Standards in Trade

# U.S. Approach to Conformity Assessment for Electrical and Electronic Products – Part 2

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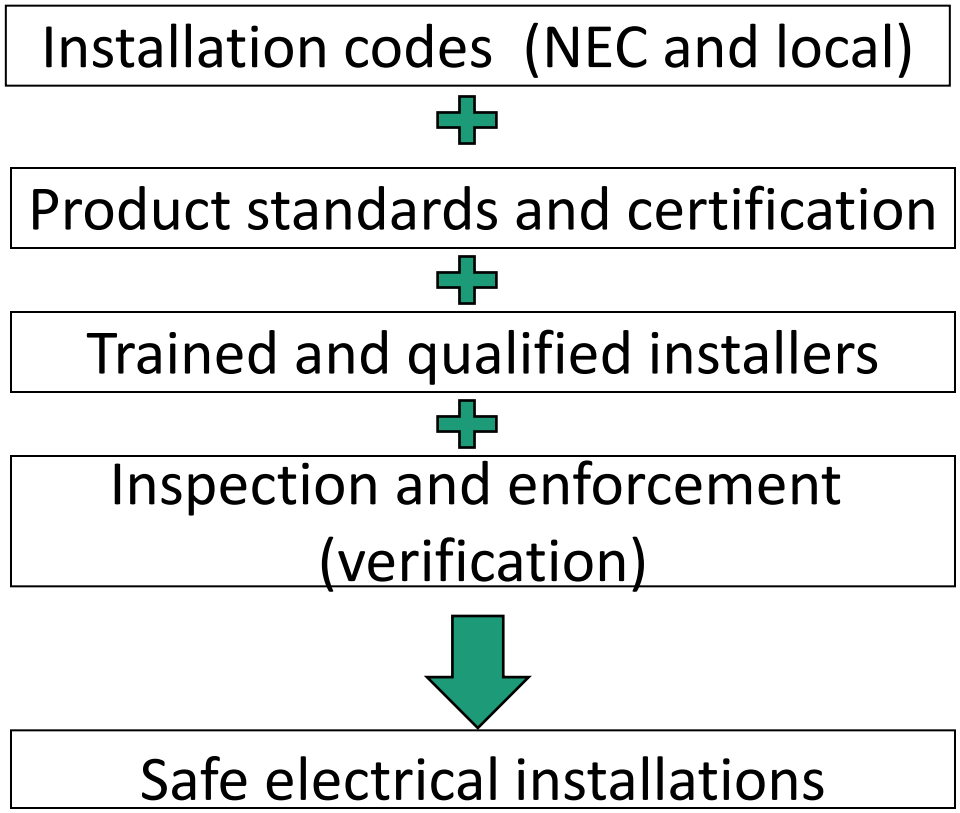
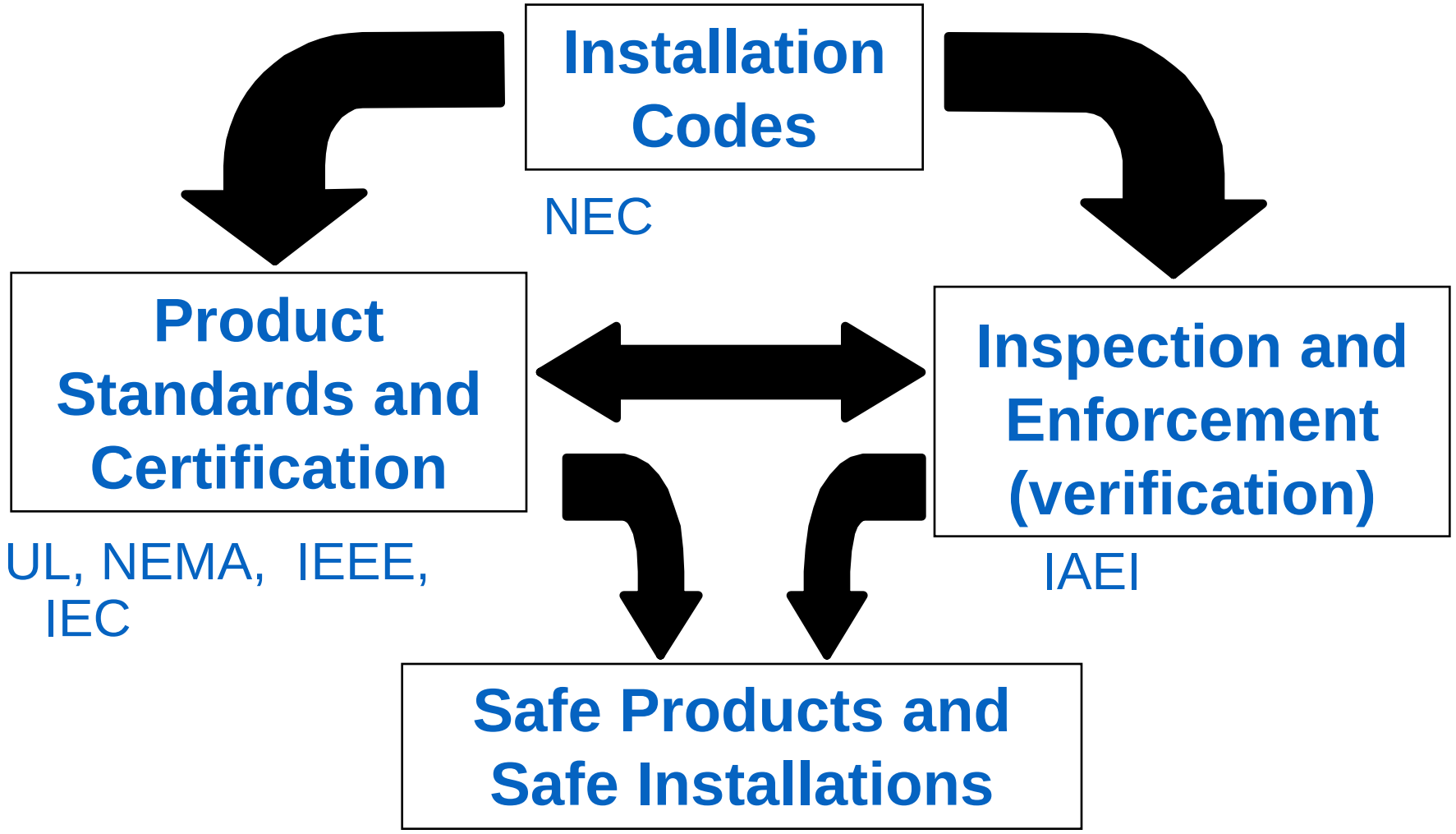
# Objectives

