March 7, 2007

ORGANIZATIONS: Electric Power Research Institute (EPRI) and Nuclear Energy Institute (NEI)

SUBJECT: SUMMARY OF MARCH 28-29, 2006, EPRI AND NEI WORKSHOP ON DIGITAL INSTRUMENTATION AND CONTROLS (I&C) AND CONTROL ROOM LICENSING ISSUES.

On March 28-29, 2006, EPRI and NEI held a workshop at the EPRI offices in Washington, D.C. The purpose of the workshop was to established dialogue between vendors, utilities, and the U.S. Nuclear Regulatory Commission (NRC) to identify and prioritize generic I&C issues and discuss resolution strategies. The meeting attendees are listed in Enclosure 1 and the meeting agenda is given in Enclosure 2.

Several handouts were distributed during this meeting. They are listed at the end of this memorandum with their accession numbers. All the handouts can be accessed through the Agencywide Documents Access and Management System (ADAMS) by accession number. This system provides text and image files of NRC's public documents. If you do not have access to ADAMS or if you have problems in accessing the handouts in ADAMS, call the NRC Public Document Room (PDR) reference staff at 1-800-397-4209 or 301-415-4737 or e-mail pdr@nrc.gov.

Meeting Summary

During the first day of the workshop presentations were given by EPRI, NEI, equipment vendors, new plant consortia, and the NRC. The presentations highlighted and prioritize I&C issues, and discussed possible resolutions. The NRC also gave a presentation describing the ITAAC/DAC process for new plant licensing as well as provided information about the development of the regulatory guide for COL applications. There were several points highlighted and repeated in many of the presentations. Configuration management was highlighted in many of the presentations as becoming much more important as plants implement more complex digital systems and communications networks. It was also determine that guidance on this subject already exist. Another issue highlighted was simulator fidelity and how it will be critical for the first new plant because it will be used to support design, as well as training. A few presenters expressed concerns about the NRC's limited resources when COL application begin to arrive. The industry wanted know what they can do with respect to helping the NRC review COL applications. It was suggested that standardizing designs and submittals, and improve communication with NRC may help mitigate this problem. The NRC and industry agreed that the NRC should take the lead with the industry support.

It also was stated that there is not a common understanding of how the NRC will close DAC issues prior to combined license application. There were concerns that the guidance on many key issues are incomplete or dated. It was also stated that there is not a clear and common understanding of the regulatory implications when a vendor modifies a qualified platform. It was determine by both the NRC and the industry that even though there is no common

understanding, the needed guidance already exist in the SRP, EPRI guidelines and standards. 10 CFR 50 Appendix B processes and the CFR CFR 50.59 regulation also addresses this situation, including the decision as to whether NRC review and approval might be needed prior to implementation in a safety-related application. It was also expressed in many of the presentations that there is a need for better and more frequent communication between the industry and the NRC to resolve issues in a timely manner. There was also concern that currently there is no common understanding of what documentation should be expected to support a review of a digital upgrade. It was suggested that the industry form working groups with the NRC participation to address generic issues. It was also stated that the SRP is intended to guide the NRC reviewers, not the utility I&C design engineers. It was suggested that there may be need for the SRP updates and industry guidance on I&C design issues.

The second day of the workshop began with a closed industry session in parallel with a NRC meeting. Both groups were asked to identify the highest priority issues, consolidate where appropriate, and to discuss potential strategies for resolution. The NRC and industry came together in an open meeting to compare and discuss the prioritization and strategies for resolution. The group developed a final list of priority issues by including everything highlighted by either the industry or the NRC. The group agreed that for each of these, additional industry and guidance is needed to establish a clear understanding of what resolutions are technically appropriate and would be acceptable. Proposed resolution paths were developed for each issue.

