

NRR-PMDAPem Resource

From: Lubinski, John
Sent: Tuesday, December 15, 2015 11:57 AM
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Subject: December 17, 2015 NRC Commission Meeting
Attachments: One-Pager- License Process-Commision-Meeting-12-02-15.pdf; One-Pager-50.59-Commission-Meeting-12-02-15.pdf; One-Pager-Common-Cause-Failure-12-02-2015.pdf; One-Pager-Cyber-Commission Meeting-12-02-15.pdf; One-Pager-DraftActionPlan-Commission Meeting-12-02-15.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Last Thursday I provided you all the information below regarding the upcoming Commission Meeting. The purpose of this e-mail is to supplement the information by providing the five attachments regarding the other key regulatory initiatives listed in the information below.

Each of you has been invited by the NRC Office of the Secretary and agreed to participate in the subject meeting on Digital Instrumentation and Controls. I would like to provide you a draft outline of NRC staff's presentation that is being developed for the meeting. You are not being requested by NRC staff to address or respond to these specific topics in your presentation. Rather, we would like to provide it to you for overall awareness as you develop your presentation on the topics requested in your invitation from the NRC Office of the Secretary.

Draft Outline of NRC staff presentation (subject to change)

Background of Digital I&C and Recent Lessons Learned

- *Unique Aspects of Digital I&C*
- *Digital technology challenges and guidance development (e.g., 80s & 90s)*
- *Digital I&C Steering Committee and ISGs (2007-2011)*
- *Recent Lessons learned for operating and new reactors*

Proposed Rule: Incorporation by Reference of the IEEE 603-2009 Standard

- Overview of the IEEE 603 standard and use in digital I&C licensing
- Changes from the 1991 to the 2009 edition of the standard
- Discussion of applicability & additional conditions in the proposed rule
- Potential impacts of proposed rule on operating plants and new reactors
- Stakeholder engagement and feedback on the proposed rule

Other Key Regulatory Initiatives

- **Draft NRC Digital Instrumentation and Control Action Plan.** Staff will discuss its draft digital I&C action plan. The plan addresses key policy review and guidance activities that staff is focused on in the near-

term, based on industry feedback and staff experience. Staff will also note the upcoming interactions with the NEI digital I&C working group on these topics early next year.

- **Examination of NRC position on software common cause failure and relationship to IEEE 603-2009 rulemaking.** Staff will discuss its plan to examine NRC's policy on software common cause failure (CCF). Staff's position on this issue is derived significantly from Commission policy established in SRM-SECY-93-087. The staff has discussed this as a high priority activity at the most recent meeting with the NEI digital I&C working group. The current regulatory treatment and acceptance criteria for addressing the potential for software common cause failures in digital I&C systems have been problematic for licensees. Although staff has licensed digital systems using this criteria, the staff believes the assumptions in SECY-93-087 should be re-evaluated, in light of the changes in the technology and new considerations of graded safety approaches.
- **Review of draft NEI guidance for digital modifications under 10 CFR 50.59.** Staff will discuss its plans to review the anticipated guidance from NEI in implementing digital upgrades under 10 CFR 50.59. NEI is developing Appendix D to NEI 96-07 to provide specific guidelines for application of 10 CFR 50.59 to digital modifications. NRC has not yet seen this guidance. Current guidance for the 50.59 screening and evaluation of digital I&C systems has not been sufficient in ensuring licensees are consistently performing appropriate modifications under 50.59. NRC and industry agree that this is a high priority activity.
- **Enhancement of licensing process guidance in Digital I&C Interim Staff Guidance-06 and design specific review standards for new reactors.** Staff will discuss its plans to enhance the current licensing process under ISG-06 for operating reactor digital reviews - - based on experience from its pilot use in the Diablo Canyon license amendment review and industry feedback. Staff would also discuss its on-going efforts to develop design specific review standards for new reactors. Existing review guidance may not fully address the accompanying safety hazards that can result from highly-integrated I&C systems. Industry has expressed concerns regarding the level of technical detail needed in license applications, and the need for factory acceptance test reports as part of NRC's licensing decision. The staff discussed this as a high priority activity at the recent meeting with the NEI digital I&C working group meeting.
- **Examination of policy for reviewing cybersecurity design features during licensing** Staff will discuss its plans to examine options for reviewing cybersecurity design features as part of the license review process. The ACRS and a segment of industry have encouraged staff to consider this option. There are benefits to considering cyber security early in the design process in order to avoid un-securable designs. Staff intends to provide a recommendation to the Commission in 2016. This activity has been underway, and discussed with industry in two public meetings.

