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DRAFT REGULATORY GUIDE DG-1235

(Proposed Revision 1 of Regulatory Guide 1.73*, dated January 1974)*

QUALIFICATION TESTS ~~OF ELECTRIC VALVE OPERATORS INSTALLED INSIDE THE CONTAINMENT OF~~FOR SAFETY-RELATED ACTUATORS IN NUCLEAR POWER PLANTS

A. INTRODUCTION

~~Section~~

This guide describes a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for complying with the Commission's regulations for the environmental qualification of safety-related power-operated valve actuators in nuclear power plants.

The regulations established by the NRC in Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," of the *Code of Federal Regulations* (10 CFR Part 50) (Ref. 1), require that structures, systems, and components (SSCs) important to safety in a nuclear power plant be designed to accommodate the effects of environmental conditions (i.e., they must remain functional under postulated design-basis events (DBE)).

General Design Criterion (GDC) 1, "Quality Standards and Records," GDC 2, "Design Bases for Protection against Natural Phenomena," GDC 4, "Environmental and Dynamic Effects Design Bases," and GDC 23, "Protection System Failure Modes," of Appendix A, "General Design

Criteria for Nuclear Power Plants," to 10 CFR Part 50, contain general requirements to provide reasonable assurance that SSCs are designed to accommodate the effects of environmental conditions. Augmenting the above mentioned general requirements are specific requirements pertaining to qualification of certain electrical equipment important to safety in harsh environments found in 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants." In addition, Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, ~~"Licensing of Production and Utilization Facilities,"~~ requires that, ~~where~~**when** a test program is used to verify the adequacy of a specific design feature, ~~it~~**the test program must** include suitable qualification testing of a prototype unit under the most adverse design conditions. ~~This regulatory guide describes a method acceptable to the Regulatory staff for complying with the Commission's regulations with regard to qualification testing of Class I electric valve operators for service within the containment of light-water-cooled and gas-cooled nuclear power plants to assure that the valve operator design will meet its performance requirements. The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.~~ **Additionally, in accordance with 10 CFR 52.48, "Standards for Review of Applications," these GDC and quality assurance criteria also apply to nuclear power reactor licenses issued under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants" (Ref. 2).**

This regulatory guide (RG) endorses the Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) Std. 382-2006, "IEEE Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations," issued in March 2007 (Ref. 3), with the exceptions stated in the staff regulatory guidance.

The NRC issues regulatory guides 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 accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations, and compliance with them is not required.

This RG contains information collection requirements covered by 10 CFR Part 50 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0011. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number. This regulatory guide is a rule as designated in the Congressional Review Act (5 U.S.C. 801-808). However, OMB has not found it to be a major rule as designated in the Congressional Review Act.

B. DISCUSSION

~~IEEE Std 382~~

Reason for Change

Regulatory Guide 1.73, "Qualification Tests of Electric Valve Operators Installed Inside the Containment of Nuclear Power Plants," was originally issued in January 1974 to endorse IEEE Std. 382-1972, "IEEE Trial-Use Guide for Type Test[1] of Class I Electric Valve Operators for Nuclear Power Generating Stations~~," dated April 10, 1973,[2] (also designated ANSI N41.6) was prepared by~~ **" (Ref. 4). The IEEE standard was revised in 1985, again in 1996, and, most recently, in 2006.**

[1] ~~As used in this regulatory guide, the team "qualification test" and the term "type test" as defined in IEEE Std 382-1972 are synonymous.~~

[2] ~~This regulatory guide applies only to the version of IEEE Std 382-1972 dated April 10, 1973.~~

However this regulatory guide has not been updated since its original issue. This revision updates the RG to endorse the current version of IEEE Std. 382-2006, "Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations," with certain modifications.