It was established the multiple technical issues needed further attention. The technical issues include control room, HSI failure management, combined safety and non-safety related HSIs, and distributed control system (DCS) architectures which include safety and non safety related communications. It is expected that new plants will use digital control rooms, control system architectures, however these have not been built or licensed in the United States, and the licensing issues, acceptance criteria and process do not clear address these issues. Also the use of a single HSI interface with both safety and non-safety equipment is planned in some new plant designs and technical issues are being developed. However, these also have not been licensed in the United States. The proposed solution path was to develop and execute a plan to ensure guidance provided in the COL regulatory guide, updated SRP, and NRC endorsed industry guidance will establish the needed technical basis and understanding to support predictable design and licensing efforts. It was agreed that NEI will coordinate effort with a working group/task force process.

Defense-in-depth and diversity (D3) and risk informed methods were the second priorities listed. The issue with D3 is that there is an increase concern regarding the potential for digital common-cause failures. D3 evaluations are used to assess issue for I&C modification and with new plants for the entire I&C architecture. NRC guidance, BTP-19 and NUREG/CR-6303 has been available for several years. However, the application of the existing guidance to real systems has proven problematic and the regulatory environment has been unpredictable. Application of Risk informed methods to I&C is a concern because the use of risk insights and risk-informed methods has been proposed by industry but no approaches have been reviewed or approved by the NRC. Recent verbal statements from NRC staff indicate that the use of risk-informed approach or insights in D3 evaluations will require significant additional review time compared to for the deterministic evaluation. The propose resolution path for these issues was that the industry will participate in the update of the SRP. NRC will reexamine the approach in BTP-19 and NUREG/CR- 6303 to see if it is overly conservative. And the industry working

group will provide input on the use of “defense measures” approach for NUREG/CR-6303.

Cyber security was identified as another important technical and regulatory issue. The concern is that the requirements and acceptance criteria for cyber security is not well defined. Cyber security detail and solutions have not been examined by the NRC, and there is no consensus on what is needed or what would be acceptable. The proposed resolution path developed for this issues was that the industry will develop a working group/task force to organizing workshop to discuss and define issues. Industry will also discuss alternative approaches concerning the guidance provided on cyber security in RG 1.152.

Credit for self-testing and monitoring in technical specification is new issue about reducing technical specification (TS) surveillance requirements (SR) based on digital technology advances such as self-testing. Current technical specifications are based on analog systems and as a result traditional surveillance requirements were applied. It was determined that a technical basis needs to be developed for both new and existing plants that will capture technical advancements with digital technology such that reductions in surveillance requirements may justifiable. The proposed resolution path for this issue is that industry will survey new plants designers to see what they are planning in regard to self-testing. The industry with NRC participation will develop guidance based on the existing information from EPRI on-line monitoring guidelines.

The final issue that was highlighted in the list of priorities was emerging technologies. The use of first of kind architecture and components have the potential to significantly extend the review time of both new plant and existing plant applications. The proposed resolution path developed was that there is a need to have better and early communication between the industry and NRC. Industry suggested that the NRC, through RIS, explain the emerging technology concern and request that the licensees provide plans in advance. The Industry will work with the NRC to define what should be considered as new or emerging technologies.

Implementation of the proposed resolution paths will be done through future communication between industry and the NRC. The resolutions of some of the issues highlighted during the workshop will be discussed in more details and implemented during the SRP update and the development of regulatory guide for COL application. The NRC will provide information on the DG-1145 workshop schedule and content.

A few additional action items were identified during the workshop. One action item is that the vendors to need give their COL schedule to the NRC which includes the use of non-safety HSI during accidents, the schedule for D3 evaluation, and anticipated new technology issues. Another item is the EPRI will look at the extent of HFE standardization potential with AP1000 and ESBWR. Also NRC is looking for volunteers to provide platforms for the cyber security investigation.

