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Draft Regulatory Guide: Qualification of Safety-Related Actuators in Production and Utilization Facilities

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General Comment

See attached file(s)

Attachments

06-20-23 NUGEQ DG-1386 updated

NUCLEAR UTILITY GROUP
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June 20, 2023

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Subj: Comments by the ***Nuclear Utility Group on Equipment Qualification*** Regarding Draft Regulatory Guide, DG-1386, "Qualification of Safety-Related Actuators in Production and Utilization Facilities" -- Docket ID NRC–2023–0088

Dear Mr. O'Donnell:

The Nuclear Utility Group on Equipment Qualification ("NUGEQ" or "Group")[1] hereby submits five comments and one request for clarification based on our review of proposed Revision 2 of Regulatory Guide (RG) 1.73 "Qualification Tests for Safety-Related Actuators in Nuclear Power Plants."[2] DG-1386 describes an approach that is acceptable to the NRC staff ("Staff") to meet regulatory requirements for the environmental qualification of safety related actuators in production and utilization facilities. It would also endorse, with exceptions, additions, and clarifications, IEEE Standard (Std.) 382–2019, "IEEE Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations and Other Nuclear Facilities."

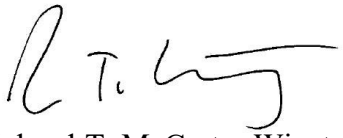
As reflected in the attached comment form, our comments include a focus on the following Staff Positions: (1) Staff Position C.1, which states that "operational experience is not an adequate method for qualifying equipment"; (2) Staff Position C.2, which is not aligned with revision 2 of Regulatory Guide 1.89 with respect to an acknowledgment that RG 1.183 is not the only

[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, and in interaction with the NRC, regarding evolving NRC requirements and guidance. Most recently, the Group was also actively involved in the NRC DBA EQ program inspections and worked with licensees and the NRC in addressing implementation issues associated with those inspections.

[2] Draft Regulatory Guide: "Qualification of Safety-Related Actuators in Production and Utilization Facilities." *See* 88 Fed. Reg. 32693 (May 22, 2023).

approved methodology for accident source terms; and (3) Staff Position C.4.3, which can be interpreted to mean that IEEE 382-2019 does not provide a full set of qualification requirements without being supplemented by ASME QME-1-2017 (as endorsed by RG 1.100 R4) for qualification of power operated valves. Lastly, the Group requests clarification in Staff Position C.4.3 as to what other elements of seismic qualification are missing from IEEE 382-2019 or in that alternative, deletion of the term "seismic" from the phrase "such as seismic and functional qualification."

Respectfully submitted,



Richard T. McCarty, Winston & Strawn LLP
Counsel to the Nuclear Utility Group on Equipment Qualification

Attachment

NUGEQ Comments on DG-1386 - Proposed Revision 2 to Regulatory Guide 1.73

Reviewed Document: U.S. NRC Draft Regulatory Guide DG-1386, "Qualification of Safety-Related Actuators in Production and Utilization Facilities," May 22, 2023.

No.	Comment Type[note 1]	Section / Page	Current Wording	Comment or Feedback	Proposed Changes (as applicable)
1	C	Related Guidance / 3	None	The regulatory guidance section is missing RG 1.183, which is specifically addressed in C.2 of DG-1386. Also see Comment 3	Consider including RG 1.183 in the Related Guidance section.
2	C	C.1 / 7	Acceptable qualification methods include type testing, analysis, or a combination thereof. Type testing is the preferred method of environmental qualification because other methods may be based on older or dissimilar equipment that may not be comparable to the equipment being qualified. **The staff finds that operational experience is not an adequate method for qualifying equipment.**	The stated staff position in C.1 that "operational experience is not an adequate method for qualifying equipment" should be deleted because it is contrary to 10 CFR 50.49(f)(3), which specifically allows the use of experience with identical or similar equipment under similar conditions with a supporting analysis as a qualification method to show that the equipment to be qualified is acceptable. The methods of qualification in Section 4.2 of IEEE 382-2019 are identified as deriving from IEC/IEEE-60780-323. Specifically, the discussion on Operating Experience as a qualification method in Section 4.2(b) of IEEE 382-2019 is identical to the discussion in Section 6.1.2 of IEC/IEEE-60780-323-2016 (endorsed by RG 1.89 (Rev. 2). Therefore, the statement in C.1 could be interpreted as a new staff position in that: • It contradicts the allowed qualification method in § 50.49(f)(3). • Section C.1 of DG-1386 is inconsistent with IEC/IEEE-60780-323-2016 as endorsed by RG 1.89 (Rev. 2), which is a normative reference to IEEE 382-2019. This inconsistency is germane because the NRC staff did not include in RG 1.89 (Rev 2) any specific clarification or exception to Section 6.1.2, "Operating Experience" of IEC/IEEE-607803-323-2016 as a qualification method. • Section C.3 of RG 1.73 R1, which endorses IEEE 382-2006, states that "applicants and licensees should perform environmental qualification of safety-related actuators using the guidance in RG 1.89." Revision 1 of RG 1.89 endorses Section 6.4 of IEEE 323-1974, which contains specific guidance on the application of Operating Experience as a qualification method without clarification or exception.	Delete statement that "The staff finds that operational experience is not an adequate method for qualifying equipment" or reword so that it is not in conflict with 10 CFR 50.49(f)(3) or RG 1.89 R2.