Sincerely,
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Office of Nuclear Reactor Regulation

Hearing Identifier: NRR_PMDA
Email Number: 2560

Mail Envelope Properties (cc2ed4c063224739bd32de7b30894e11)

Subject: December 17, 2015 NRC Commission Meeting
Sent Date: 12/15/2015 11:57:17 AM
Received Date: 12/15/2015 11:57:21 AM
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Files	Size	Date & Time
MESSAGE	5200	12/15/2015 11:57:21 AM
One-Pager- License Process-Commision-Meeting-12-02-15.pdf		115795
One-Pager-50.59-Commission-Meeting-12-02-15.pdf	94387	
One-Pager-Common-Cause-Failure-12-02-2015.pdf	150348	
One-Pager-Cyber-Commission Meeting-12-02-15.pdf	91955	
One-Pager-DraftActionPlan-Commission Meeting-12-02-15.pdf		113502

Options

Priority: Standard
Return Notification: No
Reply Requested: No

Sensitivity:	Normal
Expiration Date:	
Recipients Received:	Follow up

LICENSING PROCESSES FOR DIGITAL INSTRUMENTATION AND CONTROL SYSTEMS (December 2015)

Key Messages

- The current NRC regulatory framework provides specific criteria and guidance for performing digital I&C licensing reviews for operating and new reactors
- ISG-06 introduced a new approach to the licensing process for operating reactors, which has been piloted for the review of Diablo Canyon's upgrade of its Plant Protection System. Staff has also gained experience from recent detail I&C reviews of new reactor designs.
- Industry has expressed concerns regarding the level of technical detail needed in applications and the need for factory acceptance testing as part of the licensing process.
- Staff intends to update current guidance for the digital I&C licensing process to reflect recent experience and industry feedback.
- For small modular reactors, staff has developed and issued the Design-Specific Review Standard (DSRS) for I&C incorporating lessons learned from new reactor licensing reviews.

Background

The current NRC regulatory framework provides criteria and guidance for performing digital I&C licensing reviews. Specific focus of criteria and guidance addresses the unique aspects of the digital technology such as the software development process and data communications independence. This regulatory framework is being used to review license amendment requests for digital I&C modifications, I&C platforms, and design certification applications. Some licensees are considering digital upgrades to their safety and non-safety systems in an effort to address issues with replacing obsolete analog I&C systems and improving reliability. Some licensees and Industry stakeholders (licensees, applicants, and vendors) have historically expressed concern that the current digital instrumentation and controls (DI&C) licensing process for power reactors is cumbersome, inefficient, and/or unpredictable.

The NRC is continuing to assess its experience with licensing digital systems and seeking feedback from industry on how to improve the licensing process for digital systems. In 2007 - 2011, staff worked with industry to develop interim staff guidance (ISG) documents for key technical and process issues regarding licensing challenges at the time for digital I&C license amendments and new reactor applications. A number of these ISG's have been transitioned into more durable guidance such as Branch Technical Positions in the Standard Review Plan.

In an effort to improve the license process and provide clearer expectations for the content of digital I&C applications for operating reactors, the NRC issued Interim Staff Guide ISG-06. ISG-06 describes in detail the evaluation criteria used by the staff to review licensing submittals of DI&C systems for existing reactors. Also, ISG-06 introduced new approaches to the licensing process which were intended to improve review efficiency, reduce resource requirements, and reduce regulatory uncertainty associated with regulatory requirements for digital safety systems. The ISG has been piloted in the upgrade of the Diablo Canyon's Plant Protection System (PPS). The staff believes that the overall approach of ISG-06 has worked well, but there are areas which need improvement. The staff has also received feedback in areas in which industry believes too much detail is required by NRC prior to approving a digital upgrade. Staff has periodically met with NEI's digital I&C working group to discuss new concerns and the use of NRC licensing guidance.

