

From: Yawar Faraz
To: Coriell, Kelly L
Date: 4/19/05 3:26PM
Subject: List of standards and guidance documents related to I&C

Kelly,

I am attaching the list of standards and guidance documents USEC Inc. requested in yesterday's 4/18 I&C RAI response clarification conference call.

Yawar Faraz
301-415-8113

CC: Brian Smith; Frederick Burrows; Joel Klein; Linda Marshall; Roman Shaffer

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From: Yawar Faraz
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List of I&C standards Apr05.wpd		29906 04/19/05 03:24PM

Options

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During the I&C RAI response clarification conference call on April 18, 2005, the NRC asked USEC Inc. to consider committing to the portions of the following standards and guidance documents that would be applicable to the ACP.

- IEEE Std 603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations."
- IEEE Std 379-1994, "IEEE Standard Application of the Single Failure Criterion to Nuclear Power Generation Station Safety Systems."
- IEEE Std 384-1992, "Standard Criteria for Independence of Class 1E Equipment and Circuits."
- NUREG-800, Standard Review Plan, Branch Technical Position HICB-11, "Guidance on the Application and Qualification of Isolation Devices."
- Regulatory Guide 1.75, Revision 2, "Physical Independence of Electric Systems."
- IEEE Std 344-1987, "IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Generating Stations."
- Regulatory Guide 1.100, Revision 2, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants."
- ANSI/ISA-67.04.01-2000, "Setpoints for Nuclear Safety-Related Instrumentation."
- Regulatory Guide 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation."
- Regulatory Guide 3.17-1974, "Earthquake Instrumentation for Fuel Reprocessing Plants." (For the seismic monitoring and trip system)
- IEEE Std 338-1987, "IEEE Standard Criteria for Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems."
- NUREG-0800, Standard Review Plan, Branch Technical Position HICB-17, "Guidance on Self-Test and Surveillance Test Provisions."
- Regulatory Guide 1.118, Revision 3, "Periodic Testing of Electric Power and Protection Systems."
- IEEE Std 518-1982, "IEEE Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources."
- IEEE Std 1050-1996, "Guide for Instrumentation and Control Equipment Grounding in Generating Stations."
- Regulatory Guide 1.180, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems."

For IROFS relying on software, e.g., those specified as using software, firmware, microcode, PLCs, and/or any digital device, including hardware devices which implement data communication protocols (such as fieldbus devices and Local Area Network controllers), etc., and any design change(s) should adhere to accepted best practices in software and hardware engineering, including software quality assurance controls throughout the development process and the applicable guidance of the following industry standards and regulatory guides (including the endorsed industry standards):

- American Society of Mechanical Engineers (ASME) NQA-1-1994, Part II, subpart Part 2.7, Quality Assurance Requirements of Computer Software for Nuclear Facility Applications, as revised by NQA-1a-1995 Addenda of NQA-1-1994 and ASME NQA-1-1994, Part 1, Supplement 11S-2, Supplementary Requirements for Computer Program Testing. (Refer to SAR Chapter 11, Appendix A, Section 3.)
- Electric Power Research Institute (EPRI) NP-5652, Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Grade Applications, June 1988.
- EPRI Topical Report (TR) -102323, Guidelines for Electromagnetic Interference Testing in Power Plants, Revision 1, December 1996.
- EPRI TR-106439, Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications, October 1996.
- Regulatory Guide 1.152, Criteria for Digital Computers in Safety Systems in Nuclear Power Plants, Revision 1.
 - ◆ IEEE Std 7-4.3.2-1993, "Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations"
- Regulatory Guide 1.168, Verification, Validation, Reviews, and Audits for Digital Software Used in Safety Systems of Nuclear Power Plants, Revision 1.
 - ◆ IEEE Std 1012-1998, "IEEE Standard for Software Verification and Validation"
 - ◆ IEEE Std 1028-1997, "IEEE Standard for Software Reviews and Audits"
- Regulatory Guide 1.169, Configuration Management Plans for Digital Computer Software Used in Safety Systems of Nuclear Power Plants.
 - ◆ IEEE Std 828-1990, "IEEE Standard for Software Configuration Management Plans"
 - ◆ ANSI/IEEE Std 1042-1987, "IEEE Guide to Software Configuration Management"
- Regulatory Guide 1.170, Software Test Documentation for Digital Computer Software Used in Safety Systems of Nuclear Power Plants.

- ◆ ANSI/IEEE Std 829-1983, "IEEE Standard for Software Test Documentation"
- Regulatory Guide 1.171, Software Unit Testing for Digital Computer Software Used in Safety Systems of Nuclear Power Plants.
 - ◆ ANSI/IEEE Std 1008-1987, "IEEE Standard for Software Unit Testing"
- Regulatory Guide 1.172, Software Requirements Specifications for Digital Computer Software Used in Safety Systems of Nuclear Power Plants.
 - ◆ IEEE Std 830-1993, "IEEE Recommended Practice for Software Requirements Specifications"
- Regulatory Guide 1.173, Developing Software Life Cycle Processes for Digital Computer Software Used in Safety Systems of Nuclear Power Plants.
 - ◆ IEEE Std 1074-1995, "IEEE Standard for Developing Software Life Cycle Processes"