

SUNI Review Complete
Template=ADM-013
E-RIDS=ADM-03

ADD: Michael Eudy, Mary
Neely
Comment (5)
Publication Date:
2/18/2021
CITATION: 86 FR 10133

As of: 4/20/21 8:41 AM Received: April 19, 2021 Status: Pending_Post Tracking No. knp-1s5t-ig3k Comments Due: April 19, 2021 Submission Type: Web
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PUBLIC SUBMISSION

Docket: NRC-2020-0245

Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants

Comment On: NRC-2020-0245-0007

Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants

Document: NRC-2020-0245-DRAFT-0013

Comment on FR Doc # 2021-03220

Submitter Information

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Organization: Nuclear Utility Group on Equipment Qualification

General Comment

See attached file(s)

Attachments

NUGEQ Comments on Draft Regulatory Guide 1.89 Rev 2 - April 19 - 2021

NUCLEAR UTILITY GROUP ON EQUIPMENT QUALIFICATION

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April 19, 2021

Mr. Meraj Rahimi, Chief
Regulatory Guidance and Generic Issues Branch
Division of Engineering
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subj: Comments and Bases for Comments by the *Nuclear Utility Group on Equipment Qualification* Regarding Draft Regulatory Guide, DG-1361, “Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants”

Dear Mr. Rahimi:

INTRODUCTION

The Nuclear Utility Group on Equipment Qualification (“NUGEQ” or “Group”)¹ hereby submits comments on the proposed Revision 2 to Regulatory Guide 1.89 (“RG 1.89 R2”), Draft Regulatory Guide, DG-1361, “Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants”, in accordance with the revised comment schedule authorized by the NRC in the *Federal Register* notice “Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants,” dated February 18, 2021. See 86 Fed.Reg. 10,133.

OVERVIEW

We first extend our appreciation to the NRC staff in providing additional time for the development of public comments. This guidance plays a significant role in the implementation

¹ The Group represents approximately 75% of the operating nuclear power plants in the United States. The Group was founded in 1981, as the NRC staff was evaluating and planning the ultimate promulgation of 10 CFR 50.49, “Environmental qualification of electric equipment important to safety for nuclear power plants.” Since its inception, the Group has been actively involved in the development and implementation of licensee EQ programs in accordance with NRC requirements and guidance. The Group most recently also was actively involved in the recent NRC DBA EQ program inspections and worked with licensees and the NRC in addressing implementation issues associated with those inspections.

of 10 CFR § 50.49 and any revisions warrant careful review. Second, we believe it is important to recognize the current staff's movement on the preparation of the updated Regulatory Guide - as such a revision had been discussed, but not implemented, for many years. Indeed, the discussion over such a long period focused on many areas for potential inclusion in the ultimate revision. Third, we recognize also the NRC staff's diligence in addressing many matters, including EQ licensing basis considerations during the EQ DBA inspections and updating the applicable guidance during the inspections.

From an industry perspective, we also feel it is important to have a regulatory endorsement of IEC/IEEE 60780-323:2016 ("dual logo" standard) as it relates to environmental qualification of electric equipment important to safety that is subject to the requirements of 10 CFR § 50.49.

In addition, we recognize the importance of public meetings in contexts such as this. As illustrated during the EQ DBA inspections, meetings between the NRC, licensees and their representatives, including the Group, and the public, were crucial in reaching an understanding on EQ issues and moving forward with the inspections. We believe this draft regulatory guide comment review process will also benefit from such meetings and we look forward to those sessions as well. We thank the staff for reaching out already to arrange an initial meeting.

Thus, in response to the request for comments, and in anticipation of public meetings on the revision process and results, we provide below highlights of the Group's detailed comments, attached hereto, as well as additional comments related to process, procedure, and other parameters for consideration in resolving public comments.

Accordingly, the topics below are offered as illustrations and we ask the NRC staff to consider these comments and the attached detailed comments, provided in Attachment 1, in moving forward with the proposed Revision 2 to RG 1.89 review process.

SELECT COMMENTS AND TOPICS RELATING TO NUGEO COMMENTS AND FOR DISCUSSION IN FUTURE PUBLIC MEETINGS

The NUGEQ comments themselves are structured by Topic Area (rather than a page-by-page approach) to facilitate a better understanding of the topics of particular interest and concern to the NUGEQ with the goal of enabling the NRC to look at these from a policy perspective. Each of the topics below present, for purposes of this letter, an example of multiple comments on the same topic in the attached detailed comments.

Regulatory Guide Scope (*Topic 1*): The scope and focus of the proposed revision to Regulatory Guide (RG) 1.89 (DG-1361) appears to have expanded the scope or terms of 10 CFR § 50.49 itself, beyond just describing another method acceptable to the staff for satisfying 10 CFR § 50.49, based on IEC/IEEE 60780-323 Edition 1.0: 2016. We urge the staff to maintain the focus of DG-1361 on guidance for satisfying 10 CFR § 50.49. Expansion into other regulatory arenas will result in inconsistency and confusion now (incomplete references) and in

the future as the positions in those other arenas change and the Reg Guide 1.89 guidance becomes out of date.

Example: The draft guide misinterprets the language of the governing regulation § 50.49. For instance, it incorrectly describes the scope of application to reach beyond the “design basis accident” conditions to cover environmental stressors from “design basis events.” Several parts of DG-1361 inappropriately use the term “design-basis events” to establish its scope in lieu of the proper scope of “design basis accidents” specified in 10 CFR §§ 50.49 (d)(1), (d)(2), (d)(3) and (e).

New Positions Constituting Potential Backfits Require Backfit/Forwardfit Evaluations

(Topic 2): DG-1361 contains multiple examples of regulatory positions that differ from RG 1.89, R1 positions on the same topic (in the direction of being more strict), and even some examples that simply differ from the language of 10 CFR 50.49. One or more of these changes may have been inadvertent. Or there may be additional specific elements that the NRC believes are additional expectations appropriate to describe. But as noted in the attached detailed comments, those positions are different from RG 1.89, R 1 positions. In such contexts, NRC processes and procedures noted below dictate an issue-by-issue evaluation of such differences and the implications from a backfit or forward fit perspective even where a guidance document is involved. This has not been done.

Management Directive 6.6, which contains internal NRC guidance on the development and processing of “Regulatory Guides,” dated May 2, 2016, addresses numerous expectations for the adoption of Regulatory Guides, noting in Section II.A.3., “Staff Regulatory Guidance,” that “new or changed positions in the staff regulatory guidance section are to be addressed in the [Reg Guide] implementation section.” Section II.A.4., “Implementation,” recognizes that while a backfit is not imposed simply by issuing a revised Regulatory Guide,

“in some revisions, the staff position is presenting information in a new or different fashion from the previously applicable staff position. In these cases, the difference between the current staff position and the proposed staff position (or the newly written staff position) should be considered and the rationale for consideration of the backfit rule should be summarized.”

Regardless of the anticipated status of the new, changed position vis a vis the backfit rule, the provision in MD 6.6 for an **explanation of the rationale** for each changed position’s backfitting posture should still be followed.² DG-1361, Implementation section, presents no such analysis.

Further, the backfit rule, 10 CFR § 50.109, applies to the NRC staff. It establishes obligations and regulatory analysis obligations **on the NRC**, not the licensee. While a licensee may appeal a staff action, and mention in the Implementation section of that right is proper, it is the staff’s obligation to conduct the assessment of backfit implications first, which would include the

² See also “Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests,” and the Directive Handbook, DH 8.4, September 20, 2019.

analyses directed by staff internal guidance. DG-1361 does not reflect adherence to those NRC obligations.

