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VALUE/IMPACT ASSESSMENT ON REGULATORY GUIDE 1.9, (REVISION 1 TO SAFETY GUIDE 9) "SELECTION, DESIGN, AND QUALIFICATION FOR DIESEL-GENERATOR UNITS USED AS ONSITE ELECTRIC POWER SYSTEMS AT NUCLEAR POWER PLANTS"

Background

Regulatory Guide 1.9 (Safety Guide 9) provides guidance in the selection of diesel-generator unit capacity for use as onsite power in nuclear power plants. However, Safety Guide 9 was issued (March 1971) when the capacity requirements were only about one-half the requirements of some current plants. Also, the methods adopted by manufacturers for rating diesel generators has changed in the interim. The guidance in this area should therefore be updated. Additional NRC guidance is provided in specific limited areas by Branch Technical Positions EICSB 2, "Diesel-Generator Reliability Qualification Testing"; EICSB 8, "Use of Diesel-Generator Sets for Peaking"; EICSB 17, "Diesel-Generator Protective Trip Circuit Bypasses"; and Regulatory Guide 1.108, "Periodic Testing of Diesel-Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants." To a large extent, the NRC provisions contained in the branch technical positions have been incorporated in IEEE Std 387-1977, "IEEE Standard Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations." The revision of Regulatory Guide 1.9, will endorse, with appropriate exceptions, IEEE Std 387-1977 and will help to accomplish an objective of providing, in the form of a single comprehensive set of requirements, the requirements for the selection, design, production testing and qualification testing of diesel-generator units.

This revision of Regulatory Guide 1.9, will duplicate the design provisions included in Regulatory Guide 1.108. However, this duplication will be eliminated at the next revision of Regulatory Guide 1.108.

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Value/Impact Assessment

1. IEEE Std 387-1977 provides the principal design criteria, qualification requirements and testing requirements for diesel-generator units intended for service as onsite power systems.

Value - Guidance is given in providing acceptable design criteria, and for qualification and production testing requirements for diesel-generator units for use at nuclear power plants.

Impact - There should be no impact since the standard was developed by IEEE with industry and NRC participation and includes the provisions of Branch Technical Position EICSB 2 which provides for qualification testing and testing to demonstrate diesel-generator unit reliability.

2. Regulatory Position C.2 was modified to change the provision that predicted loads at the operating lincense stage should not exceed the short-time rating rather than the smaller of the 2000 hour rating or 90% of the 30-minute rating.

Value - This modification aligns the guide with current industry practice for rating diesel-generator units. It eliminates confusion which would exist if reference to obsolete methods of rating were used.

Impact - There is no impact since the provisions are essentially equivalent. The short-time rating is 110% of diesel-generator unit continuous rating. For a typical 2500 KW unit , the 2000 hour rating is approximately 114% of continuous rating and 90% of the 30 minute rating is approximately 110% of continuous rating. For a typical 5400 KW unit, the 2000 hour rating is approximately 107% and 90% of the 30 minute rating is approximately 108%.

3. Regulatory Position C.5 (modified former C.4) allows for an increase in time for frequency recovery following a step load change.

Value - The modification provides the possibility of shortening the interval between step load changes for some diesel-generator unit designs and still provide adequate margin for voltage and frequency recovery. It also allows for unit procurement to be more competitive as designing a 4-cycle engine to meet the shorter recovery time provision was difficult if not impractical.

Impact - There is no impact since no new provisions are imposed.

4. Regulatory Position 7 was added which provides that diesel-generator units should be designed to be testable during operation of the nuclear power plant as well as while the plant is shutdown.

Value - Being able to test the diesel-generator unit during plant operation will aid in maintaining unit reliability without shutting the plant down. With such design considerations, diesel-generator unit availability will be increased by designing the unit so that it will respond to a bona fide signal during the test mode.

Impact - There is no impact. This provision is a part of Regulatory Guide 1.108, and is currently being implemented by the staff.

5. Regulatory Position 8 was added which provides for an indication of which diesel-generator unit protective trip is activated first.

Value - Often when one protective trip is actuated, other trips are then caused to be actuated. With an indication of which trip is actuated first, trouble diagnosis can be made more readily. As a result the trouble can be corrected more quickly thus increasing the diesel-generator unit availability.

Impact - There is no impact. This provision is part of Regulatory Guide 1.108, and is currently being implemented by the staff.

6. Regulatory Position 9 was added which provides that certain diesel-generator unit protective trips be provided with coincident logic for trip actuation or else be bypassed during accident conditions.

Value - Experience has shown that some protective trip circuits have actuated spuriously thus needlessly shutting down the diesel-generator unit. The diesel-generator unit reliability is enhanced if certain protective trips have coincident logic or are bypassed during the time when the unit is most needed, i.e., during accident conditions.

Impact - There is no impact. This provision is the same as Branch Technical Position EICSB 17, and is currently being implemented by the staff.

7. Regulatory Position 11 was added to change from an option to a requirement that a test to verify correction of a problem be counted as a valid test.

Value - Any test to be counted in the statistics of reliability determination should not be biased in favor of success.

Impact - There is no impact. The provision is the same as Regulatory Guide 1.108 and is currently being implemented by the staff.

8. Regulatory Positions 4,6,10, and 12, were added to impose the regulatory guides that endorse IEEE standards or address corresponding requirements in Sections 5.1.1, 5.4, 6.3, and 6.5 of IEEE Std 387-1977.

Value - Referencing appropriate regulatory guides will help prevent overlooking pertinent staff positions associated with referenced IEEE standards.

Impact - There is no impact since the regulatory guides are currently being implemented by the staff.

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