1	Evaluate options for considering cyber security early in the design and development process and for developing a process to allow staff to review cyber security design information as a part of licensing reviews. The purpose of such early review would be to address and/or eliminate cyber vulnerabilities that could be inadvertently introduced at the early stages of development of proposed digital safety systems.
9.2	Coordinate with the NRC Office of OGC regarding proper regulatory basis for evaluating voluntary submissions of digital I&C submittal information.
9.3	Implement the resulting process for addressing cyber security early in the development of DI&C safety related systems.

Deliverables for Near-Term Items

- Policy (as directed by the Commission)
 - Update policy described in SRM to SECY 93-087, including performance of D3 analyses
 - Address policy for evaluating cyber security aspects of proposed safety upgrades in the early development stage
- Regulatory Guidance (as appropriate, and as directed by Commission)
 - Endorse NEI 96-07, Appendix D
 - Endorse IEEE 603-2009 in RG 1.153
 - Endorse the use of IEEE 7-4.3.2 in RG 1.152
 - Update regulatory guidance, to incorporate the evaluation of cyber aspects of proposed DI&C designs in the early stages of development
- Staff Review Guidance
 - Update SRP, as appropriate, to address licensing and policy issues

Mid- and Long-Term Actions

- Develop review guidance for highly-integrated systems (identify, initiate research activities needed)
- Develop guidance for evaluating proposed alternatives
- Improve technical consistency among HQ licensing reviewers and regional inspectors in evaluating 50.59 plant upgrades
- Improve platform topical report update processes
- Develop improved review criteria for graded approach based on safety significance, and for commercial grade dedication processes and incorporate into regulatory infrastructure

Let's Start ASAP!

- There is an urgency to initiate stakeholder coordination to simultaneously resolve the following three near-term issues:
 - Enhanced 50.59 Guidance for Upgrading with Digital Technology
 - Clarity of Guidance for Addressing CCF due to Software Error
 - Licensing Process Improvement
- Simultaneous resolution of these three issues would go a long way to address planned upgrades and new applications to move forward.
- We need to establish public stakeholder interactions, with deliverable and milestone expectations for addressing each of these activities
- Implementation of proposed improvements should be tested through the use of pre-selected pilot projects.

Proposed Schedule

Date	Event
January 20, 2016 (today)	DI&C Coordination Meeting –NRC/NEI
March 2016	Kick-off Meetings on Licensing, CCF
March 8-10, 2016	RIC Session on Digital I&C Path Forward
April 2016	Meeting--NEI WG on 50.59 guidance
April – May 2016	Workshop on CCF & Diversity 2 nd Meetings on Licensing, 50.59, CCF
June – July 2016	3 rd Meetings on Licensing, 50.59, CCF
August, 2016	Next DI&C Status Meeting – NRC/NEI
September, 2016	4 th Meetings on Licensing, 50.59, CCF

Questions/Discussion