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Protecting People and the Environment

Nuclear Regulatory Commission and Boiling Water Reactor Owners Group Executive Oversight Committee Meeting

December 1, 2021

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Agenda

Time	Topic	Speaker
1:00pm	Public Meeting Start / Introductions & Opening Remarks	Ngola Otto (NRC) *BWROG Project Manager* Mike King (NRC) *Deputy Office Director for Licensing and Oversight of Operating Reactors*
1:10pm	BWROG Introduction • Meeting Objectives • BWROG Overview	Tim Hanley (Exelon) *BWROG Executive Chairman*
1:25pm	Emergency Procedures Committee and EPG/SAG Revision 4 Workshop Update	Steve Douglas (TVA) *BWROG Executive Vice Chairman*
1:50pm	NRC Transformation Update • Accepting Risk in Decision Making • Systematic Approach to Risk-informed Licensing • Licensee billing process update	Ian Tseng (NRC) Anders Gilbertson (NRC) Jawanza Gibbs-Nicholson (NRC)
2:30pm	Break	-
2:45pm	Risk Informed Consensus Standards (IEEE, etc.) Flex Operator Actions and IDHEAS adoption	Bob Rishel (Duke) *BWROG Integrated Risk-Informed Regulations Committee Chair*
3:10pm	Update on Inspection Plans and Schedule for EPG / SAG Revision 4 Implementation	Jeffrey Bream (NRC)
3:20pm	BWROG Licensing and TSTF Update • TSTF-576 SRV • TSTF-582 WIC	Ryan Joyce (SNC) *BWROG Licensing Committee Chair*
3:45pm	• Update on Power Operated Valve Inspections • 10 CFR 50.55a(b)(3)(xi) Rulemaking and ASME Code Case	Tom Scarbrough (NRC), Michael Farnan (NRC), Robert Wolfgang (NRC), and Douglas Bollock (NRC)
4:10pm	Digital Instrumentation & Controls	Jeanne Johnston (NRC)
4:25pm	Accident Tolerant Fuel	Joseph Donoghue (NRC)
4:35pm	NRC Questions/Comments/Wrap-up	NRC/BWROG
4:45pm	Opportunity Public Questions/Comments	Public/NRC
5:00pm	Adjourn	

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Opening Remarks

Michael King

Deputy Office Director for Reactor Programs

Office of Nuclear Reactor Regulation

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NRC Transformation Update:
Accepting Risk in Decision Making Culture and Systematic Approaches to Risk-informed Licensing

Ian Tseng and Anders Gilbertson

BWROG Executive Oversight Committee Meeting

December 1, 2021

The Goal

- To improve the handling and efficiency of NRC review.

The Method

- Increasing adoption of risk-informed decision-making across the NRC's technical staff
- NRR Office Instruction LIC-206 (ML19263A645) builds off existing NRC framework and long-standing philosophies.

The Challenges

- Reviewers sometimes siloed in separate technical specialties
- Risk language is diversely presented and dispositioned
- Setting appropriate precedent for first-of-a-kind reviews

The ~~Challenges~~ Solutions

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The ~~Challenges~~ Solutions

- ~~Reviewers sometimes siloed in separate technical specialties~~

Proactive process to engage relevant technical specialties and promote collaboration as early as possible in a review

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The ~~Challenges~~ Solutions

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- ~~Reviewers sometimes siloed in separate technical specialties~~

Proactive process to engage relevant technical specialties and promote collaboration as early as possible in a review

- ~~Risk language is diversely presented and dispositioned~~

Provide a common understanding of risk terminology to promote effective collaboration and more reliable conceptual handling by the NRC

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- ~~Setting appropriate precedent for first-of-a-kind reviews~~

A consistent intellectual framework for reviewing and documenting risk-informed approaches

What's in LIC-206 Revision 1

LIC-206 & Appendix A

Appendix B

Appendix C

Objectives

- Provides framework for considering risk-insights in licensing and licensing-related activities
- Applying a holistic and integrated view of safety that considers defense-in-depth, safety and engineering margin, engineering judgment, and PRA

Policy and Background

- 1995 – PRA Policy Statement (60 FR 42622)
- 2017 – SRM-M170511 and SECY-17-0112
- 2018 – RIDM Action Plan, Phases 1 and 2

Responsibilities and Authorities

What's in LIC-206 Revision 1

LIC-206 & Appendix A

Appendix B

Appendix C

Appendix B - The Integrated Review Team (IRT) Process

- Framework for forming a multidisciplinary review team, which typically includes a risk analyst.
- The IRT process encourages the review team to break down silos and increase discussion across disciplines to result in more collaborative decision making.
- An IRT typically provides consolidated RAI and SE input.

What's in LIC-206 Revision 1

LIC-206 & Appendix A

Appendix B

Appendix C

Appendix C – Probabilistic, Risk, and PRA Insights for Technical Reviewers

- This appendix provides technical reviewers (TRs) with the tools needed to use probabilistic, risk, and probabilistic risk assessment (PRA) insights to:
  1) Determine an appropriate scope or depth of review, and
  2) Reach or support regulatory findings, as part of a systematic approach.
- This approach is intended to leverage TRs' existing experience and engineering knowledge while expanding their use of risk information and risk insights as a member of an IRT.

