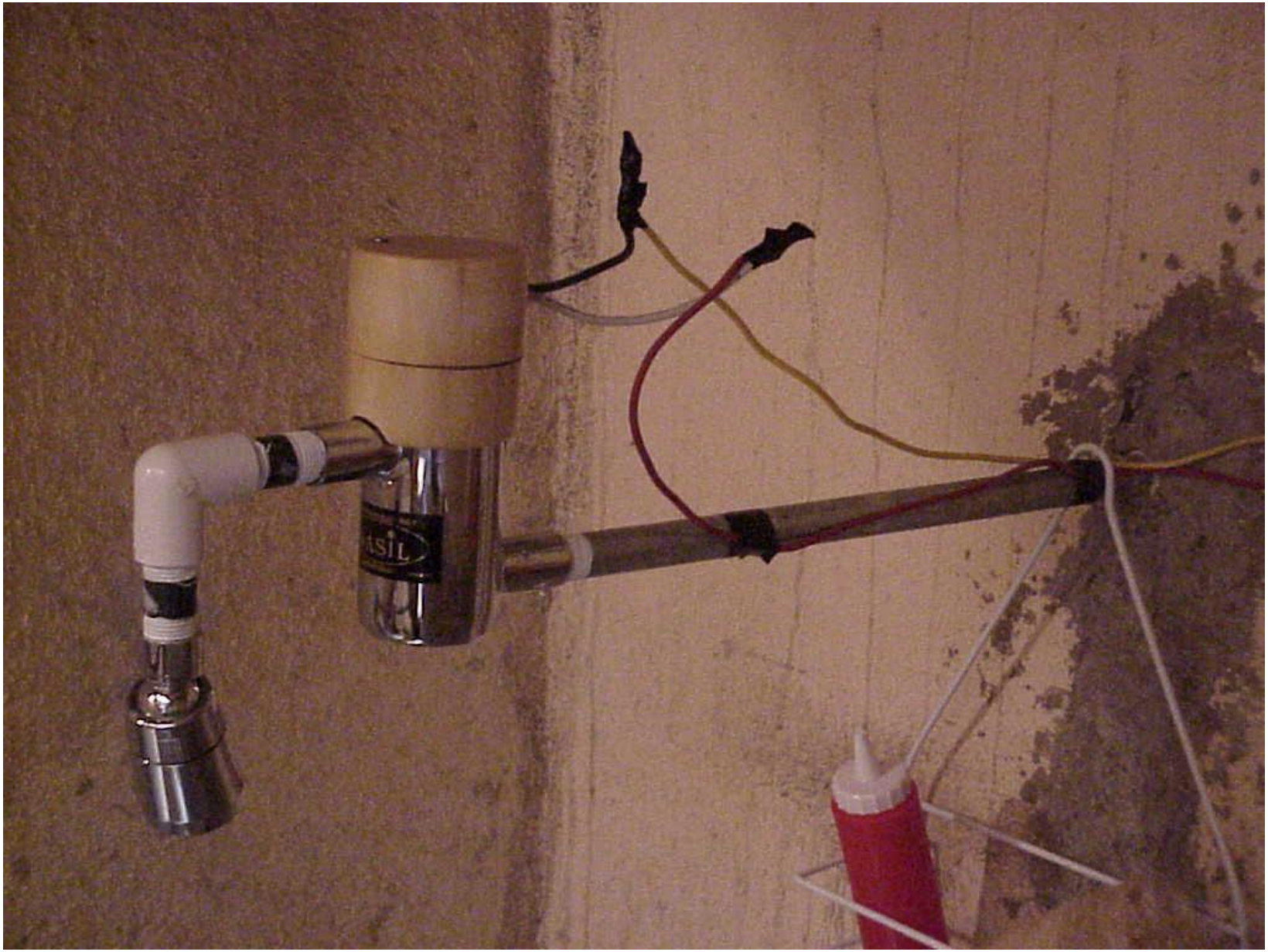

WORKLIGHT OUTLET
150 WATTS 110

We Have Some Problems With Non-Listed Equipment



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ludwik
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DANGER / PELIGRO

NFPA 790 / 791 Evaluation of Unlabeled Equipment

There's a new Standard in town!

(Well two, actually)

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BERKELEY LAB
LAWRENCE BERKELEY NATIONAL LABORATORY

Titles

- **NFPA 790; Standard for Competency of Third Party Field Evaluation Bodies**
- **NFPA 791; Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation**
- **Both will be issued in 2012**

History

- June 2003: Two documents on these subjects were developed and issued by the American Council for Electrical Safety (ACES)
  - A Division of the American Council of Independent Laboratories (ACIL)
- 2008 ACES requested NFPA to formalize them as Standards
- 2008 EEE Committee commissioned

Committee Members

- **Principals**:
- Tim McClintock, Chair; Wayne County, Ohio
- William Anderson; Procter & Gamble
- Julian Burns; Quality Power Solutions
- William Burr; CSA
- Keith Gershon; LBNL
- Gordon Gillerman; NIST
- Nancy Gunderson; Square D
- Joseph Halferty; United Inspection Agency
- Edward Karl; Applied Materials
- Charles Mello; UL
- Russell Nichols; SGS
- Kenneth Rempe; Siemens
- Lawrence Todd; Intertek