Background

IEEE Std. 382-2006, was published on March 15, 2007. It was developed by the Subcommittee~~, Equipment~~ **on** Qualification~~,~~ **(SC 2.3)** of the IEEE ~~Joint~~**Nuclear Power Engineering** Committee ~~on Nuclear Power~~ **and approved by the IEEE** Standards ~~of the Institute of Electrical and Electronics Engineers, Inc.~~**Association** (IEEE~~) and subsequently was approved by the IEEE Standards Committee~~ **SA)** on ~~September 20, 1972~~**December 6, 2006**. The standard ~~delineates specific procedures~~**establishes criteria** for the qualification ~~testing of Class I electric valve operators~~**of safety-related actuators and actuator components,** to demonstrate ~~design adequacy for service within the containment of a nuclear power plant. The procedure provides for~~ **with reasonable assurance that safety-related actuators for which a qualified life or condition has been established can perform their safety function(s) without common-cause failures before, during, and after applicable design basis events. Safety-related actuators and their interfaces must meet or exceed the equipment specification requirements. The standard specifies procedures for** testing under conditions ~~simulating~~**that simulate** (1) those that would be imposed during and after a design basis loss-of-coolant accident and (2) those occurring during normal operating conditions.

~~The standard specifies procedures for accomplishing accelerated aging of components to simulate the effects of long-term operation under normal operating conditions. These effects include exposure to nuclear radiation, temperature, pressure, humidity, and chemical sprays. The standard also includes procedures for accomplishing accelerated aging due to wear under rated load conditions for the estimated number of operating cycles over a 40-year period or for 500 operating cycles, whichever is larger.~~

~~C. REGULATORY POSITION~~

~~The procedures specified by IEEE Std 382-1972, "IEEE Trial-Use Guide for Type Test of Class I Electric Valve Operators for Nuclear Power Generating Stations,"[3] dated April 10, 1973, for conducting qualification tests of electric valve operators for service inside the containment vessel of water-cooled and gas-cooled nuclear power plants are generally acceptable and provide an adequate basis for complying with the qualification testing requirements of Section III~~

Section 1.2 of IEEE Std. 382-2006 references IEEE Std. 323-2003, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations" (Ref. 5) which provides guidance for demonstrating the qualification of safety-related equipment including components of any interface whose failure could adversely affect the performance of safety-related systems and electric equipment. Revision 1 of RG 1.89, "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants" (Ref. 6) endorses, in part, IEEE Std. 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations" (Ref. 7) and is generally used by the nuclear industry to qualify safety-related (Class 1E) electrical equipment located in a harsh environment, non-safety related equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of certain safety functions, and for certain post-accident monitoring equipment for satisfying the requirements in 10 CFR 50.49. IEEE Std. 323-1974 may also be used for the qualification of equipment in mild environments. The testing and documentation requirements are, however, more rigorous for equipment in a harsh environment.

~~[3] Copies may be obtained from the Institute of Electrical and Electronics Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.~~

In RG 1.100, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants," (Ref. 8) the NRC staff describes methods considered acceptable in the seismic qualification of electrical and active mechanical equipment and the functional qualification of active mechanical equipment for nuclear power plants. In RG 1.100, the NRC staff accepts the use of IEEE Std 344-2004, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," (Ref. 9) and the American Society of Mechanical Engineers (ASME) Standard QME-1-2007, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plant," (Ref. 10) with specific conditions.

ASME Standard QME-1-2007 incorporates lessons learned from valve operating experience and research programs for the qualification of power-operated valves used in nuclear power plants. For example, ASME QME-1-2007 includes more stringent provisions for the functional qualification of power-operated valves regarding acceptable qualification methods, actuator grouping, actuator output capability testing, and extrapolation of actuator qualification than specified in IEEE Std. 382-2006. ASME QME-1-2007 specifies the seismic qualification of valve assemblies in accordance with IEEE Std. 344-2004 as addressed in RG 1.100 or as described in that ASME standard.