Implementation

- The NRC has stood up an active and motivated team to roll out the LIC-206 approach and contents, with special focus on:
  - Training – Person to person contact to bring the concepts to life and help staff link them to their existing expertise.
  - Observation – Real time feedback from within the process to inform training and implementation.
  - Metrics – Building the foundation for tracking and monitoring on-going health for long-lasting effect.
- A working group is looking into expanding the use of this process.
- Licensee and applicant facing guidance will be developed once the process is sufficiently mature.

Takeaways

- NRR has a new office instruction, LIC-206 Revision 1 (ML19263A645) to promote the practices and culture change needed for expanded use of risk-information in reviews.
- The method builds on existing regulatory framework and methods to better equip the staff to use risk-information and engineering judgment to assess how much effort to focus on each part of their review.
- **The regulations must still be met** – but some suggested review procedures and optional acceptance criteria can be adjusted commensurate with risk and safety significance.

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Other Systematic Uses of Risk in Licensing RG 1.200 and 10 CFR 50.69

Anders Gilbertson
BWROG Executive Oversight Committee Meeting
December 1, 2021

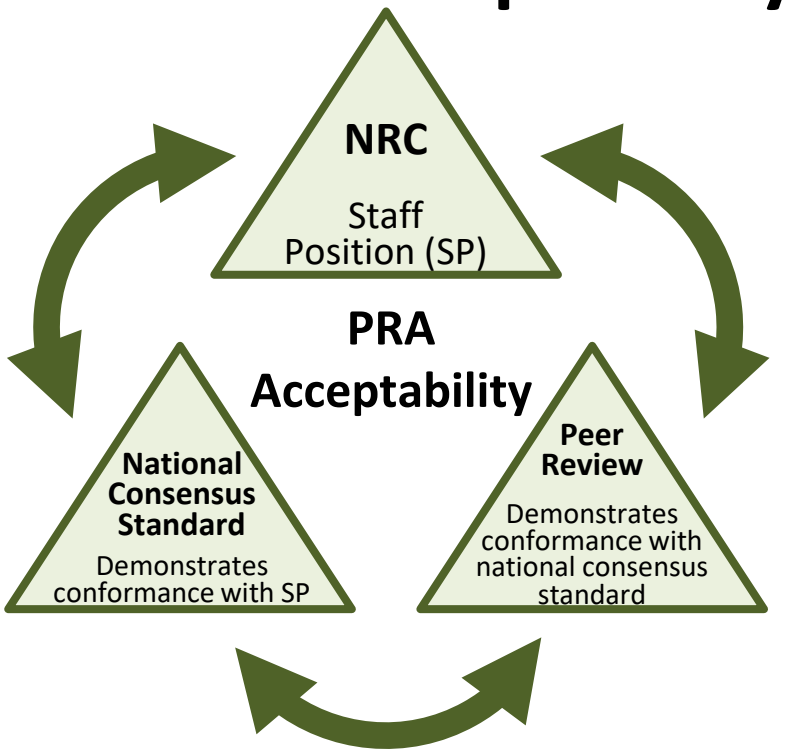
Development and Use of Voluntary Consensus PRA Standards

- NRC participates as per OMB Circular A-119
- NRC has participated since the inception of the development effort in 1998
- SDOs (ASME and ANS) jointly develop national consensus PRA standards for LWRs and NLWRs
- NRC informs SDOs about promulgated staff positions and provides technical expertise

Regulatory Guidance on PRA Acceptability

- NRC promulgates the staff position on PRA acceptability for use in LWR regulatory activities in RG 1.200
- RG 1.247 will soon be published with the staff position on PRA acceptability for NLWRs
- RG 1.200 endorses voluntary consensus PRA standards, guidance on an acceptable PRA peer review process, and other related industry guidance

PRA Acceptability Paradigm



- All three elements are needed to assess PRA acceptability.
- For RG 1.200, this serves to obviate the need for an in-depth staff review of the PRA.

Use of RG 1.200

- RG 1.200 has been used extensively over the past 15 years in risk-informed regulatory activities
- Some important activities include
  - SSC categorization (10 CFR 50.69)
  - Risk-informed completion times (RITSTF Initiative 4b)

How RG 1.200 is Implemented

- For 50.69 applications, licensees may use guidance such as RG 1.201 and NEI 00-04 to develop the submittal
- RG 1.200 is used to determine the acceptability of the PRA submitted in support of the program

Accurate Invoicing

Jawanza Gibbs-Nicholson, Team Leader
Office of Chief Financial Officer
Division of the Comptroller
Labor Administration and Fee Billing Branch