- **Alternates:**
- Peter Bowers; Satellite Electric Company, Inc.
- Ron Chilton; North Carolina Department of Insurance
- Michael Farrell; Lucas County MI Building Regulations
- Jeff Hamilton; Applied Materials
- Mark Lewandowski; Procter & Gamble
- Richard Roux; Staff Liaison; NFPA

Current Status

- ACES documents have been converted to conform to NFPA style
- Proposals are being accepted
- Proposal period closes November 24, 2009

NFPA 790 Contents

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 Field Evaluation Body (FEB) Application for Recognition
- Chapter 5 Field Evaluation Body (FEB) Organization
- Chapter 6 Field Evaluation Body Personnel
- Chapter 7 Appeals, Complaints and Disputes
- Chapter 8 Application for Evaluation
- Chapter 9 Preparation for Evaluation
- Chapter 10 Evaluation
- Chapter 11 Evaluation Report
- Chapter 12 Decision to Issue a FEB Statement of Conformity
- Chapter 13 Use of FEB Statements of Conformity
- Chapter 14 Test and Measuring Equipment
- Annex A Explanatory Material
- Annex B Application for Recognition as a Field Evaluation Body (FEB)
- Annex C Electrical Product Groups
- Annex D Informational References

NFPA 791 Contents

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- **Chapter 2 Referenced Publications**
- **Chapter 3 Definitions**
- **Chapter 4 Procedure Overview**
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- **Chapter 6 Construction Inspection**
- **Chapter 7 Electrical Testing**
- **Chapter 8 Reporting and Documentation**
- **Chapter 9 Field Evaluation Body (FEB) Label**
- **Annex A Explanatory Material**
- **Annex B Multiple Units of Same Equipment**
- **Annex C Informational References**
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Purpose and Scope

- **1.2.2** This document provides for uniformity and consistency in the overall evaluation process used to complete evaluations and evaluation reports on unlabeled electrical equipment.

4.2.2 Electrical Testing

- Electrical testing includes but is not limited to:
- (1) Insulation resistance
- (2) Heat rise testing
- (3) Dielectric withstand
- (4) Ground continuity test
- (5) Ground Bond Test
- (6) Leakage current tests
- (7) Safety circuit functional tests including safety interlocks and emergency power off switches.

Reference Standards

- **5.3 Standard(s).** The assessor should determine the appropriate standard, based on the standard‟s scope, for the equipment to be evaluated based on the equipment design and intended application.
- **5.3.1 General**. Where no single standard applies to the equipment, then applicable portions of related standards for subassemblies and supplementary standards should be applied.
- **5.3.2 Primary Standard.** The primary standard to be used should be a nationally recognized product safety standard written and maintained by a standards development organization that issues product safety standards such as Underwriters Laboratories, Factory Mutual Research Corporation and Institute of Electrical and Electronic Engineers.

6.2 Construction of Enclosures

- Inspect enclosure construction including but not limited to the following:
- (1) Suitable construction materials, metallic or non-metallic
- (2) Listed and labeled for the intended environment or evaluated for the intended environment as part of the project
- (3) Corrosion protection of internal and external parts
- (4) Hinged doors open at least 90 degrees
- (5) Proper door bonding for hinged doors that have electrical equipment mounted on the door
- (6) No access to live parts through any opening in the enclosure walls or ventilation openings

6.3 Disconnecting Means.

- A lockable disconnecting means should be provided.

Components

- (1) Match the bill of material or create one from inventory of equipment
- (2) Critical components are to be listed or recognized and labeled by a Nationally Recognized Testing Laboratory
- (3) Critical components are to be used in accordance with their listing or the “conditions of acceptability” that is part of the component‟s recognition
- (4) Components are properly mounted
- (5) Adequate spacing is provided around components for mounting, termination and heat dissipation under maximum designed loading

Overcurrent Protection

- (1) Proper protection of conductors per the conductor ampacity
- (2) Power supplies including power supplies for PLCs and computers
- (3) Transformers for power and control
- (4) Inspect motors for proper overcurrent protection including to ensure that short circuit, ground fault, and overload protection is provided and properly rated
- (5) Maintenance receptacle overcurrent protection provided
- (6) Heater loads have proper overcurrent protection
- (7) Plug strips and portable power taps have proper protection

6.8 Maintenance Receptacles and Lighting

- Inspect maintenance receptacles and lighting for the following:
- (1) Separate circuit(s) identified
- (2) Class A GFCI protection as applicable

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6.9 Wiring

- (1) Correct color code or other identification used.
- (2) Insulation types rated for the application and intended environment
- (3) Conductor temperature ratings adequate
- (4) Ampacity for load served and overcurrent protection provided
- (5) Flame rating of VW-1 or equivalent on insulation
- (6) Proper use of flexible cords
- (7) Proper use and physical protection of flexible cables
- (8) Separation of low energy circuits from power circuits

6.10 Markings

- (1) Access warnings for shock hazard
- (2) Multiple source warnings
- (3) Environmental restrictions such as “Indoor Use Only”
- (4) Field wiring type such as “ Copper Conductors Only”
- (5) Component designations that match the layout and schematic drawings
- (6) Control device functional identification
- (7) Equipment grounding terminal marking

6.11 Grounding

- Inspect for the following grounding/bonding provisions:
- (1) Ensure that there is a provision for terminating the supply equipment grounding conductor
- (2) One conductor per terminal for all equipment grounding conductors in ground fault paths
- (3) Equipment grounding conductors are properly indentified by color coding (green or green with one or more yellow stripes) or by other suitable markings
- (4) All conductive enclosure doors and panels are properly bonded