IEEE Std 1115™-2000 (R2011)
(Revision of
IEEE Std 1115-1992)

IEEE Recommended Practice for Sizing Nickel-Cadmium Batteries for Stationary Applications

Sponsor

IEEE Standards Coordinating Committee 29
on
Stationary Batteries

Approved 10 September 2011
Reaffirmed 6 December 2005

IEEE-SA Standards Board

Abstract: The sizing of nickel-cadmium batteries used in full float operation for stationary applications is covered in this recommended practice.
Keywords: nickel-cadmium batteries, stationary applications

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Print: ISBN 0-7381-1950-4 SH94818
PDF: ISBN 0-7381-1951-2 SS94818

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

Use of an IEEE Standard is wholly voluntary. The IEEE disclaims liability for any personal injury, property or other damage, of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance upon this, or any other IEEE Standard document.

The IEEE does not warrant or represent the accuracy or content of the material contained herein, and expressly disclaims any express or implied warranty, including any implied warranty of merchantability or fitness for a specific purpose, or that the use of the material contained herein is free from patent infringement. IEEE Standards documents are supplied "**AS IS**."

The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation, or every ten years for stabilization. When a document is more than five years old and has not been reaffirmed, or more than ten years old and has not been stabilized, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

In publishing and making this document available, the IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity. Nor is the IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing this, and any other IEEE Standards document, should rely upon his or her independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration. A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal interpretation of the IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position, explanation, or interpretation of the IEEE.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Recommendations to change the status of a stabilized standard should include a rationale as to why a revision or withdrawal is required. Comments and recommendations on standards, and requests for interpretations should be addressed to:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854
USA

Introduction

(This introduction is not part of IEEE 1115-2000, IEEE Recommended Practice for Sizing Nickel-Cadmium Batteries for Stationary Applications.)

The storage battery is of primary importance in ensuring the satisfactory operation of generating stations, substations, and other stationary applications. This recommended practice is based on commonly accepted methods used to define the load and to ensure adequate battery capacity. The method described is applicable to all installations and battery sizes.

The installations considered herein are designed for operation with a battery charger serving to maintain the battery in a charged condition as well as to supply the normal dc load. Alternate energy systems (e.g., windmills and photovoltaic systems) may provide only partial or intermittent charging, and are beyond the scope of this document. See IEEE Std 1144-1996 [B6][1] for details.

This recommended practice was prepared by the Nickel-Cadmium Sizing Working Group of IEEE Standards Coordinating Committee 29 (SCC29). It may be used separately, but when combined with IEEE Std 1106-1995, it will provide the user with a general guide to designing, placing in service, and maintaining a nickel-cadmium battery installation. At the time this standard was approved the members of the Nickel-Cadmium Sizing Working Group were as follows:

James A. McDowall, *Chair*

Richard T. Bolgeo
Jay L. Chamberlin
Anthony Green
José Marrero
Leif Olsson
Lesley Varga
Graham Walker

The following persons were on the balloting committee:

Curtis Ashton
Terry Bostian
Jay L. Chamberlin
John K. Coyle
Thomas G. Croda
Peter J. DeMar
Harold E. Epstein
Timothy Furlong
Richard A. Greco
Paul E. Hellen
Robert M. Herritty
Daniel S. Levin
Joel A. Long
José A. Marrero
James A. McDowall
Bansi Patel
Robert S. Robinson
Saba N. Saba
Martin M. Stanton
Frank L. Tarantino
Kurt W. Uhlir
Lesley Varga

When the IEEE-SA Standards Board approved this standard on 30 March 2000, it had the following membership:

Donald N. Heirman, *Chair*
James T. Carlo, *Vice Chair*
Judith Gorman, *Secretary*

Satish K. Aggarwal
Mark D. Bowman
Gary R. Engmann
Harold E. Epstein
H. Landis Floyd
Jay Forster*
Howard M. Frazier
Ruben D. Garzon
James H. Gurney
Richard J. Holleman
Lowell G. Johnson
Robert J. Kennelly
Joseph L. Koepfinger*
Peter H. Lips
L. Bruce McClung
Daleep C. Mohla
James W. Moore
Robert F. Munzner
Ronald C. Petersen
Gerald H. Peterson
John B. Posey
Gary S. Robinson
Akio Tojo
Donald W. Zipse

*Member Emeritus

[1]The numbers in brackets correspond to those of the bibliography in Annex D.

Also included is the following nonvoting IEEE-SA Standards Board liaison:

Alan Cookson, *NIST Representative*
Donald R. Volzka, *TAB Representative*

Andrew D. Ickowicz
IEEE Standards Project Editor

Contents

IEEE Recommended Practice for Sizing Nickel-Cadmium Batteries for Stationary Applications

1. Overview

This recommended practice describes methods for defining the dc load and for sizing a nickel-cadmium battery to supply that load. Some factors relating to cell selection are provided for consideration.

1.1 Scope

This recommended practice covers the sizing of nickel-cadmium batteries used in full float operation for stationary applications. Installation, maintenance, qualification, testing procedures, and consideration of battery types other than nickel-cadmium batteries are beyond the scope of this recommended practice.

Design of the dc system and sizing of the battery charger(s) are also beyond the scope of this recommended practice.

1.2 Purpose

The purpose of this recommended practice is to provide a proven and standardized sizing technique for nickel-cadmium batteries. This sizing method takes normal usage factors into account, and forms the basis for reliable battery operation.

2. References

This standard shall be used in conjunction with the following publications:

IEEE Std 1106-1995, IEEE Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications.[1]

IEEE Std 1184-1994, IEEE Guide for the Selection and Sizing of Batteries for Uninterruptible Power Systems.

---

[1]IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA (http://standards.ieee.org/).