

# U.S. NUCLEAR REGULATORY COMMISSION

## DRAFT REGULATORY GUIDE DG-1329



### *Proposed Revision 4 to Regulatory Guide RG 1.8*

Issue Date: February 2018  
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## QUALIFICATION AND TRAINING OF PERSONNEL FOR NUCLEAR POWER PLANTS

### A. INTRODUCTION

#### **Purpose**

This regulatory guide (RG) describes methods acceptable to the staff of the U.S. Nuclear Regulatory Commission (NRC) for complying with those portions of the Commission's regulations associated with the selection, qualifications, and training for nuclear power plant personnel.

#### **Applicability**

This RG applies to reactor licensees subject to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities" (Ref. 1), 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants" (Ref.2), and 10 CFR Part 55, "Operators' Licenses" (Ref. 3). Personnel of test, training, research, and mobile reactors are not covered by this regulatory guide.

#### **Applicable Regulations**

- 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."
  - 10 CFR 50.120, "Training and Qualification of Nuclear Power Plant Personnel," requires that each nuclear power plant licensee or applicant for an operating license implement training and qualification programs that are derived from a systems approach to training.
  - Paragraph 50.34(b)(6)(i) requires that an application for a license to operate a nuclear power plant include information concerning the applicant's organizational structure and personnel qualifications.
- 10 CFR 55, Subpart D, "Applications," describes the requirements of an application for a nuclear power plant operator or senior operator's license.

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This regulatory guide 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 draft guide and its associated regulatory analysis. Comments should be accompanied by appropriate supporting data. Comments may be submitted through the Federal-rulemaking Web site, <http://www.regulations.gov>, by searching for DG-1329. Alternatively, comments may be submitted to the Rules, Announcements, and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Comments must be submitted by the date indicated in the *Federal Register* notice.

Electronic copies of this draft regulatory guide, previous versions of this guide, and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at <http://www.nrc.gov/reading-rm/doc-collections/reg-guides/>. The draft regulatory guide 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. ML16091A267. The regulatory analysis may be found in ADAMS under Accession No. ML16091A271.

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## **Related Guidance**

- NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition” (Ref. 4), provides guidance for the staff’s review of information describing the applicant’s implementation of policy, organization, training, and design.

## **Purpose of Regulatory Guides**

The NRC issues RGs to describe to the public methods that the staff considers acceptable for use in implementing specific parts of the agency’s regulations, to explain techniques that the staff uses in evaluating specific problems or postulated events, and to provide guidance to applicants. RGs are not substitutes for regulations and compliance with them is not required. Methods and solutions that differ from those set forth in RGs will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

## **Paperwork Reduction Act**

This RG provides guidance for implementing the mandatory information collections in 10 CFR Parts 50 and 55 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 3150-0011 and 3150-0018. Send comments regarding this information collection to the Information Services Branch, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0011, 3150-0151, 3150-0018) Office of Management and Budget, Washington, DC 20503.

## **Public Protection Notification**

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

## B. DISCUSSION

### Reason for Revision

This revision of the guide (Revision 4) updates the guidance with additional experience gained through inspections since Revision 3 was issued in 2000. It endorses American National Standards Institute/American Nuclear Society (ANSI/ANS) -3.1-2014, "Selection, Qualification and Training of Personnel for Nuclear Power Plants" (Ref. 5), with certain exceptions that are listed in the Staff Regulatory Guidance section of this guide.

### Background

The following is a chronology of industry and NRC actions regarding the qualification and training of personnel for nuclear power plants:

