Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

December 22, 2006

9/22/06
71FR55517
(46)

Rules and Directives Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001 (MS T-6 D59)

Gentlemen:

TENNESSEE VALLEY AUTHORITY (TVA) - COMMENTS ON DRAFT REGULATORY GUIDE DG -1172, "APPLICATION AND TESTING OF SAFETY-RELATED DIESEL GENERATORS IN NUCLEAR POWER PLANTS" *(VOL. 71 FR 55517-55520)*

This letter provides TVA's comments on the subject draft Regulatory Guide.

The TVA individual providing these comments, Mr. Tim Chan, is the Chairman of the Engine Systems Inc. Electro-Motive Diesel (ESI-EMD) Owners Group Regulatory Subcommittee. The ESI-EMD Owners Group is the largest emergency diesel generator Owners Group, representing over 30 U.S. nuclear plants.

The enclosed comments should therefore be considered to be the ESI-EMD Owners Group and TVA's comments.

TVA appreciates the opportunity to comment on the proposed guidance. If you have questions regarding our comments, please contact Fred Mashburn at (423) 751-8817.

Sincerely,

Beth A. Wetzel

Beth A. Wetzel
Manager, Corporate Licensing
and Industry Affairs

Enclosure
cc: See page 2

E-RIDS = ADM-03
Addr = S. Aggarwal (SKA)
S. O'Connor (SCO)
J. Rutgely (JAR)
J. T. Yerokun (JTY)

SUNSI Review Complete
template = ADM-013

Enclosure
cc (Enclosure):
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Enclosure

DG-1172: RG 1.9, Revision 4 (Draft)
Comments from ESI-EMD Owners Group

Attachment 1 – RG and SRP Review Form

Document Name/Number:		**Reviewer Name/Affiliation**	**Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA**	
		Date:	**December 15, 2006**	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.X.Y.n.m	**1, 2 or 3**	**Cite NRC's regulatory basis, if any (e.g., 10 CFR 50.xxx, NRC Bulletin 98-xx, etc.). Basis for comments on inadequacy**	**Description of the issue: why this is an issue; reasons for inability of current plants to comply, if any**	**Mark-up text or alternate wording, where possible**
B.1st pp (2)	**3**	"(2) provide power promptly to engineered safety features if a loss of offsite power and a design-basis event occur during the same time period, and…"	Need to clarify here if a LOOP is considered a design basis event.	Possibly add Design Basis Event to definitions in Section C.
B.7th pp	**2**	"However, the design-basis event loads during the operating license or combined license stages should be within the continuous rating of the emergency diesel generators with margin."	A numerical value for margin should be specified. A 5% margin is certainly adequate given that virtually all diesels can exceed continuous ratings for a period of time.	Add 5% margin

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	*December 15, 2006*	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.1.3	**2**	"During the operating license or combined license stages of review, the design-basis event loads should be within the continuous rating (as defined in Section 3.2 of IEEE Std. 387-1995) of the diesel generator with margin."	A numerical value for margin should be specified. A 5% margin is certainly adequate given that virtually all diesels can exceed continuous ratings for a period of time.	Add 5% margin
C.1.4	**2**	This clause provides specific details regarding "the starting and load-accepting capabilities of the diesel generator."	Ideally, minimum voltage readings should be specified at motor terminals, however, data collection is significantly more difficult. Consequently, reasonable and conservative numbers should be specified for voltage at the diesel output breaker. The location where voltage and frequency data is collected should be specified.	Add a sentence stating that voltage and frequency data should be collected at the diesel output breaker.
C.1.5	**2**	"The design should allow testing of the diesel generators to simulate the parameters of operation (e.g., manual start, automatic start, load sequencing, load shedding, operation time), normal standby conditions, and environments (e.g., temperature, humidity) that would be expected if actual demand were placed on the system."	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	Delete ".... and environments (e.g., temperature, humidity)" or better explain that this clause is not intended to have sites control DG room temperature and humidity for testing.