- Overview of the US Electrical Safety System
- How the elements of the system interact
- Key players
- What is the National Electrical Code®?
- What is the role of product standards
- Who are the electrical inspectors?
- Conclusion

# US Electrical Safety System



# U.S. Electrical Safety System- Conformity Assessment of Installations



# Key Organizations




# Key Organizations

Product Standards




# Key Organizations

Installation Code

Product Standards




# Key Organizations

Installation Code

Product Standards

NFPA

Electrical Inspection

Working for a safer world

# Installation Code


- Importance
  - Directs the safe installation of products and systems
  - Helps to ensure use of safe products
- Tie to other parts of the safety system
  - Influences requirements in product standards
- Stated purpose
  - NEC 90.1(A) and (B)The purpose of this code is the practical safeguarding of persons and property from hazards arising from the use of electricity

# US Electrical Installation Code

- National Electrical Code® – NFPA 70
- Developed and published by National Fire Protection Association
- Date of the current version-2014
- Next edition-2017 (published in Sept. 2016)
- Adopted, used, and enforced in all 50 US states
- Adopted/used in a number of other countries

# National Fire Protection Association

- First edition-1897
- Assumed sponsorship in 1910
- Published annual and biennial editions until 1953
- Has published triennial editions since 1953
- Published 45 of the 53 editions

# National Fire Protection Association

- Founded in 1896
- Private, Non-Profit, Voluntary Codes and Standards Developer
- ANSI Accredited Organization
- Membership Organization - 70,000
  - ♦ Members from around 100 Nations

# Interest Categories

- Categories of Interest
  - ♦ Users
  - ♦ Manufacturers
  - ♦ Enforcers
  - ♦ Testing/Research
  - ♦ Special Experts
  - ♦ Insurance
  - ♦ Installer/Maintainer
  - ♦ Consumer
  - ♦ Labor
  - ♦ Utilities

# Installation Codes


**CANADA (CEC)**

**US (NEC)**

**MEXICO (MEC)**

**IEC 364 (TC64)**

Presently compatible

Same base document

Harmonized Codes in the Americas

# Tying the Code to the Product Standards


**Installation Codes**

**Product Standards and Certification**

- Code panels (and proposers) use the fact that a product standard has certain requirements to justify acceptance of a rule.
- Some have decided that if the Code doesn't state a specific product standard, then anything can be used.
- Annex listing applicable product standards.