ASME QME-1-2007 specifies the environmental qualification of valve actuators in accordance with IEEE Std. 323-1983, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," (Ref. 11) and IEEE Std. 382-1985, "Standard for Qualification of Actuators for Power-Operated Valve Assemblies with Safety-Related Functions for Nuclear Power Plants" (Ref. 12). The NRC staff however, accepts the use of IEEE Std. 382-2006 for the environmental qualification of power-operated valve actuators in nuclear power plants subject to the provisions of this regulatory guide. In this regulatory guide, environmental qualification includes such activities as aging (e.g., thermal, cycling, radiation, and vibration), pressurization cycle testing, radiation exposure testing, and ambient condition testing (e.g., temperature, pressure, moisture, and spray environment). The users of IEEE Std. 382-2006 will need to address the other aspects of the qualification process (such as seismic and functional qualification) for power-operated valves through the guidance in RG 1.100.

Other Codes and Standards

This regulatory guide endorses the use of one or more voluntary consensus codes or standards developed by external organizations. These codes or standards may contain references to other codes or standards. These references should be considered individually. If a referenced standard has been incorporated separately into NRC regulations, licensees and applicants must comply with that standard as set forth in the regulation. If the referenced standard has been endorsed in a regulatory guide, the standard constitutes a method acceptable to the NRC staff for meeting a regulatory requirement as described in the specific regulatory guide. If a referenced standard has been neither incorporated into NRC regulations, nor endorsed in a regulatory guide, licensees and applicants may consider and use the information in the referenced standard, if appropriately justified and consistent with current regulatory practice.

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 are international standards to help users striving to achieve high levels of safety. Pertinent to this regulatory guide, IAEA Safety Reports Series No. 3, "Equipment Qualification in

Operational Nuclear Power Plats: Upgrading, Preserving, and Reviewing" issued April 1998 (Ref. 13) addresses environmental qualification of equipment important to safety in nuclear power plants. This regulatory guide incorporates similar environmental qualification recommendations and is consistent with the basic safety principles provided in IAEA Safety Report Series No. 3.

Additionally, this regulatory guide endorses, in whole or in part, international voluntary consensus standards produced by international organizations such as the IEEE.

The IEEE is a nonprofit professional association dedicated to advancing technological innovation and excellence. It has more than 400,000 members in more than 160 countries and produces 30 percent of the world's literature in the electrical and electronics engineering and computer science fields, including multiple tutorials and standards produced by its standardization committees.

Endorsement of international vonuntary concensus standards, in whole or in part, reduces the need for the development of unique NRC standards and is consistent with the agency goal of improved harmonization with international organizations.

C. STAFF REGULATORY GUIDANCE

The guidance in IEEE Std. 382-2006 provides an acceptable approach to the NRC for meeting the agency's regulatory requirements for environmental qualification of safety-related power-operated valve actuators in nuclear power plants with the exceptions and additions listed in these regulatory positions. The guidance also provides an adequate basis for complying with the qualification testing requirements of Criterion III, "Design Control" of Appendix B to 10 CFR Part 50 to verify adequacy of design for service under design basis event conditions~~, subject to the following:~~**.**

1. The NRC staff considers the guidance in IEEE Std. 382-2006 as an acceptable method for the environmental qualification of valve actuators as part of the qualification process for power-operated valves described in RG 1.100. The users of IEEE Std. 382-2006 need to address the other aspects of the qualification process (such as seismic and functional qualification) for power-operated valves as described in RG 1.100.

~~1.~~**2.** To the extent ~~practicable~~**practical**, auxiliary equipment (e.g., limit switches) that is not integral with the ~~valve operator~~**actuator** mechanism but will be part of the installed ~~valve operator~~**actuator** assembly should be tested in accordance with the subject standard.