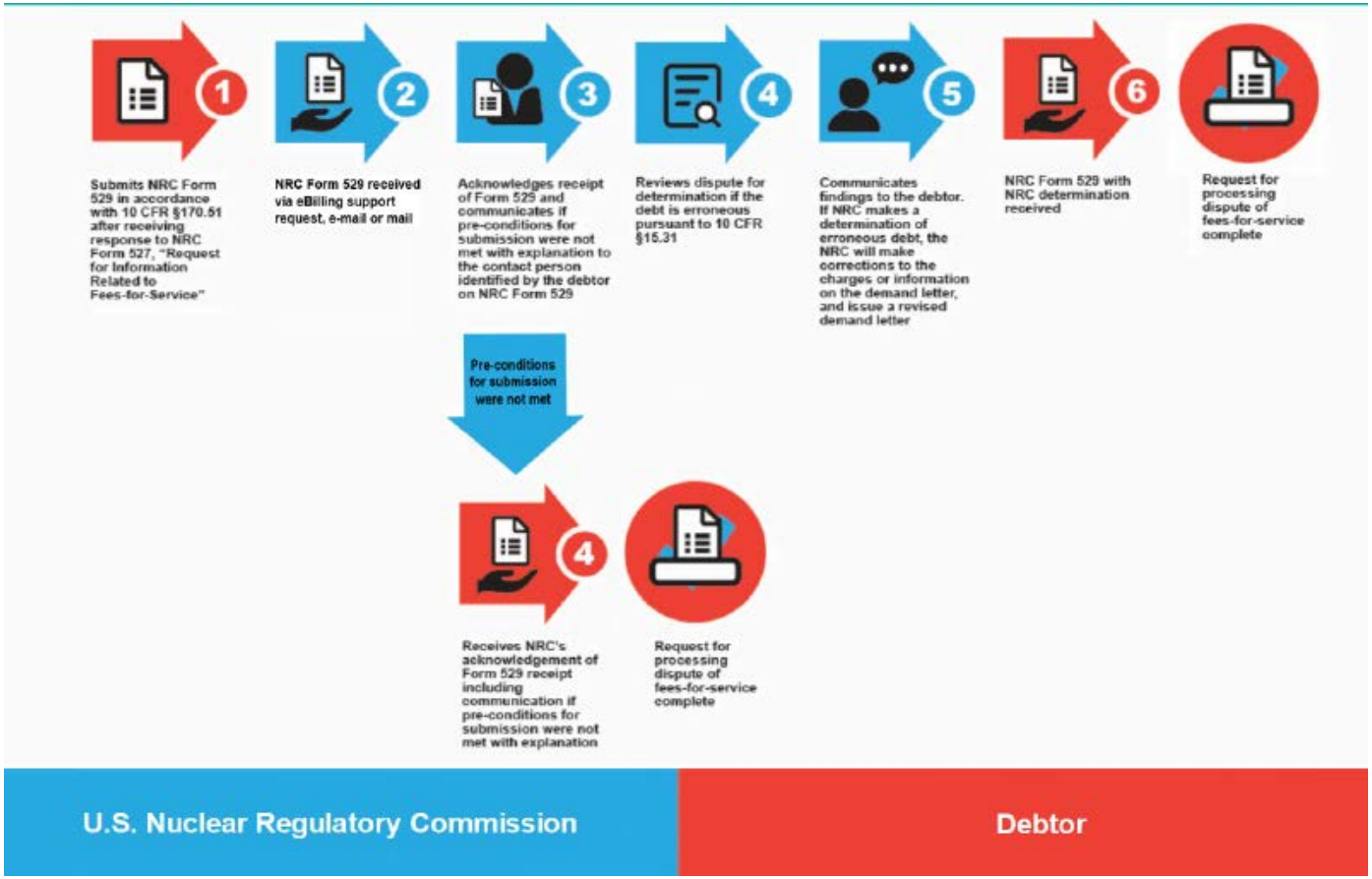
NEIMA Section 102(d) - Accurate Invoicing

- With respect to invoices for fees described in subsection (b)(2), the Commission shall –
  - (1) ensure appropriate review and approval prior to the issuance of invoices;
  - (2) develop and implement processes to audit invoices to ensure accuracy, transparency, and fairness; and
  - (3) modify regulations to ensure fair and appropriate processes to provide licensees and applicants an opportunity to efficiently dispute or otherwise seek review and correction of errors in invoices for those fees

NEIMA Section 102(d) - Accurate Invoicing Projects Completed

- Invoice & Billing Data Structure Redesign
- Standardization of the Fee Billing Validation Process
- eBilling
- NRC Form 527 - Request for Information Related to Fees-for-Service

NRC Form 529 - Dispute of Fees-for-Service Charges in Accordance with Title 10 of the Code of Federal Regulations (10 CFR) §170.51



eBilling Video

To learn more about eBilling, please visit:
https://www.nrc.gov/about-nrc/regulatory/licensing/fees.html#ebilling

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Update on Inspection Plans and Schedule for EPG / SAG Revision 4 Implementation

Jeff Bream, Reactor Operations Engineer
Office of Nuclear Reactor Regulation
Division or Reactor Oversight

