



BROWARD COUNTY BOARD OF RULES AND APPEALS

To: Members of the Committee to Address Uniform Procedures for Installation of Bi-Directional Amplifiers (BDA)

D. Rice, P.E.	B. Bowers	M. Bray	K. Brown	J. DeZayas
T. DiBernardo	R. Dinello	J. Franklin	K. Grams	B. Higdon
W. Keys	H. Melamed	J. Preston	M. Sheehan	R. Taylor
A. Zackria				

From: Bryan Parks, Chief Fire Code Compliance Officer
Ken Castronovo, Chief Electrical Code Compliance Officer

Date: April 25, 2019

Subj: BDA Committee to Discuss Agenda Items

1 N. University Drive, Suite 3500B
Plantation, FL 33324

Phone: 954-765-4500

Fax: 954-765-4504

broward.org/CodeAppeals

2019 Voting Members

Chair

Mr. Daniel Lavrich, P.E.,
S.I., SECB, F.ASCE, F.SEI
Structural Engineer

Vice-Chair

Mr. Stephen E. Bailey, P.E.,
Electrical Engineer

Mr. Jeffrey Lucas, FM, CFI, CFEL,
Fire Service Professional

Mr. John Famularo,
Roofing Contractor

Mrs. Shalanda Giles Nelson,
General Contractor

Mr. Daniel Rourke,
Master Plumber

Mr. Gregg D'Attile,
Mechanical Contractor

VACANT,

Representative Disabled Community
Mr. Ron Burr,

Swimming Pool Contractor
Mr. John Sims,
Master Electrician

Mr. Dennis A. Ulmer,
Consumer Advocate

Mr. Abbas H. Zackria, CSI,
Architect

Mr. Robert A. Kamm, P.E.,
Mechanical Engineer

2019 Alternate Board Members

Mr. Jeff Falkanger,
Architect

Mr. Steven Feller, P.E.,
Mechanical Engineer

Mr. Alberto Fernandez,
General Contractor

Mr. Robert Taylor,
Fire Service Professional

Mr. Gary Elzweig, P.E.,
Structural Engineer

Mr. David Rice, P.E.,
Electrical Engineer

Mr. James Terry,
Master Plumber

Mr. David Tringo,
Master Electrician

Mr. William Flett,
Roofing Contractor

Board Attorney

Charles M. Kramer, Esq.

Board Administrative Director

James DiPietro

The Chairman of the BDA Committee, Mr. Dave Rice, P.E., has called for a meeting of the BDA Committee on April 25, 2019 at 1:30pm at the Plantation Fire Station, 550 NW 65th Avenue, Plantation, FL 33317. The latest issues concerning Bi-Directional Amplifiers, Section 118 of the Broward County Amendments to the Florida Building Code, will be discussed.

AGENDA

Chairman Welcoming Remarks

Roll Call

Acceptance of February 26, 2019 Meeting Minutes

Regular Meeting

Guest Speaker: Mr. William Redmond, Broward County Elevator Division, will be discussing the procedure for submitting an Elevator Variance Request, ASME 17.1, equipment in hoist ways, machine spaces, machine rooms, control spaces and control rooms, coaxial cables and antennas. See attachment.

Item 1: Discussion on the use of elevator shafts and stairwells as a two-hour fire rated enclosure for riser cables. NFPA 72, 2013 5

Item 2: Review Formal interpretation #20 concerning UL Standard 2524 for Bi-Directional Amplifier Systems..... 7
 A. Memo to all interested BDA parties concerning UL 2524 (Effective Date: April 19, 2019) 9

Item 3: Third-Party Field Evaluations, NFPA 790 and NFPA 791 10

Item 4: Electrical Contractors Licensing Board specialty licensing option for the Bi-Directional Amplifier profession update 40

Item 5: Discussion on enforcing the code in effect 44

Item 6: Approved Engineer. FBC 118.1.4 47

Item 7: Lightning Protection, 9.6.3 NFPA 1221, 2016 52

Item 8: Surge Arrestor, NFPA 70, 2014, 810.6 54

Discussion

Schedule Next Meeting

Adjournment



Broward County Board of Rules and Appeals

Phone: 954-765-4500 | Fax: 954-765-4504

broward.org/CodeAppeals

MEETING OF THE COMMITTEE TO ADDRESS UNIFORM PROCEDURES FOR INSTALLATION OF BI-DIRECTIONAL AMPLIFIERS

Minutes
February 26, 2019

Call to order:

Chair David Rice, P.E. called a published meeting of the Broward County Board of Rules and Appeals Committee to Address Uniform Procedures for Installation of Bi-Directional Amplifiers to order at 1:31pm.

The roll was called, and the following members were present:

Present:

Bruce Bowers	Johnathan Franklin	John Preston
Mickey Bray	Kevin Grams	David Rice, P.E.
Kenneth "Sean" Brown	Brad Higdon	Robert Taylor
Robert "Bob" Dinello	William "Bill" Keys, CFPE	

Staff: Bryan Parks, Chief Fire Code Compliance Officer
Kenneth Castronovo, Chief Electrical Code Compliance Officer

A MOTION WAS MADE BY MR. PRESTON AND SECONDED BY MR. FRANKLIN TO APPROVE THE DECEMBER 5, 2018 COMMITTEE TO ADDRESS UNIFORM PROCEDURES FOR INSTALLATION OF BI-DIRECTIONAL AMPLIFIERS MEETING MINUTES. THE MOTION PASSED BY UNANIMOUS VOTE.

Mr. Thomas Sullivan, Mobile Communication, noticed an error in the December 2018 minutes. Mr. Sullivan said that in Item 1, the minutes should describe the Honeywell BDAs as "a device suitable for smaller buildings, rather than large ones," rather its current description as a device that would only be suitable for large buildings, rather than smaller ones.

A MOTION WAS MADE BY MR. PRESTON AND SECONDED BY MR. FRANKLIN TO APPROVE THE MODIFICATIONS FOR THE DECEMBER 5, 2018 COMMITTEE TO ADDRESS UNIFORM PROCEDURES FOR INSTALLATION OF BI-DIRECTIONAL AMPLIFIERS MEETING MINUTES. THE MOTION PASSED BY UNANIMOUS VOTE.

Chair David Rice, P.E. introduced Mr. Mickey Bray, Chief Electrical Inspector, City of Pompano Beach and Mr. Robert Dinello, Electrical Plans Examiner, City of Fort Lauderdale, as the newest

members of the Committee to Address Uniform Procedures for Installation of Bi-Directional Amplifiers.

Item 1: Review Formal Interpretation #20 concerning UL Standard 2524 for Bi-Directional Amplifier Systems

**A. Memo to all interested BDA parties concerning UL 2524
(Effective Date: April 19, 2019)**

Mr. Kenneth Castronovo, Broward County Board of Rules and Appeals, informed the public that the BDA committee members voted to approve a six-month delay to postpone the approval of UL Standard 2524 at the December 2018 BDA Committee Meeting. After the recommendation was presented to the Broward County Board of Rules and Appeals, the request was denied. This will require all BDA systems to be subjected to a field evaluation by April 19, 2019.