- Subcommittee ANS-3, Reactor Operations, American Nuclear Society Standards Committee, developed a standard that contained criteria for the qualifications and training of nuclear power plant personnel. This standard was approved by the ANSI Committee N18, Design Criteria for Nuclear Power Plants, and designated ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel" (Ref. 6).
- RG 1.8, "Personnel Selection and Training" (Ref. 7), endorsed ANSI N18.1-1971, issued in March 1971. Regulatory Guide 1.8, Revision 1 (Ref. 8), was issued in September 1975.
- In January 1978, a revision of ANSI N18.1-1971 was approved by the ANSI Board of Standards Review and issued as ANSI/ANS-3.1-1978, "Selection and Training of Nuclear Power Plant Personnel" (Ref. 9).
- In December 1981, ANSI/ANS-3.1-1978 was updated to factor in lessons learned from the Three Mile Island (TMI) -2 event and changing regulatory requirements. ANSI/ANS 3.1-1978 was reissued as ANSI/ANS-3.1-1981, "Selection, Qualification and Training of Personnel for Nuclear Power Plants" (Ref. 10).
- Revision 2 of RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants" (Ref. 11), was issued in April 1987. This revision endorsed Sections 4.3.1.1, "Shift Supervisor," 4.3.1.2, "Senior Operator," 4.5.1.2, "Licensed Operators," 4.4.8, "Shift Technical Advisor," and 4.4.4, "Radiation Protection," of ANSI/ANS 3.1 1981. Acceptance for use of all other positions remained with ANSI N18.1 1971.
- A revision of ANSI/ANS-3.1-1981 was issued on May 19, 1987, and designated ANSI/ANS-3.1-1987, "Selection, Qualification and Training of Personnel for Nuclear Power Plants" (Ref. 12). The 1987 standard contained major revisions in content and format from the 1981 standard. These revisions resulted from actions taken by the NRC and industry since the 1981 standard in selection, qualification, and training practices, including the following.
  - On March 20, 1985, the NRC issued a "Commission Policy Statement on Training and Qualifications of Nuclear Power Plant Personnel" (Ref. 13). The policy statement provided guidance on qualification programs and on a systems approach to training at commercial nuclear power plants. The policy statement also "endorses the Institute of Nuclear Power Operations (INPO) -managed Training Accreditation Program in that it encompasses the

elements of performance-based training and will provide the basis to ensure that personnel have qualifications commensurate with the performance requirements of their jobs."

- A "Policy Statement on Engineering Expertise on Shift," issued on October 28, 1985 (Ref. 14), provided two options for meeting the requirements in 10 CFR 50.54(m)(2)(i) for nuclear power plant staffing and the requirement to have a shift technical advisor (STA) available to the shift (see Section I.A.1.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980 (Ref. 15)). One option in the Policy Statement allowed combining the functions of the STA with one of the required senior operators as long as specific training and education requirements are met. The other option allows for continuation of an approved independent STA program.
- Following an April 17, 1990, a decision from the U.S. Court of Appeals for the District of Columbia Circuit the NRC issued a rule, 10 CFR 50.120, establishing mandatory requirements for the training and qualification of nuclear power plant personnel. Each licensee or applicant for a license was required to ensure that personnel listed in 10 CFR 50.120(b)(1), regardless of whether they are employees or contractor personnel, have qualifications commensurate with the performance requirements of the jobs to which they are assigned. The rule requires that each licensee or applicant provide training to selected categories of personnel using a systems approach to training. This rule superseded the above mentioned Policy Statement on training and qualifications.
- On April 23, 1993, ANSI/ANS-3.1-1993, "Selection, Qualification and Training of Personnel for Nuclear Power Plants" (Ref. 16), was issued. This standard reflects actions of the NRC and industry since 1987, including the requirement to use the systems approach to training process to establish and maintain training programs for certain positions. In addition, this standard does not allow credit for simulator and classroom training to substitute for an operator's nuclear power plant experience; a compensating change has been made to the experience requirements.
- Draft Regulatory Guide (DG) DG-1012, the proposed Revision 3 to Regulatory Guide 1.8, was published for public comment in September 1996 (Ref. 17).
- DG-1084, the second proposed Revision 3 to Regulatory Guide 1.8, was published for public comment in March 1999 (Ref. 18). DG-1084 reflected modifications made to DG-1012 following the first public comment period. Some regulatory positions remained unchanged from DG-1012, some were modified, and some were developed following the publication of DG-1012 for public comment.
- Revision 3 of RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants" (Ref. 19), reflected further modifications made as a result of staff regulatory positions and the resolution of public comments.
- On November 20, 2014, ANSI/ANS-3.1-2014 was issued. Revisions to the standard aligns the ANS, NRC, and INPO with industry selection, training, and qualification standards; provide for a common language across the industry; address supplemental personnel training and qualification; and updates previous positions in light of new nuclear power plant construction, current position terminology, and evolving technology.
- NRC inspection observations have revealed that some plants have assigned inadequately qualified Radiation Protection middle Managers (RPMs) and others have temporarily appointed