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No.	Comment Type[note 1]	Section / Page	Current Wording	Comment or Feedback	Proposed Changes (as applicable)
3	C	C.2 / 7	The radiological source term for qualification tests in a nuclear radiation environment should be based on the source term methodology used in RG 1.89 and RG 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" (Ref. 19). The containment size should be considered in each case. For exposed organic materials, calculations should consider neutron, beta, and gamma radiation.	The following comment is similar to a previous NUGEQ comment on DG-1361 that was addressed as reflected in Revision 2 to RG 1.89 that "RG 1.183 is not the only approved methodology for accident source terms …" As a result, there should be consistency in the discussion of radiological source terms used to establish qualification between RG 1.89 R2 and DG-1386. This draft regulatory guide makes no provision or allowance for the continued use of TID-14844 as a radiological source term for environmental qualification purposes. The wording in C.2 specifically focuses on AST, which would be appropriate for new plants, but not necessarily applicable to the qualification of actuators for existing plants. DG-1386 should expand upon and clarify the continued acceptability of source terms based on TID-14844 for EQ purposes in a manner that is consistent with RG 1.89 R2. Also, the guidance on the applicable source term for EQ should be consistent with the resolution of GSI-187, which concluded that licensees may continue to use TID-14844 for EQ even if they adopt AST (See ML011210348). The NRC staff concluded that there is no clear basis for backfitting the requirements to modify the design basis for equipment qualification to adopt the AST.	**DG-1386 should provide wording similar to the clarification for RG 1.183 in the Related Guidance section of RG 1.89 R2 that RG 1.183 is not the only approved methodology for accident source terms and while other accident source term methodologies are not specifically reference in RG 1.89 R2, approved accident source term methodologies may continue to be used provided they remain applicable.**

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No.	Comment Type[note 1]	Section / Page	Current Wording	Comment or Feedback	Proposed Changes (as applicable)
4	C	C.4.3 / 8	**IEEE Std. 382-2019 does not provide a full set of the qualification requirements for valve actuators.** The users of this RG should address the other aspects of the qualification process (such as seismic and functional qualification) for power operated valves, as described in RG 1.100, which accepts the use of American Society of Mechanical Engineers (ASME) Standard QME-1-2017, "Qualification of Active Mechanical Equipment Used in Nuclear Facilities" (Ref. 20), with specific conditions**.** ASME Standard QME-1-2017 includes more stringent provisions for the functional qualification of power-operated valves than the ones specified in IEEE Std. 382-2019, including acceptable qualification methods, actuator grouping, actuator output capability testing, and extrapolation of actuator qualification.	The position in C.4.3 goes beyond clarifying the guidance in Section 16 of IEEE 382-2016, "Seismic Simulation Test" and can be interpreted to imply that IEEE 382-2019 does not provide a full set of qualification requirements without being supplemented by ASME QME-1-2017 (as endorsed by RG 1.100 R4) for qualification of power operated valves. It should be recognized that IEEE Std 382-2019 is specific to qualification of valve actuators and that there can be additional requirements relative to ensuring functional qualification of valve assemblies without implying that IEEE 382-2019 is deficient in providing comprehensive guidance for the qualification of valve actuators as well as avoiding a potential circular reference scheme. Note that ASME QME-1-2017 states that environmental qualification of actuators is performed in accordance with IEEE Std 323 and IEEE Std 382, which also involves IEEE Std 344. So simply pointing back to ASME QME-1-2017 or RG 1.100 R4 to address environmental or seismic qualification is circular in nature. Because functional qualification in QME-1 focuses on valve assembly performance, it covers different aspects of qualification from environmental qualification of actuators. Plants not currently committed to ASME QME-1 have supplemented the environmental qualification per IEEE Std 323 and IEEE Std 382 with programs that are specific to power operated valves that were developed in response to generic communications such as GL 89-10 and GL-96-05. These programs were put in place prior to the first endorsement of QME-1-2007 in 2009 by RG 1.100 R3 and were recently the subject of NRC inspection under IP 71111.21N.02. The position in C.4.3 does not appear to address, account for, or acknowledge that licensees may address functional qualification of valve actuator assemblies by supplementing qualification developed in accordance with IEEE 382 in the manner discussed above. Therefore, to address plants not committed or licensed to ASME QME-1-2007 or -2017, this DG should recognize or address other methods acceptable to the staff that are being implemented to supplement the qualification basis established in accordance with IEEE 382 in a manner that provides reasonable assurance of actuator performance. Also see comment 5.	See Comment and recommend that C.4.3 become a standalone clarification (e.g., C.5).
5	C	C.4.3 / 8	The users of this RG should address the other aspects of the qualification process (**such as seismic** and functional qualification) for power operated valves, as described in RG 1.100, which accepts the use of American Society of Mechanical Engineers (ASME) Standard QME-1-2017, "Qualification of Active Mechanical Equipment Used in Nuclear Facilities" (Ref. 20), with specific conditions.	The qualification of valve actuators under IEEE 382-2019 includes consideration of seismic testing per IEEE Std 344, since it is a normative reference. So other than the clarifications provided in C.4.1 and C.4.2 (which are the same as C.9.1 and C.9.2 in RG 1.73 R1), DG-1386 should specifically clarify what other elements of seismic qualification are missing from IEEE 382-2019 or delete the term "seismic" from the phrase "such as seismic and functional qualification."	See Comment.

NUGEQ Comments on DG-1386 - Proposed Revision 2 to Regulatory Guide 1.73

No.	Comment Type(note 1)	Section / Page	Current Wording	Comment or Feedback	Proposed Changes (as applicable)
6	C	C.4.3 / 8	None	Per IEEE 382-2019, undated references require the use of the latest edition of the referenced document. DG-1386 provides no clarification on undated normative references such as IEEE 344. In the case of IEEE 344, this would involve the application of IEC/IEEE-60980-344-2020, which is not a currently endorsed edition. Clarification Request: Therefore, DG-1386 should provide specific guidance on the use of normative references that may not be part of the current licensing basis for a plant in a manner similar to what is set forth in C.5 of RG 1.73 Rev 1.	See Comment for the requested clarification.

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