Notably, the Commission and NRC Staff have made efforts over the last several years to present even further comprehensive measures to improve the backfitting process. Indeed, NRC guidance just updated (though waiting final approval) presents the result of extensive collaboration between the NRC (at all levels) and stakeholders representing the industry and public. This has produced even more comprehensive backfitting and forwardfitting guidance for use by the NRC and affected parties. *See* NUREG-1409, Rev. 1, “Backfitting Guidelines Final Report,” transmitted to the Commission by SECY-21-0037, “NUREG-1409, “Backfitting Guidelines,” March 31, 2021. Without analyzing its application specifically here, we observe that guidance relevant to the issues raised here with respect to DG-1361 is presented in NUREG-1409, for instance, in both Section 5.2.3, “Guidance Documents,” and Section 5.2.3.1, “Regulatory Guides.”

Finally, we urge the NRC to clarify the applicability of DG-1361 provisions to current licensees, current and future applicants, and Part 50 and Part 52 licensing entities. Evaluation of such uncertainty,³ when included in the analysis dictated by NRC internal guidance we note here, would be essential for future clarity of DG-1361 application by the NRC as well as applicants/licensees.

Applicability to Different Facilities (*Topic 3*): The proposed revision to RG 1.89 needs to be organized in a manner that clearly differentiates the guidance related to Part 52 plants from the guidance related to Part 50 plants. The NUGAQ recognizes that 10 CFR § 50.49 (a) sets forth the applicability of the regulation to both Part 50 and Part 52 facilities. However, there are topics addressed in the proposed revision that may only relate to one or the other Part, yet the discussion is not clear in that regard.

Example: The proposed change to the guidance and Appendix D, “Qualification in the Radiation Environment” regarding the use of alternate source term (AST) is an example where the DG is primarily focused on Part 52 plants. While the DG does recognize RG 1.183, “Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors,” it does not recognize that Part 50 plants continue to use radiological source terms for EQ that are based on TID-14844, “Calculation of Distance Factors for Power and Test Reactors.”

Anticipated Industry/NRC EQ Guidance Areas (*Topic 4*): The proposed revision does not include or reflect consideration of burden reduction topics that the staff deferred to a future revision of RG 1.89.

³ The Federal Register notice of DG-1361’s issuance indicates it both “applies” to Part 50 licensees and applicants, and yet those entities also are “not required” to comply. *See* 85 Fed. Reg 81958-59 (December 17, 2020). Further, the Applicability section of DG-1361, says it applies to “licensees and applicants” and “holders of or an applicant for [a] Part 50] operating license.”

Example: In 2004, the NRC responded to many questions posed by NUGEQ in the spirit of ongoing and developing efforts in arenas related to industry and NRC efforts to focus the application of regulations to reduce licensee regulatory burden, consider risk-informed application of requirements, eliminate inconsistent application of regulations with the ultimate goal of assuring safety while reducing costs. Although the staff was interested in those topics, they took the position that many of the topics could be dealt with in other contexts, citing the future revision of Regulatory Guide 1.89 as one path. The NUGEQ identifies some of those topics and believes that those actions could be achievable under existing regulatory direction without license amendments (e.g., application of 10 CFR 50.59, or application of existing guidance). The Group would like to see such positions referenced in DG-1361, perhaps in an Appendix.

Completeness of EQ Regulatory References (*Topic 5 – Limited⁴ Meeting Discussion*): The proposed revision does not currently address or reflect all of the relevant regulatory guidance or regulations related to 10 CFR § 50.49.

Example: 10 CFR § 50.69, “Risk-Informed categorization and treatment of structures, systems and components for nuclear power reactors” is an example of a regulation that is not addressed but is relevant to the guidance in DG-1361.

Miscellaneous and Editorial (*Topics 6 and 7 – Limited Meeting Discussion*):

Several comments fall into the above categories and are set forth in those sections of the comments.

PROGRAMMATIC LESSONS-LEARNED - APPLICATION GOING FORWARD

Finally, there is a matter not directly tied to the comments on the Regulatory Guide, but certainly tied to its value in the regulatory process going forward. The guidance ultimately set forth in the Regulatory Guide 1.89, Rev. 2, will be considered both by applicants, licensees, and the NRC staff, in every step of the licensing and operations processes. We believe that one of the most significant set of findings for those processes was set forth in a NRC memorandum in the follow-up to the DBA EQ inspections. Those findings relate to the need for preparation in the review and inspection process for EQ understanding (and would apply in other disciplines, of course).

We urge documented recognition and direction for consideration in the applicable processes of that NRC lessons-learned memorandum. Specifically, these lessons learned are set forth in the NRC Memorandum to Ho K. Nieh, Dir. NRR, from C.G.Miller, Dir. Div. Inspection and Regional Support, thru E.J.Benner, Dir. Div.Eng, entitled “*Programmatic Lessons Learned from Environmental Qualification Inspections*,” dated August 9, 2019 (ML19183A063). That

⁴ Lower priority for initial discussions.

Nuclear Utility Group on Equipment Qualification

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document reflects a sound assessment of what is needed to assure an understanding of the EQ discipline, and its value cannot be underestimated in guiding the ultimately smooth application of the implementation and review of this discipline going forward.

Respectfully submitted,

William A. Horin

William A. Horin, Winston & Strawn

Counsel to the Nuclear Utility Group on Equipment Qualification

Attachment

Cc: Mr. Matthew McConnell, Nuclear Reactor Regulation
Mr. Michael Eudy, Nuclear Regulatory Research

Reviewed Document: U.S. NRC Draft Regulatory Guide DG-1361, “Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants,” Issued December 2020

Docket ID: NRC-2020-0245

Reviewer: Nuclear Utility Group on Equipment Qualification (NUGEQ)

High Level Observations on DG-1361

- The scope and focus of the proposed revision to RG 1.89 extends beyond an approved method of meeting 10CFR50.49 requirements.
- There are new or revised staff positions constituting potential backfit/forward fit which need further evaluation.
- The proposed revision to RG 1.89 could be enhanced by clearly distinguishing guidance related to Part 50 and Part 52 plants.
- The proposed revision does not include or reflect consideration of burden reduction topics that the staff deferred to a future revision of RG 1.89.
- The cited EQ regulatory references in the proposed revision are incomplete.
- In its current form, there is little to no incentive or advantage for the existing fleet of Part 50 plants to adopt the dual logo standard as endorsed by DG-1361 at the plant or component level.

NUGEQ comments are presented within the following topical areas:

- Topic 1 Scope and Focus of Proposed Revision to RG 1.89
- Topic 2 New or Revised Staff Positions Warranting Further Evaluation
- Topic 3 Need to Distinguish Between Guidance related to Part 52 plants from the Guidance related to Part 50 plants
- Topic 4 Failure to Include or Consider Deferred Burden Reduction Topics
- Topic 5 Proposed Changes or lack of changes to the Appendices of RG 1.89
- Topic 6 Miscellaneous Comments
- Topic 7 Editorial Comments

Since the current NUGEQ membership is composed of Part 50 licensees, the focus of our review is primarily related to the effect of DG-1361 on the licensing bases for Part 50 plants. Our Part 52 comments are not the results of a comprehensive review.

NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 1		Scope and Focus of Proposed Revision to RG 1.89			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
1.1	O	General Observation		<p>There are several examples of where DG-1361 goes beyond the scope of providing another acceptable method of complying with 10CFR50.49.</p> <p>For specific examples, see Comments 1.2 through 1.5.</p>	<p>Consistency with the stated objective in Section 2 of the Regulatory Analysis for DG-1361, which states;</p> <p><i>The objective of this regulatory action is to access the need to revise NRC guidance and provide applicants with an updated method to demonstrate compliance with 10 CFR 50.49, "Environmental qualifications of electric equipment important to safety for nuclear power plants."</i></p> <p>Keeping RG 1.89 specific to an acceptable method of meeting 10CFR50.49 also results in consistency with RG 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants."</p>

Note 1: Codes for Types of Comments - (E) = Editorial (C) = Comment, (Q) = Question, (O) = Observation

NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 1		Scope and Focus of Proposed Revision to RG 1.89			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
1.2	C	Section C.1.e / 11	<p>Paragraph 4 of Section 5.1 of IEC/IEEE Std. 60780-323, Edition 1, 2016-02, notes that “Requirements, including EMC [Electromagnetic Compatibility], environmental/operational ageing and seismic requirements shall be specified in the design/purchase specifications.</p> <p>The prerequisite for aging electric equipment located in a mild environment is not within the scope of 10 CFR 50.49.”</p>	<p>The staff position in C.1.e makes a clarification related to Section 5.1 of IEC/IEEE Std. 60780-323 by removing the prerequisite for aging for electric equipment located in mild environment since this equipment is not within the scope of 50.49. This clarification appears to be inappropriate since design and procurement specifications include requirements related to equipment qualification, which are not limited to environmental qualification requirement related to 50.49 compliance.</p> <p>Proposed Change: Delete Position C.1.e</p>	<p>Any guidance related to the content of design / qualification / procurement specifications should not be construed as being limited to environmental qualification under 50.49.</p> <p>The intent of the clarification is also confusing since the same rationale, used for excluding aging of mild environment equipment, is true with respect to EMC and seismic requirements (which are also not within the scope of 50.49).</p>

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 1		Scope and Focus of Proposed Revision to RG 1.89			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
1.3	C	Section C.2.c / 16	“An additional stressor to be considered in the qualification of digital systems is smoke exposure from an electrical fire.”	<p>The staff position in C.2.c brings up smoke exposure from a fire as an additional stressor to be considered in the qualification of digital systems. Smoke exposure from a fire is not a condition addressed or required by 10CFR50.49 and results from an event other than a design basis accident.</p> <p>Proposed Change: Remove discussion in C.2.c regarding the consideration of smoke in the qualification of digital systems.</p>	There is no need to include or address smoke as fire is not an event that is covered by environmental qualification under 50.49. Smoke effects are adequately addressed in RG 1.209 as well as Appendix R.
1.4	C	Section C.1.i / 11	<p>Section 7.2.6.4 of IEC/IEEE Std. 60780-323, Edition 1, 2016-02, should be supplemented with the following:</p> <p>“Electromagnetic conditions are generally independent of aging and design-basis events. Therefore, qualification can be established on a different sample than the sample subjected to aging and design-basis events.”</p>	<p>The supplemental guidance in C.1.i is clarifying that the testing for EMC can be separate from EQ testing. This clarification is not necessary since the dual logo standard already reflects this (See Note 1 in Section 7.4.1.8.c on page 22 of the dual logo standard).</p> <p>Proposed Change: Remove text.</p>	<p>This is another example of where the DG is providing guidance that is outside the scope of 10CFR50.49. EMI/RFI or electrical power surges are not identified in 10CFR50.49. As indicated in the C.1.i, EMC and electrical power surges are independent from DBEs and DBAs.</p> <p>There is currently sufficient guidance to address EMC in RG 1.180, “Guidelines for Evaluating Electromagnetic and Radio Frequency Interference in Safety-Related Instrumentation and Control Systems.”</p>
1.5		Section B, Background / 7	“For the purposes of this guide, the primary objective of “qualification” is to	The primary objective of this RG should remain unchanged from Revision 1.	The rewording of the primary objective of qualification represents an example of

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 1		Scope and Focus of Proposed Revision to RG 1.89			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
			<p><i>demonstrate that equipment important to safety can perform its safety function(s) without experiencing common-cause failures before, during and after applicable design-basis events.</i></p>	<p>The wording in the Background section of DG-1361 is misleading and could be interpreted as expanding beyond the scope of 10CFR50.49. Section B of DG-1361 reflects a change from Part B of RG 1.89 R1 which reads;</p> <p><i>“For the purpose of this guide, “qualification” is a verification of design limited to demonstrating that the electric equipment is capable of performing its safety function under significant environmental stresses resulting from design basis accidents in order to avoid common cause failures.”</i> (Emphasis added)</p> <p>The revised wording in DG-1361 currently reads;</p> <p><i>“For the purposes of this guide, the primary objective of “qualification” is to demonstrate that equipment important to safety can perform its safety function(s) without experiencing common-cause failures before, during and after applicable design-basis events.”</i> (Emphasis added)</p>	<p>expanding its scope beyond an acceptable method to meet 10CFR50.49.</p> <p>Several parts of DG-1361 use the term “design-basis events” in place of “design-basis accidents.” The use of design-basis events is inconsistent with, and represents an expansion from, the design basis accident parameters specified in 10CFR50.49 (d)(1), (d)(2), (d)(3) and (e) that need to be considered when establishing environmental qualification.</p> <p>10CFR50.49 is not associated with the prevention of environmentally induced common-cause failures prior to a design basis event.</p> <p>The terminology of “...before, during and after...” is also inconsistent with Regulatory Position C.1.c. It also reflects a change from Section B of RG 1.89 R1 as well as Section B of RG 1.209.</p>

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 1		Scope and Focus of Proposed Revision to RG 1.89			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
1.6	C	Section A, Related Guidance / 4	<p>“Recognizing that this RG and IEC/IEEE 60780-323, Edition 1, 2016-02, provide the fundamental approach for establishing EQ of electrical equipment in general, the ...”</p>	<p>The wording of “provide the fundamental approach” should be reworded to clarify that this is one acceptable approach, but not the only acceptable standard to use in establishing EQ in accordance with 10CFR50.49.</p> <p>Proposed Rewording: Change “<i>provide the fundamental approach</i>” to “<i>provides one acceptable approach</i>” so that it is clear that qualification to standards such as IEEE 323-74 (as endorsed by RG 1.89 R1) or any applicable daughter standards remains an acceptable approach.</p>	<p>IEEE Std. 323-1974 as modified by RG 1.89R1 also provides an equally acceptable approach for establishing EQ of electrical equipment in accordance with 10CFR50.49.</p>