unqualified RPMs for such lengths of time that it appeared they were permanent appointees. The RPM is the management-level representative responsible for the adequacy of the plant's radiation protection program and for ensuring that program is able to enforce appropriate prioritization of radiological safety issues. Therefore, to be considered adequately qualified, the RPM must be sufficiently experienced and knowledgeable of the plant-specific radiological conditions to judge whether the radiation protection program is able to achieve its purpose.

In researching potential regulatory responses to these inspection observations, the staff realized that clarifications related to the RPM position were inadvertently deleted in Revision 3 to RG 1.8. As such, RG 1.8, Revision 4, endorses with exceptions, ANSI-3.1, 2014, "Selection, Qualification and Training of Personnel for Nuclear Power Plants," and provides clarification in regards to NRC expectations pertaining to the selection, qualification and training of the plant RPM.

### **Harmonization with International Standards**

The International Atomic Energy Agency (IAEA) has established a series of safety guides and standards constituting a high level of safety for protecting people and the environment. IAEA safety guides present international good practices and increasingly reflects best practices to help users striving to achieve high levels of safety. The IAEA Technical Documents (IAEA-TECDOC) series reports on many aspects of the Agency's work. The NRC staff reviewed the following documents from the IAEA and found that this regulatory guide is consistent with guidance in those documents for the selection, qualification, and training of personnel for nuclear power plants:

- "Competency Assessments For Nuclear Industry Personnel, IAEA Publication 1236" (Ref. 20);
- "Recruitment, Qualification and Training of Personnel for Nuclear Power Plants," IAEA Safety Guide NS-G-2.8 (Ref. 21);
- "Selection, Competency Development, And Assessment of Nuclear Power Plant Managers," IAEA-TECDOC-1024 (Ref. 22);
- "Nuclear Power Plant Organization and Staffing for Improved Performance: Lessons Learned," IAEA-TECDOC-1052 (Ref. 23);
- "Experience in the Use of Systematic Approach to Training (SAT) for Nuclear Power Plant Personnel," IAEA-TECDOC-1057 (Ref. 24);
- "Analysis Phase of Systematic Approach to Training (SAT) for Nuclear Plant Personnel," IAEA-TECDOC-1170 (Ref. 25);
- "Assuring the Competence of Nuclear Power Plant Contractor Personnel," IAEA-TECDOC-1232 (Ref. 26);
- "Means of Evaluating and Improving the Effectiveness of Training of Nuclear Power Plant Personnel," IAEA-TECDOC-1358 (Ref. 27); and
- "Development of Instructors for Nuclear Power Plant Personnel Training," IAEA-TECDOC-1392 (Ref. 28).

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

This RG endorses, in part, 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, consistent with current regulatory practice, and consistent with applicable NRC requirements.

## **C. STAFF REGULATORY GUIDANCE**

ANSI/ANS -3.1-2014, “Selection, Qualification, and Training of Personnel for Nuclear Power Plants,” provides criteria for the selection, qualification, and training of personnel for nuclear power plants for complying with the qualifications and training requirements of 10 CFR Parts 50 and 55 and is endorsed, with the following exceptions and clarifications.

### **1. QUALIFICATION**

The qualification criteria described in Section 4 of ANSI/ANS-3.1-2014 are acceptable to the NRC staff with the following exceptions:

#### **1.1 Section 4.3, Middle Manager Level**

An individual assigned to a specific position should meet the requirements for that position; therefore, the allowance for a specific position to be filled by a person that does not meet the requirements for that position if that person is provided a staff whose qualifications meet the selected middle manager qualification is not endorsed.

#### **1.2 Section 4.3.1, Training**

Section 3.3.1 states, “The training middle manager is the individual responsible for management of the initial and continuing training programs, and shall meet the following requirements.” This section is clarified as follows: “The training middle manager is the onsite member of the power plant staff responsible for management of the initial and continuing training programs, and shall meet the following requirements.”

