

NRCREP Resource

From: Horin, William A. [WHorin@winston.com]
Sent: Tuesday, September 23, 2008 3:07 PM
To: NRCREP Resource
Subject: NUGEQ Comments on DG-1149
Attachments: NUGEQ Comments DG-1149 09-22-2008.pdf

Please find attached the comments of the Nuclear Utility Group on Equipment Qualification (NUGEQ) regarding Draft Regulatory Guide - 1149, "Qualification of Safety-Related Motor Control Centers for Nuclear Power Plants."

If you have any questions, please contact me.

Thank you.

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NUCLEAR UTILITY GROUP
ON EQUIPMENT QUALIFICATION

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September 22, 2008

Chief, Rules, Directives and Editing Branch
Office of Administration
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
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SUBJ: Comments on Draft Regulatory Guide DG-1149, "Qualification of
Safety-Related Motor Control Centers for Nuclear Power Plants."
(73 Fed. Reg. 42,627 (July 22, 2008))

Ladies and Gentlemen:

In the referenced *Federal Register* Notice, the U.S. Nuclear Regulatory Commission ("NRC") Staff requested comments concerning proposed revisions to its regulatory guidance on Qualification of Safety-Related Motor Control Centers for Nuclear Power Plants. The comments provided herein are submitted on behalf of the Nuclear Utility Group on Equipment Qualification ("NUGEQ" or the "Group").¹

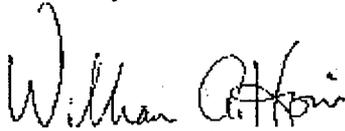
The enclosed comments and recommended DG-1149 changes are intended to help clarify the NRC guidance. We appreciate the opportunity to comment on DG-1149. Please feel

¹ The NUGEQ is comprised of member electric utilities in the United States and Canada, including NRC licensees authorized to operate over 80 nuclear power reactors in the United States. The NUGEQ was formed in 1981 to address and monitor topics and issues related to equipment qualification, particularly with respect to the environmental qualification of electrical equipment pursuant to 10 C.F.R. § 50.49.

Chief, Rules, Directives, and Editing Branch
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free to contact the NUGEQ if the NRC Staff would like further information or clarification on any of these comments.

Sincerely,

A handwritten signature in black ink that reads "William A. Horin". The signature is written in a cursive style with a large initial "W".

William A. Horin
Counsel to the Nuclear Utility Group
On Equipment Qualification

Enclosure: DG-1149 – NUGEQ Comments

1. Regulatory Guide 1.100 Should be Cited for Seismic Qualification Guidance

(Note: Applicable DG-1149 text in Times Roman font precedes NUGEQ Comment and NUGEQ Recommendation)

B. Discussion (page 2) – entire paragraph beginning “Clause 9.5 of IEEE Standard 649-2006 references IEEE Standard 344-2004 . . .” and entire Footnote 1.

NUGEQ Comment: The NRC has recently sought comments on Draft Regulatory Guide DG-1175 (*Proposed Revision 3 of Regulatory Guide 1.100*), “*Seismic Qualification of Electric and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants*.” Regulatory Guide 1.100 (RG1.100) is the appropriate location for staff guidance on seismic qualification of electrical equipment and the information contained in this discussion paragraph is redundant to the information provided in the proposed revision of RG1.100 (see DG-1175 page 5). The DG-1149 Discussion text should point the reader to RG1.100 for staff seismic qualification guidance and then supplement the RG1.00 guidance to the extent that additional seismic qualification guidance specific to MCCs and associated components is needed. However, our review of DG-1149 suggests that no supplemental seismic guidance unique to MCCs and associate components is provided.

NUGEQ Recommendation: Delete the referenced paragraph and Footnote 1 and replaced with the following:

“Regulatory Guide 1.100 Revision 3 describes methods that the NRC staff considers acceptable for use in seismic qualification of electric and mechanical equipment. Regulatory Guide 1.100 Section 1.1 “*Regulatory Positions on IEEE Std 344-2004*” contains specific staff guidance that applies to the use of IEEE Std 344-2004 for the qualification of electrical equipment, including MCCs.”

2. Operational Aging of Transformers is Unnecessary

C Regulatory Position 1 (page 3):

“1. The operational aging of transformers (control power and distribution) should be considered for “Test per 5 year aging period” (Table 1 of IEEE Standard 649-2006), if the motor control centers are located in “harsh environments.””