Mr. John Preston, Oakland Park Fire Rescue, asked Mr. Castronovo if there was any explanation at the Board Meeting about the reason that the Board denied the BDA Committee's recommendation. Mr. Castronovo said that after the presentation was made, it was recommended that the deadline not be extended since UL Standard 2524 is a code article and the code must be followed.

Chair Rice added that he did not decide what his recommendation would be until the day of the meeting. Prior to the Board meeting, a group of electrical chiefs met to discuss the upcoming vote. One of the concerns that came up during the meeting was that once the first extension was approved, it had the potential to be followed by more extensions. It was recommended that the protocol should return to its original state before the inception of Formal Interpretation #20: Two-Way Radio Communication Enhanced Public Safety Signal Booster

Mr. Jonathan Franklin, Signal Communications, LLC, asked if there was any change in the number of vendors that offer UL listed equipment. Chair Rice answered that there is only one UL listed product, which is sold by a number of Honeywell distributors.

Mr. Preston asked if the BDA Committee had intentions of creating a monopoly. Chair Rice said that is not the committee's intention and clarified that the intention is to return to the practice of interpreting the code as it is written. He added that the system has to be listed and inspected by a third-party before it can be approved by an electrical inspector. Mr. Franklin asked if the qualifications for being a third-party inspector have been solidified. Chair Rice responded that in NFPA 70, Section 110, a third-party testing laboratory is defined as being listed by UL, ETL or comparable listing agencies.

Chair Rice reminded the audience, that they are encouraged to contact Mr. Castronovo with their comments and suggestions about third-party testing.

Mr. Edmond Langdo, Advanced BDA, inquired about the BDA system protocols for Miami-Dade County. Chair Rice explained that the rules that apply for Miami-Dade County are not congruent with those of Broward County, but he suggested getting systems that are not listed, inspected by a third-party.

Mr. Franklin asked if anyone was aware of local firms that offer third-party testing. Mr. Mike Brownson, Westell Technologies, Inc., said that the certified, nationally recognized

independent testing labs provide field inspection, but because the process is so new, their operation is slow and has a limited number of personnel qualified to perform the inspections.

Mr. Brownson added that he expects a lot of issues with inspections, simply because of how new the process is. He said that when UL 2524 is broken down, it consists of two UL Standards combined with a few new standards that have been added in efforts to comply with the NFPA. Field testing would require the inspector to test the enclosures with: UL 609-50, an electrical safety test, and UL 50E, a NRTL-tested NEMA 4.

Chair Rice asked Mr. Brownson if he had an established date for his products having a UL listing. Mr. Brownson said that mid-June is the soonest that he expects that his products will be UL listed.

Mr. John Dignan, RF FREQS, mentioned that he completed a job in Davie. He was told that he was required to have an inspection, but after hiring inspectors from a California-based company, he was charged \$6,500 for the consultation. The consultation cost was followed by an additional \$3,500 fee for repairing and certifying the project. Mr. Dignan raised the questions about affordability after he shared his personal experience with BDA system inspections.

Mr. Michael Millard, Cell Antenna Corp., said that as of February 15, his company, Cell Antenna Corp., reached out to five BDA manufacturers that they collaborate with routinely. Mr. Millard and his team found that none of the manufacturers provide products that meet the UL 2524 listing requirement. The companies gave a range of responses. Some could not give an estimation of when they would be ready, one suggested that they could possibly be ready by June and one gave conflicting responses about when Cell Antenna Corp. could expect their products to be listed. He stated that by April, he and his team will not have any providers that offer UL listed products.

Mr. Alan Perdue, Safer Buildings Coalition, disclosed that in his experience, the issue that developed about UL was initiated by his organization. He said that their issue is that there are multiple boxes being manufactured in different cities and countries and there is no standard being upheld. The Safer Buildings Coalition approached UL to establish a uniform standard.

Mr. Perdue added that the Safer Buildings Coalition worked with UL to develop UL 2524, with the understanding that it would take time for the industry to catch up to the standards. The code requirement for UL 2524 can be found in the 2021 Edition of the International Fire Code, which submitted proposals to NFPA 1 and NFPA 101.

Mr. Perdue explained that it is important to understand the cost for building owners and consider the complexities of this issue and its impact on the political environment. The BDA systems were designed to save lives, but the public safety aspect of it becomes too complex for the general public. It has the potential to alienate building owners, which will result in a decrease in compliance. If they don't comply, it becomes even more difficult to get owners to agree to spending excessive amounts of money. Mr. Perdue expressed that in his experience, frustrated building owners go directly to their elected officials to attempt to get the code altered.

Mr. John Foley, Safer Buildings Coalition, asked for clarification about the BDA certification process. Chair Rice informed him that the inspectors charge a daily fee in addition to the cost of their requirements.

Mr. Foley also asked if UL 2524 only covered the active components, rather than also including the support material (i.e. antennas, coaxial cables, etc.) in the inspection process. He believes that this process has the potential to be flawed because the box alone cannot account for the totality of the system. Also, if all boxes are procured from the same manufacturers they are identical in every building. Chair Rice noted that each certification inspection is tailored to each building.

Mr. Preston believed that when a vendor is charged \$6,000 - \$10,000 per installation, the vendor cannot be competitive on the same levels that the current manufacturers are.

Mr. Dwight Greer, CBN Solutions Group, asked if the BDA certification is directed towards the building or the BDA system. As well as, if he uses the same product with no modifications, how can the results of the inspection be any different from one building to the next?

Chair Rice stated that when a new design is presented, all the industrial equipment involved must be UL listed or third party certified. While some manufacturers adopted the new standards as soon as they were aware of them, many companies are slower to make changes. He added that no matter when companies heard about it, now is the time that everyone needs to begin adapting for the advancement of their business.

Mr. Brian Feero, Fire Controls Inc., shared that he currently has 14 BDA systems under contract. He said that none of his customers have complained to him about cost. He said that companies should be holding themselves accountable to the highest UL standard, rather than trying to hold the industry back for personal gain.

NO MOTION.

Item 2: Discussion on the Electrical Contractors Licensing Board specialty licensing option for the Bi-Directional Amplifier profession update

Mr. Castronovo reported that the Electrical Contractors Licensing Board (ECLB) is moving forward with making specialty licenses available. Since the ECLB has approved specialty licensing, the organization is now in the process of creating an exam. Because most of the BDA installers are radio systems professionals, the ECLB believed that the test should not be based in electrical subject matter, so a new test must be generated. Mr. Castronovo added that the ECLB is expected to have an exam available by summer 2019.

Chair Rice explained the formal process for BDA contracting: an owner can contract with a general contractor who can contract with an electrical contractor who has the authority to contract with a vendor.

The electrical contractor cannot work with the vendor because the vendor is not a contractor. The Broward County Board of Rules and Appeals does not take the place of or overrule the licensing laws.

NO MOTION.

Item 3: Discussion on enforcing the code in effect

Mr. Bryan Parks, Broward County Board of Rules and Appeals, cited NFPA 72 2013, which states that the local officials cannot mandate any other code than the code that is noted on the plans, but the engineer-of-record has the authority to discern which version of the code would be best for the design to adhere to.

Chair Rice added that a problem with the State of Florida codes is that the Florida codes are six years behind in the process of adopting the latest codes.