#### **1.3 Section 4.3.3, Radiation Protection**

The RPM is the onsite member of the power plant staff that is responsible for implementation of the radiological protection program and that meets the education, experience, and special requirements listed in section 4.3.3. In addition to the experience requirements listed in section 4.3.3, individuals with no prior RPM experience should have six months of time onsite before being assigned RPM duties. Licensees should evaluate required onsite time for experienced RPMs who are new to a site or a reactor technology (i.e. Pressurized Water Reactor (PWR) or Boiling Water Reactor (BWR)). The purpose of the onsite time is to provide a newly assigned RPM sufficient opportunity to learn the location and performance characteristics of key equipment and other plant-specific information that is necessary to make informed decisions concerning radiological safety. As a modification to item (3) in the Special Requirements section of 4.3.3, the majority of the station RPM’s experience should be relevant to supervising in-field radiation protection program activities (e.g., As Low As Reasonably Achievable (ALARA), radiation protection operations, and radioactive waste shipping). Personnel who are temporarily assigned to fill the RPM position as described in section 4.1 and who do not meet the requirements to serve as an RPM should have first line supervisor experience of in-field radiation protection program activities. Personnel who do not meet the requirements for this position should not be assigned to temporarily fill the position for periods exceeding three months.

#### **1.4 Section 4.4.1, Senior Operator**

A non-licensed applicant (an instant candidate) for a senior operator (SO) license should have three years of responsible nuclear power plant experience. A professional engineering license or Bachelor of Science degree in engineering, engineering technology, or related sciences should only be allowed to account for a maximum of eighteen months of responsible nuclear power plant experience. A Bachelor of Science degree in an area other than engineering, engineering technology, or related sciences should only be credited for a maximum of eighteen months if at least 80 semester hours (college credits) are in engineering, mathematics, chemistry, or physics. Applicants for an SO position who do not hold a bachelor's degree in engineering or the equivalent should have held an operator's license and should have been actively involved in the performance of licensed duties for at least one year at a commercial power reactor facility of the same vendor, or have 1.5 years at a comparable or non-comparable commercial power reactor facility, or have at least two years of military experience in a position equivalent to a licensed reactor operator.

#### **1.5 Section 4.4.2, Senior Operator Limited to Fuel Handling**

An applicant for a senior operator limited to fuel handling (Limited Senior Reactor Operator) LSRO license should have three years of responsible power plant experience that includes active participation in at least one refueling outage at the site for which a license is sought or at a similar facility. The applicant should also have six months of experience at the site for which the LSRO license is sought or at a similar facility owned by the same facility licensee.

#### **1.6 Section 4.5.1, Reactor Operator**

An applicant for a reactor operator (RO) license should have three years of power plant experience. An applicant should have at least six months as a non-licensed operator at the plant for which an applicant seeks a license, or twelve months as a non-licensed operator at a comparable facility (BWR/PWR), or eighteen months as a non-licensed operator at a non-comparable facility, or six months as a qualified reactor operator at a comparable facility, or nine months experience at a non-comparable facility, or two years in a position equivalent to a reactor operator at a military reactor.

#### **1.7 Section 4.5.2, Operator**

Minimum qualifications, education, experience and training – are specified in the facility licensee's "systematic approach to training" program. Non-licensed operators who complete an accredited initial training program (qualified for all power block and system systems operational duties) may be considered to meet the minimum power plant experience and/or nuclear power plant experience requirement for power plant experience based on qualifying for the Operator position.



## D. IMPLEMENTATION

The purpose of this section is to provide information on how applicants and licensees<sup>1</sup> may use this guide and information regarding the NRC's plans for using this regulatory guide. In addition, it describes how the NRC staff complies with 10 CFR 50.109, "Backfitting" and any applicable finality provisions in 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

### Use by Applicants and Licensees

Applicants and licensees may voluntarily<sup>2</sup> use the guidance in this document to demonstrate compliance with the underlying NRC regulations. Methods or solutions that differ from those described in this regulatory guide may be deemed acceptable if they provide sufficient basis and information for the NRC staff to verify that the proposed alternative demonstrates compliance with the appropriate NRC regulations. Current licensees may continue to use guidance the NRC found acceptable for complying with the identified regulations as long as their current licensing basis remains unchanged.

