

# U.S. NUCLEAR REGULATORY COMMISSION

## DRAFT REGULATORY GUIDE DG-1415

*Proposed Revision 1 to Regulatory Guide 1.164*

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Technical Lead: Deanna Zhang



## DEDICATION OF COMMERCIAL-GRADE ITEMS FOR USE IN NUCLEAR POWER PLANTS

### A. INTRODUCTION

#### Purpose

This regulatory guide (RG) describes methods that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable in meeting regulatory requirements for the dedication of commercial grade items and services used in nuclear power plants.

#### Applicability

This RG applies to applicants, licensees, dedicating entities, and their suppliers associated with constructing, owning, operating, or supplying of nuclear power plants subject to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21 “Reporting of Defects and Noncompliance,” (Ref. 1), and regulated pursuant to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” (Ref. 2), and 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants” (Ref. 3).

#### Applicable Rules and Regulations

- 10 CFR Part 21 establishes the framework for an acceptance process under the definition for “dedication.” This process is undertaken to provide reasonable assurance that a commercial-grade item to be used as a basic component will perform its intended safety function. Specifically, the definition for “dedication” requires that the dedication process be conducted in accordance with the applicable provisions of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to 10 CFR Part 50.
- 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” includes the provisions for quality assurance (QA) and quality control that are applicable to the acceptance and dedication process for commercial-grade design and analysis computer programs. Criterion III fulfills the requirement in Appendix B to 10 CFR Part 50 established by the definition of “dedication” in 10 CFR Part 21 for commercial-grade dedication programs. Criterion III design control measures include requirements, in part, for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components (SSCs), and are applicable to a commercial-grade design and analysis computer program associated with basic components.

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This RG is being issued in draft form to involve the public in the development of regulatory guidance in this area. It has not received final staff review or approval and does not represent an NRC final staff position. Public comments are being solicited on this DG and its associated regulatory analysis. Comments should be accompanied by appropriate supporting data. Comments may be submitted through the Federal rulemaking website, <http://www.regulations.gov>, by searching for draft regulatory guide DG-1415. Alternatively, comments may be submitted to the Office of Administration, Mailstop: TWFN 7A-06M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing Staff. Comments must be submitted by the date indicated in the *Federal Register* notice.

Electronic copies of this DG, previous versions of DGs, and other recently issued guides are available through the NRC’s public website under the Regulatory Guides document collection of the NRC Library at <https://nrc.gov/reading-rm/doc-collections/reg-guides/index.html>. The DG is also available through the NRC’s Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>, under Accession No. ML23187A531. The regulatory analysis may be found in ADAMS under Accession No. ML23187A534.

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- 10 CFR Part 50, Appendix B, Criterion VII, “Control of Purchased Material, Equipment, and Services,” requires, in part, the establishing of measures for assuring that “purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery.
- 10 CFR 50.34(a)(7) and 10 CFR 50.34(b)(6)(ii) refer to 10 CFR Part 50, Appendix B, for establishing and implementing a QA program for the design, construction and operation of nuclear power plants and fuel reprocessing plants licensed or approved under 10 CFR Part 50 or 10 CFR Part 52.
- 10 CFR 52.17(a)(1)(xi) refers to 10 CFR Part 50, Appendix B, for establishing and implementing a QA program for site-related activities for the future design and construction of nuclear power facility early site permits under 10 CFR Part 52.
- 10 CFR 52.47(a)(19) refers to 10 CFR Part 50, Appendix B, for establishing and implementing a QA program for the design of nuclear power facility standard design certifications under 10 CFR Part 52.
- 10 CFR 52.79(a)(25) refers to 10 CFR Part 50, Appendix B, for establishing and implementing a QA program for the design and construction of nuclear power facilities with combined licenses under 10 CFR Part 52.

