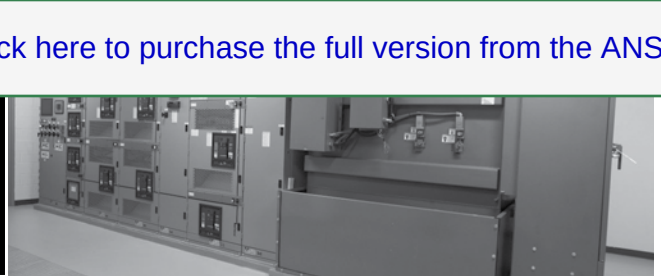
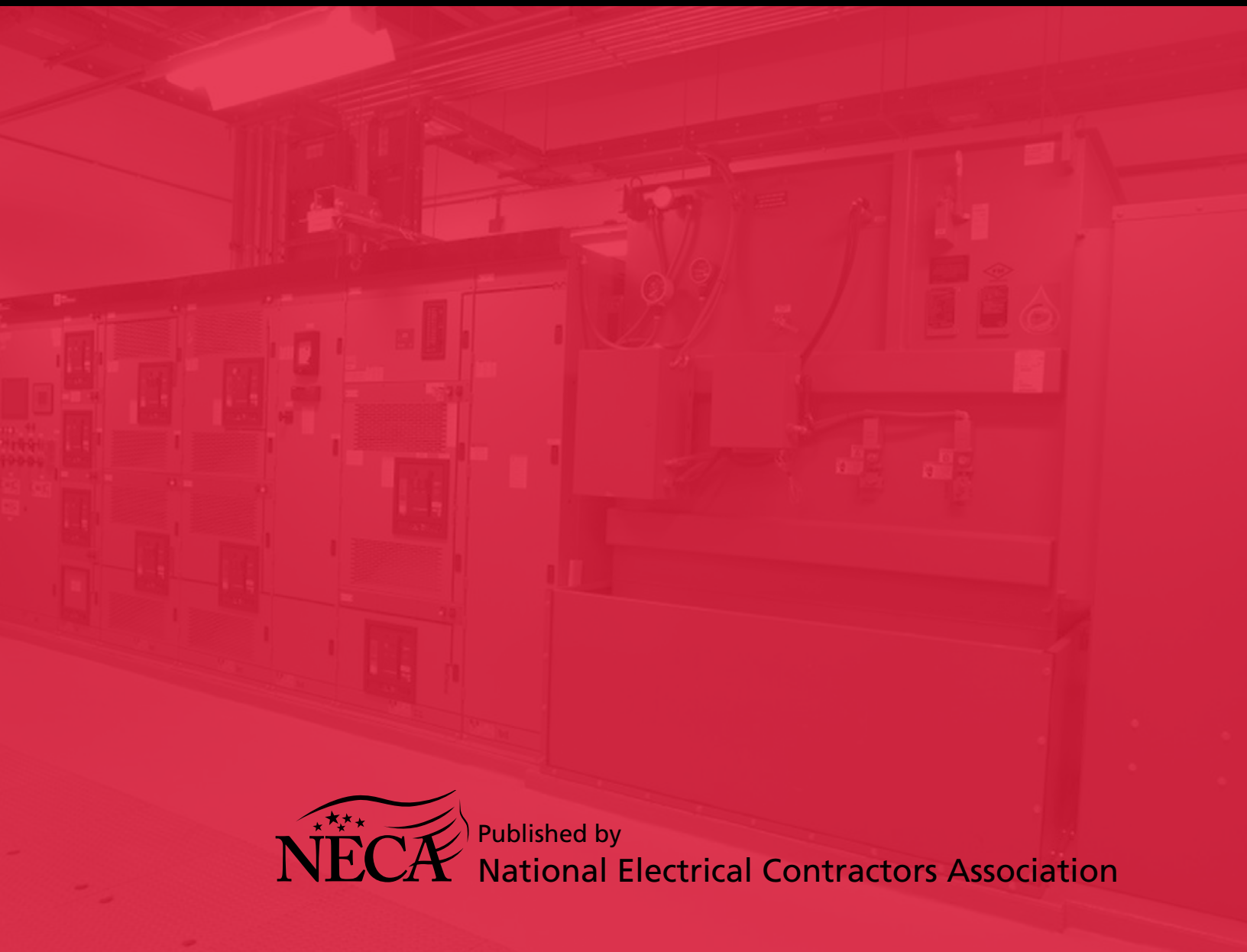