~~1. The test sequence described in Section 4.5.2 of the standard should be used unless the anticipated actual service operating sequence for the valve operator is expected to create a more severe operating condition than described in Section 4.5.2. In such case, the actual service sequence should be used in the test.~~

~~2. To assure that the valve operator is tested under an environment of sufficient severity, the magnitude of the environmental conditions (e.g., temperature, pressure, radiation, humidity) that simulate the conditions to which the valve operator is expected to be exposed during and following a design basis accident (Section 4.4, second paragraph) should be based on conservative calculations.~~

~~2.~~**3.** The radiological source term for qualification tests in a nuclear radiation environment should be based on the same source term used in ~~Regulatory Guide 1.7 (Safety Guide 7), "Control, of~~

~~Combustible Gas Concentrations in Containment Following a Loss of Coolant Accident," for BWRs and PWRs. An equivalent source term (i.e., 100% of the noble gases, 50% of the halogens, and 1% of the remaining solids developed from maximum full-power operation of the core) should be used for HTGRs.~~**RG 1.89.** The containment size should be taken into account in each case. For exposed organic materials, calculations should take into account both beta and gamma radiation.

~~3. Qualification testing for gas-cooled reactor (HTGR) components should follow the written description in Section 4 of IEEE Std 382-1972 through at least two environmental transients of the temperature profiles depicted in Figures 2 and 3 of IEEE Std 382-1972.~~

~~Part I, Section 6, "Standard References," of IEEE Std 382-1972, dated April 10, 1972~~

4. The applicants and licensees should perform qualification of safety-related actuators by using the guidance put forward in RG 1.89, that includes type testing, operating experience, analysis as a supplement to type testing and operating experience, ongoing qualification, or any combination thereof. Nonetheless, the preferred method of qualification is type testing, because other methods may be based on older or dissimilar equipment that may not be comparable to the equipment being qualified.

5. Section 2, "Normative References," of IEEE Std. 382-2006, lists additional applicable IEEE Standards. The specific applicability or acceptability of these referenced standards has been or will be covered separately in other regulatory guides, where appropriate.

6. The qualification criteria described in Section 6, "Qualification Testing of Selected Actuators in Generic Actuator Group," and Section 7, "Qualification of Actuator for Specific Application," of IEEE Std. 382-2006 should be used to qualify actuators in generic and specific applications, respectively, unless the anticipated actual service operating sequence for the actuator is expected to create a more severe operating condition than described in Section 6.3.2, "Test Sequence and Requirements." In such case, the actual service sequence should be used in the test.

7. The documentation requirements to determine the level of qualification of actuators intended for generic or specific applications should conform to Section 8, "Documentation," of IEEE Std 382-2006.

8. Section 12.3, "Test Conduct," of IEEE 382-2006 provides a representative number of cycles for the valve application. The applicant or licensee will be responsible for qualifying the actuator for its qualified life including its design cycles as specified in the design requirements for new nuclear power plants or plants receiving license renewal for extension, such as 60 years.

9. Section 14, "Vibration Aging Test," of IEEE 382-2006 states that the vibration aging test is intended to provide a vibratory environment that is representative of normal plant induced vibration including system operating transients and other dynamic vibratory environments. The environmental qualification for power-operated valves should also address flow-induced vibration caused by acoustic resonance and hydraulic loading in the reactor, steam, and feed-water systems.

10. To assure that the actuator is tested under an environment of sufficient severity, the magnitude of the environmental conditions (e.g., temperature, pressure, radiation, humidity) that simulate the conditions to which the actuator is expected to be exposed

during and following a design basis event (Section 17, "DBE environment test" of IEEE Std. 382-2006) should be based on conservative calculations. The equipment needs to be qualified for the duration of its operational performance requirement for each applicable design basis event condition, including any required post design basis event operability period.

D. IMPLEMENTATION

The purpose of this section is to provide information on how applicants and licensees[4] may use this guide and information about the NRC's plans for using this regulatory guide. In addition, it describes how the 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[5] 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 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 in the past to comply with the identified regulations, as long as their current licensing basis remains unchanged.

Licensees may use the information in this regulatory guide for actions that 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.

This regulatory guide is not being imposed upon current licensees and may be voluntarily used by existing licensees.