### **Related Guidance**

- RG 1.28, “Quality Assurance Program Criteria (Design and Construction)” (Ref. 4), describes an acceptable method for establishing and implementing a QA program for the design and construction of nuclear power plants and fuel reprocessing plants that meets the requirements of Appendix B to 10 CFR Part 50.
- RG 1.33, “Quality Assurance Program Requirements (Operation)” (Ref. 5), describes an acceptable method for complying with the Commission’s regulations regarding overall QA program requirements for the operations phase of nuclear power plants that meet the requirements of Appendix B to 10 CFR Part 50.

### **Purpose of Regulatory Guides**

The NRC issues RGs to describe methods that are acceptable to the staff for implementing specific parts of the agency’s regulations, to explain techniques that the staff uses in evaluating specific issues or postulated events, and to describe information that the staff needs in its review of applications for permits and licenses. Regulatory guides are not NRC regulations and compliance with them is not required. Methods and solutions that differ from those set forth in RGs are acceptable if supported by a basis for the issuance or continuance of a permit or license by the Commission.

## **Paperwork Reduction Act**

This RG provides voluntary guidance for implementing the mandatory information collections in 10 CFR Parts 21, 50, and 52 that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB), under control numbers 3150-0035, 3150-0011, and 3150-0151, respectively. Send comments regarding this information collection to the FOIA, Library, and Information Collections Branch (T6-A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0035, 3150-0011, and 3150-0151), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17<sup>th</sup> Street, NW, Washington, DC, 20503, email: [oira\\_submissions@omb.eop.gov](mailto:oira_submissions@omb.eop.gov).

## **Public Protection Notification**

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

## B. DISCUSSION

### Reason for Revision

This revision of the guide (Revision 1) updates the guidance to provide additional clarification on the NRC's definition of counterfeit, fraudulent, and suspect items (CFSI). This revision also adds regulatory language to provide additional clarity on requirements applicable to the dedication of commercial-grade items. In addition, the staff made several editorial changes to conform to the current format and content of RGs.

### Background

This RG provides guidance for the dedication of commercial-grade items and services used in nuclear power plants. This RG endorses, in part, Electric Power Research Institute (EPRI) 3002002982, Revision 1 to EPRI NP-5652 and TR-102260, "Plant Engineering: Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications," issued September 2014 (Ref. 6), with respect to the acceptance of the commercial-grade dedication of items and services to be used as basic components for nuclear power plants.

Use of commercial-grade dedication for items and services used in nuclear power plants is common in the nuclear industry, but the acceptance processes for those items or services vary. Industry guidance for acceptance of commercial-grade products was developed in the late 1980s. In the early 1990s, the NRC conducted a series of procurement inspections at licensee facilities that identified weaknesses in their procurement and dedication programs. In the late 1980s, the industry issued supplemental guidance in the initial version (Revision 0) of EPRI NP-5652 (Ref. 7) to (1) provide clarifications in certain areas, (2) share lessons learned, and (3) address industry and regulatory developments after the issuance of the original industry guidance.

The use of commercial-grade dedication continued to increase, and the NRC revised 10 CFR Part 21 to enhance the definitions of key terms such as dedication, commercial-grade item, and critical characteristics. The NRC and industry both recognized the challenges associated with commercial dedication and provided various types of supplemental guidance to address these challenges.

The NRC issued Generic Letter (GL) 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products" (Ref. 8), on March 21, 1989. This GL described the staff's perspective on good practices in procurement and dedication and provided the NRC's conditional endorsement of an industry standard (EPRI NP-5652, Revision 0) on methods of commercial-grade procurement and dedication.

The NRC issued GL 91-05, "Licensee Commercial-Grade Procurement and Dedication Programs" (Ref. 9), on April 9, 1991. This GL presented the staff's positions regarding the implementation of existing regulatory requirements, as contained in Appendix B to 10 CFR Part 50. Following a backfit analysis, the staff concluded that the requirements contained within GL 91-05 were a compliance backfit and prepared the GL in accordance with 10 CFR 50.109 (a)(4)(i).