ROP Oversight of SAMGs

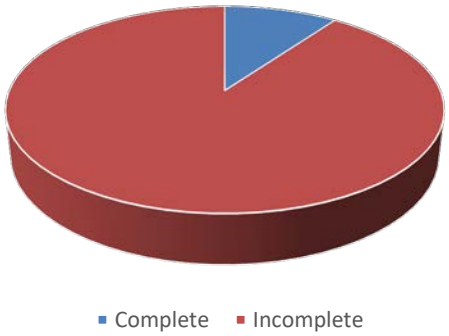
- In 2015, the Commission directed the staff to provide periodic oversight of licensee SAMGs
- All licensees committed to update and maintain their SAMGs
- BWROG issued Revision 4 to the severe accident technical guidelines in June 2018

Inspection of Licensee Commitments

- NRC staff revised IP 71111.18, "Plant Modifications" to inspect SAMG commitments
  - Added SAMGs to the optional review of plant documents and procedures for permanent modifications
  - Added a one-time sample to verify plant SAMGs were updated consistent with the generic severe accident technical guidelines
    - Completion due 2022

IP 71111.18 SAMG Sample

- As of the 3rd Quarter 2021, the inspection sample has been completed at 2 BWR sites (8 PWR sites)
- Currently no Resident Inspectors have reported difficulties completing the sample by the end of 2022



Next Steps

- The IP will be revised at the end of 2022 to remove the SAMG inspection sample requirement.
- The guidance will be maintained for future revisions of the generic guidelines

Questions?

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Power-Operated Valve Inspection Program

Michael F. Farnan

Thomas G. Scarbrough

Douglas R. Bollock

Office of Nuclear Reactor Regulation

U.S. Nuclear Regulatory Commission

BWROG Public Meeting

December 1, 2021

POV Inspection Program

- On July 26, 2019, NRC issued Inspection Procedure (IP) 71111.21N02, “Design-Basis Capability of Power-Operated Valves Under 10 CFR 50.55a Requirements”
- Inspection objective is to assess the reliability, functional capability, and design-basis of risk-important power-operated valves (POVs) at nuclear power plants.
- Training provided for inspectors in each NRC Region office.
- POV inspections began in January 2020.
- POV inspections focus on sample selection, scope, design, testing, and maintenance and corrective actions.

POV Inspection Status

- POV inspections using IP 71111.21N.02 have been performed at about 59 nuclear power plant units since January 2020.
- Inspections at each site focus on a sample of 8 to 12 POVs including:
  - Motor-Operated Valves (MOVs)
  - Air-Operated Valves (AOVs)
  - Hydraulic-Operated Valves (HOVs)
  - Solenoid-Operated Valves (SOVs)
  - Pyrotechnic-Operated (Squib) Valves
- Many inspections rely on partial remote means due to COVID-19.

POV Inspection Results

- POV inspections have identified several Green Non-Cited Violations (NCVs) and numerous minor and licensee identified violations.
- At a virtual public meeting on December 8, 2020, NRC staff discussed lessons learned from the POV inspections up to that time.
- 14 categories of lessons learned from POV inspections are presented in NRC Information Notice 2021-01 (May 6, 2021), “Lessons Learned from U.S. Nuclear Regulatory Commission Inspections of Design-Basis Capability of Power-Operated Valves at Nuclear Power Plants.”

IN 2021-01 POV Inspection Lessons Learned

1. Ensure IST Programs are fully consistent with ASME OM Code, such as addressing all POV safety functions, and maintaining POV risk rankings up to date.
2. Address ASME OM Code, Appendix III, requirement for mix of static and dynamic testing.
3. Follow NRC-accepted commitment change process (e.g., JOG Program does not include test interval grace periods).
4. Properly determine POV operating requirements and actuator capability, including parameters used in calculations such as friction values, temperature, pressure, and flow.

IN 2021-01 POV Inspection Lessons Learned

5. JOG Program determined potential for degradation of valve friction coefficients, but did not establish valve friction database.
6. Establish methods to periodically demonstrate design-basis capability of JOG Class D valves.
7. Address conditions for EPRI MOV PPM applicability, such as maintaining valve in good internal condition. See NUREG-1482 (Revision 3).
8. Properly justify increasing Limitorque actuator thrust ratings. See IN 92-83.

IN 2021-01 POV Inspection Lessons Learned

9. Properly conduct POV testing and adequately evaluate results to demonstrate POV can perform its safety function.
   a) Properly translate test acceptance criteria from design calculations to test procedures
   b) Verify diagnostic equipment installed and operating properly
   c) Evaluate test data for full valve stroke
   d) Verify required parameters are within acceptable range
   e) Determine if test data exceed JOG threshold values
   f) Address potential variation of data from single test
   g) Justify reliance on static diagnostic testing
   h) Periodic evaluation of thermal overload devices
   i) Prepare monitoring reports in accordance with plant procedures

IN 2021-01 POV Inspection Lessons Learned

10. Provide assurance that MOVs set on limit control under static conditions will fully close under dynamic conditions.
11. Provide assurance of qualified life of POVs if extended.
12. Properly implement guidance provided by Boiling Water Reactor Owners Group for assessing susceptibility of separation of stem-disk connection in Anchor/Darling double-disk gate valves (see IN 2017-03).
13. Implement 10 CFR 50.55a(b)(3)(xi) for supplemental valve position indication when conducting testing for ISTC-3700 in ASME OM Code (2012 or later edition).