For new reactors, the staff is using current interim staff guidance to review I&C system designs submitted in design certification (DC) and combined license (COL) applications. Applicants were able to successfully demonstrate safety by addressing NRC requirements by sufficiently addressing all safety issues with information at a higher level of the I&C design in some cases. However, guidance similar to ISG-06 would be useful for the licensing of new reactor digital safety systems. Within the context of 10 Part 52, DC, and COL applicants should submit organized and appropriate DI&C design information presenting clear evidence as to how each design requirement will be met, in a manner that supports efficient reviews and facilitates future FSAR maintenance. In addition, existing review guidance does not fully address the accompanying safety hazards that can result from highly-integrated I&C systems. A Design Specific Review Standard has been developed for NuScale that incorporates these concepts and will be piloted on that review.

As described in the draft digital I&C action plan the staff intends to assess the lessons learned with the pilot application of ISG-06 in the Diablo Canyon review, experience from new reactor reviews, and update the licensing guidance for operating reactors and new reactors. This will include a consideration of new options for reviewing factory acceptance testing results, which occur late in the design and implementation phase of a digital upgrade, as part of the licensing process.

Status

- The technical review of Diablo Canyon LRA is close to completion, with the exception of information needed from the applicant regarding the performance of the digital equipment under seismic conditions.
- Staff is developing lessons learned in parallel from the use of ISG-06 for Diablo Canyon and other relevant reviews.
- Staff is developing lessons learned from recent DC and COL applications reviews.
- Staff has developed NuScale DSRS Chapter 7 (I&C), incorporating lessons learned.

Next Steps

- The staff will engage the NEI working group for digital I&C, describe its lessons learned, and further seek feedback on potential enhancements to licensing guidance.
- The staff will conduct public workshops in approximately Spring 2016 to discuss these concepts and determine an approach to improving the process in durable guidance.
- Staff will likely update or revise guidance on Branch Technical Position within Chapter 7 of the Standard Review Plan, NUREG-0800 to incorporate the new licensing process.

Challenges

- Generically defining the level of technical detail necessary for each type of digital system, and options for acceptance testing for digital upgrades.
- Defining for DC and COL applicants the identification, type, and level of detail of informational material that is needed by the staff to perform its evaluations at the design certification, and combined license approval phases, and what level of detail is needed at various stages during the ITAAC closure phase.

10 CFR 50.59 ISSUES REGARDING DIGITAL I&C UPGRADES (December 2015)

Key Messages

- The NRC staff, INPO, and NEI have all identified problems with the use and implementation of previously-issued industry guidance described in NEI 01-01 for implementing digital upgrades under 10 CFR 50.59. This includes both the screening and evaluation of associated plant modifications.
- NEI is preparing new guidance for implementing digital upgrades under 50.59, as a new Appendix D to NEI 96-07. Appendix D would replace in whole the guidance in NEI 01-01 for digital implementation using 10 CFR 50.59, which has been previously endorsed by NRC through RIS-2002-22.
- The NRC staff plans to evaluate and comment on the new NEI draft Appendix D when it is provided to NRC by end of 2015. If deemed appropriate, the NRC will endorse the use of this new guidance in a future revision to a regulatory guide.

Background

Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," provides the staff's endorsement of industry guidance for evaluating the impact on plant safety analyses for plant modifications performed under 10 CFR 50.59. The objectives of 10 CFR 50.59 are to ensure that licensees (1) evaluate proposed changes to their facilities for their effects on the licensing basis of the plant, as described in the FSAR, and (2) obtain prior NRC approval for changes that meet specified criteria as having a potential impact upon the plant license basis.

