

IEEE Recommended Practice for the Design of Safety-Related DC Auxiliary Power Systems for Nuclear Power Generating Stations

Sponsor

**Power Generation Committee of the
IEEE Power Engineering Society**

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Foreword

(This Foreword is not a part of IEEE 946-1985, IEEE Recommended Practice for the Design of Safety-Related DC Auxiliary Power Systems for Nuclear Power Generating Stations.)

DC auxiliary power systems play an ever-increasing role in nuclear power generating station control and in providing backup power for emergencies. This recommended practice fulfills a need within the nuclear industry to provide common or standard practices for the design of safety-related dc systems. The design features described are applicable to all Class 1E nuclear installations and system capacities.

This recommended practice may be used separately and, when combined with applicable portions of IEEE Std 450-1980, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations; IEEE Std 484-1981, IEEE Recommended Practice for Installation Design and Installation of Large Lead Storage Batteries for Generating Stations and Substations; ANSI/IEEE Std 485-1983, IEEE Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations; ANSI/IEEE Std 535-1979, IEEE Standard for Qualification of Class 1E Lead Storage Batteries for Nuclear Power Generating Stations; and ANSI/IEEE Std 650-1979, IEEE Standard for Qualification of Class 1E Static Battery Chargers and Inverters for Nuclear Power Generating Stations, will provide the user with a general guide to designing, qualifying, maintaining, and testing safety-related dc systems.

This recommended practice was prepared by the Working Group on DC Auxiliary Power, Nuclear Power Subcommittee of the Power Generation Committee of the IEEE Power Engineering Society. The members of the working group were:

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Contents

SECTION	PAGE
1. Scope	7
2. Definition	7
3. References	7
4. General	
4.1 Description and Operation	8
4.2 Number of Batteries	8
4.3 Number of Chargers and Distribution Panels	8
4.4 System Voltage Considerations	8
4.5 Physical Layout	9
5. Batteries	9
5.1 Determination of Battery Duty Cycles and Battery Size (Capacity)	9
5.2 Installation Design	9
5.3 Maintenance, Testing, and Replacement	9
5.4 Qualification	9
6. Battery Chargers	9
6.1 General Description	9
6.2 Determination of Required Rating	9
6.3 Sample Calculations	10
6.4 Qualification	10
6.5 Output Characteristics	10
6.5.1 Output Ripple	10
6.5.2 Operation Without a Connected Battery	10
7. Distribution System and Equipment	10
7.1 Description and Rating	10
7.2 Typical Diagram	10
7.3 Voltage Ratings for DC Powered Components	10
7.4 Instrumentation, Controls, and Alarms	12
7.5 Special DC Loads	12
7.5.1 Load Transfers	12
7.5.2 Current Demand Increases As Voltage Decreases	14
7.5.3 Switching Surges	14
7.6 Design Features to Assist in Battery Testing	14
7.7 Cross-Tie Between Buses	14
7.8 Qualification	14
7.9 Available Short Circuit Current	14
7.9.1 Batteries	14
7.9.2 Chargers	14
7.9.3 Motors	14
8. Spare Equipment	14
FIGURES	
Fig 1 1:125 V Class 1E DC System Key Diagram	11
Fig 2 1:125 V Class 1E DC System Instrumentation and Alarms	13
TABLE	
Table 1 Recommended Voltage Range of 125 V and 250 V DC (Nominal) Rated Components	12

Appendix A Battery Charger Rating—Sample Calculations	16
Appendix B Batteries—Available Short Circuit Current—Sample Calculations	17

APPENDIX FIGURE

Fig B3 Typical Characteristic Curve—Amperes/Positive Plate versus Ampere-Hours/Positive Plate ...	18
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IEEE Recommended Practice for the Design of Safety-Related DC Auxiliary Power Systems for Nuclear Power Generating Stations

1. Scope

This recommended practice provides guidance for the design of the safety-related dc auxiliary power systems for nuclear power generating stations, including lead batteries, static battery chargers, and distribution equipment. This recommended practice also provides guidance for selecting the quantity and types of equipment, the equipment ratings, interconnections, instrumentation, control, and protection.

The ac power supply (to the chargers) and the loads served by the dc systems, except as they influence the dc system design, are beyond the scope of this recommended practice.

2. Definitions

For definitions of terms used in this document, see ANSI/IEEE Std 100-1984 [3]¹ and other referenced standards.

3. References

[1] ANSI C37.16-1980, Preferred Ratings, Related Requirements and Application Recommendations for Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors.²

¹ The numbers in brackets correspond to those of the references listed in Section 3.

² ANSI publications are available from the Sales Department American National Standards Institute, 1430 Broadway, New York 10018.

[2] ANSI/IEEE C37.90-1978 (R 1982), IEEE Standard Relays and Relay Systems Associated with Electric Power Apparatus.³

[3] ANSI/IEEE Std 100-1984, IEEE Standard Dictionary of Electrical and Electronics Terms.

[4] ANSI/IEEE Std 308-1980, IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations.

[5] ANSI/IEEE Std 336-1985, IEEE Standard Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities.

[6] ANSI/IEEE Std 384-1981, IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits.

[7] ANSI/IEEE Std 450-1980, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

[8] ANSI/IEEE Std 485-1983, IEEE Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations.

[9] ANSI/IEEE Std 535-1979, IEEE Standard for Qualification of Class 1E Lead Storage Batteries for Nuclear Power Generating Stations.

[10] ANSI/IEEE Std 649-1980, IEEE Standard for Qualifying Class 1E Motor Control Centers for Nuclear Power Generating Stations.

³ IEEE Standards are available from the Sales Department, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854.