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.1.9.2	**2**	"(2) A trip may be bypassed under design-basis events, provided the operator has sufficient time to react appropriately to an abnormal diesel generator condition."	This section implies trips should not be bypassed if operators cannot react in sufficient time. Under DBE conditions, operator response time cannot be assured as operators are not normally present initially or continuously at the EDG during an event. We are of the opinion that trips other than overspeed and generator differential should be bypassed during design basis events due to the possibility of a spurious trip. In addition, this reduces the complexity of the control scheme in the emergency mode.	IEEE Std. 387-1995, Section 4.5.4 a and b language is sufficient. Eliminate clause on operator.
C.1.8-p.7	**3**	"1.8 Clause 4.5.2.2 of IEEE Std. 387-1995 should be modified to read as follows:"	The section is numbered 1.8 – it should be numbered 1.10	Clerical fix.
C.2.1	**2**	"component malfunctions or operating errors that did not prevent the emergency diesel generator from being restarted and brought to load within a few minutes (i.e., without corrective maintenance or significant problem diagnosis)"	The term "within a few minutes" is too vague and allows for inconsistent interpretation both from the licensee and the regulator. A numerical value such as 30 minutes should be selected.	Change within a few minutes to 30 minutes
C.2.2	**2**	"Test Descriptions...The following test descriptions should be used in conjunction with the preoperational and surveillance testing described in the table."	This section of the document is very confusing for the following reasons: 1) The section lists only 11 tests, though 21 are listed in Table 1; 2) Many tests do not have a description, with most simply notes where the IEEE guidance should be supplemented; 3) Site acceptance tests are mixed in with availability tests.	Please improve section by 1) Having separate sections for site acceptance tests and Availability tests; 2) Provide brief descriptions (even if repeated from IEEE) for all required tests.

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
			Some examples of confusion are 1) Starting test (a site acceptance test) as 2.2.1 with Slow Start test as 2.2.2., and 2) Load Run (load acceptance) Test as 2.2.3, and Rated Load Test as 2.2.4: Though these tests are similar, having them together with very vague descriptions makes the document confusing.	
C.2.2	**2**	Table 1	Table 1 is very confusing for the following reasons: 1) All tests are not present in the Test Description portion of the document, and 2) The Table seems to be incomplete with no boxes checked for Availability tests.	Please improve section as follows: 1) Have separate test description sections for each of tests listed, and 2) Refer back to IEEE guidance to complete Table.

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.2.2.3	1	"This test involves demonstrating 90–100 percent of the continuous rating or worst case design-basis event loads (whichever is higher) of the emergency diesel generator,..."	DBE loads in excess of continuous ratings are effectively not permitted by C.1.3 due to margin requirements – as such this should not apply to any plant designed after 2007. If the site somehow does have maximum design basis loads greater than the continuous rating (typically only for a short period of time) it is recommended that the EDG not have monthly testing at overload conditions. This is potentially destructive testing that is expected to have a significant impact on EDG reliability over time. Testing at the continuous rating monthly should be sufficient to verify successful performance of the EDG – meeting DBE loading can be satisfactorily verified during part of the endurance run performed every 18-24 months. This is a significant equipment issue that has not been recommended by IEEE.	Eliminate "...or worst case design-based event loads (whichever is higher)..."

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.2.2.4	1	"If the design-basis event loads are higher than the continuous rating of the emergency diesel generator, the test should be conducted at the worst case design-basis event loads..."	DBE loads in excess of continuous ratings are effectively not permitted by C.1.3 due to margin requirements – as such this should not apply to any plant designed after 2007; If the site somehow does have maximum design basis loads greater than the continuous rating (typically only for a short period of time) it is recommended that the EDG not have monthly testing at overload conditions. This is potentially destructive testing that is expected to have a significant impact on EDG reliability over time. Testing at the continuous rating monthly should be sufficient to verify successful performance of the EDG – meeting DBE loading can be satisfactorily verified during part of the endurance run performed every 18-24 months. This is a significant equipment issue that has not been recommended by IEEE.	Eliminate clause.
C.2.2.6	2	"Combined Safety Injection Actuation System (SIAS) and Loss-Of-Offsite Power Test"	It is our understanding that the NRC is in conversation with the BWR Owners Group regarding the separation of the LOOP and LOCA design basis events. If this is indeed the case, this test may no longer be necessary.	It is suggested that the NRC review their current position on separation of LOOP and LOCA design basis events and ensure that the testing required in this document (i.e., the Combined SIAS / LOOP Test) is consistent with the NRC position.