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

1.7	C	Section C.2.b / 16	<p>When replacing previously qualified components, or subcomponents with commercially procured equipment, no significant changes in form, fit, or function should have occurred to the subcomponents since performance of the original qualification testing. This would include any changes to materials, material formulations, or critical manufacturing processes. Visual examinations or material-type verifications alone may not be sufficient to determine that relevant changes have not occurred. In such cases, a combination of material testing along with partial requalification testing of the components may be necessary, since an assessment of manufacturing process changes is typically not practical for commercially procured components.</p>	<p>The first sentence in C.2.b indicates that no significant changes in form, fit or function should have occurred since the performance of the original qualification testing. The staff position that there has been “no significant change” to the item being procured since its original qualification seems related to maintaining test report applicability for “like-for-like” replacements. The staff position then goes on to state that since visual examinations or material-type verifications alone may not be sufficient to determine whether significant changes have not occurred, a combination of material testing along with partial requalification testing of the components may be necessary. As worded, this seems to infer that some level of requalification is warranted even for “like-for-like” replacements in order to establish the basis for test report applicability. In effect, this appears to be treating the dedication of a “like-for-like” replacement items in a manner that more closely resembles dedication for “equivalent” or “alternative” replacements. Both of these procurement scenarios (“like-for-like” and “equivalent”) are currently addressed in Section B.3.2 of EPRI Report 3002002982, which is endorsed by RG 1.164.</p> <p>This is an example of a new or expanded regulatory position that appears to be inconsistent with RG 1.164.</p>	<p>The guidance in Section C.2.b appears to be broadening the scope of RG 1.89 to overlap with RG 1.164.</p>
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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 2		New or Revised Staff Positions Warranting Further Evaluation			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
2.1	0	General Observation		<p>DG-1361 contains multiple examples of regulatory positions that differ from RG 1.89, R1 positions on the same topic (in the direction of being more restrictive), and even some examples that simply differ from the language of 10 CFR 50.49. In either instance, NRC processes and procedures dictate an issue-by-issue evaluation of such differences for backfit or forward fit implications.</p> <p>Section D, "Implementation" of DG-1361 does not identify or address any new or changed staff positions. Our review of DG-1361 has identified multiple examples of new or revised staff positions are described in the following comments.</p>	<p>Comments 2.2 – 2.18 are provided in response to the specific request in the FRN for DG-1361 to identify any concerns related to backfitting or forward fitting. Section IV of FRN / Vol. 85, No. 243 / December 17, 2020.</p> <p>Alignment with DH 6.6 II.A. 3</p>

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 2		New or Revised Staff Positions Warranting Further Evaluation			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
2.2	C	Generic Comment		The NRC staff has previously found the existing Licensees programs in compliance with the regulation, yet this DG presents many potential backfit positions if used to interpret current 'requirements' as opposed to clearly limiting guidance to new reactors.	The RG in its introduction should clearly repeat 10CFR50.49 (k): <i>(k) Applicants for and holders of operating licenses are not required to requalify electric equipment important to safety in accordance with the provisions of this section if the Commission has previously required qualification of that equipment in accordance with "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 (DOR Guidelines), or NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment."</i>
2.3	C	Generic Comment		Please add a statement that clarifies whether equipment qualification testing to the standard endorsed under this RG meets the requirements of IEEE Std 323-1974 and satisfies the requirements for compliance with a prior license basis. Also see comment 3.2.	To clarify what would be needed for a licensee, who is committed to IEEE Std 323-1974, to accept or install a component that has been qualified in accordance with the dual logo standard.

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 2		New or Revised Staff Positions Warranting Further Evaluation			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
2.4	C	Section C.2.d (2) / 16	“concurrent radiation and thermal aging or sequential aging, as well as the order of radiation and thermal aging, based on which produces the worst-case degradation, and...”	<p>This is a new regulatory position that is not included in RG 1.89 R1. The existing regulatory requirement in 10CFR50.49(e)(5) is for accelerated aging during a qualification test program to simulate an end-of-installed life condition. The expectation to have an accelerated aging program to produce the “worst-case” or “most-severe” degradation is a new regulatory position that extends beyond 10 CFR 50.49.</p> <p>Proposed Change: Remove C.2.d (2).</p> <p>Also See Comment 2.19.</p>	<p>10CFR50.49(e)(5) does not require the aging in a test program to produce a “worst-case” state of degradation.</p> <p>As noted in Comment 2.12, the staff’s research into simultaneous vs. sequential test sequence exposures did not identify a significant effect on performance.</p>
2.5	C	Section C.1.c / 10	“period for which an equipment has been demonstrated, through testing, analysis and/or experience, to be capable of remaining functional during and following design basis events to ensure that the criteria specified in 10 CFR 50.49(b)(1)(i)(A), (B), and (C) are satisfied.”	<p>The proposed change in the definition of “qualified life” and the use of “design basis events” would infer qualified life extends to equipment that is relied upon for events not addressed by 50.49 EQ programs.</p> <p>Also see Comment 2.6</p>	<p>The change in definition for “qualified life” should clearly reflect that the need to establish a qualified life is specifically limited to equipment subject to harsh environment qualification under 50.49. As noted in RG 1.209, the need to establish a qualified life for mild environment equipment does not apply.</p>

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NUGEQ Comments on DG-1361 - Proposed Revision 2 to Regulatory Guide 1.89

Topic 2		New or Revised Staff Positions Warranting Further Evaluation			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
2.6	C	Section C.1.c / 10-11	<p>“period for which an equipment has been demonstrated, through testing, analysis and/or experience, to be capable of remaining functional during and following design basis events to ensure that the criteria specified in 10 CFR 50.49(b)(1)(i)(A), (B), and (C) are satisfied.”</p>	<p>Since the qualified life does not (in and by itself) ensure the performance of a safety function under harsh DBA conditions, it is suggested that the basis be tied to 50.49(e)(5) in lieu of 50.49(b)(1).</p> <p>Suggest “design basis events” be changed to “design basis accidents” to be consistent with the requirements in 50.49 (d) and (e).</p> <p>Also See comment 2.5.</p>	<p>By being specific to 50.49 (b)(1), the proposed definition of qualified life could be misinterpreted as exempting EQ equipment that is qualified based on 50.49 (b)(2) or (b)(3) functions from having a qualified life.</p> <p>The definition of qualified life, which is specific to 50.49 should be specific to design basis accidents, since design basis events includes scenarios which are excluded per 50.49 (c).</p>

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2.7	C	Section C.1.d / 10-11	<p>“However, the period before the operational phase of the SSC (i.e., shelf life) could also adversely impact the qualified life.”</p> <p>“Note: The period before the operational phase of the structure, system or component (i.e., shelf life), could also adversely impact the qualified life and, therefore, should be addressed.”</p>	<p>There is no apparent need to supplement the definition of service life in the dual logo standard.</p> <p>The addition of the “note” comingles the definition of service life and qualified life. The added note is also inconsistent with the following unmodified definition of service life; “period from <i>initial operation to final withdrawal</i> from service of a structure, system or component,” as it excludes time prior to initial operation (e.g., storage time).</p> <p>This note should be removed.</p> <p>Also See Comments 2.8 and 2.9.</p>	<p>The proposed wording in the note inappropriately blends service life and qualified life. These definitions have distinct and separate meanings with qualified life being specific to 50.49 qualification.</p> <p>The need to consider degradation prior to installation in establishing qualified life is a new regulatory position based on 50.49(e)(5) which states; “Equipment qualified by test must be preconditioned by natural or artificial (accelerated) aging to its end-of-<u>installed life</u> condition. Consideration must be given to all significant types of degradation which can have an effect on the functional capability of the equipment.” Application of this regulatory interpretation of 50.49 is incorrect from a regulatory perspective, whether considered in current licensing bases or future licensing bases relying on 50.49.</p>

