

Concerns 4 & 8
from NRC Nov. 5, 2013 letter to NEI
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NEI 01-01 Focus Team
Public Meeting to discuss NEI 01-01
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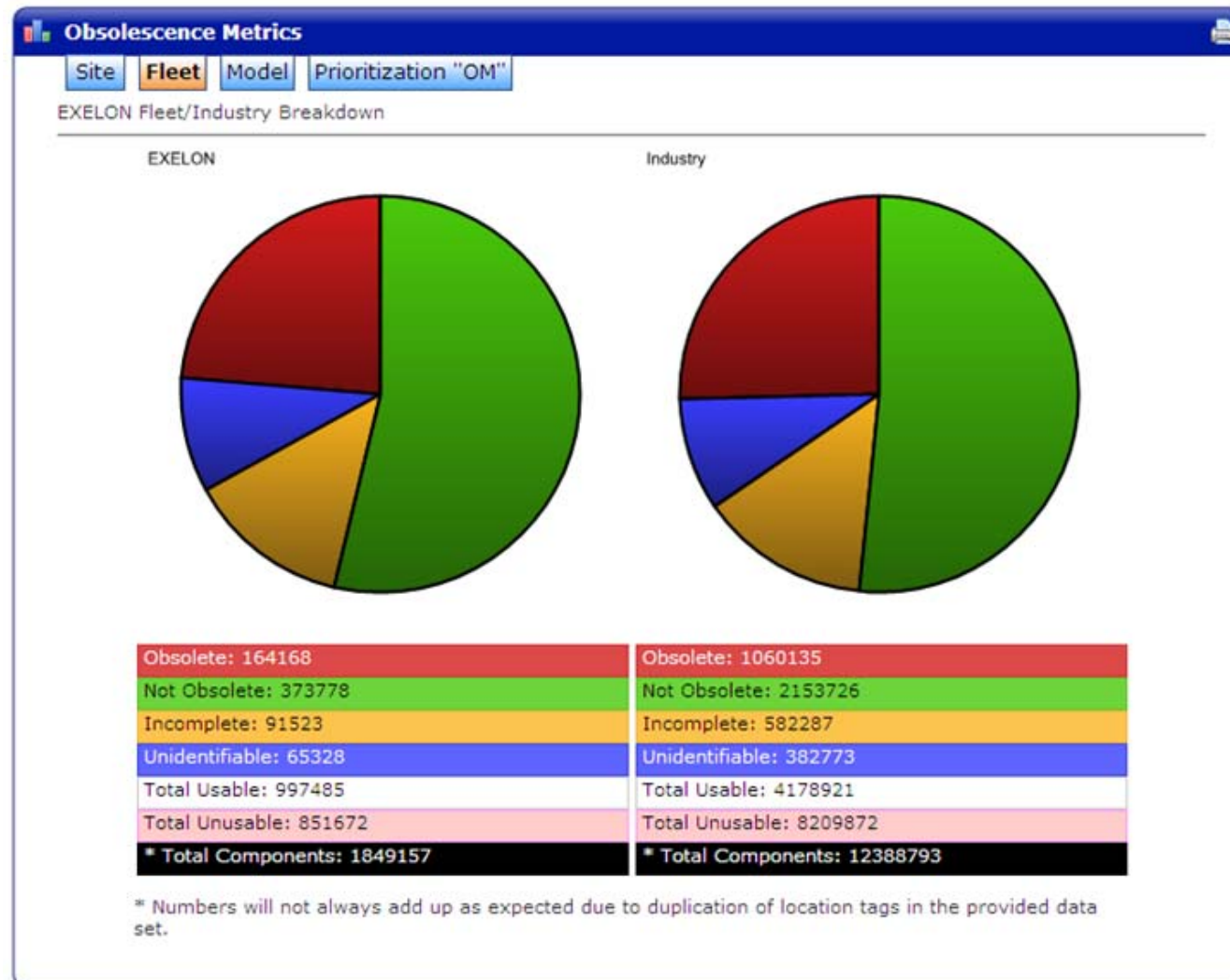
Purpose of NEI 01-01 Focus Team

- Ensure clear criteria, scope & guidance exist for application of 10 CFR 50.59 to Digital I&C activities allowing licensees to maintain and improve margins of safety by efficiently managing component obsolescence issues

Industry Perspective

- Recent experience would suggest continuing obstacles to the application of digital technology
 - Draft RIS on embedded digital (RIS 2013-XX)
 - Harris SSPS 50.59 inspection finding
 - Staff and Industry concerns with NEI 01-01
- **Principle Concern** - These barriers place the industry at a substantial disadvantage in the management of aging systems and components.

A shared sense of urgency...



Industry Perspective

- As plant components continue to age and technology continues to shift away from the analog domain, the need for regulatory certainty in licensing of SR and NSR digital technology becomes increasingly urgent
- The industry and NRC share a common goal – safe and reliable operations
- *A regulatory framework for digital technology aligned with the precepts of the 50.59 process is imperative to maintain and improve equipment reliability and reduce initiating events*

Today's discussion...

- Concerns 4 and 8 from 20131105 NRC letter to Mr. Anthony Pietrangelo, NEI (ML13298A787)

4. Documentation of 10 CFR 50.59 Reviews for Digital Changes

- Implementing RIS 2002-22 understandings
- Addressing security considerations

8. Guidance Pertaining to Digital Changes

- Guidance for compliance with NRC criteria
- Guidance to determine if an LAR is required

Concern #4

- Implementing RIS 2002-22 Understandings
 - First Item: “...some safety-significant systems such as the RPS and ESFAS...will require prior staff review...”
 - Second Item: “...there are no established consensus methods for accurately quantifying the reliability and dependability of digital equipment.”