Mr. Parks informed the public that Florida Statute 633.202 only pertains to the fire discipline, but references for the electrical discipline can be found in the Florida Building Code, Chapter I, Section 118: Two-Way Radio Communication Enhanced Public Safety Signal Booster Systems.

NO MOTION.

Item 4: Bi-Directional Amplifier plan review checklist discussion

Chair Rice informed the public that he, along with Mr. Castronovo and Mr. Parks, will be creating a checklist for guidelines for the design permitting and installation of two-way radio communication systems. The guidelines will be comprised of codes, as well as defining a project's chain of command. Chair Rice says that he does not want to release the information until the content has been agreed upon by Electrical Chiefs, Fire Chiefs and the FCC.

Mr. Millard mentioned that he has seen a large influx in last minute changes before the final inspection. He asked if there will be a way to require early access to the information about any potential revisions to avoid requiring multiple inspections and postponing the building's opening.

Chair Rice said that his goal is to have all of the probable scenarios that have the potential to emerge during BDA system installations established. The viable scenarios that can be identified, will be added to the guideline checklist.

Mr. Barry Smith, ORCAT, shared his contact information with the public, offering his assistance to anyone who needed it. He also recommended utilizing reputable online resources to gain knowledge about BDA systems. ORCAT is trying to transition the local government from the 800 System and onto the UHF System. Eventually, the systems will be P25-700 and Mr. Smith suggested that a plan should be created rapidly to avoid waiting until the last minute to make the necessary changes.

Chair Rice opened the floor to the public.

Mr. Perdue volunteered to announce some of the trends that are emerging in the industry. He said that FirstNet is being refined. He also warned members of the public that because the BDA systems industry is changing so rapidly, adopting new trends should be done cautiously in attempts to make sure that all investments being made possess a valuated benefit to the company.

Mr. Gary Gray, City of Fort Lauderdale, explained that FirstNet is not permitted in Fort Lauderdale because cellular services are not permitted to be broadcasted on a public BDA system.

John J. Diamond, ORCAT, said that he encountered a case where a vendor turned on a BDA system without the notifying ORCAT. He asked if there was exiting protocol for similar situations because turning on a BDA system unbeknownst to the jurisdiction has the potential to shut down larger systems.

Chair Rice answered that systems are not to be turned on until they receive written consent from the jurisdiction. Turning a system on without authorization is a violation of the code and it is also a FCC violation.

Chair Rice stated that before the system is turned on, approval from ORCAT, the jurisdiction and the jurisdiction's fire marshal is required.

Mr. Robert Taylor, Town of Davie Fire Department, said that a recent fire marshal's meeting, he suggested that there be a universal sign displayed, for police and fire, to identify a building's BDA system.

Chair Rice asked Mr. Taylor to put his proposal in writing and submit it to Mr. Parks.

NO MOTION.

A MOTION WAS MADE BY MR. PRESTON AND SECONDED BY MR. BROWN TO ADJOURN THE MEETING. THE MOTION PASSED BY UNANIMOUS VOTE.

Adjournment

Having no further business to go before the Committee, the meeting adjourned at 2:52pm.

Guest Speaker:

Mr. William Redmond, Broward County Elevator Division.

Bi-Directional Amplifier Plan Review Guidelines For Electrical.
TWO-WAY RADIO COMMUNICATIONS ENHANCEMENT SYSTEM.
Based on NFPA 72, 2013. NFPA 70, 2014. Section 118, FBC Broward County, November 28th, 2018.

NFPA 72 10.6.9.1.1 Failure of either supply shall result in a trouble signal in accordance with Section 10.15.



NFPA 72. 24.5.2.6.2* Dedicated Panel. A dedicated monitoring panel shall be provided within the fire command center to annunciate the status of all signal booster locations. The monitoring panel shall provide visual and labeled indication of the following for each signal booster:

- (1) Normal ac power
- (2) Signal booster trouble
- (3) Loss of normal ac power
- (4) Failure of battery charger
- (5) Low-battery capacity



Elevators. ASME A17.1. 2013/CSA B44-13 Section 2.8.1. Equipment Allowed. Only machinery and equipment used directly in connection with the elevator shall be permitted in elevator hoist ways, machine spaces, machine rooms, control spaces and control rooms.

Note: Waivers to the elevator safety code may be obtained by the AHJ per ASME 17.1, section 1.2 and Florida Statutes Chapter 120.

Note: No unauthorized workers are allowed in hoist ways.

ASME A17.1-2013/CSA B44-13

Info

ASME A17.1-2013/CSA B44-13

Safety Code for Elevators and Escalators

SECTION 2.8

EQUIPMENT IN HOISTWAYS, MACHINERY SPACES, MACHINE ROOMS, CONTROL SPACES, AND CONTROL ROOMS

2.8.1 Equipment Allowed

Only machinery and equipment used directly in connection with the elevator shall be permitted in elevator hoistways, machinery spaces, machine rooms, control spaces, and control rooms.

2017 Florida Building Code – Building, Sixth

3001.2 Referenced standards.

Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to **ASME A17.1/CSA B44**, ASME A17.7/CSA B44.7, ASME A17.3 and ASME A18.1, ASME A90.1, ASME B20.1, ANSI MH29.1, ALI ALCTV, and ASCE 24 for construction in flood hazard areas established in Section 1612.3. The Division of Hotels and Restaurants may grant exceptions, variances and waivers to the Elevator Safety Code as authorized by the Safety Code for Elevators and Escalators (ASME A17.1, Section 1.2) and Florida Statutes (Chapter 120.)

Info

Elevator Variance Request

When an elevator owner is unable to comply with requirements due to hardship, a variance may be requested. In order for a variance to be granted the petitioner must present the following on a company or personal letterhead:

1. The specific codes the variance is requested for
2. A demonstrated hardship if they are required to meet the code
3. How the petitioner intends to meet the intent of those specific codes (a variance cannot be granted unless the intent of the code is met in some other way)
4. A \$50 application fee

A petition for variance which does not meet these requirements will be denied.

Each variance request must include the Broward County ID # (BCID) for the conveyance and supportive materials and documents providing the information necessary for rendering a decision.

The applicant is responsible for demonstrating a substantial hardship exists and presenting facts relevant to and supportive of the variance request.

The Building Code Services Division (BCSD) responds to routine requests within 90 days of receipt. An emergency petition will be responded to within 30 days, but you must include justification why a response is needed within 30 days. Without justification, the petition may be deemed a non-emergency and treated as a routine petition.

Upon consideration of the merits of each variance request, the director or designee will either grant a variance, as requested, or deny the variance request.

The owner or lessee of an elevator which has a variance approved by BCSD is responsible for maintaining a copy of the approved variance in the machine room at the physical location of the elevator and available for review during an elevator inspection.

Variances will be granted when the elevator owner(s) demonstrates that the purpose of the underlying requirements will be or has been achieved by other means by the owner(s) and when application of a requirement would create a substantial hardship or would violate principles of fairness. For purposes of this section, "substantial hardship" means a demonstrated economic, technological, legal, or other type of hardship to the person requesting the variance or waiver.

Item 1:

Discussion on the use of elevator shafts and stairwells as a two-hour fire rated enclosure for riser cables. NFPA 72, 2013

Discussion on the use of Elevator shafts and stairwells as a two-hour fire rated enclosure for riser cables.

