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**Docket:** NRC-2020-0279

DG-1303 Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants

**Comment On:** NRC-2020-0279-0001

Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants

**Document:** NRC-2020-0279-DRAFT-0005

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## General Comment

As Chair of IEEE/PES/NPEC SC-4, I am submitting the attached Comments on NRC draft regulatory guide DG-1303 on behalf of IEEE/PES/NPEC/SC-4. WG 4.2.

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## Attachments

IEEE NRC RG DG-1303 Comments (2012-02-18)

**NEI Template for Comments on Draft Regulatory Guide DG-1303, “Application and Testing of Onsite Emergency Alternating Current Power Sources in Nuclear Power Plants.”**

The following comments on NRC Draft Guide DG-1303 are provided by the non-regulatory members of IEEE/PES/NPEC/SC-4, Working Group 4.2 and are specifically the position of this subgroup and do not necessarily represent the views of the IEEE/PES/NPEC Subcommittee 4, IEEE-SA, or IEEE.

<b>Section</b>	<b>Comment/Basis</b>	<b>Recommendation</b>
B “Discussion”	<i>The onsite emergency AC power source should be capable of operating for a minimum of 30 days with replenishment of fuel oil and other fluids/materials as required.</i> A subgroup (containing non-regulatory members) of the IEEE/PES/NPEC/SC-4 WG 4.2 infers this statement refers to an EDG mission time capability of 30 days; however, it is not in Section C “Staff Regulatory Guidance” of the Draft Guide. This was not part of any qualification type-testing and also was not part of any original design specifications used by the OEM when furnishing EDGs to the nuclear industry.	This should be removed, since per PWROG PA-LSC-1707, <i>“Unless a plant was licensed with a specific “Mission Time” for the EDGs, there is none. The inference of a 30 day capability requirement of the EDGs is not a part of any standard plant licensing basis. The closest requirement to a 30 day operating capability operating time for an EDG in a plant’s current licensing basis is typically associated with EDG fuel storage quantity requirements.”</i>  If the item regarding 30 day capability for EDGs is to remain in the Reg. Guide, further clarification needs to be provided for mechanism of verification (test). This is not part of any NUREG 1431, 1432, or 1433 Tech Specs.
Section 1.4	Enhancement Suggestion: Paragraph is cumbersome and contains many items.	Consider putting the individual requirements in bullet form.
Section 2.1	Clause 1.4 “Inclusions for Site Testing”: NRC Draft Guide recommends supplementing field flashing devices. Field flashing devices are already included within the scope of IEEE Std 387-2017 (Section 1.3.1.b.1)	Remove supplement 2.1 for IEEE Std 387-2017 Clause 1.4 as Clause 1.3.1.b.1 includes field flashing devices as part of the voltage regulator & exciter.
Section 2.2	Section 2.2 should be deleted because 1) Provisions are already provided in IEEE 387-2017, and 2) it is not practical to simulate environments during testing. Additional information is provided as follows: 1) Provisions are already provided in IEEE Std 387-2017:	Section 2.2 should be deleted because 1) Provisions are already provided in IEEE 387-2017, and 2) it is not practical to simulate environments during testing

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	<ul style="list-style-type: none"> <li>a. 7.5 Test description (pre-lubrication and manufacturer’s recommendations for reducing wear)</li> <li>b. 7.5.1 Slow-start test (manual start, standby conditions)</li> <li>c. 7.5.3 Fast-start test (manual start; standby conditions)</li> <li>d. 7.5.4 Loss of offsite power test (load shedding, automatic start, load sequencing)</li> <li>e. 7.5.5 Safety injection auction signal (SIAS) test (automatic start)</li> <li>f. 7.5.6 Combined SIAS and LOOP test – (load shedding automatic start, load sequencing)</li> <li>g. 7.5.9 Endurance and load test (operating time)</li> </ul> <p>2) It is not practical to simulate environments during testing.</p> <ul style="list-style-type: none"> <li>a. NEI’s comment on the 4th revision of RG 1.9, was regarding “environments (e.g. temperature, humidity)”: Sites currently have no capability to control the environment – outside temperature and/or humidity – for current testing. For future plants controlling these parameters would be very cost prohibitive to test at these extremes. Testing from normal standby conditions is appropriate”.</li> <li>b. The NRC Response to RG 1.9, R4 comments (August 22, 2007 letter to NEI’s Mr. Adrian P. Heymer, from NRC’s William Reckley): “The staff agrees that the use of the words “simulate...environments” in Regulatory Position 1.5 is subject to different interpretations. The staff intended that the effects of environments (temperature and humidity) should be considered in establishing the rating of the diesel generator. <ul style="list-style-type: none"> <li>i. It is our position that These items are covered in IEEE Section 4, Principal design criteria, subsection 4.1.2.a Design conditions, items 3) Temperatures at equipment locations (minimum and maximum with durations and average annual ambient) and 6) Humidity (minimum and maximum with durations)</li> </ul> </li> </ul>	
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	<p>c. Continued response from the NRC was “The tests should confirm that the capacity margin provided in the design of the EDG is continued to be adequate for design basis event mitigation during worst case expected temperature and humidity condition for a given plant.”</p> <p>i. It is our position that the existing diesel rooms do not have the capability to “simulate” temperature and humidity during testing for future plants controlling these parameters would be very cost prohibitive to test at these extremes. Testing from normal standby conditions is appropriate. This proposed C.2.2 position should be eliminated.</p> <p>d. The NRC stated in the letter that, “The staff agrees to include this clarification in the next revision of RG 1.9 regarding this issue”. It does not appear that this was addressed in this revision.</p>	
<p>Section 2.3.a</p>	<p>Regulatory Guide should clarify this is planned loading. Additionally, the Reg Guide needs to acknowledge the variety of rating schemes currently in place in the industry. Each of these rating levels represent the manufacturer’s estimated liability for warranty claim at a given load level. Accordingly, the resulting ratings lack consistent basis and their application toward maintenance interval adjustments is of questionable validity. The application of the proposed guidance should be reviewed by the EDG manufacturer against their rating basis with appropriate clarification/changes documented for the licensee. There are, however, some EDG manufacturers that no longer exist, meaning that a valid review of rating basis is not possible. In these cases, the Reg Guide needs to include allowance for EDG owner group recommendations for accelerated maintenance as appropriate.</p> <p>Current STS recognizes that grid instability and cycling plant loads can perturbate EDG load while paralleled with offsite power. Accordingly, allowance is specifically provided for short-term “momentary” episodes where load is above the specified level. Likewise, if kept, NRC should allow</p>	<p>This requirement should be removed as IEEE Std 387-2017, Section 6.5.1 covers establishing a maintenance program (with sufficient technical basis) that factors in operating hours, testing, condition, operating experience, or a combination of these for emergency diesel generator units.</p> <p>Also consider adding language that acknowledges and accepts momentary episodes where the load is above the EDG rating.</p>