In SECY-11-0135, "Staff Plans to Develop the Regulatory Basis for Clarifying the Requirements in Title 10 of the *Code of Federal Regulations* Part 21, 'Reporting of Defects and Noncompliance'," dated September 29, 2011 (Ref. 10), the staff indicated to the Commission that the development of RGs for dedication activities would be an important milestone. In September 2014, EPRI issued EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260. The NRC determined that this latest

EPRI (3002002982) dedication guidance is consistent with the existing 10 CFR Part 21, which is subject to this RG.

In Appendix I, “Qualification versus Dedication,” EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260, describes the difference between the process for qualification of a component and the commercial-grade dedication process. Appendix I states that attempting to use one process to accomplish the objectives of both qualification and commercial-grade dedication is inappropriate because it could result in inadequately qualified equipment or the specification of unnecessary acceptance requirements. As noted by EPRI, equipment qualification is a part of the design process covered under 10 CFR Part 50, Appendix B, Criterion III, which demonstrates that an item exhibits design characteristics that allow it to function or survive a set of environmental conditions and seismic spectra. The purpose of commercial-grade dedication acceptance is to provide reasonable assurance that the commercial item intended to be used as a basic component will perform its intended safety function. Therefore, equipment qualification requirements become an important input to the commercial-grade acceptance process when critical characteristics are selected. In addition, Step 5.2.2, “Is the Item Required to Comply with Codes and/or Standards?” of EPRI 3002002982 indicates that dedication is a process used to accept an item by establishing reasonable assurance that it will perform its safety function and is not intended for use as a basis for certifying a code or standard. EPRI 3002002982 specifies that if absolute assurance of compliance with all applicable requirements of a code or standard is required, and the item is not eligible for dedication, then the item should be procured as a basic component or otherwise controlled in accordance with a QA program compliant with 10 CFR Part 50, Appendix B.

EPRI 3002002982, Section 5.14, “Screen for Eligibility Process: Steps 5.2.1–5.2.6,” states that one option to obtain information that will help determine whether an item can be dedicated is “reverse engineering” of the component. Operating experience has revealed challenges associated with the use of reverse engineering in determining significant design and performance attributes for replacement components in nuclear power plants. Reverse engineering is not within the scope of EPRI 3002002982. EPRI is preparing a separate guidance document for the use of reverse engineering to provide reasonable assurance of the capability of replacement components to perform their intended functions consistent with the design and performance of the original component.

EPRI 3002002982 Section A "Design versus Acceptance states: “As discussed in GL 89-02, “Actions to Improve the Detection of Counterfeit and Fraudulently Marked Products,” appropriate engineering involvement is warranted during the procurement and product acceptance processes, including testing, for products used in nuclear power plants”. To provide consistency when addressing NRC oversight activities, the NRC staff is clarifying the definition of counterfeit, fraudulent, and suspect items in the Staff Regulatory Guidance.

Section C of this RG approves the use, in part, of EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260. By approving the use, in part, of that document, this guidance affords stakeholders the ability to use these revised references with the exceptions and clarifications noted.

### **Consideration of International Standards**

The International Atomic Energy Agency (IAEA) and Nuclear Energy Agency (NEA) work cooperatively with member states and other partners to promote the safe, secure, and peaceful use of nuclear technologies. This system of safety fundamentals, safety requirements, safety guides, and other relevant reports, reflect an international perspective on what constitutes a high level of safety. To inform its development of this RG, the NRC considered IAEA and NEA safety requirements and safety guides pursuant to the Commission’s International Policy Statement (Ref. 11) and Management Directive and Handbook 6.6, “Regulatory Guides” (Ref. 12).