NFPA 72, 2013

24.3.6.8.3* Riser coaxial cables shall be rated as riser cables and routed through a 2-hour rated enclosure.

A.24.3.6.8.3 Examples of 2-hour-rated enclosures could include stairwells and elevator hoist ways for first responders—use elevators.

24.3.6.8.4 The connection between the riser and feeder coaxial cables shall be made within the 2-hour-rated enclosure, and passage of the feeder cable in and out of the 2-hour-rated enclosure shall be fire stopped to 2-hour ratings.

Item 2:

Review Formal interpretation #20 concerning UL Standard 2524 for Bi-Directional Amplifier Systems



BROWARD COUNTY BOARD OF RULES AND APPEALS

ONE NORTH UNIVERSITY DRIVE
SUITE 3500-B
PLANTATION, FLORIDA 33324

PHONE: 954-765-4500
FAX: 954-765-4504

www.broward.org/codeappeal

2019 Voting Members

Chair

Mr. Daniel Lavrich,
P.E., S.I., SECB, F.ASCE, F.SEI
Structural Engineer

Vice-Chair

Mr. Stephen E. Bailey, P.E.
Electrical Engineer
Mr. Jeffrey Lucas, FM, CFI, CFEI
Fire Service Professional
Mr. John Famularo,
Roofing Contractor
Mrs. Shalanda Giles Nelson,
General Contractor
Mr. Daniel Rourke
Master Plumber
Mr. Gregg D'Attile,
Mechanical Contractor
Mr. Ron Burr
Swimming Pool Contractor
Mr. John Sims,
Master Electrician
Mr. Dennis A. Ulmer
Consumer Advocate
Mr. Abbas H. Zackria, CSI
Architect
Mr. Robert A. Kamm, P.E.
Mechanical Engineer

Vacant

Representative Disabled Community

2019 Alternate Board Members

Mr. Jeff Falkanger
Architect
Mr. Steven Feller, P.E.
Mechanical Engineer
Mr. Alberto Fernandez,
General Contractor
Mr. Robert Taylor
Fire Service
Mr. Gary Elzweig, P.E., F.ASCE
Structural Engineer
Mr. David Rice, P.E.
Electrical Engineer
Mr. James Terry,
Master Plumber
Mr. David Tringo,
Master Electrician
Mr. William Flett,
Roofing Contractor

Board Attorney

Charles M. Kramer, Esq.

Board Administrative Director

James DiPietro

—ESTABLISHED 1971—

Subject: Formal Interpretation # 20 Expiring April 19, 2019

Date: April 25, 2019

To: All Bi-Directional Amplifier Interested Parties

From: Kenneth Castronovo, Chief Electrical Code Compliance Officer

Broward County Formal Interpretation #20 (FI #20) will expire April 19, 2019. FI #20 allows the Engineer of Record to certify BDA Systems equipment for AHJ approvals up to six months after a standard is issued by a Nationally Recognized Testing Laboratory. UL Standard 2524 was issued on October 19, 2018. The extension deadline for FI #20 is rapidly approaching. All specifications submitted for BDA systems for permitting after the above date will be required to be UL 2524 compliant. Any BDA System can still be certified by a third-party field evaluation company using NFPA 790 and 791. Third-Party Field Evaluation companies shall be accepted by the Authority Having Jurisdiction to perform Field Evaluations.

Sincerely,

Kenneth Castronovo

Item 2a:

Memo to all interested BDA parties concerning UL 2524
(Effective Date: April 19, 2019)

Item 3:

Third-Party Field Evaluations, NFPA 790 and NFPA 791

Copyright © 2013 National Fire Protection Association®. All Rights Reserved.

NFPA® 790

Standard for

Competency of Third-Party Field Evaluation Bodies

2014 Edition

This edition of NFPA 790, *Standard for Competency of Third-Party Field Evaluation Bodies*, was prepared by the Technical Committee on Electrical Equipment Evaluation and released by the Technical Correlating Committee on National Electrical Code®. It was issued by the Standards Council on July 5, 2013, with an effective date of July 25, 2013, and supersedes all previous editions.

This edition of NFPA 790 was approved as an American National Standard on July 25, 2013.

Origin and Development of NFPA 790

The Technical Committee on Electrical Equipment Evaluation was organized in 2008 by NFPA in recognition of the need for requirements for the qualifications and competency of third parties performing field evaluations on electrical products and assemblies and to guide the process for field evaluations.

One means to demonstrate conformance of products to an applicable product safety standard is through certification. Historically, certification was accomplished through a laboratory investigation of a prototype or initial sample to determine compliance with the standard, with a system of ongoing follow-up inspections conducted to continue certification. The result was a "Certification," "Listing," "Recognition," or "Classification" of the product as defined by various standards, including *NFPA 70®*, *National Electrical Code®*. These processes were formalized in several international standards, including ISO/IEC Guide 65, *General Requirements for Bodies Operating Product Certification Systems*, and ISO/IEC Standard 17020, *General Criteria for the Operation of Various Types of Bodies Performing Inspection*.

As the marketplace evolved, more and more products needed to be evaluated differently from the above system because they were already installed at the installation site. Another condition that did not fit the normal process and required some other process of evaluation was that some products needed to be evaluated but were not produced in quantities that fit the traditional certification model economically. The alternative process to meet the needs for evaluation of unique, modified, or other equipment beyond the manufacturing process became known as a "field evaluation." The process used for field evaluations, by the nature of the work, is a blend of ISO/IEC Guide 65 and ISO/IEC Standard 17020.

In 2008, a task group identified the need to create two documents covering the performance of field evaluations of electrical equipment and used the following document as the basis for development: *Recommended Competency Guidelines for Third Party Field Evaluation Bodies*, which was developed by the American Council for Electrical Safety (ACES), a division of the American Council of Independent Laboratories (ACIL) (first edition, November 17, 2005).

The ACES document provided guidelines regarding the competency of firms that perform field evaluations. NFPA 790 and its companion document, NFPA 791, *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*, provide their users with the ability to qualify who can complete field evaluations and how field evaluations specifically for electrical products are to be completed.

No changes were made to the 2014 edition of NFPA 790 other than updating the reference of *NFPA 70®*, *National Electrical Code®*, from the 2011 edition to the 2014 edition.

Technical Correlating Committee on National Electrical Code®

Michael J. Johnston, Chair
National Electrical Contractors Association, MD [IM]

Mark W. Earley, Nonvoting Secretary
National Fire Protection Association, MA

Kimberly L. Shea, Recording Secretary
National Fire Protection Association, MA

James E. Brunssen, Telcordia, NJ [UT]

Rep. Alliance for Telecommunications Industry Solutions

Merton W. Bunker, Jr., U.S. Department of State, VA [U]

William R. Drake, Actuant Electrical, CA [M]

William T. Fiske, Intertek Testing Services, NY [RT]

Palmer L. Hickman, National Joint Apprentice & Training Committee, MD [L]

Rep. International Brotherhood of Electrical Workers

David L. Hittinger, Independent Electrical Contractors of Greater Cincinnati, OH [IM]

Rep. Independent Electrical Contractors, Inc.