In the late 1990s and early 2000s, the industry developed guidance document NEI 01-01 to assist utilities in implementing and licensing plant changes specific to digital instrumentation and control system upgrades, in a consistent and comprehensive manner. NEI 01-01 includes guidance for:

- carrying out important steps in the design and implementation process to ensure that digital upgrade issues are adequately addressed;
- performing 10 CFR 50.59 evaluations for digital upgrades,
- preparing License Amendment Requests (LARs) when needed, and
- complying with other regulatory requirements that pertain to digital equipment in nuclear power plants.

The NRC endorsed the use of NEI 01-01 in RIS 2002-22, "Use of EPRI/NEI Joint Task Force Report, "Guideline on Licensing Digital Upgrades: EPRI TR-102348, Revision 1, NEI 01-01: A Revision of EPRI TR-102348 to Reflect Changes to the 10 CFR 50.59 Rule." However, experience with implementing DI&C upgrades under 10 CFR 50.59 at nuclear power plants have revealed several shortfalls in the screening of modifications, addressing the appropriate design criteria, and evaluating the impact of proposed digital I&C on established licensing basis.

In a November, 2013 letter to NEI, the NRC staff summarized its concerns regarding licensee implementation of the current guidance in NEI 01-01 (ML13298A787). In response, NEI formed a working group to update its guidance for implementing digital &C modifications under 10 CFR

50.59. The NEI working group found that additional guidance was needed to support three specific aspects of evaluating the impact of such modifications on plant safety. The NEI working group identified that additional guidance is needed for assessing whether the impact of the new digital equipment will: a) result in more than a minimal increase the likelihood of occurrence of a malfunction of a system or component important to safety previously analyzed; b) create the possibility for an accident of a different type than previously evaluated; and c) create the possibility for a malfunction of a system or component important to safety with a different result than previously analyzed.

Status

- The NEI working group on digital I&C modifications performed under 10 CFR 50.59 is nearing completion of its activities. NEI has stated it will issue its draft guidance for staff evaluation in December 2015.
- NRC staff has engaged NEI on this issue during in periodic working group meetings.

Next Steps

- NRC staff has arranged for a meeting to discuss the revised guidance with NEI on January 13, 2016.
- NRC staff plans to evaluate the guidance for possible endorsement, if appropriate, in a future revision to a regulatory guide.
- Staff will consider options for evaluating the success and implementation of the new guidance through our inspection process.

SOFTWARE COMMON CAUSE FAILURE (December 2015)

Key Messages

- SRM-SECY 93-087, “Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs,” defines specific acceptance criteria for addressing software common cause failure, by performing a diversity and defense-in-depth analysis and providing a diverse means of accomplishing the safety function.
- NRC’s position and licensing guidance on addressing potential software common cause failure is derived from the direction in the SRM.
- Addressing NRC guidance for assessing the potential for CCF may be one of the most challenging issues identified by licensees in the design and licensing of digital I&C systems.
- The staff is currently evaluating NRC position on software common cause failure. Staff will review all aspects of the current position and assess potential options for updating or affirming the current position including the possibility of risk-informing the position and/or achieving a graded approach based on safety significance. The staff intends to prepare a report and policy paper outlining the technical basis for updating NRC’s position through either rulemaking or change in Commission policy.

Background

One of the most significant issues associated with digital systems is the potential for software common cause failure (CCF). One significant challenge is the use of identical software across redundant safety channels that can potentially defeat this redundancy and lead to CCF. Software CCF is unique because software code has no real physical form, unlike the reactor plant mechanical components that may be controlled by the software. The potential for software CCF is purely a digital I&C design issue and cannot be easily addressed by other means such as analysis, testing, or operational experience. The design of a digital I&C systems must therefore consider the potential risk for the introduction of undetected systematic faults that could result in software CCF and unwanted system interactions.

Staff Position and Guidance

The staff position for addressing potential software CCF has been essentially the same for the past 20 years. The Commission’s SRM to SECY 93-087, “Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs,” defines specific acceptance criteria for addressing software common cause failure through performing a diversity and defense-in-depth analysis and providing a diverse means of accomplishing the safety function. At the time the SRM-SECY-93-087 was issued, few standards and regulatory guidance documents existed for implementing digital technology in nuclear power plants. The staff implemented this direction in Chapter 7 of the Standard Review Plan NUREG-0800, Branch Technical Position 7-19, “Guidance on Evaluation of Defense-in-Depth and Diversity in Digital Computer-Based Instrumentation and Control Systems”.