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.2.2.7	**1**	"This test involves demonstrating the emergency diesel generator's capability to reject a load equal to loss of the largest single load while operating at largest load power factor and verify that the frequency and voltage requirements are met and the unit will not trip on overspeed."	Testing "while operating at the largest load power factor" is a potentially destructive test. When paralleled to the grid, the voltage is artificially offset high to allow rated kvar loading. Upon load rejection, the accompanying voltage spike can potentially exceed max vendor recommended voltage (based on the how large the load is). Recommend performing this test at 1.0 power factor and placing limits on maximum voltage seen (overshoot no greater than 15% and/or within 10% in 2 seconds).	Eliminate "...while operating at largest load power factor..."
C.2.2.8	**1**	"This test involves demonstrating the emergency diesel generator's capability to reject a load equal to 90–100 percent of the continuous rating while operating at a worst case design load power factor and verify that the voltage requirements are met and that the unit will not trip on overspeed."	Testing "at the worst case design load power factor" is a potentially destructive test. When paralleled to the grid, the voltage is artificially offset high to allow rated kvar loading. Upon load rejection, the accompanying voltage spike will typically exceed max vendor recommended voltage. Recommend performing this test at 1.0 power factor and placing limits on maximum voltage seen (overshoot no greater than 15% and/or within 10% in 2 seconds).	Eliminate "...while operating at worst case design load power factor..."

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.2.2.9	**1**	"This test involves demonstrating the full load-carrying capability at a worst case design load power factor for an interval of not less than 24 hours."	The 24 hour endurance run is contrary to the IEEE-387 (1995) recommendation (Section 7.5.9) that the endurance run be completed in eight hours – two hours at load equivalent to the short term rating (110% of continuous), and six hours equivalent to 90-100% of the continuous rating. On the pre-op test the endurance run is still recommended to be a 24 hour run, but it recommends that the 18-24 month periodic endurance run be performed for only a total of eight hours. Accordingly, there is no regulatory basis for a 24 hour run. Some plants have recently had their Technical Specification approved to operate in this manner (8 hour endurance run).	Change clause to reflect an 8 hour endurance run.
C.2.2.10	**1**	"This test involves demonstrating the hot restart functional capability at full load-temperature conditions (after the emergency diesel generator has operated for 2 hours at continuous or design-basis event loads whichever is higher)..."	This test should not be contingent on operating the EDG for two hours at "design basis loads (whichever is higher). As noted previously, EDG loads for new plants should not exceed the continuous rating, and if they did, the EDG should not be routinely testing at loads exceeding the continuous rating. Performing this test after two hours of operation at the EDG's continuous rating is sufficient enough to meet the objective of this test.	Eliminate the clause "...or design-basis event loads whichever is higher."

Document Name/Number:		Reviewer Name/Affiliation	Tim Chan / ESI-EMD Owners Group Regulatory Subcommittee; TVA	
		Date:	December 15, 2006	
Section	**Priority (Hi, Med, Low)**	**Regulatory Basis**	**Description of the Issue**	**Proposed Alternate**
C.2.2.11	**1**	"...This test should also verify that the critical protective trips that are not automatically bypassed perform their intended function..."	It is not recommended that the critical protective trips that are not bypassed are tested to perform their intended function during this test. The function of these trips can be verified in pre-start tests, relay tests, or with simulation per the site's existing maintenance program. The intent of the test is to verify that the bypassed trips do not trip the EDG during a design basis accident. This is not recommended in IEEE-387 and has no regulatory basis.	Eliminate this clause.
General	**1**		There currently exist several different protocols and regulations regarding EDG performance including Maintenance Rule, mitigating system performance indicators (MSPI), and INPO requirements. Has the NRC performed a review to ensure this guidance is consistent with other documents, specifically MSPI and Improved Technical Specifications?	It is recommended the NRC review this document against MSPI guidance and Improved Technical Specifications to ensure this guidance is consistent.
General	**2**		The vast majority of "should" statements should be "shall" statements. This reduces ambiguity between the licensee and the regulator. This draft Regulatory Guide is really only appropriate for plants that haven't been built yet. Consequently, "shall" statements clearly define the design requirements as well as the test requirements.	