Daniel J. Kissane, Legrand/Pass & Seymour, NY [M]

Rep. National Electrical Manufacturers Association

John R. Kovacik, UL LLC, IL [RT]

Neil F. LaBrake, Jr., National Grid, NY [UT]

Rep. Electric Light & Power Group/EEI

Danny Liggett, The DuPont Company, Inc., TX [U]

Rep. American Chemistry Council

Richard P. Owen, Oakdale, MN [E]

Rep. International Association of Electrical Inspectors

Alternates

Thomas L. Adams, Engineering Consultant, IL [UT]

(Alt. to N. F. LaBrake, Jr.)

Lawrence S. Ayer, Biz Com Electric, Inc., OH [IM]

(Alt. to D. L. Hittinger)

James T. Dollard, Jr., IBEW Local Union 98, PA [L]

(Alt. to P. L. Hickman)

Stanley J. Folz, Morse Electric Company, NV [IM]

(Alt. to M. J. Johnston)

Ernest J. Gallo, Telcordia Technologies, Inc., NJ [UT]

(Alt. to J. E. Brunssen)

Alan Manche, Schneider Electric, KY [M]

(Alt. to W. R. Drake)

Robert A. McCullough, Tuckerton, NJ [E]

(Alt. to R. P. Owen)

Michael E. McNeil, FMC Bio Polymer, ME [U]

(Alt. to D. Liggett)

Mark C. Ode, UL LLC, AZ [RT]

(Alt. to J. R. Kovacik)

James F. Pierce, Intertek, OR [RT]

(Alt. to W. T. Fiske)

Vincent J. Saporita, Cooper Bussmann, MO [M]

(Alt. to D. J. Kissane)

Nonvoting

Richard G. Biermann, Biermann Electric Company, Inc., IA [IM]

(Member Emeritus)

Timothy J. Pope, Canadian Standards Association, Canada [SE]

Rep. CSA/Canadian Electrical Code Committee

D. Harold Ware, Libra Electric Company, OK [IM]

(Member Emeritus)

Mark W. Earley, NFPA Staff Liaison

Committee Scope: This Committee shall have primary responsibility for documents on minimizing the risk of electricity as a source of electric shock and as a potential ignition source of fires and explosions. It shall also be responsible for text to minimize the propagation of fire and explosions due to electrical installations.

Technical Committee on Electrical Equipment Evaluation

Julian R. Burns, *Chair*

Quality Power Solutions, Inc., NC [IM]
Rep. Independent Electrical Contractors, Inc.

Nancy W. Chilton, Schneider Electric, NC [M]
Ron B. Chilton, North Carolina Department of
Insurance, NC [E]

Rep. International Association of Electrical Inspectors

Keith D. Gershon, Electrical Safety Institute, CA [SE]

Gordon Gillerman, National Institute of Standards
& Technology, MD [C]

Joseph P. Halferty, Jr., United Inspection Agency, Inc.,
PA [L]

Rep. International Brotherhood of Electrical Workers

Mark L. Lewandowski, The Procter & Gamble Company,
OH [U]

Rep. American Chemistry Council

Charles F. Mello, UL LLC, WA [RT]

Russell J. Nichols, SGS North America Inc., Consumer
Testing Services, NJ [RT]

Shawn Paulsen, CSA Group, Canada [RT]

Kenneth J. Rempe, Siemens Industry Inc., GA [M]

Rep. National Electrical Manufacturers Association

John E. Staires, City of Tulsa, Oklahoma, OK [E]

Andras Szende, TUV Rheinland of North America, Inc.,
NY [RT]

Lawrence E. Todd, Intertek Testing Services, KY [RT]

Richard S. Trainor, TUV SUD America Inc., MA [RT]

John J. Whipple, Battelle Energy Alliance/Idaho National
Laboratory, ID [U]

Ron Widup, Shermco Industries, TX [IM]

Rep. InterNational Electrical Testing Association

Alternates

Peter E. Bowers, Satellite Electric Company, Inc.,
MD-[IM]

(Alt. to J. R. Burns)

Michael J. Farrell III, Lucas County Building Regulation,
MI [L]

(Alt. to J. P. Halferty, Jr.)

Gary T. Flom, Intertek, GA [RT]

(Alt. to L. E. Todd)

Amy Phelps, National Institute of Standards and
Technology, MD [C]

(Alt. to G. Gillerman)

Christopher G. Walker, Eaton Corporation, PA [M]

(Alt. to K. J. Rempe)

Richard J. Roux, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This committee shall have primary responsibility for documents covering the performance of field evaluations of electrical equipment. This committee shall also have primary responsibility for documents on the competency of companies and individuals within those companies conducting field evaluations. This committee shall have primary jurisdiction, but shall report to the Association through the National Electrical Code Technical Correlating Committee.

Contents

Chapter 1 Administration	790- 5	8.2 Application	790-10
1.1 Scope	790- 5	Chapter 9 Preparation for Evaluation	790-10
1.2 Purpose	790- 5	9.1 Evaluation Preparation	790-10
1.3 Application	790- 5	9.2 Assignment of Qualified FEB Personnel ...	790-10
Chapter 2 Referenced Publications	790- 5	Chapter 10 Evaluation	790-10
2.1 General	790- 5	10.1 Evaluation Standards	790-10
2.2 NFPA Publications. (Reserved)	790- 5	10.2 Evaluation Locations	790-10
2.3 Other Publications	790- 5	Chapter 11 Evaluation Report	790-10
2.4 References for Extracts in Mandatory Sections	790- 5	11.1 Technical Reports	790-10
Chapter 3 Definitions	790- 5	11.2 Personnel	790-10
3.1 General	790- 5	11.3 Notification of Applicant	790-10
3.2 NFPA Official Definitions	790- 5	11.4 Corrective Actions	790-10
3.3 General Definitions	790- 5	11.5 Format and Content	790-10
Chapter 4 FEB Application for Recognition	790- 6	11.6 Accuracy	790-10
4.1 Application	790- 6	11.7 Review	790-10
4.2 Contents of Application	790- 6	Chapter 12 Decision to Issue an FEB Statement of Conformity	790-10
Chapter 5 FEB Organization	790- 6	12.1 Conformity Decision	790-10
5.1 General Provisions	790- 6	12.2 Evaluator Decision	790-10
5.2 Organization and Management	790- 6	12.3 Delegation	790-10
5.3 Operations	790- 7	Chapter 13 Use of FEB Statement of Conformity	790-10
5.4 Subcontracting	790- 7	13.1 Control of FEB Statements of Conformity	790-10
5.5 Management System	790- 7	13.2 Improper References	790-10
5.6 Conditions and Procedures for Field Evaluations	790- 8	Chapter 14 Test and Measuring Equipment	790-10
5.7 Internal Audits and Management Review	790- 8	14.1 Calibration Program	790-10
5.8 Documentation	790- 8	14.2 Operator and Maintenance Instructions ...	790-10
5.9 Records	790- 8	14.3 Suspect Test Equipment	790-11
5.10 Confidentiality	790- 9	14.4 Trace Back Process	790-11
Chapter 6 FEB Personnel	790- 9	14.5 Calibration Marking	790-11
6.1 General	790- 9	14.6 Equipment Records	790-11
6.2 Qualification Criteria	790- 9	Annex A Explanatory Material	790-11
Chapter 7 Appeals, Complaints, and Disputes	790- 9	Annex B Application for Recognition as a Field Evaluation Body (FEB)	790-12
7.1 Appeals, Complaints, and Disputes Procedures	790- 9	Annex C Electrical Product Groups	790-12
7.2 Documentation and Subsequent Actions	790- 9	Annex D Informational References	790-12
Chapter 8 Application for Evaluation	790- 9	Index	790-17
8.1 Information on Procedures	790- 9		

NFFPA 790

Standard for

Competency of Third-Party Field
Evaluation Bodies

2014 Edition

IMPORTANT NOTE: This NFFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notices and Disclaimers Concerning NFFPA Documents." They can also be obtained on request from NFFPA or viewed at www.nffpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex D. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex D.