Licensees may use the information in this regulatory guide for actions which do not require NRC review and approval such as changes to a facility design under 10 CFR 50.59, "Changes, Tests, and Experiments." Licensees may use the information in this regulatory guide or applicable parts to resolve regulatory or inspection issues.

### Use by NRC Staff

The NRC staff does not intend or approve any imposition or backfitting of the guidance in this regulatory guide. The NRC staff does not expect any existing licensee to use or commit to using the guidance in this regulatory guide, unless the licensee makes a change to its licensing basis. The NRC staff does not expect or plan to request licensees to voluntarily adopt this regulatory guide to resolve a generic regulatory issue. The NRC staff does not expect or plan to initiate NRC regulatory action which would require the use of this regulatory guide. Examples of such unplanned NRC regulatory actions include issuance of an order requiring the use of this regulatory guide, requests for information under 10 CFR 50.54(f) as to whether a licensee intends to commit to the use of this regulatory guide, generic communication, or promulgation of a rule requiring the use of this regulatory guide without further backfit consideration.

During regulatory discussions on plant specific operational issues, the staff may discuss with licensees various actions consistent with staff positions in this regulatory guide, as one acceptable means of meeting the underlying NRC regulatory requirement. Such discussions would not ordinarily be considered backfitting even if prior versions of this regulatory guide are part of the licensing basis of the facility. However, unless this regulatory guide is part of the licensing basis for a facility, the staff may not represent to the licensee that the licensee's failure to comply with the positions in this regulatory guide constitutes a violation.

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<sup>1</sup> In this section, "licensees" refers to licensees of nuclear power plants under 10 CFR Parts 50 and 52; and the term "applicants," refers to applicants for licenses and permits for (or relating to) nuclear power plants under 10 CFR Parts 50 and 52, and applicants for standard design approvals and standard design certifications under 10 CFR Part 52.

<sup>2</sup> In this section, "voluntary" and "voluntarily" means that the licensee is seeking the action of its own accord, without the force of a legally binding requirement or an NRC representation of further licensing or enforcement action.

If an existing licensee voluntarily seeks a license amendment or change and (1) the NRC staff's consideration of the request involves a regulatory issue directly relevant to this new or revised regulatory guide and (2) the specific subject matter of this regulatory guide is an essential consideration in the staff's determination of the acceptability of the licensee's request, then the staff may request that the licensee either follow the guidance in this regulatory guide or provide an equivalent alternative process that demonstrates compliance with the underlying NRC regulatory requirements. This is not considered backfitting as defined in 10 CFR 50.109(a)(1) or a violation of any of the issue finality provisions in 10 CFR Part 52.

Additionally, an existing applicant may be required to comply with new rules, orders, or guidance if 10 CFR 50.109(a)(3) applies.

If a licensee believes that the NRC is either using this RG or requesting or requiring the licensee to implement the methods or processes in this RG in a manner inconsistent with the discussion in this Implementation section, then the licensee may file a backfit appeal with the NRC in accordance with the guidance in NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection" (Ref. 29), and in NUREG-1409, "Backfitting Guidelines" (Ref. 30).