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2.8	C	Section C.1.d / 10-11	<p>“However, the period before the operational phase of the SSC (i.e., shelf life) could also adversely impact the qualified life.”</p> <p>“Note: The period before the operational phase of the structure, system or component (i.e., shelf life), could also adversely impact the qualified life and, therefore, should be addressed.”</p>	<p>This change is essentially introducing a new regulatory position that significant aging occurs during storage regardless of the shelf life or storage conditions that must be addressed under the provisions of Criterion XIII of 10 CFR 50 Appendix B.</p> <p>Also See Comments 2.7 and 2.9.</p>	<p>As indicated in EPRI 1022959, shelf-life programs are fundamentally based on ensuring that qualified life is not reduced by the length of time in storage. The control of aging during storage is addressed for applicable equipment through a licensee’s shelf-life program (10 CFR 50 Appendix B, Criterion XIII).</p> <p>A properly executed shelf life and storage program effectively prevents significant aging effects from occurring. This approach is also consistent with the NRC’s Equipment Qualification Training Manual for Nuclear Regulatory Commission Technical Reviewers and Inspectors (see training slide 225; Accession No. ML16252A163).</p>
2.9	C	Section C.1.d / 10-11	<p>“Note: The period before the operational phase of the structure, system or component (i.e., shelf life), could also adversely impact the qualified life and, therefore, should be addressed.”</p>	<p>This wording is inconsistent with current industry practice where qualified life and shelf life are typically treated separately.</p> <p>The degree of degradation of a properly packaged and stored item that is subject to a shelf-life program is not significant compared to the inherent level of uncertainty in defining a qualified life that is based on the Arrhenius methodology.</p> <p>Also See Comments 2.7 and 2.8.</p>	<p>This appears to be a new regulatory position or expectation since 50.49(e)(5) only requires the consideration of significant aging mechanisms.</p> <p>According to EPRI Report 1021067 (EQ Reference Manual (Reference 26 of DG-1361)), Section I.4, “Nuclear plant practice has been to assume that the shelf storage life of a component does not affect its in-service qualified life. That is, when installed, the item is “like new.”” This assumption is reasonable provided proper storage conditions are used and conservative shelf-life limitations are specified.</p>

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2.10	C	Section C.1.h (1) / 12	“The radiation qualification should factor in doses from all potential radiation sources at the equipment location.”	<p>This statement should be clarified as meaning all significant radiation sources that are considered as part of the licensing basis.</p> <p>Proposed Change: “The radiation qualification should factor in doses from all significant radiation sources at the equipment location.”</p>	<p>To make it clear that this is not indicating any change from the radiation sources that are identified as being significant in the current licensing basis, which can vary.</p> <p>Consistency with RG 1.183 and 1.195.</p>
2.11	C	Section C.1.h (2) / 12	“Electric equipment that may be exposed to low-level radiation doses should not generally be considered exempt from radiation qualification testing.”	<p>This statement should be clarified that this is referring to low-level radiation doses that exceed the radiation harsh or radiation damage thresholds (i.e., the lowest dose that induces an observable change in physical properties of a material).</p> <p>Also see Comment 2.18.</p>	<p>Keeping the guidance in RG 1.89 specific to an acceptable method of complying with 10CFR50.49.</p> <p>Consistency with the guidance in RG 1.89 R1 Position C.2.c (8).</p>

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2.12	C	Section C.1.j (1) / 12	<p>The synergistic effect is the result of the combined environmental effects of the plant conditions such as radiation, humidity, and temperature that could result in greater degradation of equipment in relation to sequential application of the plant environment under normal, abnormal, and accident conditions.</p> <p>The synergistic effects on materials that are known to have such increased degradation under these conditions should be accounted for when assessing the qualified life.</p>	<p>The guidance in C.1.j (1) brings up the difference between simultaneous vs. sequential testing as a synergistic effect. NRC research presented in NUREG/CR-0275, NUREG/CR-4301 and NUREG/CR-4091 addresses simultaneous vs. sequential test sequences. This research did not identify a significant effect on performance. Per 50.49(e)(7), the need to address synergistic effects is conditional upon the synergism having a significant effect on equipment performance.</p> <p>This statement also appears to be addressing dose rate effects and test sequence effects. Additional information on the effect of dose rate and test sequence effects is provided in NUREG/CR-2127 and NUREG/CR-3629.</p> <p>Proposed Change: Eliminate discussion on simultaneous vs. sequential aging and revise or reword for consistency with previous staff position in Section C.5.a of RG 1.89 R1.</p>	<p>The staff's research results from NUREG/CR-0275, NUREG/CR-4301, and NUREG/CR-4091 did not identify a significant effect on performance based on simultaneous vs. sequential test sequences.</p> <p>Consistency with 50.49(e)(7).</p> <p>10CFR50.49(e)(5) does not require the aging in a test program to produce a "worst-case" state of degradation.</p> <p>The position differs from the guidance in C.5.a of RG 1.89R1, which indicates the need to account for synergistic effects that have been identified prior to the initiation of qualification test program.</p>

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2.13	C	Section C.1.j.3 / 12	<p><i>Activation energy values should be based on the testing of the specific compound used in the equipment and on the most relevant material property and property endpoint (i.e., failure mechanism). Of note, the activation energy should be selected based on the temperature range of the equipment in service (Emphasis added) to ensure that the equipment remains functional during and following a design basis event."</i></p>	<p>This is a new staff position that would impose very specific expectations for activation energies that are not requirements as set forth in 10 CFR 50.49, and therefore applicable to any plant to which 10 CFR 50.49 is applied, and are changes to current guidance in Regulatory Guide 1.89, Rev. 1, Section C.5.c as has been applied to currently licensed plants [and potentially to replacement equipment in those currently licensed plants.].</p> <p>The staff position that activation energies should be based on the data from the specific compound is new. While this may be the optimum approach, the guidance needs to account for situations where the specific formulation is proprietary or not currently available.</p> <p>The staff position that activation energy should be selected based on the temperature range of the equipment in service is also new. Activation energies that are based on isothermal testing and analysis per IEEE 101 are not based on data points within the range of normal operating temperatures when the equipment is in service. These data points are higher and extrapolated down to the equipment's service temperature.</p>	<p>The proposed wording represents a backfit for current plant licensing bases, would constitute a forward fit for current plants taking actions that would appropriately be managed premised on the existing licensing basis or under the specific regulatory terms of 10 CFR 50.49, related to the selection and justification for selecting an activation energy value for a material.</p> <p>This information is generally unavailable to the licensee and where it does exist, it is often considered proprietary by many manufacturers.</p> <p>This new staff position:</p> <ol style="list-style-type: none"> a) Could be interpreted as meaning that the basis for the activation energy must include data within the temperature range that the equipment or component is exposed to during normal operation. This would directly conflict with IEEE Std. 101 b) Doesn't address or provide options for justifying an activation energy (either by the manufacturer, vendor, or licensee) when activation energy data for the specific formulation is not available or is only available for a generic material family.
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	C	Section C.1.j.3 / 13	<i>“The selected activation energy values should be traceable to a specific test report (Emphasis added) for which these values were established, ……”</i>	The expectation of the activation energy being traceable to a specific test report is also a new regulatory position compared to C.5.c of RG 1.89 R1.	c) Doesn’t reflect the position in IP 71111.21N regarding validation of information in EQ Reports (e.g., Activation Energy) from approved 10CFR50 Appendix B suppliers. A significant portion of the activation energies selected by manufacturers is derived from materials databases, academic research, and testing performed for or by other organizations, which the vendors may consider proprietary or otherwise retained in their record system.
2.14	C	Section C.1.f / 11	<i>“If used, these methodologies must ensure that equipment important to safety will perform under the conditions specified in 10 CFR 50.49.”</i>	The use of the term “must ensure” should be clarified since it could be interpreted as going beyond providing reasonable assurance that certain important to safety electrical equipment is not susceptible to environmentally induced common cause failures. Proposed Wording: “If used, these methodologies should continue to provide reasonable assurance that equipment important to safety will perform as required under design basis accident conditions.”	Consistency with Management Directive MD 6.6.