The following IAEA and NEA Safety Requirements and Guides were considered in the development/ update of the Regulatory Guide:

- IAEA Safety Guide No. GS-G-3.1, “Application of the Management System for Facilities and Activities,” issued 2006 (Ref. 13), provides guidance for activities in the procurement process for nuclear power plants.
- IAEA Technical Document (TECDOC)-919, “Management of Procurement Activities in a Nuclear Installation,” issued 1997 (Ref. 14), provides the fundamental concepts and methodologies to organize and manage procurement activities in support of a nuclear installation.
- Nuclear Energy Agency (NEA) Committee on Nuclear Regulatory Activities (CRNA) Report NEA/CRNA/R (2012)7, “Regulatory Oversight of Non-Conforming, Counterfeit, Fraudulent, and Suspect Items (NCFSI),” dated February 13, 2013 (Ref. 15), discusses different approaches to managing NCFSI and notes that existing controls may need to be put in place throughout the supply chain.

This RG incorporates similar quality assurance guidance and is generally consistent with the basic safety principles provided in these documents.

#### **Documents Discussed in Staff Regulatory Guidance**

This RG endorses, in part, the use of one or more codes or standards developed by external organizations, and other third-party guidance documents. These codes, standards and third-party guidance documents may contain references to other codes, standards or third-party guidance documents (“secondary references”). If a secondary reference has itself been incorporated by reference into NRC regulations as a requirement, then licensees and applicants must comply with that standard as set forth in the regulation. If the secondary reference has been endorsed in a RG as an acceptable approach for meeting an NRC requirement, then the standard constitutes a method acceptable to the NRC staff for meeting that regulatory requirement as described in the specific RG. If the secondary reference has neither been incorporated by reference into NRC regulations nor endorsed in a RG, then the secondary reference is neither a legally-binding requirement nor a “generic” NRC approved acceptable approach for meeting an NRC requirement. However, licensees and applicants may consider and use the information in the secondary reference, if appropriately justified and consistent with current regulatory practice, and consistent with applicable NRC requirements.

## C. STAFF REGULATORY GUIDANCE

In 10 CFR Part 21, the NRC states, in part, “In all cases, the dedication process must be conducted in accordance with 10 CFR Part 50, Appendix B.” In support of this requirement, Appendix B to 10 CFR Part 50 provides evaluation and acceptance requirements that are applicable to the dedication of commercial-grade items and services for use in nuclear power plants. The guidance below endorses, with the listed exceptions or clarifications, EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260.

EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260, addresses the acceptance of commercial-grade dedication of items and services for use in nuclear power plants. EPRI 3002002982 is acceptable to the NRC staff in providing an adequate basis for dedication as defined in 10 CFR Part 21 and fulfills the QA requirement in Appendix B to 10 CFR Part 50, subject to the following exceptions or clarifications:

1. Section I.3 of Appendix I to EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260, refers to two EPRI guidance documents, NP-7484, “Seismic Technical Evaluation of Replacement Items for Nuclear Power Plants,” (Ref. 16), and TR-105849, “Plant Support Engineering: Generic Seismic Technical Evaluations of Replacement Items for Nuclear Power Plants—Item-Specific Evaluations,” Revision 1, issued September 2008 (Ref. 17). The NRC has not reviewed or approved NP-7484 or TR-105849 as an acceptable approach for meeting an NRC requirement. The NRC provides its guidance on qualification in RG 1.100, “Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants,” (Ref. 18). EPRI-3002002982, section 6.6, Appendix B, “Technical Evaluation Process Overview,” and Appendix I contain guidance on documenting an adequate technical justification.
2. Section 14.1, “Digital Equipment and Computer Programs Integral to Plant SSCs,” of EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260, lists six EPRI guidance documents for accepting digital devices. The NRC has only reviewed TR-106439, “Guideline on Evaluation and Acceptance of Commercial-Grade Digital Equipment for Nuclear Safety Applications,” (Ref. 19) and TR-107330, “Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants,” (Ref. 20) in letters dated July 17, 1997 (Ref. 21), and July 30, 1998, (Ref. 22), respectively. The NRC has approved several licensing actions which make use of TR-106439 and TR-107330, including in the Waterford Steam Electric Station, Unit 3 Core Protection Calculator and Control Element Assembly Calculator System (ADAMS Accession No. ML21131A243) and the APR1400 Design Certification (ADAMS Accession No. ML18215A241). The NRC has not reviewed or approved the following four guidance documents referenced in EPRI 3002002982: EPRI 1025283, “Commercial-Grade Digital Equipment for High-Integrity Applications: Oversight and Review of Evaluation and Acceptance Activities,” dated August 28, 2013, (Ref. 23); EPRI TR-107339, “Evaluating Commercial Digital Equipment for High-Integrity Applications: A Supplement to EPRI Report TR-106439,” issued December 1997 (Ref. 24); EPRI 1011710, “Handbook for Evaluating Critical Digital Equipment and Systems,” dated November 28, 2005, (Ref. 25); and EPRI TR-103291, “Handbook for Verification and Validation of Digital Systems,” dated December 15, 1998, (Ref. 26), as an acceptable approach for meeting an NRC requirement.
3. EPRI 3002002982, Revision 1 to EPRI NP-5652 and TR-102260 reference counterfeit and fraudulently marked products and state that appropriate engineering involvement is warranted during the procurement and product acceptance processes, including testing, for products used in