Chapter 1 Administration

1.1 Scope.

1.1.1 Establishing Competence.

1.1.1.1 The provisions of this standard shall address requirements for the qualification and competency of a body performing field evaluations on electrical products and assemblies with electrical components.

1.1.1.2 These requirements are based on ISO/IEC Guide 65 and ISO/IEC 17020 with adaptation for the unique characteristics of field evaluations.

1.1.2 Competent FEBs.

1.1.2.1 A field evaluation body (FEB) meeting the requirements of this standard shall be considered competent to perform field evaluations.

1.1.2.2 These requirements shall apply to both the initial and continued competency of FEBs.

1.2 **Purpose.** This standard shall provide the requirements for the competency of an FEB and for the recognition of an FEB by an authority having jurisdiction or other recognition body.

1.3 **Application.** This standard shall be used by FEBs as the basis to seek recognition by an authority having jurisdiction or other recognition body in the application of evaluating the conformance of electrical equipment to the companion document.

Chapter 2 Referenced Publications

2.1 **General.** The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 **NFFPA Publications. (Reserved)**

2.3 **Other Publications.**

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 **References for Extracts in Mandatory Sections.**

NFFPA 70[®], *National Electrical Code*[®], 2014 edition.

Chapter 3 Definitions

3.1 **General.** The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 **NFFPA Official Definitions.**

3.2.1* **Approved.** Acceptable to the authority having jurisdiction.

3.2.2* **Authority Having Jurisdiction (AHJ).** An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 **Labeled.** Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* **Listed.** Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 **Shall.** Indicates a mandatory requirement.

3.2.6 **Should.** Indicates a recommendation or that which is advised but not required.

3.2.7 **Standard.** A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3 **General Definitions.**

3.3.1* **Electrical Equipment.** Any device, appliance, or machine that generates, conducts, or utilizes electrical energy.

3.3.2 Equipment. A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation. [70, 2014]

3.3.3 Field Evaluation. The process used to determine conformance with requirements for one-of-a-kind, limited production, used, or modified products that are not listed or field labeled under a certification program.

3.3.4 Field Evaluation Body (FEB). An organization, or part of an organization, that performs field evaluations of electrical or other equipment.

3.3.5 Field Evaluation Body Statement of Conformity. Mark, logo, certificate, label, or other mechanism by which the FEB identifies an individual product or system that has been evaluated resulting in a successful demonstration that specified requirements have been fulfilled.

3.3.6 Field Labeled (as applied to evaluated products). Equipment or materials to which has been attached a label, symbol, or other identifying mark of an FEB indicating the equipment or materials were evaluated and found to comply with requirements as described in an accompanying field evaluation report.

3.3.7* Nationally Recognized Standard. A document that specifies the safety requirements for specific equipment or class of equipment and that is recognized in the country where the equipment is installed, as applicable, as a safety standard providing a level of safety; is compatible with and maintained current with periodic revisions of applicable national codes and installation standards; and was developed by a standards developing organization under a method providing for input and consideration of views of industry groups, experts, users, consumers, governmental authorities, and others having broad experience in the safety field involved; or a document that is currently designated as an American National Standards Institute (ANSI) or ASTM International safety-designated product, material, or test standard used for evaluation of products or materials.

Chapter 4 FEB Application for Recognition

4.1 Application.

4.1.1 An FEB seeking recognition to provide field evaluation services shall submit a written application to the authority having jurisdiction or other body that is being requested to grant the recognition.

4.1.2 Submitted applications shall be subject to the policies and procedures of the authority having jurisdiction or other recognition body.

4.2* Contents of Application. The application from the FEB shall have the information specified in Chapters 5 through 14 provided either in the application or the accompanying documentation.

Chapter 5 FEB Organization

5.1 General Provisions.

5.1.1 Nondiscrimination.

5.1.1.1 The policies and procedures under which the FEB and their administration operates shall be nondiscriminatory and shall be administered in a nondiscriminatory manner.

5.1.1.2 Procedures shall not be used to impede or inhibit access by applicants to the FEB, other than as provided in this standard.

5.1.2 The FEB shall make its services accessible to all applicants whose activities fall within its recognized field of operation.

5.1.2.1 The FEB shall not impose excessive financial or other requirements as a precondition for product evaluation.

5.1.2.2 Access shall not be conditional upon the financial status of the applicant or membership of any association or group, nor shall the decision to issue an FEB statement of conformity be conditional upon the number of such certificates already issued.

5.1.3 The FEB shall apply nationally recognized standards as the criteria against which the products of an applicant are evaluated.

5.1.4* The FEB shall confine its requirements, evaluations, and decisions to those matters specifically related to the scope of the field evaluation.

5.2 Organization and Management.

5.2.1 The structure and management of the FEB shall include the following criteria to gain confidence in its field evaluations:

- (1) Be impartial
- (2) Be responsible for field evaluation decisions
- (3)*Be a legally identifiable business entity, registered with a government
- (4) Have a documented structure that safeguards impartiality, including policies and procedures to ensure the impartiality of the operation of the FEB
- (5)*Have rights and responsibilities relevant to its field evaluation activities
- (6) Have arrangements to cover liabilities arising from its operation and/or activities
- (7) Have the financial stability and resources required for field evaluations
- (8) Have a management system giving confidence in its ability to perform field evaluations
- (9) Have policies and procedures that distinguish between field evaluation and any other activities in which the FEB is engaged

5.2.2 Management Structure.

5.2.2.1 The FEB shall define and document the management (committee, group, or person), which shall have overall responsibility for the following:

- (1) Performance of activities defined in this standard
- (2) Formulation of policy matters relating to the operation of the FEB
- (3) Review of field evaluation decisions
- (4) Supervision of the implementation of the FEB's policies
- (5) Supervision of the finances of the FEB
- (6) Delegation of authority to committees or individuals as required to conduct defined activities on the FEB's behalf
- (7) Definition of the technical basis for field evaluations

5.2.2.2 The management shall have a managerial staff with the authority and resources to discharge their duties.

5.2.3 The FEB shall be independent from outside influences for the products it evaluates.

5.2.4 The FEB shall use professional and ethical practices.

5.2.5 The FEB shall be a third-party evaluator with appropriate technical background for the areas in which it operates.

5.2.6 Ownership and Conflicts of Interest.

5.2.6.1 The FEB shall not be owned by manufacturers, suppliers, vendors, or installers of products using the FEB's services, nor shall such manufacturers, vendors, suppliers, or installers have any operational control over the body.