This branch technical position provides guidance on diverse means that could be used to mitigate software common cause failures, including adoption of internal diversity within the safety system or use of manual operator actions. In addition, this branch technical position also allows 100% testing of simple systems to address software common cause failures; this guidance was based on interim staff guidance developed at the request of industry to consider testing as a means to address software common cause failure. Also, guidance for performing the diversity and defense-in-depth analyses of reactor protection systems is provided in NUREG/CR-6303.

As part of a concerted effort by NRC and industry to address regulatory challenges, the staff issued a series of digital I&C interim staff guidance documents from 2007 - 2011. The staff examined the NRC position on diversity and defense-in-depth to address CCF and the potential to risk-inform digital I&C reviews. During the development of these ISG's industry stakeholders asked NRC to consider risk-informing the current NRC position on CCF and the need for diversity. The staff carefully evaluated this approach but determined it was not practical because the state-of-art did not support the proposed approach at that time. The staff position and review guidance were documented in:

- ISG-02, Diversity & Defense in Depth (incorporated into BTP 7-19 Rev 6 in Standard Review Plan).
- ISG- 03, Risk Informing Digital I&C

Current Issues with Software CCF Guidance

The current regulatory treatment and acceptance criteria for addressing the potential for software common cause failures in digital I&C systems have been problematic for some licensees. For example, the current guidance is a consequence-based approach for addressing software common cause failure and does not directly address risk to the overall reactor system. Therefore, it requires the same rigor for treatment of software common cause failures for all safety systems, without consideration to the significance of the safety function performed by the safety system.

Although the staff has effectively licensed digital systems using the current position, the staff believes the assumptions in SECY-93-087 should be re-evaluated in light of the significant technological evolution and use of digital systems. Over the past 20 years, digital technology and the tools for designing it have changed significantly, including the advancements in the use of field programmable gate arrays (FPGAs) and complex programmable logic devices (CPLDs) in nuclear power plant safety systems. Since 1993, there have been significant improvements in the methods used to design and implement digital systems, the tools needed to analyze digital system and the testing of these systems. This has led to improved quality and reliability of these systems and improved industry standards as well. Some of these changes been reflected in updates to BTP 7-19, but the basic NRC policy has not been updated.

Staff Review of NRC position on CCF

The NRC staff is evaluating this existing policy on software common cause failure and options to update it through rulemaking or modification of Commission policy. This evaluation will also assess potential options for updating or affirming the current position including the possibility of risk-informing the position and/or achieving a graded approach based on safety significance. The staff intends to prepare a report and a policy paper outlining the technical basis for either modifying the existing software common cause failure policy or for establishing a new rule regarding the appropriate application of diversity and defense-in-depth for use in designing and implementing digital I&C safety systems. The staff will use the basic rulemaking processes (e.g., early research, public workshops, stakeholder feedback, development of a technical basis, etc.) to ensure staff's recommendation is well-informed. Because digital system diversity continues to be a significant technical issue associated with the design and licensing of digital systems, this rulemaking effort is a high priority.

Status

- The formal review effort has started with the objective of fully examining and modifying (likely) current Commission position based on best science, licensing and operational experience, and consideration of stakeholder feedback.

Next Steps

- Staff intends to conduct public workshops in winter and spring of 2016.
- Staff intends to complete a technical basis by summer of 2016, and provide a proposed position and potential rule by August 2017.

Challenges

- Addressing software CCF involves complex issues that in part may be dependent on the specific design approaches and use of digital components chosen by applicants and licensees.
- Addressing software CCF through options involving PRA or highly risk-based approach could require significant effort in developing a robust technical method.

REVIEW OF CYBER SECURITY DESIGN DURING LICENSING (December 2015)

Key Messages

- There are benefits to considering cyber security early in the design process and licensing review in order to avoid unsecurable designs.
- The NRC cyber security rule is programmatic and the staff does not currently review cyber security design information during licensing reviews.
- The NRC staff is evaluating 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.