NUGEQ Comment: Operational aging (i.e., cycle aging) is not an concern for transformers because transformers do not contain moving parts or separable connections. Further, IEEE 649 indicates that operational aging is principally a concern for seismic functionality and not for during “harsh environments.”

IEEE 649 considers and provides guidance on thermal aging, radiation aging, and operational aging. Operational aging occurs when devices are mechanically cycled and within the context of IEEE 649 the terms operational aging and aging cycles are

synonymous. MCCs components potentially affected by cycle aging are either electromechanical or contain separable electrical connections (e.g., stab-on connections). IEEE 649 Table 1 - Typical operational aging parameters - specifies aging cycles for pushbuttons, switches, relays, contactors, circuit breakers, and stab-on connections. Table 1 does not require cycle aging for devices that are not electromechanical or contain separable electrical connections including resistors, indicating lights, and transformers.

The effects associated with operational aging are principally related to device functionality during or after seismic events and not for MCCs potentially exposed to "harsh environments". This focus on seismic functionality for operational aging is confirmed by IEEE 649 Clause 9.4.1.2.3 Operational Aging Analysis which states, in part, that; "*operational aging effects on seismic fragility cannot be accurately forecasted without actual test data*" but that cycle aging analysis can be used if it demonstrates that "*the component or device does not exhibit any deterioration due to aging that effects the ability of the device to function during or after a seismic event.*" (emphasis added)

NUGEQ Recommendation: Delete Regulatory Position 1.

3. Functional Tests and Criteria Should be Based on Specified Functions

Regulatory Position 2 (page 3):

"2. In addition to the typical functional tests specified in Table 2 of IEEE Standard 649-2006, the alternative criteria a, b, and c should be performed on all motor control center components that do not have a specific functional test during and after a harsh environment test.

NUGEQ Comment: IEEE 649 provides, in part, the following guidance regarding acceptance criteria:

- "*Acceptance criteria shall be defined so that all failures to perform the specified safety function(s) in the service conditions for which the equipment is being qualified can be identified.*"²
- "*Care should be taken to ensure that the acceptance criteria selected are not overly restrictive or based on measurements not related to the specified safety functions.*"³
- "*the specifier must determine which criteria are to be demonstrated during and after a harsh environment test.*"⁴

It is inappropriate for the regulatory guide to specify criteria for all components since, per IEEE 649, the criteria must be related to specified safety functions; should not be overly restrictive; and the specifier must determine which criteria are to be

² See IEEE 649, page 10, i) *Acceptance criteria.*

³ See IEEE 649, page 10, i) *Acceptance criteria.*

⁴ See IEEE 649, page 12.

demonstrated. The NUGEQ agrees that “the alternative criteria” or other criteria need to be specified for all devices whose failure would affect safety functions. The NUGEQ disagrees that the alternative criteria would apply to all devices “*that do not have a specific functional test during and after a harsh environment test.*”

NUGEQ Recommendation: Revise Regulatory Position 2 to read as follows:

“2. In addition to the typical functional tests specified in Table 2 of IEEE Standard 649-2006, the alternative criteria a, b, and c should be used for testing performed on all any motor control center components whose failure could adversely affect specified safety functions and that do not have a specified specific functional test during and after a harsh environment test.”

4. IEEE 649 Table 2 Tests are for Generic Qualification Programs

Regulatory Position 3 (page 3):

“3. Typical functional tests for “timing devices” for direct current application in Table 2 of IEEE Standard 649-2006 states, “Devices shall not drop out at or above 70% rated coil voltage.” This test should be consistent with the plant-specific voltage analysis.”

NUGEQ Comment: IEEE 649 states that: “*The operational tests given in Table 2 reflect typical requirements for a generic qualification program. Where specific applications require different values, the values shall be specified.*”⁵ (emphasis added) Consequently, the drop out voltage in Table 2 is one of several generic values in Table 2 that should be consistent with plant-specific analyses.

NUGEQ Recommendation: Revise Regulatory Position 3 to read as follows:

“3. The functional tests specified in Table 2 of IEEE Standard 649-2006, represent typical requirements for a generic qualification program. The tests and criteria should bound plant-specific requirements. For example, although Table 2 states that “*Devices shall not drop out at or above 70% rated coil voltage,*” this test should be consistent with the plant-specific voltage analysis.

⁵ See IEEE 649, page 10, *i) Acceptance criteria.*