

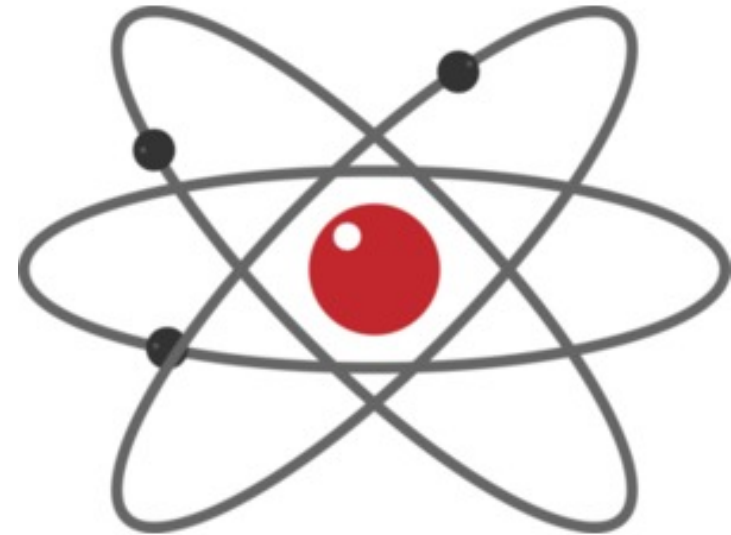
Revision 5 to Regulatory Guide 1.9, “Application and Testing of Onsite Emergency Alternating Current Power Sources in Nuclear Power Plants”

NRC Staff Presentation to the Advisory
Committee on Reactor Safety

June 25, 2021

Agenda

1. Introduction
2. Existing Guidance
3. Significant Changes
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5. Conclusion



Introduction

Current NRC guidance in Regulatory Guide 1.9 has not been updated since 2007. It does not reflect all the possible types of different onsite emergency power sources that are available today.

The NRC is issuing Revision 5 of Regulatory Guide 1.9 as technology-neutral to include diesels, combustion turbine generators (CTGs), and other types of the emergency power sources for the onsite alternative alternating current (AC) electric power system.

Technology-neutral benefits:

- Facilitate application processes allowing use of alternative onsite emergency power supplies in the future for advanced reactors and nuclear facilities.
- Reduce the number of regulatory guides that will be required to cover other alternatives.
- Reduce the overall regulatory review process.

Existing NRC Guidance

Regulatory Guide 1.9, “Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants” was last updated in 2007 to Revision 4.

Regulatory Guide 1.9 provides guidance that the NRC staff considers as an acceptable method for satisfying NRC regulations (mainly GDC 17 and 18) with respect to the design, qualification, and testing of emergency power sources used in onsite AC electric power systems for nuclear power plants.

Significant Changes

This revision (Rev 5) endorses the following two IEEE standards in full, with supplements and clarifications:

- IEEE Standard 387-2017, “IEEE Standard for Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations”
 - Includes specific details based on lessons learned from comprehensive reviews of operating reactors, new reactor applications, and other nuclear facilities.

Significant Changes (cont.)

- IEEE Standard 2420-2019, “IEEE Standard Criteria for Combustion Turbine-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations”
 - Specifically includes additional guidance on CTG’s principal design criteria, design features, qualification considerations, and testing requirements, based on the reviews performed for the US-Advanced Pressurized-Water Reactor and other Interim Staff Guidance.

Significant Changes (cont.)

Clarifications:

- “Design and Application Considerations” in 387-2017 for testability and synchronization capabilities was supplemented:
 - to address testing EDGs in the event the offsite power source has transients resulting in voltage and frequency perturbations.
- “Design and Testing Considerations” in 387-2017 was clarified:
 - to include how the EDGs envelop parameters of operation.
- “Operations” in 387-2017 was clarified:
 - to include that licensees should monitor EDGs cumulative operating time above the nominal rating for additional restrictions as specified in manufacturer-recommended accelerated maintenance requirements and industry consensus group recommendations.

Significant Changes (cont.)

Supplements:

- Both IEEE standards were supplemented to include verification of all subsystems such as fuel oil, lube oil, cooling, starting, and piping systems credited for operation.

Other important changes:

- Removal of testing and design requirements from Rev 4 because they have been incorporated in the updated IEEE 387-2017.
- Title of Regulatory Guide 1.9 changed to be more technology neutral, “Application and Testing of Onsite Emergency Alternating Current Power Sources in Nuclear Power Plants.”

Proposed New Guidance

- Includes provisions for alternatives for onsite standby emergency power supplies that meet the intent of 10 CFR 50 and 10 CFR Part 52 requirements in consideration for small modular reactors, advanced reactors, and other nuclear facilities.
- Includes criteria derived from General Design Criteria (GDC) 17 and GDC 18 (e.g., information on capacity, capability, independence, redundancy, testability, inspection, qualification, etc.).
- Includes additional design and testing considerations for EDGs, CTGs, and other emergency AC power sources.

Public Comments

- Received 51 comments from NEI, IEEE, and members of public.
- One significant change made to the background section was to combine the two sections on EDGs and CTGs into one.
- The rest of the comments were minor and incorporated by editorial changes.
- Several other comments did not require changes because they were determined to be beyond the scope of this regulatory guide.

Steps Towards Issuance

- OGC has provided NLO.
- Brief ACRS on changes and receive feedback.
- Issuance of new guide is expected in late June or early July.

Conclusion

- The staff expects publication of Revision 5 of Regulatory Guide 1.9 endorsing existing two industry standards within the next month.
- Revision 5 removes details of design and testing considerations of EDGs because these details were included in IEEE 387-2017.
- Revision 5 includes provisions for alternative emergency power sources (technology-neutral) for supplying onsite AC electric power systems.