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	momentary excursions without penalty or superfluous accounting burden.	
Section 2.4.a and b.	IEEE Std 387, Clause 4.4, Table 1 scope is for design considerations for the EDG. It is not intended to address considerations for off-normal preferred power supply. If protection design criteria, the EDG system boundary should be respected. Any Class 1E bus protection (IEEE Std 308) or Preferred Power Supply (IEEE Std 765) is out of scope of IEEE Std 387.	This should be removed or <i>"should be considered"</i> clarified in Section B whether this is to be a design requirement or operational practice.
Section 2.5.b	Item b is for Lube Oil and the IEEE Std 387 Section 4.5.1.7 is solely for Fuel Oil. If this is intended to remain in the Reg Guide, it should be its own item.	If a requirement for lube oil is to be presented in the Reg Guide, it should have its own section (see Comment/Basis).
Section 2.8	See Section 2.2	Delete per basis and recommendation in C.2.2.
Section 3.1	In IEEE 387, "Continuous rating" with 8760 hours operation is defined along with "short time rating" which requires 2 hour operation in any 24 hour period. However, IEEE Std 2420 does not have "short time rating", and therefore uses only term of "rating" instead of "continuous rating". Because the "rating of combustion turbine-generator unit" is already defined in section 3 of IEEE Std 2420, Section 3.1, this requirement should be removed from RG 1.9.	Remove requirement 3.1. See Comment/Basis.
Section 3.6	In case of emergency (accident or LOOP) startup, purge process affects startup time of emergency power system. In order to conform with safety requirement, it may be appropriate to be done during shutdown.  Also, if automatic purge system is provided, starting sequence should probably override purge process to start up the CTG within a required time.	Recommend the follow change to item 3.6 (blue italics):  Because of the potential for explosion of residual fuel or fuel vapor remaining in the CTG, the exhaust system should be purged before startup <i>or during shut down</i> . The starting <i>and / or shut down sequence</i> should include a gas purge <i>process</i> of the turbine to prevent damage to the turbine and downstream components <i>by explosion</i> .
Section 3.8	Automatic switch to open the bypass door should not be required unconditionally.	Recommend revising item 3.8 to the following (or similar):  The inlet air design should consider preventing excessive increase in pressure loss due to

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		<p>particle deposition on inlet air filter. When increase of pressure loss is not acceptable for CTG performance, inlet air filter should be removed, replaced, or cleaned without power reduction of CTG.</p>
<p>Section 3.12</p>	<p>This item does not need to specify "under a standard load".</p> <p>Also, it seems monitoring under standard load operation is required, but item b (<i>deposits or deterioration of the turbine blades or vanes (as inferred from ideal model results)</i>) cannot be monitored during operation.</p>	<p>Recommend changing to:</p> <p>In addition to IEEE Std 2420-2019, Section C.3, the following items <del>observed under a standard load</del> indicate the need for an overhaul and should be monitored when appropriate for a CTG based on the manufacturer's recommendations:</p> <ul style="list-style-type: none"> <li>a. decreasing run out time after shutdown, and</li> <li>b. deposits or deterioration of turbine blades or vanes (as inferred from ideal model results).</li> </ul>