IN 2021-01 POV Inspection Lessons Learned

14. Justify POV preventive maintenance schedules based on vendor recommendations and plant experience (e.g., MOVs in high temperature areas might need more frequent stem lubrication, and MOVs in non-normal positions might need additional attention, such as limit switch cover facing down might experience grease intrusion).

Additional POV Inspection Lessons since IN 2021-01

- Evaluation of possible consequences of drilling a hole in valve disk when preventing pressure locking
- JOG program schedule does not include grace periods so commitment change process needed
- Monitoring torque limits when operating a valve by its manual handwheel
- Ensuring leak rate requirements met for MOVs with long closing torque switch bypass
- Improper reliance on one-time stall torque limits for actuator margin calculations
- Determination of stem lube degradation factor for ball-screw stem nut

Additional POV Inspection Lessons since IN 2021-01

- Identification and correction of degraded magnesium MOV motor rotors
- Consideration of gate valve unwedging force
- Modification of JOG program schedule commitments
- 10 CFR 50.59 evaluations for valve pressure locking modifications
- Evaluation of MOVs with design-basis safety functions to throttle flow
- Potential for improper stroke time calculations that rely on computer data
- Updating POV surveillance program following PRA update

Additional POV Inspection Lessons since IN 2021-01

- Response to EPRI MOV PPM Type 1 warnings
- Verification that installed POVs match calculation assumptions
- Maintaining EPRI MOV PPM long-term applicability
- Monitoring of industry data for valves that EPRI MOV PPM is best available information
- Verification and Validation of POV software
- Removal of valves from 10 CFR Part 50, Appendix J Program without adequate technical justification

POV Region Panels

- Draft findings from each POV inspection are presented to an NRC staff panel consisting of representatives from each NRC Region office and headquarters.
- POV Region Panel discusses each POV inspection finding in comparison to findings from previous POV inspections.
- Review by POV Region Panel provides confidence in the consistency of NRC staff technical positions during POV inspections across the NRC Regions.

Summary

- Implementation of IP 71111.21N.02 for POV inspections has been successful in meeting the inspection objectives and maintaining consistency across NRC Region offices.
- POV inspections identified many lessons learned that licensees should address in providing reasonable assurance of the design-basis capability of POVs to perform their safety functions.
- NRC issued IN 2021-01 describing lessons learned from POV inspections up to that date.
- NRC staff plans to complete the POV inspection program using IP 71111.21N.02 in 2022.

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QUESTIONS?

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10 CFR 50.55a(b)(3)(xi) and ASME Code Case

Michael F. Farnan
Thomas G. Scarbrough
Robert J. Wolfgang
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

BWROG Public Meeting
December 1, 2021

Key Messages

- 10 CFR 50.55a(b)(3)(xi) emphasizes the requirements in ASME OM Code, 2012 and later Editions, Subsection ISTC-3700, to verify that valve obturator position is accurately indicated by remote indicating lights.
- On March 26, 2021, the NRC issued a proposed rule in the *Federal Register* (86 *FR* 16087) to incorporate by reference 2020 Edition of ASME OM Code into 10 CFR 50.55a with a proposed modification to 10 CFR 50.55a(b)(3)(xi) to allow an extended valve position verification interval for valves not susceptible to stem-disk separation.
- New ASME OM Code Case OMN-28 proposes an alternative test interval of 12 years in lieu of the 2-year valve position indication test interval required in ISTC-3700 if a licensee justifies that the stem-disk connection in the applicable valve is not susceptible to separation.
- NRC staff is reviewing Code Case OMN-28 for acceptance in Regulatory Guide (RG) 1.192.
- NRC considering incorporation by reference of Code Case OMN-28 directly into 10 CFR 50.55a when final rule is issued in lieu of proposed rule language.

Background

- ISTC-3700 states:

  Valves with remote position indicators shall be observed locally at least once every 2 yr. to verify that valve operation is accurately indicated. Where practicable, this local observation should be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify obturator position. These observations need not be concurrent. Where local observation is not possible, other indications shall be used for verification of valve operation. Position verification for active MOVs shall be tested in accordance with Mandatory Appendix III of this Division.

- Over many years, operating experience revealed that some licensees were not implementing ISTC-3700 in a manner that provides reasonable assurance that the remote indicating lights for valves within the scope of their IST Program are accurately verifying the position of the valve obturator.

NUREG-1482

- Beginning in 1995, NUREG-1482, ‘‘Guidelines for Inservice Testing at Nuclear Power Plants,’’ emphasized the ASME OM Code requirements for valve position indication.

- Most recently, NUREG-1482 (Revision 3) indicates that ASME OM Code allows flexibility to licensees in verifying that operation of valves with remote position indicators is accurately indicated.

- NUREG-1482 refers to various methods to verify valve operation, such as nonintrusive techniques, flow initiation or absence of flow, leak testing, and pressure testing.