5.2.6.2 The FEB shall have a policy for identifying and resolving conflicts of interest covering all employees, including the following:

- (1) Measures to ensure that there are no conflicts of interest between its staff and any client
- (2) Clear instructions for rejecting all types of improper influence the staff can encounter
- (3) Measures to prevent personnel from being assigned to a field evaluation if they have been involved in, or have been employed by a body involved in, the design, supply, installation, or maintenance of such products in a manner and within a time period that could conflict with impartiality
- (4) Measures to prevent individuals completing, contributing to, or responsible for a field evaluation from acting as an advocate or consultant for that client whose products or materials have been the subject of the field evaluation

5.2.7 The FEB shall not engage in the implementation or design of corrective measures resulting from evaluation of a product.

5.2.7.1 Design reviews, review of proposed corrective actions, consultation for applicable standards, and interpretations shall be permitted to be performed by the FEB.

5.2.7.2 The actual design or completion of corrective actions shall not be performed by the FEB.

5.2.8 The FEB shall ensure that activities of related bodies do not affect the confidentiality, objectivity, and impartiality of its field evaluations.

5.2.9 The FEB shall not perform either of the following:

- (1) Supply or design products of the types for which it performs field evaluations
- (2) Provide any other products or services that could compromise the confidentiality, objectivity, or impartiality of its field evaluations

5.2.10 The FEB shall have policies and procedures for the resolution of complaints, appeals, and disputes received from suppliers or other parties about its field evaluations.

5.3 Operations.

5.3.1 The FEB shall specify the relevant standards or parts thereof and any other requirements that formed the basis for the field evaluation.

5.3.2 The FEB shall take all steps necessary to evaluate conformance with the relevant product standards.

5.4 Subcontracting. When an FEB decides to subcontract work related to field evaluation to an external body or person, a properly documented agreement covering the arrangements, including confidentiality and conflict of interest, shall be drawn up and executed.

5.4.1 The FEB shall take full responsibility for all subcontracted work and maintain its responsibility for the field evaluation.

5.4.2 The FEB shall ensure and be able to demonstrate that its subcontractor complies with the same criteria of competence as the FEB with respect to the work being subcontracted.

5.4.3 The FEB shall ensure that the subcontractor complies with the same requirements for independence as applied to the FEB.

5.4.4 The FEB shall advise the client in writing of its intention to subcontract any field evaluation activity to another party.

5.4.5 The FEB shall record and retain details of its investigation of its subcontractors and maintain a register of all subcontractors.

5.4.6 The FEB shall maintain records of all suppliers from whom it obtains support services or supplies that affect the outcome of its field evaluations.

5.5 Management System.

5.5.1 The FEB shall have an individual with responsibility for the management system to ensure ongoing fulfillment of the requirements in this standard and its implementation.

5.5.1.1 The FEB shall define and document its policy, objectives for, and commitment to fulfilling the requirements of this standard.

5.5.1.2 The individual responsible for the management system shall have direct access to the highest levels of management at which decisions are made on field evaluation policy or resources and direct access to the technical manager.

5.5.2 The FEB shall establish and maintain an effective management system in accordance with the relevant elements of this standard and appropriate to the type, range, and volume of field evaluation activities undertaken.

5.5.2.1 The management system shall be documented, and the documentation shall be available for use by the FEB personnel.

5.5.2.2 The FEB management shall ensure that policies and objectives are communicated to, understood by, and implemented by all FEB personnel concerned.

5.5.2.3 The management system documentation shall be maintained current.

5.5.2.4 The individual responsible for the management system shall report annually to the FEB's management for review as a basis for improvement.

5.5.3 The management system documentation shall contain the following:

- (1) A policy statement regarding fulfillment of this standard, including objectives and commitments, by top management
- (2) A brief description of the legal status of the FEB, including the names of its owners, the organization, and management structure of the FEB
- (3) A brief description of the FEB that, when it is part of a larger organization, includes the description of its place in any parent organization and relevant organizational charts

- (4) The names, qualifications, experience, and terms of reference of the senior executive and other field evaluation personnel, both internal and external
- (5) An organization chart showing lines of authority, responsibility, and allocation of functions stemming from the senior executive, including the relations between management, technical operations, and support services
- (6) Administration procedures, including those for control and maintenance of documentation
- (7) The duties of staff so that the extent and limits of each person's responsibility are known to all concerned
- (8) The procedures for the recruitment, selection, and training of FEB personnel and monitoring their performance, including job descriptions of key staff and reference to the job descriptions of other staff
- (9) A list of approved subcontractors and the procedures for assessing, recording, and monitoring their competence
- (10) Procedures to be followed to handle nonconformities and ensuring the effectiveness of any corrective actions taken whenever departures from documented policies and procedures occur
- (11) Procedures for dealing with complaints, appeals, and disputes
- (12) Procedures for internal audits and the policy and procedures for conducting management reviews
- (13) Procedures for exceptions and/or departures from documented policies and procedures or from standard specifications

5.5.3.1 The FEB shall have procedures for implementing the field evaluation process, including the following:

- (1) Handling items subject to field evaluation
- (2) The FEB scope of competency
- (3) Arrangements for the FEB to review all new work to ensure that it has the appropriate resources before commencing such work
- (4) Reference to the major equipment and reference measurement standards used
- (5) Reference to procedures for calibration, verification, and maintenance of equipment used and the procedures for achieving traceability of measurements
- (6) Reference to verification practices to ensure that the field evaluation process is being followed
- (7) Systems and procedures to control the FEB statement of conformity
- (8) Procedures for protecting confidentiality and proprietary rights

5.5.3.2 The FEB shall confine its activities to those areas in its recognized scope for field evaluation.

5.6 Conditions and Procedures for Field Evaluations. The FEB shall have procedures that specify the conditions and the process for granting and withdrawing a statement of conformity.

5.7 Internal Audits and Management Review.

5.7.1 The FEB shall arrange for annual internal audits of its activities to verify that the management system is implemented and effective.

5.7.1.1 The FEB shall ensure that such audits are carried out by trained and qualified staff who are, wherever possible, independent of the activity to be audited.

5.7.1.2 The FEB shall ensure that personnel responsible for the area audited are informed of the outcome of the audit.

5.7.1.3 The FEB shall ensure that corrective action is taken in a timely and appropriate manner.

5.7.1.4 The FEB shall ensure that the results of the audit are documented.

5.7.2 Where the audit findings cast doubt on the correctness or validity of field evaluation results, the following actions shall be taken:

- (1) Immediate corrective action
- (2) Immediate notification in writing to the client whose product could have been affected as well as other parties affected

5.7.3 All internal audit and management review findings and any corrective actions that arise from them shall be documented.

5.7.3.1 The person responsible for the management system shall ensure that these actions are discharged within the agreed time frame.

5.7.3.2 The management system adopted to satisfy the requirements of this standard shall be reviewed at least once a year by the FEB management to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements.

5.8 Documentation.

5.8.1 The FEB shall provide the following data (through publications, electronic media, or other means) updated at regular intervals and made available on request:

- (1) Information about the recognition(s) under which the FEB operates, as established through Section 4.1
- (2) A documented statement of its field evaluation system, including its rules and procedures for granting and withdrawing statements of conformity
- (3) Information about evaluation procedures
- (4) A description of the means by which the FEB obtains financial support and general information on the fees charged for the evaluation service
- (5) A description of the rights and duties of applicants and suppliers to the FEB, including requirements, restrictions for, and limitations on use of the FEB's mark and the ways of referring to the statement of conformity
- (6) Information about procedures for handling complaints, appeals, and disputes

5.8.2 The FEB shall establish and maintain procedures to control all documents and data that relate to its field evaluation functions.

