



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 WASHINGTON, D.C. 20555-0001

REQUEST REPLY BY: 3/22/07

March 8, 2007

Approved. See attached comments.

MEMORANDUM TO: Chairman Klein  
 Commissioner McGaffigan  
 Commissioner Merrifield  
 Commissioner Jaczko

*Dale E. Klein*  
 Dale E. Klein 03/16/07

FROM: Commissioner Lyons *Patricia Lyons*

SUBJECT: DEVELOPMENT OF A U.S. DIGITAL INSTRUMENTATION AND CONTROL AND HUMAN-MACHINE INTERFACE TEST FACILITY

As the Commission heard at its November 2006 meeting on the status of incorporating digital instrumentation, controls, and safety systems into nuclear power plants in the U.S., this technology brings new regulatory challenges along with potential safety benefits. To address these challenges, both in the near term and on a continuing basis into the future, the NRC must develop research tools and capabilities to independently evaluate (e.g., test and demonstrate) digital safety systems (DSSs) and human-machine interfaces (HMIs) in order to confirm the results of licensee, vendor, or applicant analyses during the licensing process. Such capabilities are needed to help maintain sound technical bases upon which to license and oversee DSSs and highly computerized control room HMIs. In addition, these capabilities could enable the identification and resolution of safety questions that might arise after licensing and may further provide simulation capabilities in support of NRC staff training initiatives. The need for such capabilities can only be expected to increase as this technology expands and evolves.

The current approach for NRC research in this area is to contract with a variety of national laboratories, universities, and international research facilities on a case-by-case basis. This piece-meal approach has caused the NRC's regulatory framework to lag behind the state-of-the-art and the gap between technology and regulation in this area continues to widen. To close this gap, related research tools could be integrated into a single facility within the U.S. with an NRC-supported capability and expertise to operate and manage (or co-manage) it. This would likely create synergies and efficiencies that are not evident in our current approach. This could also have the added significant benefit of attracting new graduates, experienced professionals, and researchers in what will clearly remain a very competitive job market for digital systems expertise.

Therefore, staff should conduct a public workshop, using a third party if needed, to draft conceptual approaches for an integrated facility to meet NRC regulatory needs in the digital I&C, DSS, and HMI technical areas into the future, to engage potentially interested stakeholders to examine these approaches, and to consolidate the responses. Stakeholders with existing capabilities should be invited, as well as others who may be interested in participating, such as national laboratories, universities, other federal agencies, research and development centers, and vendors. The conference should seek to develop a defined set of viable concepts for such a facility, with corresponding potential benefits and challenges for each concept. The following questions, at a minimum, should be considered:

**Chairman Klein's Comments on COMPBL-07-0001, Development of a U.S. Digital Instrumentation and Control and Human-Machine Interface Test Facility**

I endorse Commissioner Lyons's proposal for the staff to begin developing conceptual approaches for an integrated facility to meet future needs in the technical areas of digital instrumentation and controls, digital safety systems, and human-machine interfaces. As it engages potentially interested stakeholders, the staff should aim for the establishment of a facility that will serve as a national technical center of excellence to support a wide range of agencies and industries that have needs and interests in these three rapidly advancing areas. Commercial and governmental fields that may benefit from, and contribute to, such a facility could include aerospace, ground and water transportation, petroleum, chemicals, logistics, robotics, defense, security, and heavy manufacturing, to name just a few. Furthermore, I believe that the establishment of such a facility would be of immense benefit to the NRC's training programs and would help foster the development of the next generation of NRC inspectors.

*DK*

*3/16/07*

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*Approved. See attached  
 comments.*

*E. Mc Ineffe Jr.  
 3/28/07*

MEMORANDUM TO: Chairman Klein  
 Commissioner McGaffigan  
 Commissioner Merrifield  
 Commissioner Jaczko

FROM: Commissioner Lyons *Peter Lyons*

SUBJECT: DEVELOPMENT OF A U.S. DIGITAL INSTRUMENTATION AND  
 CONTROL AND HUMAN-MACHINE INTERFACE TEST FACILITY

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Commissioner McGaffigan's Comments on COMPBL-07-0001

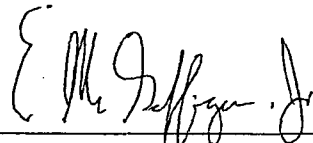
I support Commissioner Lyons' proposal for the staff to hold a public workshop and report back to the Commission regarding conceptual approaches for an integrated digital instrumentation and control and human-machine interface test facility, subject to the comments below.

As Commissioner Merrifield noted, the Commission has already directed the staff (SRM dated December 6, 2006) to establish a project plan to resolve regulatory concerns in this area and to brief the Commission in approximately six months on its progress. Additionally, the staff was instructed both to engage industry and to enhance stakeholder communication and participation as part of the ongoing efforts to develop associated regulatory guidance documents. I share Commissioner Merrifield's concern that the proposed workshop on a possible long-term facility could become burdensome and a distraction to the staff, working on issues that must be resolved in the coming months and years with the knowledge base we have today. Therefore, in planning and conducting the workshop, the staff should utilize contractors and retired annuitants and take other such measures to minimize the impact on ongoing regulatory development activities.