Status

- ASME OM Code Case OMN-28 was finalized and posted on March 16, 2021.
- EPRI Technical Report 3002019621, “Susceptibility of Valve Applications to Failure of the Stem-to-Disk Connection,” to provide guidance for licensees to implement ISTC-3700 as supplemented by 10 CFR 50.55a(b)(3)(xi) or ASME OM Code Case OMN-28.
- In response to an EPRI request, the NRC staff is preparing a safety evaluation (SE) on Technical Report 3002019621.
- The NRC staff is reviewing public comments on the 10 CFR 50.55a proposed rule, including recommendations to update the proposed rule to allow the use of Code Case OMN-28.
- ASME OM Code committees are reviewing a new proposed Code Case to improve the provisions of ISTC-3700 to provide reasonable assurance that valve obturator position is accurately indicated by remote indicating lights with the potential extension of the 2-year ISTC-3700 verification interval.

Next Steps

- NRC staff will review licensee requests to implement ASME OM Code Case OMN-28 under 10 CFR 50.55a(z) until NRC accepts Code Case OMN-28 in 10 CFR 50.55a directly or by RG 1.192 when such review will not be necessary.

- NRC staff will complete the SE on EPRI Technical Report 3002019621.

- NRC staff will complete the review of public comments on the 10 CFR 50.55a proposed rule to determine potential improvements to 10 CFR 50.55a(b)(3)(xi) when final rule is issued as scheduled in mid-2022.

QUESTIONS?

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Updated Roadmap of Digital I&C Regulatory Infrastructure

Jeanne Johnston

Branch Chief

Office of Nuclear Reactor Regulation

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NRC's Digital I&C Modernization

"… the staff is beginning to transition from infrastructure modernization to using the improved infrastructure to support the **consistent regulation of digital modernization projects**."

– SECY-21-0091 "Annual Update on Activities to Modernize the U.S. Nuclear Regulatory Commission's Digital Instrumentation and Controls Regulatory Infrastructure"

Photo: Rendering of Limerick's Main Control Room displays for planned Plant Protection System, March 31, 2021 Pre-submittal meeting: ML21063A119

NRC's Modernization Strategy for Digital I&C

Commercial Grade Dedication

- International standard – Safety Integrity Level Certification process
- Potential to expand the ability for licensees to procure and accept commercial grade digital equipment

Updated Guidance for Digital Mods (10 CFR 50.59)

- More clear regulatory process for licensees to pursue upgrades that do not require NRC prior approval
- RIS 2002-22 Supplement 1
- RG 1.187 Rev 3
- Inspector Trainings, Public Meetings as Requested

Addressing Common Cause Failures

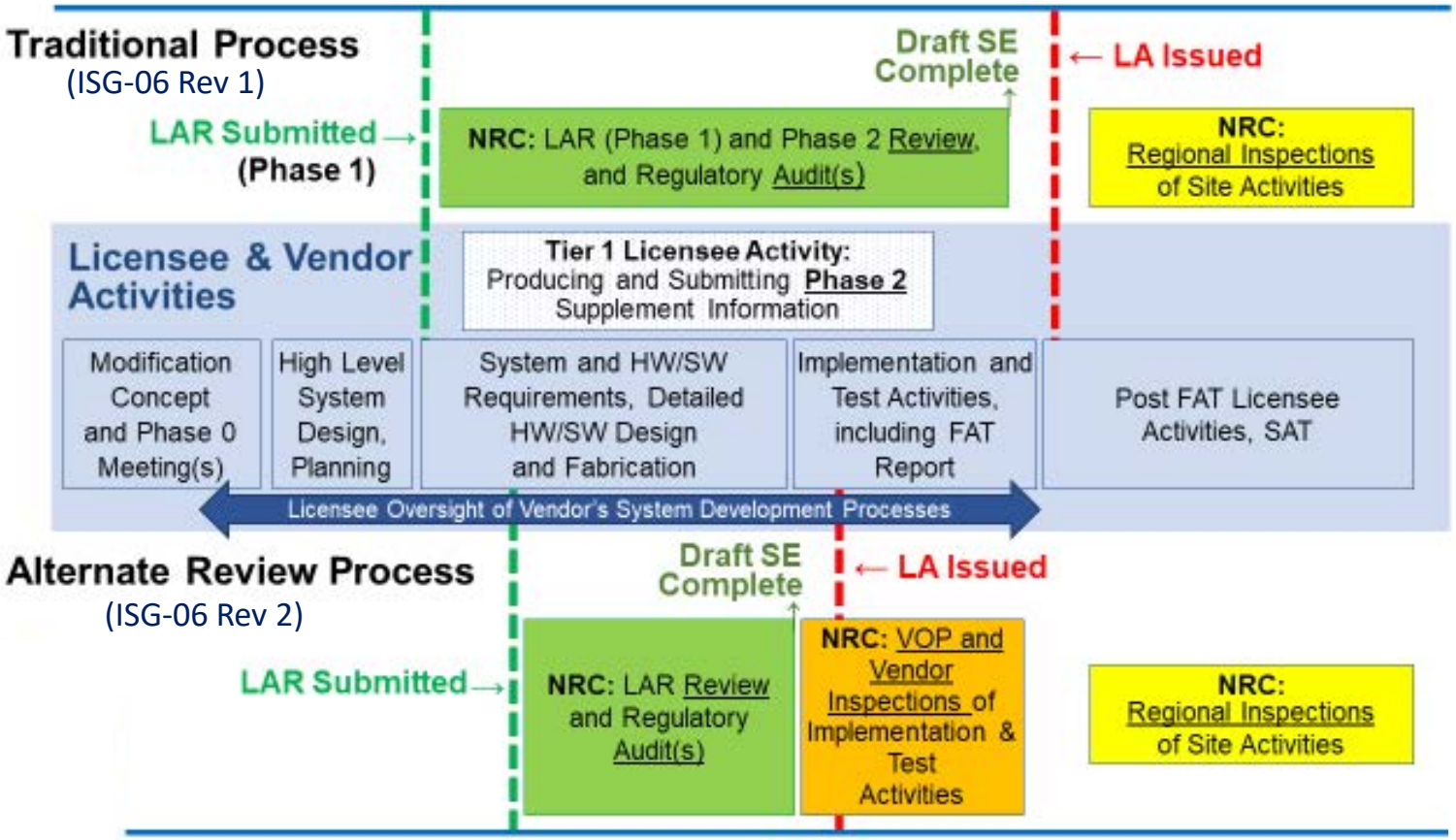
- Issued Rev 8 to BTP 7-19, to adopt a graded approach for the level of review needed for different upgrades
- Additional engagement on reviewing new alternate approaches