## REFERENCES<sup>3</sup>

1. *U.S. Code of Federal Regulations (CFR)*, “Domestic Licensing of Production and Utilization Facilities,” Part 50, Chapter 1, Title 10, “Energy.”
2. CFR, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” Part 52, Chapter I, Title 10, “Energy.”
3. CFR, “Operators’ Licenses,” Part 55, Chapter 1, Title 10, “Energy.”
4. U.S. Nuclear Regulatory Commission (NRC), NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition.”
5. American National Standards Institute/American Nuclear Society (ANSI/ANS), “Selection, Qualification, and Training of Personnel for Nuclear Power Plants,” ANSI/ANS 3.1-2014, LaGrange Park, IL.<sup>4</sup>
6. ANSI, “Selection and Training of Nuclear Power Plant Personnel,” ANSI 18.1-1971, LaGrange Park, IL.
7. NRC, Regulatory Guide (RG) 1.8, “Qualification and Training of Personnel for Nuclear Power Plants,” Revision 1971 [Revision 0].
8. NRC, RG 1.8, “Qualification and Training of Personnel for Nuclear Power Plants,” Revision 1, Washington D.C.
9. ANSI/ANS, “Selection, Qualification, and Training of Personnel for Nuclear Power Plants,” ANSI/ANS 3.1 1978, LaGrange Park, IL.
10. ANSI/ANS, “Selection, Qualification, and Training of Personnel for Nuclear Power Plants,” ANSI/ANS 3.1-1981, LaGrange Park, IL.
11. NRC, RG 1.8, “Qualification and Training of Personnel for Nuclear Power Plants,” Revision 2, Washington D.C.
12. ANSI/ANS, “Selection, Qualification, and Training of Personnel for Nuclear Power Plants,” ANSI/ANS 3.1 1987, LaGrange Park, IL.

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<sup>3</sup> Publicly available NRC published documents are available electronically through the NRC Library under Document Collections on the NRC’s public Web site 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>. The documents can also be viewed online or printed for a fee in the NRC’s Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD. For problems with ADAMS, contact the PDR staff at 301-415-4737 or (800) 397-4209; fax (301) 415-3548; or e-mail [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov).

<sup>4</sup> Copies of American Nuclear Society (ANS) standards may be purchased from the ANS Web site (<http://www.new.ans.org/store/>); or by writing to: American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60526, U.S.A., Telephone 800-323-3044.

13. NRC, "Commission Policy Statement on Training and Qualifications of Nuclear Power Plant Personnel" March 20, 1985, Washington D.C. (50 FR 11147)<sup>5</sup>.
14. NRC, "Policy Statement on Engineering Expertise on Shift," October 28, 1985, Washington D.C. (50 FR 43621).
15. NRC, NUREG-0737, "Clarification of TMI Action Plan Requirements," Washington D.C.
16. American Nuclear Society, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants," ANSI/ANS 3.1-1993, LaGrange Park, IL.
17. NRC, Draft Guide DG-1012, "Qualification and Training of Personnel for Nuclear Power Plants," Washington D.C.
18. NRC, DG-1084, "Qualification and Training of Personnel for Nuclear Power Plants," Washington D.C.
19. NRC, RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," Revision 3, Washington D.C.
20. International Atomic Energy Agency (IAEA), "Competency Assessments For Nuclear Industry Personnel," IAEA Publication 1236, IAEA, Vienna, Austria.<sup>6</sup>
21. IAEA, NS-G-2.8, "Recruitment, Qualification and Training of Personnel for Nuclear Power Plants," IAEA, Vienna, Austria, 2002.
22. IAEA TECDOC-1024, "Selection, Competency Development And Assessment of Nuclear Power Plant Managers," IAEA, Vienna, Austria., 1998.
23. IAEA TECDOC-1052 "Nuclear Power Plant Organization and Staffing for Improved Performance: Lessons Learned," IAEA, Vienna, Austria, 1998.
24. IAEA TECDOC-1057 "Experience in the Use of Systematic Approach to Training (SAT) for Nuclear Power Plant Personnel," IAEA, Vienna, Austria, 1999.
25. IAEA TECDOC-1170 "Analysis Phase of Systematic Approach to Training (SAT) for Nuclear Plant Personnel," IAEA, Vienna, Austria, 2000.
26. IAEA TECDOC-1232 "Assuring the Competence of Nuclear Power Plant Contractor Personnel," IAEA, Vienna, Austria, 2001.
27. IAEA TECDOC 1358, "Means of Evaluating and Improving the Effectiveness of Training of Nuclear Power Plant Personnel."

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<sup>5</sup> Copies of the Federal Register Notices are available electronically through the U.S. Government Printing Office web site at <http://www.gpo.gov/fdsys>.

<sup>6</sup> Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their Web site: [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.

28. IAEA TECDOC 1392, "Development of Instructors for Nuclear Power Plant Personnel Training."
29. NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection."
30. NRC, NUREG-1409, "Backfitting Guidelines," Washington, DC.