If a licensee believes that the NRC either is using this regulatory guide or requesting or requiring the licensee to implement the methods or processes in this regulatory guide 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 NUREG-1409, "Backfitting Guidelines," (Ref. 14) and the NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection" (Ref. 15).

Use by NRC Staff

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

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4 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.

5 In this section, "voluntary" and "voluntarily" mean 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.

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.

If an existing licensee voluntarily seeks a license amendment or change and (1) the 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 action is not considered backfitting as defined in §50.109(a)(1) or a violation of any of the issue finality provisions in 10 CFR Part 52.

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

Additionally, an existing applicant may be required to adhere to new rules, orders, or guidance if §50.109(a)(3) applies.

REFERENCES[6]

1. Code of Federal Regulations (CFR), *Title 10, Energy*, Part 50, "Domestic Licensing of Production and Utilization Facilities"

2. CFR, *Title 10, Energy*, Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants"

3. Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 382-2006, "Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations," IEEE, Piscataway, NJ, 2007.[7]

4. IEEE Std. 382-1972, "IEEE Trial-Use Guide for Type Test of Class I Electric Valve Operators for Nuclear Power Generating Stations," IEEE, Piscataway, NJ, 1972. (ADAMS Accession No. ML032200228).

5. IEEE Std. 323-2003, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," IEEE, Piscataway, NJ, 2003.

6. NRC, RG 1.89, "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants," Revision 1, NRC, Washington, DC. (ADAMS Accession No. ML003740271).

7. IEEE Std. 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations" IEEE, Piscataway, NJ, 1974 (ADAMS Accession No. ML032200206).

8. NRC, RG 1.100, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants," NRC, Washington, DC.

9. IEEE Std. 344-2004, "Recommended Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," IEEE, Piscataway, NJ, 2004.

10. American Society of Mechanical Engineers (ASME) Standard QME-1-2007, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plant," New York, NY.[8]

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6 Publicly available NRC published documents can be accessed electronically through the NRC Library on the NRC's public Web site at: http://www.nrc.gov/reading-rm/doc-collections/. The documents also can be viewed online or printed for a fee in the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD. The mailing address is USNRC PDR, Washington, DC 20555; telephone 301-415-4737 or 800-397-4209; fax 301-415-3548; and e-mail pdr.resource@nrc.gov.

7 Copies of Institute of Electrical and Electronics Engineers (IEEE) documents may be purchased from the IEEE Service Center, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855 or through IEEE's public Web site at http://www.ieee.org/publications_standards/index.html.

8 Copies of American Society of Mechanical Engineers (ASME) standards may be purchased from ASME, Three Park Avenue, New York, New York 10016-5990; Telephone 800-843-2763. Purchase information is available through the ASME Web site store at http://www.asme.org/Codes/Publications/.

11. IEEE Std. 323-1983, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," IEEE, Piscataway, NJ. 1983 (ADAMS Accession No. ML031600727)

12. IEEE Std. 382-1985, "Standard for Qualification of Actuators for Power-Operated Valve Assemblies with Safety-Related Functions for Nuclear Power Plants," IEEE, Piscataway, NJ. 1985.

13. International Atomic Energy Association (IAEA) Safety Reports Series No. 3, "Equipment Qualification in Operational Nuclear Power Plats: Upgrading, Preserving, and Reviewing" issued April 1998, Vienna, Austria, 2003.[9]

14. NRC, NUREG-1409, "Backfitting Guidelines," NRC, Washington, DC. (ADAMS Accession No. ML032230247)

15. NRC, Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection," NRC, Washington DC. (ADAMS Acession No. ML050110156)

9 Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their Web site: WWW.IAEA.Org/ or by writing the International Atomic Energy Agency P.O. Box 100 Wagramer Strasse 5, A-1400 Vienna, Austria. Telephone (+431) 2600-0, Fax (+431) 2600-7, or E-Mail at Official.Mail@IAEA.Org