Continue Improvements to Regulatory Guidance

- Ensure guidance work cohesively together
- Continue to leverage industry consensus standards
- Gather lessons learned and implement improvements (Alternate Review Plan and inspections for digital modifications)

Accomplishments

Additional Licensing Process



IP 52003 - ARP Related Inspection Procedure Update

Verify the licensee has performed enhanced vendor oversight activities

Verify that the licensee has developed, implemented, tested, installed, operated, and maintained the design according to the license amendment

Confirm the licensee's upgrade to the system design conforms to the plant specific licensing basis

NRC INSPECTION MANUAL EICB

INSPECTION PROCEDURE 52003

DIGITAL INSTRUMENTATION AND CONTROL MODIFICATION INSPECTION

Effective Date: 07/01/2021

PROGRAM APPLICABILITY: 2515C

52003-01 INSPECTION OBJECTIVES

01.01 [Alternate Review Process (ARP) only] To verify the licensee has performed enhanced vendor oversight activities as defined by the Vendor Oversight Plan (VOP) for designs licensed by NRC staff using the Digital Instrumentation and Control (I&C) Interim Staff Guidance (ISG)-06 Revision 2, ARP.

01.02 To verify that the licensee has developed, implemented, tested, installed, operated, and maintained the design according to the license amendment, safety evaluation, and in accordance with the manufacturer's recommendations (as appropriate), and licensee commitments, including the commitments provided in the licensee's cyber security plan (CSP).

01.03 To confirm the licensee's upgrade to the system design conforms to the plant specific licensing basis and satisfies applicable guidance.

52003-02 INSPECTION REQUIREMENTS

As an Inspection Manual Chapter (IMC) 2515 Appendix C, "Special and Infrequently Performed Inspections" procedure, all of the requirements in this section are not needed to complete the inspection. Inspection completion is determined by the inspection team leader when they meet the applicable sections of this inspection procedure for the modification they are inspecting according to their inspection plan.

02.01 [ARP only] Licensee's Vendor Oversight Plan

a. Verify that the licensee is performing vendor oversight in accordance with the VOP and procuring new equipment in accordance with the systems and services acquisition processes described in the licensee's CSP.

b. Verify changes to the VOP are in accordance with the change control processes that govern the VOP as described in the license amendment and the quality assurance (QA) program.

c. Verify the licensee's past performance of VOP activities through review of the licensee's audit reports and other records documenting the licensee implementations of the VOP. The areas of focus include oversight activities and design outputs for the following:

Issue Date: 07/09/21 1 52003

ADAMS Accession No. ML21113A169

BTP 7-19 Rev 8, Guidance Update for CCF in Digital Systems

BTP 7-19 Revision 8 provides for a Risk-Informed, Graded Approach

Incorporates Lessons-Learned from Previous Operating Reactor and New Reactor Reviews

Supports Expanded use of Defensive Measures to Address Software CCF

NUREG-0800

U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

BRANCH TECHNICAL POSITION 7-19

GUIDANCE FOR EVALUATION OF DEFENSE IN DEPTH AND DIVERSITY TO ADDRESS COMMON-CAUSE FAILURE DUE TO LATENT DESIGN DEFECTS IN DIGITAL SAFETY SYSTEMS

REVIEW RESPONSIBILITIES

Primary – Organization responsible for the review of instrumentation and controls (I&C)

Secondary – Organizations responsible for the review of reactor and containment systems and organizations responsible for the review of human factors engineering (HFE)

Review Note: The revision numbers of regulatory guides (RGs) and the years of endorsed industry standards referenced in this branch technical position (BTP) are centrally maintained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear

Revision 8 – January 2021

USNRC STANDARD REVIEW PLAN

This Standard Review Plan (SRP), NUREG-0800, has been prepared to establish criteria that the U.S. Nuclear Regulatory Commission (NRC) staff responsible for the review of applications to construct and operate nuclear power plants intends to use in evaluating whether an applicant/licensee meets the NRC's regulations. The SRP is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria, and to evaluate how the proposed alternatives to the SRP acceptance criteria provide an acceptable method of complying with the NRC's regulations.