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2.15	C	Section C.1.l / 13-14	“Alternatively, quantified margins should be applied to the environmental parameters discussed in RG 1.183 to ensure that the....”	<p>The reference to RG 1.183 is confusing as well as a change from the reference to Position C.4 in RG 1.89 R1. The current staff position in C.4 of RG 1.89 R1 covers margin and is not specific or limited to the application of quantified margin for dose.</p> <p>This staff position is effectively invoking AST or RG 1.183 on Part 50 plants.</p> <p>Proposed Change: Reword for clarity and remove wording related to <i>margins being applied to the environmental parameters discussed in RG 1.183</i>.</p> <p>Also see Comment 2.16</p>	<p>The environmental parameters discussed in RG 1.183 is limited to dose. As discussed in Comment 2.16, the source term used for EQ has margins that are inherently conservative.</p> <p>The proposed wording is not consistent with the staff’s resolution of the Nuclear Power Engineering Committee (NPEC) comment number 73 to NUREG-0588 that clarifies the intent of margin requirements in Section 6.3.1.5 of IEEE Std. 323-1974.</p>

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2.16	C	Section C.1.l / 13-14	The suggested values in Section 7.4.1.7 of IEC/IEEE Std. 60780-323, Edition 1, 2016-02, are acceptable for meeting the requirements of 10 CFR 50.49(e)(8).	The suggested margin for accident radiation dose in 7.4.1.7 of the dual logo standard should not be required when the integrated accident dose is developed consistent with RG 1.183 or RG 1.195 (or earlier analysis performed per Appendix D of NUREG-0588, Appendix D of RG 1.89 R1, RG 1.3, or 1.4).	<p>NUREG-0588 (1.4 (1)) states that additional radiation margin identified in Section 6.3.1.5 of IEEE Std. 323-1974 are not required if the required accident radiation dose is developed in accordance with the methodology in Appendix D of 0588. This position recognizes the inherent conservatism in the methodology used to define the integrated accident doses used for EQ. Since these conservatisms are quantifiable, this approach would satisfy 50.49(e)(8).</p> <p>The source term for EQ (based on earlier EQ guidance, RG 1.3¹, RG 1.4², RG 1.183³ or RG 1.195⁴) are significantly more severe than the allowable level of fuel failure under design basis accident conditions. The level of conservatism in the assumptions used to define the accident dose should be more than sufficient to eliminate the need to arbitrarily add an additional 10%. This is further supported by NUREG/CR-5313⁵ which indicates in Section VII.6.8 that core melt in-containment radiation conditions have yet to be calculated to this accuracy (e.g., within a factor of 2).</p>

¹ Reg Guide 1.3, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors.

² Reg Guide 1.4, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Pressurized Water Reactors.

³ RG 1.183, Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors.

⁴ Reg Guide 1.195, Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors.

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2.17	C	Section C.2.a(3) / 15	Identical equipment to be used as a replacement was on hand as a part of the utility's stock before February 22, 1983. The shelf life of this equipment should be addressed for its potential impact on the qualified life.	<p>Sound reasons to the contrary does not appear to the appropriate location since it is redundant with C.1.d.</p> <p>Proposed Change: Remove the proposed additional wording related to shelf life being addressed with respect to potential impact on qualified life.</p> <p>Also see comments related to C.1.d, such as 2.7, 2.8 and 2.9.</p>	Compared to RG 1.89 R1, this new guidance appears to narrow the focus on consideration of shelf life for DOR or NUREG-0588 qualified equipment that has been in stock prior to February 22, 1983.

⁵ NUREG/CR-5313, Equipment Qualification (EQ) – Risk Scoping Study

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2.18	C	Section C.2.c / 16	<p>“..., the staff considers a mild radiation environment for electronic equipment to be a total integrated dose less than 10 gray (Gy) (10³ rad) and a mild radiation environment for other equipment to be less than 100 Gy (10⁴ rad), to be acceptable.”</p>	<p>The addition of radiation thresholds changes the definition of mild as provided in 50.49.</p> <p>The proposed revision to RG 1.89 should recognize that the distinction between mild and harsh radiation environments is directly related to elevated stressors under DBA conditions that could result in environmentally induced common cause failures. Equipment items made of materials with radiation damage thresholds above the total integrated dose levels are not subject to radiation induced common cause failures.</p> <p>Proposed Change: Add the following to the end of the statement in C.2.c: <i>Total integrated dose requirements that are above these thresholds may also be considered a mild radiation environment when it can be demonstrated that the radiation damage threshold for the equipment is higher than the required total integrated dose to which the equipment is being qualified to.</i></p> <p>Also see Comment 3.3.</p>	<p>Consistent with the staff’s response to Comment 37 to NUREG-0588 and Table C-1 of the DOR Guidelines, there should be some recognition or allowance for equipment to be classified as being in a mild radiation only environment when it can be demonstrated that the total integrated dose for which the equipment is being qualified is below the lowest radiation damage threshold for any of the items that are relied upon for the equipment to perform the credited important to safety function(s).</p>

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2.19	C	Section C.2.d (2) / 16	Diffusion-limited oxidation, synergisms, dose-rate effects, and inverse temperature are examples of such effects.	<p>Regulatory Staff position C.2.d is largely based on wording from Section B, "Discussion" section of RG 1.89, Rev 1. However, the wording in C.2.d.(2) is a new staff position.</p> <p>The inclusion of inverse temperature effects has been added as an example of uncertainties with respect to the ability of an accelerated aging program being able to simulate an end-of-installed life condition.</p> <p>Also see Comment 2.4.</p>	As noted in Comment 2.4, the imposition of an aging sequence that produces the "worst-case" degradation goes beyond the regulatory requirement in 10 CFR 50.49(e)(5) to precondition the test specimen(s) to their end-of-installed-life condition.

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Topic 3					
Need to Distinguish Between Guidance related to Part 52 plants from the Guidance related to Part 50 plants					
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
3.1	O	General Observation		<p>The following comments address the need for DG-1361 to clearly differentiate between Part 50 and Part 52 guidance. There are several examples in DG-1361 where the distinction between specific guidance relative to Part 50 or Part 52 plants is not clearly delineated. See following comments.</p>	<p>It would be helpful to end users of the revised RG if the guidance was structured in a way that clearly differentiated between the guidance for Part 52 plants vs. Part 50 plants. Having clear and concise delineation of requirements that apply would be consistent with NRC Management Directive MD 6.6.</p>
3.2	C	General Comment	None	<p>The relevant guidance that would be applicable to Part 50 plants should be clearly identified for situations such as when an existing plant decides to install a new or replacement item that has been type tested to the dual logo standard.</p> <p>For existing plants, this should be able to be done using CLB/CDB for environmental conditions. For example, equipment that is type tested to the dual logo standard could be qualified without having to adopt or apply AST for the purpose of environmental qualification.</p> <p>For existing plants, it should be clarified that if there are any specific aspects of type testing to the dual logo standard that would need to be reconciled or addressed to ensure continued compliance to IEEE Std. 323-1974.</p>	<p>Consistency with Management Directive MD 6.6.</p> <p>Also see comment 2.3.</p>

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Topic 3					
Need to Distinguish Between Guidance related to Part 52 plants from the Guidance related to Part 50 plants					
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3.3	C	Section C.2.c / 16	<p>“(As stated in Chapter 3, “Design of Structures, Components, Equipment, and Systems,” of both NUREG-1503, “Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design,” issued July 1994 (Ref. 34); and NUREG-1793, “Final Safety Evaluation Report Related to the Certification of the AP1000 Standard Design,””</p>	<p>These NUREGs are used as the reference for accepting a mild radiation environment for electronic equipment as 10³ rad and 10⁴ rad for other equipment. As worded, it is not clear if this position is specific to just Part 52 plants. Additional discussion should be provided to clarify why regulatory positions in SERs for Part 52 plants is applicable to Part 50 plants.</p> <p>Note that this citation may be impacted depending on the resolution of Comment 2.18.</p>	Consistency with Management Directive MD 6.6.

