

MFFFNPEm Resource

From: Tiktinsky, David
Sent: Tuesday, January 05, 2010 9:20 AM
To: Gwyn, Dealis W.
Cc: MFFFHearingFile Resource
Subject: I and C codes and standards
Attachments: i and c codes and standards.doc

David Rahn's cut related to I and C codes and standards.

Hearing Identifier: MixedOxideFuelFabricationFacility_NonPublic
Email Number: 1560

Mail Envelope Properties (0A64B42AAA8FD4418CE1EB5240A6FED10DF6A09648)

Subject: I and C codes and standards
Sent Date: 1/5/2010 9:20:04 AM
Received Date: 1/5/2010 9:20:06 AM
From: Tiktinsky, David

Created By: David.Tiktinsky@nrc.gov

Recipients:

"MFFFHearingFile Resource" <MFFFHearingFile.Resource@nrc.gov>
Tracking Status: None
"Gwyn, Dealis W." <DWGwyn@moxproject.com>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

Files	Size	Date & Time
MESSAGE	58	1/5/2010 9:20:06 AM
i and c codes and standards.doc		36858

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

To implement the design criteria described above, the MFFF I&C Systems have been designed using guidance from the following industry standards:

- For overall I&C system design (including seismic monitoring and trip system):

Institute of Electrical and Electronics Engineers (IEEE) IEEE Std 603-1998, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," issued 1998 (IEEE, 1998)

- For single failure design:

IEEE Std 379-1994, "IEEE Standard Application of the Single Failure Criterion to Nuclear Power Generating Station Safety Systems (IEEE, 1994)

- For software programmable electronic systems:

Electric Power Research Institute (EPRI) TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," issued October 1996 (EPRI, 1996)

International Electrotechnical Commission (IEC) 61131-3 (1993-03), "Programmable Controllers -Part 3: Programming Languages," issued 1993 (IEC, 1993)

IEEE Std 7-4.3.2-1993, "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations," issued 1993 (IEEE, 1993)

IEEE Std 730-1998, "Software Quality Assurance Plans," issued 1998 (IEEE, 1998)

IEEE Std 828-1998, "IEEE Standard for Software Configuration Management Plans," issued 1998 (IEEE, 1998)

IEEE Std 830-1998, "IEEE Standard Recommended Practice for Software Requirements Specifications," issued 1998 (IEEE, 1998)

IEEE Std 1012-1998, "IEEE Standard for the Software Verification and Validation," issued 1998 (IEEE, 1998)

IEEE Std 1028-1997, "IEEE Standard for Software Reviews," issued 1997 (IEEE, 1997)

IEEE Guide 1042-1987, "Software Configuration Management," issued 1987 (IEEE, 1987)

IEEE Std 1074-1997, "IEEE Standard for Developing Software Life Cycle Processes," issued 1997 (IEEE, 1997)

IEEE Std 1228-1994, "IEEE Standard for Software Safety Plans," issued 1994 (IEEE, 1994b)

USNRC RG 1.152, Rev 1, "Criteria for Digital Computers in Safety Systems of Nuclear Power Plants" (NRC, 1996)

USNRC RG 1.153, Rev 1, "Criteria for Safety Systems," (NRC, 1996)

USNRC RG 1.168, "Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," issued September 1997 (NRC, 1997)

USNRC RG 1.169, Configuration Management Plans for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," issued September 1997 (NRC, 1997)

USNRC RG 1.170, "Software Test Documentation for Digital Computer Software Used in Safety Systems of Nuclear Power Plants" (NRC, 1997)

USNRC RG 1.171 "Software Unit Testing for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," (NRC, 1997)

USNRC RG 1.172, "Software Requirements Specifications for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," issued September 1997 (NRC, 1997)

USNRC RG 1.173, "Developing Software Life Cycle Processes for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," September 1997 (NRC, 1997)

Safety Evaluation by the Office of Nuclear Reactor Regulation, "EPRI Topical Report TR-106439," issued May 1997 (NRC, 1997)

- For electrical independence and separation:

IEEE Std 384-1992 "IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits (IEEE, 1992)

NUREG-0800, Standard Review Plan, Branch Technical Position HICB-11, "Guidance on the Application and Qualification of Isolation Devices," issued June 1997 (NRC, 1997)

USNRC RG 1.75, "Physical Independence of Electric Systems," Revision 2 (NRC, 1978)

- For seismic qualification of equipment:

IEEE Std 344-1987, IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Generating Stations (IEEE, 1987)

USNRC RG 1.100, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants," Revision 2 (NRC, 1988)

- For the establishment of process instrument setpoints:

ANSI/ISA-67.04.01-2000, "Setpoints for Nuclear Safety Related Instrumentation," (ANSI, 2000)

USNRC RG 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," issued December 1999 (NRC, 1999).

- For the evaluation of human-system interfaces:

IEEE Std 1023-1988, "IEEE Guide for the Application of Human Factors Engineering to Systems, Equipment, and Facilities of Nuclear Power Generating Stations," issued 1988 (NRC, 1988)

NUREG-0700, Revision 2, "Human System Design Review Guidelines," issued May 2002 (NRC, 2002) (Rev 1, 1996?)

- For the design of the seismic monitoring and trip system (recording function):

USNRC RG 3.17-1974, "Earthquake Instrumentation for Fuel Reprocessing Plants," issued 1974 (NRC, 1974)

- For periodic testing:

IEEE Std 338-1992, "IEEE Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems," (IEEE, 1992)

NUREG-0800, Standard Review Plan, Branch Technical Position HICB-17, "Guidance on Self-Test and Surveillance Test Provisions," issued June 1997 (NRC, 1997)

USNRC RG 1.118, "Periodic Testing of Electric Power and Protection Systems Revision 3 (NRC, 1995)

- For reduction of electromagnetic and radio frequency interference:

IEEE Std 518-1982, "IEEE Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources," issued 1982 (IEEE, 1982)

IEEE Std 1050-1996, "Guide for Instrumentation and Control Equipment Grounding in Generating Stations," issued 1996 (IEEE, 1996)

USNRC RG 1.180, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems," issued January 2000 (NRC, 2000)

- For the design of data communications networks:

ANSI/IEEE 802.3 Standards Series, "IEEE Standards for Local Area Networks: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications," issued 2000 (ANSI, 2000)

- For the evaluation of Commercial Grade equipment dedicated for use in safety applications:

USNRC NUREG/CR-6421, "Guideline on the Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications"