PROCESS INDUSTRY PRACTICES

April 2022

Electrical

PIP ELTFT08
Battery Maintenance

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

PUBLISHING HISTORY
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1. Scope

This Practice covers minimum requirements for the maintenance of vented lead acid (VLA) batteries, valve regulated lead acid (VRLA) batteries, and vented nickel cadmium (NiCd) batteries in stationary applications. Aspects of electrical maintenance are described.

Auxiliary equipment such as battery chargers, UPS systems, etc. are not part of this Practice.

2. References

Applicable parts of the following industry codes and standards and references shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Industry Codes and Standards

- Institute of Electrical and Electronic Engineers (IEEE)
  - IEEE 450 – Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications
  - IEEE 1106 – Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications
  - IEEE 1188 – Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications
  - IEEE 1188a – Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications - Amendment 1: Updated VRLA Maintenance Considerations
  - IEEE 1657 – Recommended Practice for Personnel Qualifications for Installation and Maintenance of Stationary Batteries
- InterNational Electrical Testing Association (NETA)
  - MTS – Standard for Maintenance Testing Specifications for Electrical Power Equipment and Systems
- National Fire Protection Association (NFPA)
  - NFPA 70B – Recommended Practice for Electrical Equipment Maintenance
  - NFPA 70E – Standard for Electrical Safety in the Workplace

2.2 Publications

[1] *The New Weibull Handbook* – Dr. Robert B. Abernethy, Fourth Edition 2002

[2] Battery Testing Guide – Megger, 2017

[3] *Megger Webinars* – The following webinars found on Megger's website provide insight on batteries construction, failure modes, testing, etc.

a. You Ask We Answer: Panel Discussion on Battery Testing

b. Battery Test Data Analysis