PROCESS INDUSTRY PRACTICES

TECHNICAL CORRECTION
September 2019

Electrical

PIP ELSTR01
Design and Fabrication of Liquid-Immersed Substation Power Transformers, 750 kVA and Above, Three Phase

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

September 1997	*Issued*	*April 2016*	*Complete Revision*
April 2002	*Complete Revision*	*September 2019*	*Technical Correction*
April 2009	*Complete Revision*		

Not printed with State funds

PIP ELSTR01
Design and Fabrication of Liquid-Immersed Substation Power Transformers, 750 kVA and Above, Three Phase

Table of Contents

1. Scope

This Practice describes the requirements for design, manufacture, inspection, testing, and shipping of three-phase, liquid-immersed power transformers with a rating of 750 kVA and above.

2. References

Applicable parts of the following Practices and industry codes and standards 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 Process Industry Practices (PIP)

– PIP ELSTR01-D - *Data Sheet for Design and Manufacture of Liquid-Immersed Power Transformers*

2.2 Industry Codes and Standards

- American Society for Standards and Materials (ASTM)
  - ASTM D1535 - *Standard Practice for Specifying Color by the Munsell System*
  - ASTM D3487- *Standard Specification for Mineral Insulating Oil Used in Electrical Apparatus*
  - ASTM D1275-2006 - *Standard Test Method for Corrosive Sulfur in Electrical Insulating Oils*
- Factory Mutual
  - FM Global Property Loss Prevention Data Sheets 5-4, Transformers
- Federal Register
  - 10 CFR Part 431 - *Energy Conservation Program for Commercial Equipment: Distribution Transformers Energy Conservation Standards; Final Rule (reference for energy efficiency of 2500kVA or less)*
- Institute of Electrical and Electronic Engineers (IEEE)
  - IEEE C37.110 - *IEEE Guide for the Application of Current Transformers Used for Protective Relaying Purposes*
  - IEEE Std C57.12.00 - *IEEE Standard for Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers (ANSI/IEEE)*
  - IEEE Std C57.12.10 - *Standard Requirements for Liquid-Immersed Power Transformers*
  - IEEE Std C57.12.28 - *IEEE Standard for Pad-Mounted Equipment - Enclosure Integrity (reference for coatings only)*
  - IEEE Std C57.12.29 - *IEEE Standard for Pad-Mounted Equipment-Enclosure Integrity for Coastal Environments (reference for coatings only)*
  - IEEE Std C57.12.70 - *IEEE Standard Terminal Markings and Connections for Distribution and Power Transformers (ANSI/IEEE)*
  - IEEE Std C57.12.80 - *IEEE Standard Terminology for Power and Distribution Transformers (ANSI/IEEE)*