Concern #4

Proposed Resolution for First Item:

- Digital upgrades to safety significant systems such as RPS and ESFAS will be treated as ‘adverse’ in the 10 CFR 50.59 Screen
- 50.59 Evaluation [Questions 1 - 8]
 - Focus on Question 2 → impact on malfunction likelihood addresses “applicable regulatory requirements...” (NEI 96-07, Rev. 1, section 4.3.2)
 - Focus on Question 6 → impact on malfunction results considers CCF susceptibility (criteria forthcoming)

Concern #4

- Implementing RIS 2002-22 Understandings
 - First Item: “...some safety-significant systems such as the RPS and ESFAS...will require prior staff review...”
 - Second Item: “...there are no established consensus methods for accurately quantifying the reliability and dependability of digital equipment.”

Concern #4

Disposition for Second Item:

- Reference to a “Method of Evaluation”
- Lack of Quantitative Consensus Methods

Concern #4

- *Consensus Methods are **NOT** Methods of Evaluation [10 CFR 50.59(c)(2)(viii)]*
 - *Identify Methods of Evaluation*
 - Definition
 - Criteria
 - *Clarify Consensus Methods*
 - *Present Conclusions*

Concern #4

- Method of Evaluation Identification
 - Reference: NEI 96-07, Rev. 1, Section 3.10
 - Definition: “...the *calculational framework* used for evaluating behavior or response of the facility or an SSC.” [emphasis added]
 - Criteria for a *Method of Evaluation*
 - Used either in UFSAR safety analyses or in establishing the design bases
 - Only if described, outlined or summarized in the UFSAR

Concern #4

- Consensus Methods Clarification
 - Examples of Consensus Methods
 - ASME Codes
 - IEEE Standards

Concern #4

- Consensus Methods Summary
 - *Consensus Methods* do not involve a “computational framework”
 - *Consensus Methods* are not used “in UFSAR safety analyses or in establishing the design bases”
 - *Consensus Methods* are not “described, outlined or summarized in the UFSAR”

Concern #4

- Conclusions
 - *Consensus Methods* do not meet the definition of a *Method of Evaluation*
 - 10 CFR 50.59(c)(2)(viii) does not apply
 - NEI 96-07, Rev. 1 guidance for a *Method of Evaluation* does not apply to *Consensus Methods*
 - Section 4.2.1.3 (Screen Phase)
 - Section 4.3.8 (Evaluation Phase)

Concern #4

Disposition for Second Item:

- Reference to a “Method of Evaluation”
- Lack of Quantitative Consensus Methods

Concern #4

Disposition for Second Item:

- Lack of Consensus Methods to quantify the reliability and dependability of digital equipment
 - In most cases, reliability and dependability were based on conformance with applicable regulatory guidance; as such, the UFSAR does not typically include quantitative determination of reliability and dependability
 - NEI 96-07 clearly states that quantification is not necessary and is seldom used as the basis for determination of the answers to Evaluation questions 1 and 2 (Sections 4.3.1 and 4.3.2)

Concern #4

Disposition for Second Item (Continued):

- Lack of Consensus Methods to quantify the reliability and dependability of digital equipment
 - For digital changes, reliability and dependability will be determined based on conformance with applicable regulatory guidance; quantitative reliability and dependability is not required
 - Conformance with applicable regulatory guidance, including guidance for Commercial Grade Dedication, provides reasonable expectation that the digital system does not result in more than a minimal increase in the likelihood of a malfunction

Concern #4

Security Considerations

- Concern: NEI 01-01, Section 5.3.4.5, “Security Considerations should be modified to clearly address the related NRC concerns in Regulatory Guide (RG) 1.152...and 5.71.”
- Proposed Resolutions
 - Cyber Security (10 CFR 73.54 and RG 5.71) is governed by 10 CFR 50.54(p), not 50.59
 - Although we agree with compliance to the SDOE guidance of RG 1.152, technical requirements will not be included in the updated digital 50.59 guidance to preclude unnecessary duplication and inconsistency caused by the evolution of guidance

Today's discussion...

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Concern #8

- Guidance for Compliance with NRC Criteria
 - EPRI guidance will provide criteria for CCF susceptibility and coping analyses
 - Other technical criteria for digital changes are addressed in NRC and Industry documents
- Guidance to Determine if an LAR is Required
 - Industry intent is to develop an appendix to NEI 96-07, which would most likely lead to “retirement” of NEI 01-01

Examples Development

- Topics
 - Acceptable justification
 - Level of detail needed for 50.59 Evaluation
- Examples will cover multiple scenarios
 - Range of complexity
 - Single/redundant train systems
 - Safety/non-safety applications
 - Variety of justifications and outcomes

Future Plans for Examples

- Turbine-driven AFW pump (TDAFWP) controller
- Apply concepts from TDAFWP digital controller to more complex applications
 - BWR HPCI (dual train)
 - Steam-driven main feedwater pumps (non-safety)
- Digital transmitters in numerous applications
- Redundant safety-related chillers
- Redundant EDG voltage regulators
- Digital components in MCCs
- Reactor trip switchgear