nuclear power plants. However, no definition has been included in the guidance. In order to provide clarity and ensure consistency when addressing related agency oversight activities, for the purposes of this guidance, the NRC staff understands CFSI to mean: Items that are intentionally manufactured or altered to imitate a legitimate product without the legal right to do so (Counterfeit); intentionally misrepresented with the intent to deceive (Fraudulent); or reasonably suspected of being Counterfeit or Fraudulent (Suspect).



## **D. IMPLEMENTATION**

The NRC staff may use this regulatory guide as a reference in its regulatory processes, such as licensing, inspection, or enforcement. However, the NRC staff does not intend to use the guidance in this regulatory guide to support NRC staff actions in a manner that would constitute backfitting as that term is defined in 10 CFR 50.109, "Backfitting," and as described in NRC Management Directive 8.4, "Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests" (Ref. 27), nor does the NRC staff intend to use the guidance to affect the issue finality of an approval under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." The staff also does not intend to use the guidance to support NRC staff actions in a manner that constitutes forward fitting as that term is defined and described in Management Directive 8.4. If a licensee believes that the NRC is using this regulatory guide in a manner inconsistent with the discussion in this Implementation section, then the licensee may file a backfitting or forward fitting appeal with the NRC in accordance with the process in Management Directive 8.4.

## REFERENCES<sup>1</sup>

1. *U.S. Code of Federal Regulations* (CFR), “Reporting of Defects and Noncompliance,” Part 21, Chapter I, Title 10, “Energy.”
2. CFR, “Domestic Licensing of Production and Utilization Facilities,” Part 50, Chapter I, Title 10, “Energy.”
3. CFR, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” Part 52, Chapter I, Title 10, “Energy.”
4. U.S. Nuclear Regulatory Commission (NRC), Regulatory Guide (RG) 1.28, “Quality Assurance Program Criteria (Design and Construction),” Washington, DC.
5. NRC, RG 1.33, “Quality Assurance Program Requirements (Operation),” Washington, DC.
6. Electric Power Research Institute (EPRI) 3002002982, Revision 1 to EPRI NP-5652 and TR-102260, “Plant Engineering: Guideline for the Acceptance of Commercial-Grade Items in Nuclear Safety-Related Applications,” Palo Alto, California, September 2014.<sup>2</sup>
7. EPRI, NP-5652, Revision 0, “Guideline for the Utilization of Commercial Grade Items in Nuclear Safety-Related Applications (NCIG-07),” Palo Alto, California, June 1988.
8. NRC, Generic Letter (GL) 89-02, “Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products,” Washington, DC, March 21, 1989.
9. NRC, GL 91-05, “Licensee Commercial-Grade Procurement and Dedication Programs,” Washington, DC, April 9, 1991.
10. NRC, SECY-11-0135, “Staff Plans to Develop the Regulatory Basis for Clarifying the Requirements in Title 10 of the *Code of Federal Regulations* Part 21, ‘Reporting of Defects and Noncompliance,’” Washington, DC, September 29, 2011.
11. NRC, “Nuclear Regulatory Commission International Policy Statement,” *Federal Register*, Vol. 79, No. 132, pp. 39415–39418 (79 FR 39415), Washington, DC, July 10, 2014.
12. NRC, Management Directive (MD) 6.6, “Regulatory Guides,” Washington, DC.