The SRP sections are numbered in accordance with corresponding sections in RG 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)." Not all sections of RG 1.70 have a corresponding review plan section. The SRP sections applicable to a combined license application for a new light-water reactor (LWR) are based on RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

These documents are made available to the public as part of the NRC's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-0800 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments may be submitted by e-mail to NRR_SRP@nrc.gov.

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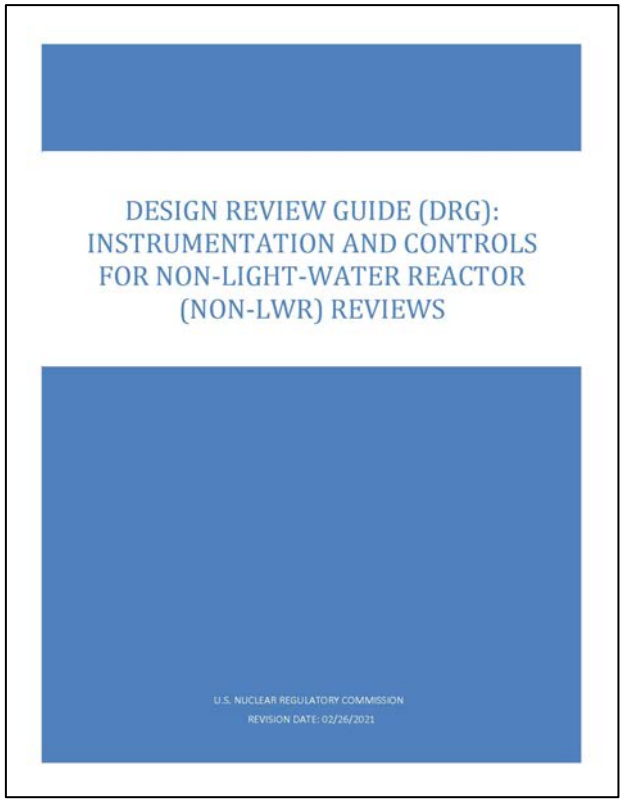
ADAMS Accession No. ML20339A647

Non-Light Water Reactor I&C Design Review Guide (DRG)

Guidance for flexible regulatory review processes for non-LWRs within the bounds of existing regulations

A new non-LWR regulatory framework that is risk-informed and performance-based, and that features NRC staff's review efforts commensurate with the demonstrated safety performance of non-LWR technologies


DESIGN REVIEW GUIDE (DRG): INSTRUMENTATION AND CONTROLS FOR NON-LIGHT-WATER REACTOR (NON-LWR) REVIEWS

U.S. NUCLEAR REGULATORY COMMISSION
REVISION DATE: 02/26/2021

Completed Review Activities

New Reactors	Research Reactors	Operating Reactors	Topical Reports
• APR1400 Design Certification • NuScale Design Certification	• Purdue • MIT	• Hope Creek Power Range Neutron Monitoring System • Waterford Core Protection Calculator System (using ARP)	–HFC (FPGA-based) (2019) • Radiy (RadICS Digital I&C Platform) • (FPGA-based) (2020) • Surveillance Elimination Westinghouse (2020) • Analysis and Measurement Services Corporation (AMS) Online Monitoring (OLM) technology (2021)

Ongoing Work

Preparing for Digital Modernization License Amendment Applications

- *Turkey Point digital license amendment request anticipated late Q1 2022*

- *Limerick digital modernization license amendment request anticipated Q3 2022*

NEI 17-06: IEC 61508 Certification Supporting Commercial Grade Dedication Process

Provides guidance on using 3rd party certifications to support the evaluation of platform reliability aspects for commercial grade dedication of digital equipment

Version requesting endorsement submitted to NRC in February 2021

Staff is now performing a detailed review for suitability for endorsement via a new regulatory guide.

Looking Forward

- Early Engagement is Key
  - Goal is the same – path to get there may be different
  - Identify technical/policy barriers and solutions

Acronyms

- BTP Branch Technical Position
- EPRI Electric Power Research Institute
- IEC International Electrotechnical Commission
- ISG Interim Staff Guidance
- NEI Nuclear Energy Institute
- NRR Nuclear Reactor Regulation
- OMB Office of Management and Budget
- OM Code Code for Operations and Maintenance of Nuclear Power Plants
- PRA Probabilistic Risk Assessment
- PPM Performance Prediction Methodology
- RG Regulatory Guide
- RIS Regulatory Issue Summary
- SDOs Standards Developing Organizations
- SSC Structures, Systems and Components