Background

The current regulatory framework for cyber security provides programmatic requirements for licensees to provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the DBT, as described in 10 CFR 73.1. 10 CFR 73.54 requires operating reactor licensees and COL applicants to submit a cyber security plan to describe how the facility's cyber security program has been, or will be, established in order to protect digital computer and communication systems and networks associated with safety and important-to-safety, security and emergency preparedness (SSEP) functions against cyber attacks. RG 5.71 provides guidance to COL applicants and operating reactor licensees for satisfying the requirements of 10 CFR 73.54.

Currently, operating reactor licensees and COL applicants are required to submit a cyber security plan to be reviewed by the NRC. However, they are not required to submit design information used to address cyber security requirements for NRC licensing reviews. Thus, for new reactors, the first opportunity for the NRC to inspect the implementation of the cyber security program is after the COL is issued. This inspection typically occurs after the design certification applicants have completed the design of systems that support SSEP functions, particularly systems that perform safety and important-to-safety functions. For operating reactors, design information becomes available for inspection when a system is entered into the operating reactor licensee's cyber security program. This increases the regulatory uncertainty for COL holders and operating reactor licensees, who are ultimately responsible for ensuring their systems comply with the NRC's cyber security regulations (e.g., 10 CFR 73.54), and who may have to address vulnerabilities in system's design after the design has been completed. Due to this regulatory uncertainty, the NRC received feedback from some design certification applicants that staff review of cyber security design features should be performed during design certification application reviews.

The Advisory Committee on Reactor Safeguards (ACRS) has raised concerns associated with the control of access to plant equipment and networks. Specifically, the ACRS stated that control of access to critical plant systems should be reviewed as part of design certifications and COL application reviews. ACRS made the same recommendation relative to licensing reviews of operating plant digital instrumentation and controls (I&C) upgrades. Such a review would consist of evaluating the design of the communication flow enforcement device between cyber security defensive architecture Level 4 and Level 3, and between Level 3 and Level 2, to verify this device maintains unidirectional flow from higher security levels to lower security levels.

During the review of Chapter 7, Instrumentation and Controls, mPower Design-Specific Review Standard, the ACRS raised a similar concern (i.e., control of access) in a letter dated March 19, 2013 (ML13084A057). In a letter dated August 5, 2014 (ML14196A137), the ACRS made similar recommendations for the proposed 10 CFR 50.55a rulemaking to incorporate by reference IEEE Std. 603-2009, "IEEE Standard Criteria for Safety Systems for Nuclear power Generating Stations." In the staff's response letter dated April 3, 2014 (ADAMS Accession No. ML14071A121), NRC staff committed to develop a SECY paper seeking Commission direction on the particular issue of evaluating design features to address cyber security during licensing and design certification application reviews.

Status

- Staff is drafting a SECY paper with options for considering cyber security information early in the design and development process.
- Staff has held two public meetings with industry stakeholders in April, 2015 (ADAMS Accession No. ML15119A289) and August, 2015 (ML15261A695), respectively. Neither meeting resulted in significant revisions to the draft SECY.

Next Steps

- ACRS will review the draft SECY during upcoming subcommittee and full committee meetings. The ACRS intends to issue their recommendation to the Commission after the meetings.
- The SECY is currently scheduled to be submitted to the Commission in spring 2016.

**DRAFT DI&C ACTION PLAN
TO IMPROVE REGULATORY PROCESS AND EFFICIENCY
(December 2015)**

Key Messages

- Staff has developed a working-level draft action plan to improve the effectiveness and efficiency of digital instrumentation and control (DI&C) licensing reviews and address oversight issues involving DI&C modifications.
- The draft action plan addresses specific issues based on feedback from industry stakeholders on recent licensing and inspection issues associated with DI&C.
- The topics and general “problem statements” in this plan have been discussed in periodic meetings with the NEI digital I&C working group. The NEI working group is developing an industry “roadmap” for digital I&C modifications, which aligns well with the issues identified in the NRC draft action plan.
- The draft action plan itself has not been shared with industry. Staff intends to hold a public meeting with the NEI working group in January 2016 to discuss this plan and industry’s roadmap. Staff will then revise and adjust this plan as appropriate.

Background

In the operating nuclear fleet, analog I&C equipment obsolescence management is becoming significantly burdensome to licensees. Obtaining replacement parts for analog components has become increasingly difficult as well. Several licensees therefore desire to implement digital technology in safety control systems to resolve obsolescence issues, increase system reliability, reduce opportunities for human error during surveillances, and reduce maintenance costs.

New reactor designs reviewed by the NRC are fully utilizing DI&C design approaches and technology. Such approaches and technology offer many benefits to nuclear power plant operation, including increased reliability and diagnostics, and improved human-machine interfaces. However, use of such approaches and technology has also challenged the safety evaluation process by introducing potential hazards to the design as a result of the highly-integrated DI&C systems. For example, the staff has spent a significant level of effort during recent licensing actions to evaluate data communication independence, the potential for spurious actuation of safety and non-safety control systems, and the control of safety-related equipment from non-safety-related controls. Current assessment approaches and review guidance do not efficiently address the continually evolving nature of digital technology. Experience with new reactor DI&C designs has shown that, in several cases, applicants have initially proposed new and unique technology or design approaches without a sufficient analysis of the hazards associated with I&C interactions with plant systems.

The NRC staff has engaged industry on regulatory issues for DI&C. Industry representatives have stated the overall licensing cost is high and the efficiency of the current process needs improvement. For example, industry stakeholders have stated the process for DI&C safety system licensing is not flexible or “scalable” based on risk information. Some stakeholders also voiced a need for a “graded approach” to licensing based on safety significance. Industry stakeholders also express the need for the NRC staff to re-examine the regulatory treatment of

potential CCF due to software errors. Finally, industry stakeholders prefer to perform more digital safety system modifications with a more reliable 10 CFR 50.59 evaluation process.

The Nuclear Energy Institute (NEI) formed a NEI digital I&C working group to address industry issues with the implementation of digital I&C, including regulatory issues. The NRC staff has met periodically with the NEI working group to discuss key issues, and identify high priority concerns that should be addressed by both NRC and industry.

In response to these concerns and NEI working group meetings, the staff has developed a draft action plan, which consist of a series of “problem statements” to outline specific areas for regulatory efficiency improvement. The staff is using the “problem statement” format to ensure alignment on specific technical or regulatory issues that need to be addressed (based on industry feedback) and to define potential outcomes that could resolve each issue. The action plan summarizes key actions for each item and target milestones. The plan also identifies areas where further solicitation of stakeholder feedback is warranted. Finally, the action plan identifies DI&C research activities that support these action items.

The staff have discussed these issues and the general “problem statements” with the NEI digital I&C working group (ML15183A031, ML15162A520). NEI have generally agreed with the issues and problem definitions presented by NRC. NEI is developing its own “DI&C Roadmap” to more broadly address industry issues regarding implementation of digital I&C, including regulatory issues. NEI intends to consider and align its roadmap with the issues that have been identified in the staff’s action plan.

Although the specific issues to be resolved have been discussed with NEI and stakeholders, the draft action plan project planning details have not yet been shared with industry. Staff intends to hold a public meeting with the NEI working group in January 2016 to discuss this plan, and provide comments on NEI’s proposed “DI&C roadmap.” Staff intends to update this plan on a semi-annual basis to reflect additional feedback and progress.

Status

- The staff is actively working on several items in the draft action plan.
- A meeting is scheduled with NEI in January 2016 to discuss the draft action plan and NEI’s roadmap. Progress of specific activities will be tracked in the action plan.

Next Steps

- Staff will formalize the action plan after the January 2016 meeting with NEI.
- The staff will update the action plan on a semi-annual basis.

Challenges

- Staff will need to coordinate resources for individual items that overlap in common regulatory or technical areas.
- NEI’s roadmap may influence staff’s plan. The specific regulatory products and timeframes that NEI may propose some issues are unclear.