

Kinectrics review of Draft Regulatory Guide DG-1361, Proposed Revision 2 to Regulatory Guide 1.89

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

Number	Section	Comment	Proposed Resolution
1	C.1.a	In the context of IEC/IEEE 60780-323 end condition means the condition of the equipment after completion of the aging treatment. End of installed life may end up being different than the qualified life, for instance if condition-based qualification is applied. As such this paragraph is confusing and does not provide clarity for the terms referenced.	Recommend deleting this paragraph, or providing further clarification between end of installed life vs qualified life. The 4 th line states: “Note: Qualified equipment must be capable of performing its design function at the end-of-installed life”. To be specific, suggest adding the word “qualified” to read: “Note: Qualified equipment must be capable of performing its design function at the end-of-installed qualified life”.
2	C.1.b	This section is intended to provide clarity about the phrase “important to safety”. The last paragraph does that but the rest of the section, specifically the second paragraph, do not provide useful information and make the section more confusing than it needs to be.	Recommend removing the second paragraph.
3	C.1.d	The term service life in IEC/IEEE 60780-323 does not imply anything about aging effects outside of the time the equipment was in service. While improper control of shelf life can affect qualified life, it does not relate to service life.	Recommend removing this section as it introduces confusion between service life and qualified life in relation to the impact of improper control of shelf life.
4	C.1.j(3)	While it is preferred to use the activation for the actual compound being tested, it is not always practical and the accepted industry approach has been to use available conservative values. More often than not, activation energies for a specific compound are not available.	Given the importance of activation energies for qualified life of equipment, as much guidance as possible should be given on selection of activation energies. It is recommended to refer to IEEE 98, 99 and/or UL Std 746B for the determination of activation energies. The section should also indicate that while the activation

			<p>energy for the specific material being considered is sometimes required, such as in IEEE 383, the conservative approach is also acceptable if properly justified.</p> <p>Selecting the lowest activation energy from a group available for a specific failure parameter may be too conservative. Guidance could be given that the activation energy for the material that has the closest UL temperature index to the material being evaluated should be selected rather than the lowest activation energy in the group.</p>
5	C.1.l	This section endorses the margins presented in Section 7.4.1.7 of IEC/IEEE Std. 60780-323 are acceptable. The margins presented are only applicable to the accident conditions. Is there any guidance for margins applied to normal conditions?	Provide guidance for margins to use for normal conditions.
6	C.1.n	It is not clear how a double peak should be used for equipment vulnerable to thermal binding or when there are limitations of the steam supply during testing.	Recommend to providing additional guidance or specific examples.
7	C.2.c	This section refers to additional stressors such as smoke exposure. This type of aging mechanism is not part of the scope of IEC/IEEE 60780-323.	Recommend this comment should be removed. Alternatively it should be made clearer that while this aging mechanism is addressed in other documents such as RG 1.209.
8	C.2.d(1)	This section refers to preconditioning of test samples employing the Arrhenius methodology. It is not clear as to what aspect of preconditioning this statement refers to and what the reader should consider. IEC/IEEE 60780-323 clearly describes the use of the Arrhenius methodology.	This statement should be clarified to indicate what it alludes to, otherwise it should either refer to the discussion in IEC/IEEE 60780-323 on that topic or be removed. Item #2 is also discussed in IEC/IEEE 60780-323 so this statement does not provide any additional clarity.

9	C.2.e(4)	<p>The 7th line bullet # 4 states: “analyses taking into account arrangements of equipment and radiation sources may be necessary to determine whether equipment needed for mitigation of design basis accidents other than LOCA or high-energy line breaks (HELB) could be exposed to a more severe environment than the plant specific LOCA or HELB environments”.</p> <p>This could be clarified.</p>	<p>In order to be clear, suggest defining the other DBA’s that are more severe than the plant specific LOCA or HELB.</p>
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