/RA/

Leslie Perkins, Project Manager
Guidance, Infrastructure,
and Financial Review Branch
Division of New Reactors Licensing
Office of New Reactors

Enclosures:
1. List of attendees
2. Agenda
3. EPRI Slides from March 28-29, 2006, I&C Workshop on Meeting Objectives (ML061440073)
4. EPRI Slides from the March 28-29 I&C Workshop, I&C Regulatory Issues (ML061440075)
5. EPRI Slides from I&C Workshop (ML061440078)
6. NEI Slides from the March 28-29 I&C Workshop (ML061440079)
7. Westinghouse Slides from the EPRI/NEI Workshop (ML061440082)
8. AREVA Slides from the EPRI/NEI I&C Workshop (ML061440118)
9. Invensys Slides from the EPRI/NEI I&C Workshop (ML061440122)
10. NuStart Slides from the EPRI/NEI I&C Workshop (ML061440126)
11. Dominion Slides from the EPRI/NEI I&C Workshop (ML061440129)
12. Constellation Slides from the EPRI/NEI I&C Workshop (ML061440091)
13. Duke Energy Slides from the EPRI/NEI I&C Workshop (ML061440099)
14. TXU Power Slides from the EPRI/NEI I&C Workshop (ML061440101)
15. NRC Slides from the EPRI/NEI I&C Workshop (ML061440103)

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*See previous concurrence
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Electric Power Research Institute/Nuclear Energy Institute Workshop on Digital Instrumentation and Control (I&C) and Control Room Licensing Issues
Tuesday, March 28,2006
9:00 a.m. to 5:30 p.m.
and
Wednesday, March 29, 2006
10:00 a.m. - 2:00 p.m.
EPRI Offices
2000 L Street N.W., Suite 805
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Enclosure 1

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Ryan Stone ♯	Duke Energy
----------	Representative Mitsubishi Heavy Industries
♯= Attended both First and Second Day	

Proposed Agenda for Tuesday, March 28, 2006

9:00 a.m.	NEI Activities
9:45 a.m.	Break
10:00 a.m.	Vendor Perspective
11:20 a.m.	Consortia Perspective
12:20 p.m.	Lunch
1:30 p.m.	Existing Plant Activities and Lessons Learned
3:00 p.m.	Break
3:15 p.m.	NRC Perspective
5:00 p.m.	Q & A/ Review for tomorrow
5:30 p.m.	Adjourn

Proposed Agenda for Wednesday, March 29, 2006

10:00 a.m.	Discussion of Breakout Results (Industry and NRC)
12:00 p.m.	Lunch
1:00 p.m	Next Steps/Action Items
2:00 p.m.	Adjourn

NOTE: Specific topics and associated discussion times may change without notice

Contact:
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Enclosure 3

EPRI Slides from March 28-29, 2006
I&C Workshop on Meeting Objectives

ML061440073

Enclosure 4

EPRI Slides from the March 28-29 I&C Workshop,
I&C Regulatory Issues

ML061440075

Enclosure 5

EPRI Slides from
I&C Workshop

ML061440078

Enclosure 6

NEI Slides from the March 28-29
I&C Workshop

ML06144079

Enclosure 7

Westinghouse Slides from the
EPRI/NEI Workshop

ML06144082

Enclosure 8

AREVA Slides from the
EPRI/NEI I&C Workshop

ML061440122

Enclosure 9

Invensys Slides from
EPRI/NEI I&C Workshop

ML061440126

Enclosure 10

NuStart Slides from the
EPRI/NEI I&C Workshop

ML061440126

Enclosure 11

Dominion Slides from the
ERPI/NEI I&C Workshop

ML061440129

Enclosure 12

Constellation Slides from the
EPRI/NEI I&C Workshop

ML061440091

Enclosure 13

Duke Energy Slides from the
EPRI/NEI I&C Workshop

ML061440099

Enclosure 14

TXU Power Slides from the
EPRI/NEI I&C Workshop

ML061440101

Enclosure 15

NRC Slides from the
EPRI/NEI I&C Workshop

ML061440126

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TJKim, EDO
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