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1 Publicly available NRC published documents are available electronically through the NRC Library on the NRC’s public website at <http://www.nrc.gov/reading-rm/doc-collections/> and through the NRC’s Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>. For problems with ADAMS, contact the Public Document Room staff at 301-415-4737 or (800) 397-4209, or email [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The NRC Public Document Room (PDR), where you may also examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov) or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

2 Copies of Electric Power Research Institute (EPRI) standards and reports may be purchased from EPRI, 3420 Hillview Ave., Palo Alto, CA 94304, telephone (800) 313-3374; fax (925) 609-1310.

13. International Atomic Energy Agency (IAEA), Safety Guide No. GS-G-3.1, “Application of the Management System for Facilities and Activities,” Vienna, Austria, 2006.<sup>3</sup>
14. IAEA, TECDOC-919, “Management of Procurement Activities in a Nuclear Installation,” Vienna, Austria, 1997.
15. Nuclear Energy Agency Committee on Nuclear Regulatory Activities, Report NEA/CRNA/R (2012)7, “Regulatory Oversight of Non-Conforming, Counterfeit, Fraudulent, and Suspect Items (NCFSI),” Paris, France, February 13, 2013.<sup>4</sup>
16. EPRI, NP-7484, “Seismic Technical Evaluation of Replacement Items for Nuclear Power Plants,” Palo Alto, California, June 1, 1993.
17. EPRI, TR-105849, “Plant Support Engineering: Generic Seismic Technical Evaluations of Replacement Items for Nuclear Power Plants—Item-Specific Evaluations,” Revision 1, Palo Alto, California, September 2008.
18. NRC, RG 1.100, “Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants,” Washington, DC.
19. EPRI, TR-106439, “Guideline on Evaluation and Acceptance of Commercial-Grade Digital Equipment for Nuclear Safety Applications,” Palo Alto, California, November 1996.
20. EPRI, TR-107330, “Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants,” Palo Alto, California January 1998.
21. NRC, “Review of EPRI Topical Report TR-106439, ‘Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications’ (TAC No. M94127),” Washington, DC, July 17, 1997. (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12205A284)
22. NRC, “Safety Evaluation by Office of Nuclear Reactor Regulation Electric Power Research Institute (EPRI) Topical Report, TR-107330, Final Report, ‘Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants,’” Washington, DC, July 30, 1998. (ML12205A265)
23. EPRI 1025283, “Commercial-Grade Digital Equipment for High-Integrity Applications: Oversight and Review of Evaluation and Acceptance Activities,” Palo Alto, California, August 28, 2013.

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3 Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their website: [WWW.IAEA.Org/](http://WWW.IAEA.Org/) or by writing the International Atomic Energy Agency, P.O. Box 100 Wagramer Strasse 5, A-1400 Vienna, Austria.

4 Publications from the Nuclear Energy Agency (NEA) are available at its website: <https://www.oecd-nea.org/> or by contacting the headquarters at Nuclear Energy Agency, 2, rue André Pascal, 75775 Paris Cedex 16, France, telephone: +33 1 73 21 28 19.

24. EPRI TR-107339, "Evaluating Commercial Digital Equipment for High-Integrity Applications: A Supplement to EPRI Report TR-106439," Palo Alto, California, December 1997.
25. EPRI 1011710, "Handbook for Evaluating Critical Digital Equipment and Systems," Palo Alto, California, November 28, 2005.
26. EPRI TR-103291, "Handbook for Verification and Validation of Digital Systems," Palo Alto, California, December 15, 1998
27. NRC, MD 8.4, "Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests," Washington, DC.