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3.4	C	Applicable Guidance / 4 and Appendix D / D-2		<p>The proposed change to the guidance and Appendix D, “Qualification in the Radiation Environment” regarding the use of alternate source term (AST) is an example where the DG is primarily focused on Part 52 plants.</p> <p>There is no need to repeat the information in Appendix D, Section D-2, that is already contained in Appendix I to RG 1.183.</p> <p>Proposed Change: Appendix D should simply refer to Appendix I of RG 1.183 and expand upon the continued acceptability of source terms based on TID-14844 for EQ purposes, even if the plant has adopted AST for other radiological analysis. Appendix D-2 should also cover the resolution of GSI-187, which concluded that licensees may continue to use TID-14844 for EQ even if they adopt AST (See ML011210348).</p> <p>Also See Comment 5.2.</p>	<p>The text should be revised or clarified. The proposed revision specifically focuses on AST, which would be appropriate for a Part 52 plant, but not necessarily applicable to EQ for a Part 50 plant.</p> <p>The Draft Guide is not clear whether Technical Information Document (TID) 14844, “Calculation of Distance Factors for Power and Test Reactor Sites” remains a valid methodology for calculating source terms.</p> <p>The proposed revision to RG 1.89 does not recognize or reference RG 1.195, “Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors” or the acceptability for Part 50 plants to use source terms developed in accordance with NUREG-0588, Appendix D of RG 1.89 R1, or RGs 1.3 or 1.4 which are based on TID-14844.</p>

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Topic 3					
Need to Distinguish Between Guidance related to Part 52 plants from the Guidance related to Part 50 plants					
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3.5	C	References / 19-20		DG 1361 doesn't reference or point to RG 1.152 or IEEE Std 7-4.3.2. At a minimum, inclusion of these references this would seem appropriate for Part 52 plants.	As noted in Section 3.11 of currently issued DSRS', these documents contain guidance acceptable to the staff for environmental design and qualification of computer-specific requirements that should be used in conjunction with NUREG-0588 and RG 1.89, as appropriate, for evaluating computer specific requirements.
3.6	C	Section C.2.f / 17	<p>Although initially used only for siting evaluations, the TID 14844 source term has been used for design-basis applications, such as EQ of equipment under 10 CFR 50.49. Regulations in 10 CFR 50.67, "Accident source term," allows licensees to revise the accident source term used in design-basis radiological consequence analyses.</p> <p>RG 1.183 establishes an acceptable alternative source term (AST) and identifies the significant attributes of other ASTs that the NRC staff may find acceptable.</p>	<p>In addition to the guidance regarding AST and RG 1.183, this section should also address the continued acceptability of the TID-14844 source term for defining accident doses for EQ, even for plants which have adopted AST.</p> <p>Suggest inclusion of RG 1.195 for plants where EQ is not based on AST.</p> <p>Also see comments 3.4 and 5.2.</p>	<p>While Part 52 plants will utilize AST, Part 50 plants continue to use a radiological source term based on TID-14844 based on the resolution of GSI-187 (which dealt with the potential impact of postulated cesium concentration on Equipment Qualification). GSI-187 was closed out based on the conclusion by the staff that there was no clear basis for backfitting the requirement to modify the design basis for equipment qualification to adopt AST. (See ML011210348).</p> <p>This section should also address or cover the guidance in RG 1.195 in addition to RG 1.183. RG 1.3 and RG 1.4 were withdrawn based on the guidance in these documents being updated and incorporated into RG 1.183 and 1.195.</p>

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Topic 4					
Failure to Include or Consider Deferred Burden Reduction Topics					
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
4.1	O	General Observation		<p>The proposed revision to RG 1.89 does not address or cover some of the potential burden reduction areas that the staff previously indicated would be considered in the next revision to RG 1.89.</p> <p>The staff's prior indication to consider these in a future revision of RG 1.89 was not captured or identified in the staff's periodic review that concluded in 2018 that a revision to this regulatory guide was warranted.</p>	<p>For example:</p> <ol style="list-style-type: none"> 1) Graded Qualification Methods Based on Severity of Accident Environment <p>NRC response: We are considering whether to clarify the option to qualify a component specific to the environment through a revision to Regulatory Guide (RG) 1.89.</p> <ol style="list-style-type: none"> 2) Alternative Qualification Methods for Equipment Exposed to Radiation-Only Harsh Conditions <p>NRC response: We are considering whether to clarify the option to address EQ for "radiation only environments" through a revision to RG 1.89.</p> <p>Reference Accession No. ML040510309 The NUGEQ believes that these examples could be achievable under existing regulatory direction with license amendments (e.g., application of 10 CFR 50.59, or application of existing guidance).</p> <p>The Group would like to see such positions referenced in DG-1361, perhaps in an Appendix.</p>

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Topic 5		Proposed Changes or lack of changes to the Appendices of RG 1.89			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
5.1	C	Section C.1.g (1) / 11 App C / C-1	“Methods for calculating mass and energy release rates for LOCAs and MSLBs are referenced in Appendix C of this guide.”	<p>The cited methods in Appendix C are unchanged from RG 1.89 R1 and only cover B&W, CE, Westinghouse and GE designs that were licensed under Part 50.</p> <p>It would be more appropriate to make Appendix C more generic by linking the methodology for mass and energy release to be consistent with the methodology used to define the containment response to design basis accidents for the safety analysis or consistent with the methodology used for HELB analysis. This approach would result in the appendix being applicable to both Part 50 and Part 52 plants.</p> <p>Proposed Change: C.1.g should be reworded in a more generic manner that avoids the use of specific codes since these are established and approved as part of the plant’s design and licensing basis.</p>	The guidance in Appendix C doesn’t cover Part 52 plants.

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5.2	C	Applicable Guidance / 4 and Appendix D / D-2	None	<p>Since DG-1361 covers both Part 50 and Part 52 plants, it should continue to address radiological source terms based on TID-14844 as well as AST. The guidance in Section D-2 focuses exclusively on AST. The methodology and sample calculation for EQ radiation dose using a non-AST source term has been removed from Appendix D.</p> <p>Proposed Change: DG-1361 should include a reference to RG 1.195 along with changes needed to satisfy 10CFR50.49 (if any). The proposed revision to RG 1.89 should also reflect the conclusion from the resolution of GSI-187 that licensees can continue to use TID-14844 for EQ even if they adopt AST.</p> <p>Also see Comment 3.4.</p>	<p>For Part 50 plants, GSI-187 (which deals with the potential impact of postulated cesium concentration on Equipment Qualification) was closed out based on the conclusion by the staff that there was no clear basis for backfitting the requirement to modify the design basis for equipment qualification to adopt AST (See MLO11210348).</p> <p>Consistent with the resolution of GSI-187, it is common industry practice for operating plants to continue to use a source term based on TID-14844 for establishing EQ even if the plant has otherwise adopted AST.</p>

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5.3	C	Appendix A		<p>Appendix A is used to provide examples of typical safety-related electrical equipment (Class 1E) or systems. Suggest that the additional clarification or examples from Chapter 3.11 of NUREG-0800 (SRP) be considered for inclusion.</p> <p>Proposed Change: Add additional clarification consistent with Footnote ⁶</p>	Consistency between regulatory guidance documents.