# Product Safety Standards and the NEC

- Product safety standards and third party certification are a key element to safe electrical installations
- The NEC requires that listed and labeled products be installed in accordance with the product certification requirements
- Inspectors rely on product certification as part of the process of approving an installation

# Product Standards


- Importance
  - product standards set design, performance, construction, and certification requirements for products
  - provides basic requirements for “safe products”
- Tie to Other Parts of the Safety System
  - certified compliance with standards indicates suitability for installation and use in accordance with the installation Code.
  - inspectors rely on compliance to products standards to approve a particular product for installation

# Who is Enforces the Code?

- Usually the Authority Having Jurisdiction (AHJ)
  - Authority Having Jurisdiction. “The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.”
- May be delegated representative of Building Official or Chief Electrical Inspector
- Derives authority from state, county or municipal law or ordinance
- Duties may be contracted to private organization

# Who is the Electrical Inspector?

- Qualifications vary by jurisdiction.
  - Often a journeyman electrician
  - Sometimes multiple-discipline inspector
- Certification as electrical or multiple-discipline inspector may be required
- Often, Continuing Education is required to maintain certification

# Who is the Electrical Inspector?

- May be part of bigger organization such as the Fire Marshal's office
- Duties may be shared or limited such as for fire pumps, fire alarms, schools and hospitals
- Some inspectors have duties for one- and two-family dwellings only
- Some inspect residential, commercial and industrials
- Some specialty inspectors such as for signs or health care facilities

# Electrical Inspection & Safety

- The primary function of the NEC and those who enforce it is to ensure the practical safeguarding the persons and property from hazards arising from the use of electricity
- The electrical inspector protects the public from unsafe electrical installations
- The inspector does so by enforcing the NEC and local electrical regulations

# Inspection/Enforcement

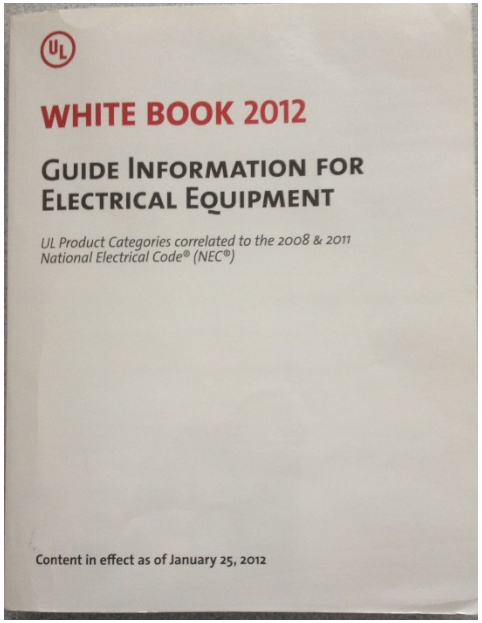

- Importance
  - inspector verifies that installation complies with Code
  - provides for systematic checks and balances in the system
  - uniform interpretation of the installation code
  - products that do not comply meet required standards will most likely not be used
- Tie to Other Parts of the Safety System
  - certified compliance with standards is evidence for the inspector that a product can be safely installed and used in accordance with the installation codes
  - enforcer of the installation code

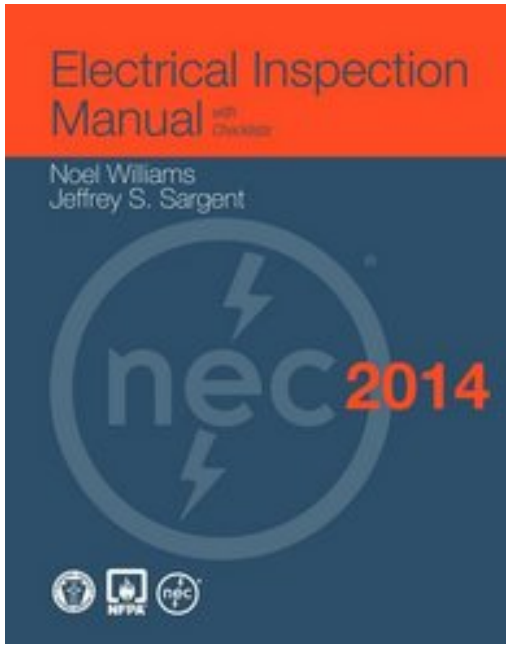
# Inspection Functions

- Plan Review
- Rough-in
- Final Inspection
- Certificate of Occupancy

# Inspector's Tools

- National Electrical Code®
- UL White Book
- Electrical Inspection Manual

# Conclusion


- The Safety System-Conformity Assessment of Installations
  - The components of the conformity assessment part of the safety system is tightly integrated
  - Installation Code
  - Product Standards
  - Qualified Electrical Inspectors
- Trained and Qualified Installers are an important element in the Electrical Safety System

# U.S. Electrical Safety System- Conformity Assessment of Installations