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CAPRI
TECHNOLOGY
INCORPORATED

P.O. Box 2357
Nipomo CA 93444

www.capritechnology.com

Phone (805) 343-2668
Fax (805) 343-9498

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Rules and Directives Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Reference: "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants", Draft Regulatory Guide DG-1130, U.S. Nuclear Regulatory Commission, December 2004

Dear Sir/Madam,

This letter is in response to a request for comments from the public on the referenced draft regulatory guide (DG-1130). My comments are based on decades of experience with the use of computers in the nuclear power industry and do not reflect the position or opinion of any licensee.

After studying DG-1130, my conclusions are: (1) this reg. guide is premature and will need to be revised in the near future, (2) its conclusions are questionable, and (3) it sends mixed messages to the industry. I will expand on these three points in the following discussion.

1. Issuing this reg. guide now would be premature.

Apparently, the motivation for this revision to R.G. 1.152 was to endorse the latest version of IEEE Std 7-4.3.2-2003. However, along with that endorsement, the reg. guide tries to incorporate guidance for cyber security and the topics covered in the annexes of 7-4.3.2. Although this may seem reasonable to the NRC, it makes the reg. guide difficult to follow and brings in other references that are well outside the scope of the IEEE standard. For example, the existing version of R.G. 1.152 endorses IEEE Std 7-4.3.2-1993, except for clause 5.15. This is very simple and clear. Contrast this with the proposed revision (DG-1130).

SISP Review Complete

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Add=S. Aggarwal (SKA)
P. Garrity (PAG1)

DG-1130 endorses IEEE Std. 7-4.3.2 2003 (but not the annexes) and also explains that 7-4.3.2 does not cover cyber security, so DG-1130 identifies the following shopping list of additional documents that need to be incorporated into any digital safety system review:

- Regulatory Positions 2.1 – 2.9 (included in DG-1130)
- HICB-19, "Guidance for Evaluation of Defense-in Depth and Diversity in Digial Computer-Based Instrumentation and Control Systems"
- NUREG-0800, "Standard Review Plan", Section 7, "Instrumentation and Controls"
- EPRI TR-106439 "Guidance on Evaluation and Acceptance of Commercial Grade Digital lEquipment for Nuclear Safety Applications"
- HICB-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems"
- NUREG-0800, "Standard Review Plan", Appendix 7.0-A, "Review Process for Digital Instrumentation and Control Systems"
- NUREG-0800, "Standard Review Plan", Appendix 7.1-C, "Guidance for Evaluation of Conformance to IEEE Std 603"
- NUREG-0800, "Standard Review Plan", Section 7.9, "Data Communication Systems"

Furthermore, IEEE Std 7-4.3.2-2003 adds additional requirements and reference documents that were not in the previous 1993 version. These additions need to be considered if DG-1130 is approved at this time.. For example:

- Software quality metrics clause was added (but no further information is provided)
- Software Tools clause was added (but no further information is provided)
- The Verification and Validation clause was revised to reference IEEE Std 1012-1998. The 1998 revision is a major change to the previous version of IEEE Std 1012, which was used as a basis for many NPP SQA programs.
- The Software Configuration Management clause was revised to incorporate IEEE Std 828-1998
- A Software Project Risk Management clause was added that is consistent with IEEE Std. 1540-2001 and IEEE Std. 12207.0-1996. These standards are not generally included in SQA programs at NPPs.

Approving DG-1130 at this time will cause problems with both the licensees and the NRC. The guidance for cyber security is still undergoing development. The NRC itself is conducting studies and evaluations on this topic. The regulatory positions identified in DG-1130 are a "work-in-progress" and are not yet finalized for general use. The NRC is working with NEI (representing the NPPs) to define an acceptable cyber security program. Jumping ahead or second-guessing that effort will not succeed and will require another revision to 1.152 when the cyber security effort is complete.

2. The conclusions stated in DG-1130 are questionable.

The conclusions section of DG-1130 states:

> *"The NRC should revise Regulatory Guide 1.152, since this action should enhance the licensing process. The staff has concluded that the proposed*

action will reduce unnecessary burden on both the NRC and its licensees, and ..."

There is no evidence that this revision will enhance the licensing process. If anything, it will dissuade a licensee from implementing a digital safety system.

What data does the staff have that shows a reduction of burden on the licensee? From my comments above, I expect a licensee to incur a significant burden just to adopt this revision. Since the basis requirements addressed by R.G. 1.152 are the same as DG-1130, why would a licensee sustain this additional expense?

3. The reg. guide sends mixed messages to the industry.

The NRC tries to promote the use of digital technology in the nuclear power industry on the one hand, but then over-prescribes what is needed when a digital safety system is proposed. After decades of discussing this problem, there are still only a few isolated examples of digital safety systems that have been licensed under IEEE Std. 7-4.3.2. There is still a large uncertainty in the licensing process and this revision to R.G. 1.152 adds to that uncertainty and will cause the licensees to "step back" and wait for the smoke to clear. If the NRC wants to promote safe, digital technology, then issuing premature reg.guides is not the way to go, however, if the NRC wants to limit the use of digital technology in NPPs, then this reg guide accomplishes that goal.

Sincerely,

William Petrick
President
Capri Technology Inc.
P.O. Box 2357
Nipomo, CA 93444

Cc: Senator Dianne Feinstein, US Senate
Congressman Bill Thomas, US House of Representatives