⁶ **(A)** Electrical equipment that are essential for shutting down the reactor and maintaining it in a safe shutdown condition, containment isolation, reactor core cooling, and containment and reactor heat removal, or otherwise are essential in preventing significant release of radioactive material to the environment following a design basis accident; **(B)** Electrical equipment that initiates the above functions automatically; **(C)** Electrical equipment that is used by the operators to initiate the above functions manually; **(D)** Electrical equipment whose failure can prevent the satisfactory accomplishment of one or more of the above safety functions; **(E)** Other electrical equipment important to safety, as described in 10 CFR 50.49(b)(1) and (2); **(F)** Certain post-accident monitoring equipment, as described in 10 CFR 50.49(b)(3) and RG 1.97; and **(G)** Protection and safety systems as described in 10 CFR 50.55a(h) and RG 1.209.

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5.4	C	Appendix B / B-1	The first paragraph of Appendix B from RG 1.89 R1	<p>The discussion on associated circuits has been removed. This is relevant information pertaining to the identification or exemption of equipment being classified as subject to EQ per 50.49(b)(2).</p> <p>Proposed Change: Reinstate first paragraph of Appendix B from RG 1.89 R1.</p>	<p>Since the DG will still apply to Part 50 plants, the guidance should be retained.</p> <p>Ensuring associated circuits of nonsafety-related equipment will not fail and prevent satisfactory accomplishment of safety functions by safety-related equipment <i>should</i> remain cited as a typical example of nonsafety-related equipment being addressed by 50.49.</p>
5.5	C	App D, Section D-1 / D-1	'The period of exposure for a normal operational dose is generally the duration of the plant license.'	<p>The period of exposure may be limited to a qualified life that is less than the plant license.</p> <p>Proposed Change: <i>'The period of exposure for a normal operational dose is generally the duration of the plant license; however, the period of exposure may be limited to the qualified life of the equipment.'</i></p>	

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5.6	C	Missing App E	Not Included	<p>The current guidance in Appendix E of RG 1.89 R1 remains relevant to Part 50 and Part 52 plants. Appendix E should remain part of RG 1.89 since it includes specific information related to qualification documentation.</p> <p>Suggested Change: Reinstate and retain Appendix E.</p>	<p>The guidance in Appendix E specifically defines EQ categories that are not part of the documentation requirements in the dual logo standard. The EQ categories in Appendix E, Sections 3.a thru 3.d are still relevant and in use by both Part 50 and Part 52 licensees.</p>

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Topic 6		Miscellaneous Comments			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
6.1	C	Related Guidance / 3	None	<p>The proposed revision to RG 1.89 should recognize and reflect EQ program scope and implementation basis in accordance with risk-informed rule 10CFR50.69 by acknowledging the nexus between EQ program scope and that rule in the Regulatory Guidance section.</p> <p>Proposed Change: Add or address 10CFR50.69.</p> <p>Also see Comment 6.4.</p>	<p>10CFR50.69 is relevant since it can eliminate safety-related electrical equipment from the scope of the EQ program if it is classified as RISC-3.</p> <p>Consistency with existing regulation that can change the scope of equipment subject to 10 CFR 50.49.</p>
6.2	C	Related Guidance / 3 Section C.1	None	<p>Staff has provided acceptable methods related to reassessing qualified life in NUREG-1801 & NUREG-2191. Section X.E1 contains specific guidance related to the reanalysis of an EQ aging evaluations or TLAA.</p> <p>Proposed change – Add a staff position in Section C.1 that covers Section 6.2 of the dual logo standard by providing a reference to the existing guidance in Section X.E1 of NUREG-1801 & NUREG-2191.</p>	<p>Section 6.2 of IEC/IEEE 60780-323 is specific to reassessing qualified life, but there is no specific reference to the existing guidance in X.E1 related to the reanalysis of TLAA.</p> <p>Consistency with existing regulatory guidance.</p>

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Topic 6		Miscellaneous Comments			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
6.3	C	Reason for Revision / 7	“The IEEE updated this standard in 1983 and 2003. However, the NRC did not officially endorse these versions in a regulatory guidance document.”	<p>Note that the NRC has endorsed the use of IEEE 323-2003 for qualifying computer-based I&C equipment in mild environment applications in RG 1.209.</p> <p>Proposed Change: Reword to clarify that the NRC did not officially endorse these standards for qualification of electrical equipment to harsh design basis accident conditions.</p>	Consistency between RG 1.89 and RG 1.209.
6.4	C	Section C.1.b / 10	“10 CFR 50.49 requires safety-related electric equipment (Class 1E) as defined in 10 CFR 50.49(b)(1) to be qualified to perform intended safety functions.”	<p>This statement does not reflect or recognize that electrical equipment important to safety that is classified as RISC-3 under 10CFR50.69 is not subject to 10CFR50.49. DG-1361 should clarify that under 10 CFR 50.69, safety-related equipment that perform low risk significant functions (i.e., RISC-3) are not subject to 10 CFR 50.49 requirements.</p> <p>Also See comment 6.1</p> <p>Proposed Change: “10 CFR 50.49 requires safety-related electric equipment (Class 1E) as defined in 10 CFR 50.49(b)(1) to be qualified to perform intended safety functions, unless classified as RISC-3 under 10 CFR 50.69.”</p>	<p>Consistency with 10CFR50.69.</p> <p>To clarify that not all safety-related electrical equipment that must function during or following exposure to harsh accident conditions is subject to 50.49, if they are classified as RISC-3 under 10CFR50.69.</p>

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No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
6.5	C	Section C.2.f / 17	Electric equipment to be qualified in a nuclear radiation environment should be exposed to radiation, <u>before testing</u> , that simulates the calculated integrated dose (normal and accident) that the equipment must withstand before completion of its intended safety functions. (Emphasis added)	<p>This statement is confusing, particularly the interjection of “before testing” when discussing various elements of a test sequence.</p> <p>Suggest changing “before testing” to “before the DBA simulation” to remove any confusion regarding what testing the radiation test needs to be done prior to.</p> <p>It would also be appropriate to retain the guidance from C.2.c of RG 1.89 R1.</p>	

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Topic 7		Editorial Comments			
No.	Comment Type ^(note 1)	Section / Page	Current Wording	Comment or Feedback / Proposed Changes (as applicable)	Basis for Comment
7.1	E	Applicable Regulations / 2	“For a manufacturing license as defined in 10 CFR 52.157, only electric....”	The citation to 10 CFR 52.157 appears to be a typo because the Commission findings necessary for issuance of a “manufacturing license” are set forth in 10 CFR 52.167. This may be intended to reference 10 CFR 52.167 for the definition of a manufacturing license.	The reference to 10 CFR 52.157, “Contents of applications; technical information in final safety analysis report” does not provide a definition of a manufacturing license.
7.2	E	References / 20	Reference 26 - Electric Power Research Institute, (EPRI) Nuclear Energy Institute (NEI) EPRI/NEI Report No. 1021067, “Plant Support Engineering: Nuclear Power Plant Equipment Qualification Reference Manual,” Palo Alto, CA, September 2010.	The citation to EPRI Report 1021067 should not include NEI . Suggested citation: Electric Power Research Institute (EPRI), “ <i>Nuclear Power Plant Equipment Qualification Reference Manual, Revision 1</i> ”. EPRI, Palo Alto, CA: 2010. 1021067	
7.3	E	Appendix C Footnote 10 / C-1	Documents referenced in this Appendix are publicly available NRC published documents and are available electronically through the NRC Library on the NRC’s public Web site at http://www.nrc.gov/reading-rm/doccollections/ and	The embedded hyperlink to Doc Collections includes the word “and” as part of the address.	Correct the embedded hyperlink address to remove the word “and” at the end.

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