NECA 410-2013

Standard for

Installing and Maintaining Liquid-Filled Transformers

AN AMERICAN NATIONAL STANDARD



Published by
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Revision History		
NECA 410-2005	07/2005	First publication
NECA 410-2013	08/2013	Revision

Table of Contents

(This foreword is not a part of the standard)

Foreword

National Electrical Installation Standards™ are designed to improve communication among specifiers, purchasers, and suppliers of electrical construction services. They define a minimum baseline of quality and workmanship for installing electrical products and systems. *NEIS*™ are intended to be referenced in contract documents for electrical construction projects. The following language is recommended:

> Liquid-filled transformers should be installed in accordance with NECA 410-2013, *Standard for Installing and Maintaining Liquid-Filled Transformers* (ANSI).

Use of *NEIS*™ is voluntary, and the National Electrical Contractors Association assumes no obligation or liability to users of this publication. Existence of a standard shall not preclude any member or nonmember of NECA from specifying or using alternate construction methods permitted by applicable regulations.

This publication is intended to comply with the National Electrical Code® (NEC). Because they are quality standards, *NEIS* may in some cases go beyond the minimum safety requirements of the NEC. It is the responsibility of users of this publication to comply with state and local electrical codes and Federal and state OSHA safety regulations as well as follow manufacturers installation instructions when installing electrical products and systems.

Suggestions for revisions and improvements to this standard are welcome. They should be addressed to:

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To purchase *National Electrical Installation Standards* contact the NECA Order Desk at (301) 215-4504 tel, (301) 215-4500 fax, or orderdesk@necanet.org. *NEIS* can also be purchased in .pdf download format at *www.neca-neis.org/standards.*

Cover illustration courtesy of Schneider Electric.

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1. Scope

1.1 Products and Applications Included

This standard describes installation procedures for pad-mounted, sealed, self-cooled or fan-cooled, compartmental, single- and three-phase liquid filled distribution and power transformers with primary windings rated from 2400 volts to 35 kV AC, nominal, and rated from 75 kVA through 5000 kVA, and associated accessories, designed for outdoor installation at grade level with underground entrance of primary and secondary conductors, and used for supplying power, heating and lighting loads for commercial, institutional, and industrial use in non-hazardous locations.

It also covers periodic routine maintenance procedures for transformers, and special procedures used after adverse operating conditions such as short-circuit, ground-fault, or immersion in water.

1.2 Products and Applications Excluded

This publication does not apply to the following:

1. Dry-type transformers
2. Specialty transformers such as control, industrial control, instrument, current, potential, metering, buck-boost transformers, or lighting and ballast transformers
3. Autotransformers
4. Cast coil transformers
5. Arc furnace transformers
6. Rectifier transformers
7. Network transformers
8. Unit substation transformers, or
9. Transformers with more than two sets of windings

1.3 Regulatory and Other Requirements

All information in this publication is intended to conform to the National Electrical Code (ANSI/NFPA 70). Installers should always follow the NEC, applicable state and local codes, manufacturer's instructions, and contract documents when installing liquid-filled transformers.

Only qualified persons as defined in the NEC familiar with the construction and installation of liquid-filled transformers should perform the technical work described in this publication. Administrative functions such as receiving, handling and storing required in Section 3, and other tasks can be performed under the supervision of a qualified person. All work should be performed in accordance with NFPA 70E, *Standard for Electrical Safety in the Workplace.*

General requirements for installing electrical products and systems are described in the latest version of NECA 1, *Standard for Good Workmanship in Electrical Construction* (ANSI). Other *National Electrical Installation Standards* provide additional guidance for installing particular types of electrical products and systems. A complete list of *NEIS* is provided in Annex C.