I also join Commissioner Merrifield's concerns about whether the test facility housed at a university or national laboratory would really fit within NRC's research program, which must focus primarily on confirmatory research to support regulatory decisions. Such a facility would fit more readily within the mission of large research agencies such as DOE and DOD, with perhaps NRC making a small budgetary contribution to ensure access to results.

NRC will face substantial costs in purchasing new nuclear plant control room simulators, if COL licenses are issued. Such simulators will be needed to train properly (and maintain the expertise of) our technical reviewers, inspectors and operating license examiners, just as the NRC today uses simulators at the Technical Training Center in Chattanooga. I have strong doubts that a digital instrumentation and control and human-machine interface test facility at a university or national laboratory would have relevance to meeting NRC staff training requirements on control-room simulators, especially if the facility were shared with others.

Commissioner Lyons anticipates these matters in the questions posed for the workshop. So I will wait for the workshop results and the staff's recommendation as whether or how to proceed with the test facility before reaching final conclusions.



Edward McGaffigan, Jr.

3/28/07

(Date)



UNITED STATES  
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March 8, 2007

*I approve in part and  
disapprove in part.*

MEMORANDUM TO: Chairman Klein  
Commissioner McGaffigan  
~~Commissioner Merrifield~~  
Commissioner Jaczko

FROM: Commissioner Lyons

*Peter Lyons* *[Signature]*  
3/22/07

SUBJECT: DEVELOPMENT OF A U.S. DIGITAL INSTRUMENTATION AND CONTROL AND HUMAN-MACHINE INTERFACE TEST FACILITY

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Development of a U. S. Digital Instrumentation and Control  
and Human-Machine Interface Test Facility

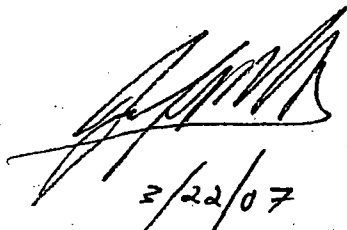
I generally support Commissioner Lyons' proposal for the staff to hold a public workshop, and to report back to the Commission, regarding conceptual approaches for an integrated digital instrumentation and control and human-machine interface test facility but I would find it very difficult to support any additional activity beyond that at this time. I concur with my colleagues that current technological advances in digital safety systems and human-machine interface bring new and difficult regulatory challenges to our ability to independently evaluate control rooms at nuclear power plants. I also support the views expressed by Commissioners Jaczko and Lyons that an open public workshop will bring many stakeholders together and better serve to inform the Commission on future policy and decisions in this area.

While generally supporting the proposal for a public workshop, I would find it difficult to support the workshop as a priority activity and I have three additional concerns with the proposal. First, Commission direction to the staff to hold a public workshop and then to develop a paper with options places additional burden on a staff that is already strained for resources by reviews of new reactor design certifications, design modifications to currently operating plants, development of new reactor licensing guidance and infrastructure, and, soon by the review of combined operating licenses. In its SRM dated December 6, 2006, the Commission directed the staff to establish a project plan to specifically resolve regulatory concerns in this area. In response, the staff established a digital instrumentation and controls steering committee and has met with stakeholders on issues related to licensing requirements for digital instrumentation and controls and human-machine interface. The SRM also required the staff to brief the Commission in approximately six months on its progress in resolving outstanding regulatory issues in this subject area. If the workshop is viewed as a high priority by the Commission, it is not clear to me whether Commissioner Lyons' proposal would be more supportive of or detract from the current staff efforts required in the December 2006 SRM. Further, I do not believe that the staff has resources budgeted for workshop activities and, if directed by the Commission, I am concerned that some important regulatory activity will have to be dropped to support the workshop.

Second, although I find the proposal to have some merit, I find it difficult to support this proposal from a timing perspective. The speed at which new reactor activities for potential applicants has progressed may have overtaken the window of opportunity for such a proposal. In my opinion, the earliest that the NRC would be able to derive some benefit from such a facility would likely be five or six years from now. In my opinion, we have missed our window of opportunity and the benefits to be gained by Commissioner Lyons' proposals would be relatively small while potentially detracting from our required review work. I must also believe that the staff has been diligent in its efforts to develop the necessary technical review capability as well as supporting infrastructure to successfully review the current and pending design certifications as well as future combined license applications. I do not see any clear benefits from this proposal to enhance our ability to license the next wave of reactors.

Finally, I have substantial reservations with proposals that we operate separate facilities for research in the areas of digital instrumentation and control systems. I also have substantial reservations about finding the resources within our budget to fund such an activity when we are confronted with substantial growth and infrastructure demands. Our research activities have rightfully focused on confirmatory research activities and I do not believe that our mission would

support developing a leading research facility on human-machine interaction. I personally believe that there are other facilities that we could use to enhance our capabilities through training or research activities without a substantial investment in a separate facility, however, I will reserve any decision on the best way to proceed until the staff has had an opportunity to develop options for Commission consideration.



2/22/07


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MEMORANDUM TO: Chairman Klein  
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Approved. See attached comments.

  
 Gregory B. Jaczko

3/13/07  
 Date

FROM: Commissioner Lyons 

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