5.9 Records.

5.9.1 Record System.

5.9.1.1 The FEB shall maintain a record system to suit its particular circumstances.

5.9.1.2 The records shall demonstrate that the field evaluation procedures have been fulfilled, particularly with respect to application forms, evaluation reports, and other documents relating to granting or withdrawing the statement of conformity.

5.9.1.3 Records shall be identified, managed, and disposed of in such a way as to ensure the integrity of the process and the security and confidentiality of the information.

5.9.1.4 The records shall contain all original observations, calculations, delivered data, calibration records, and other documentation resulting from the evaluation.

5.9.1.5 The records shall include the identity of personnel involved in conducting and reviewing the evaluation work.

5.9.2 Record Retention. The FEB shall have a policy and procedures for retaining records for a period of time consistent with contractual, legal, or other obligations, except they shall be retained for a minimum period of 36 months.

5.10 Confidentiality.

5.10.1 Safeguarding Confidentiality.

5.10.1.1 The FEB shall have arrangements consistent with applicable laws to safeguard confidentiality of the information obtained or derived in the course of the evaluation activities.

5.10.1.2 This confidentiality shall apply to all persons and all levels within the FEB organization, including any subcontractors that might be employed.

5.10.2 Disclosure to Third Party.

5.10.2.1 Except as required by this standard or by law, information gained in the course of the evaluation about a particular product, supplier, or the applicant shall not be disclosed to a third party without the written consent of the applicant.

5.10.2.2 Where the law requires information to be disclosed to a third party, the applicant shall be informed of the information provided as permitted by the law.

Chapter 6 FEB Personnel

6.1 General.

6.1.1 The personnel of the FEB shall be competent for the functions they perform, including making required technical judgments and decisions.

6.1.2 Instructions.

6.1.2.1 Clearly documented instructions shall be available to the personnel describing their duties and responsibilities.

6.1.2.2 These instructions shall be maintained up-to-date.

6.1.3 Technical Manager. The FEB shall have a technical manager(s) with overall responsibility for the technical operations of the organization.

6.1.3.1 The technical manager(s) shall have knowledge of the principles of the technical disciplines and provide oversight of evaluation procedures.

6.1.3.2* The technical manager(s) shall be competent for the functions performed, including making required technical judgements, framing policies, and implementing them.

6.1.3.3 The technical manager(s) shall have the final authority within the FEB to interpret standards.

6.2 Qualification Criteria.

6.2.1 In order to ensure that field evaluation activities are carried out effectively and uniformly, the minimum relevant criteria for the competence of personnel involved in field evaluation activities shall be defined by the FEB.

6.2.2 The FEB shall require its personnel involved in the field evaluation process to sign a contract or other document by which they commit themselves as follows:

- (1) To comply with the rules defined by the FEB, including those relating to confidentiality and independence from commercial and other interests
- (2) To declare any prior and/or present association on their own part, or on the part of their employer, with a supplier or designer of products

6.2.3 Qualifications Records.

6.2.3.1 Information on the relevant qualifications, training, and experience of each of the personnel involved with field evaluation activities shall be maintained by the FEB.

6.2.3.2 Records of training and experience shall be kept up-to-date, in particular the following:

- (1) Name and address
- (2) Organization affiliation and position held
- (3) Educational qualifications and professional status
- (4) Experience and training in each technical area
- (5) Date of most recent revision to the record
- (6) Performance appraisal

6.2.4 The FEB shall maintain a training program to keep individuals completing evaluations up-to-date on applicable requirements.

6.2.4.1 The training and competency of individuals shall be regularly audited under the FEB management system.

6.2.4.2 The FEB shall comply with any requirements for registration of technical staff as provided by statute in the states or provinces where services are performed.

Chapter 7 Appeals, Complaints, and Disputes

7.1 Appeals, Complaints, and Disputes Procedures. Appeals, complaints, and disputes brought before the FEB by applicants or other parties shall be subject to the procedures of the FEB.

7.2 Documentation and Subsequent Actions. Each FEB shall perform the following duties:

- (1) Keep a record of all appeals, complaints, and disputes and the remedial actions taken relative to the evaluation
- (2) Take appropriate subsequent action
- (3) Document the action(s) taken and its effectiveness

Chapter 8 Application for Evaluation

8.1* Information on Procedures.

8.1.1 The FEB shall provide applicants with an up-to-date detailed description of the evaluation procedures used for the evaluation process.

8.1.2 These procedures shall include the rights and duties of the applicant.

8.1.3 The FEB shall require the applicant to do the following:

- (1) To make all necessary arrangements for the conduct of the evaluation, including provisions for examining documentation and access to all areas, records, and personnel for the purposes of completing the evaluation
- (2) To make any claims regarding field evaluation only within the scope of the statement of conformity

- (3) To not use the statement of conformity in such a manner as to bring the FEB into disrepute and to not make any statement regarding the statement of conformity that the FEB could consider misleading or unauthorized
- (4) To use the statement of conformity only to indicate that the product is in conformity with the specified standard(s)
- (5) To comply with the requirements of the FEB when referring to a statement of conformity in any communication media, such as documents, brochures, or advertising

8.2 Application.

8.2.1 The FEB shall require completion of an official application form submitted by an authorized representative of the applicant and including the following:

- (1) The scope of the desired evaluation
- (2) A statement that the applicant agrees to comply with all the requirements for the evaluation
- (3) A statement that the applicant agrees to supply any information requested for the evaluation of the product

8.2.2 The applicant, as a minimum, shall provide the following information:

- (1) Corporate entity, name, address, and legal status as applicable
- (2) A definition of the product(s) to be evaluated and, if known, the standard(s) for evaluation

Chapter 9 Preparation for Evaluation

9.1 Evaluation Preparation. Before proceeding with the evaluation, the FEB shall conduct a review, and maintain records of that review, of the application for the evaluation to ensure that the FEB has the capability to perform the evaluation service within the identified scope.

9.2 Assignment of Qualified FEB Personnel. The FEB shall assign personnel appropriately qualified to perform the tasks for the specific evaluation.

Chapter 10 Evaluation

10.1 Evaluation Standards. The FEB shall evaluate the products of the applicant in accordance with the following:

- (1) The standard(s) covered by the scope of the product as defined in the application
- (2) All the applicable evaluation criteria specified in the rules of the FEB's evaluation program

10.2 Evaluation Locations.

10.2.1 The field evaluation process shall be completed at the final installation site.

10.2.2 A preliminary evaluation for the field evaluation, if conducted, shall be permitted to be conducted at the point of manufacturing, at interim points of distribution, in the evaluating company's facilities, or at the final installation site.

Chapter 11 Evaluation Report

11.1 Technical Reports. The FEB shall adopt reporting procedures that suit its needs, the needs of the applicant, and the needs of any other affected parties.

11.2 Personnel. Personnel contributing to and responsible for the evaluation of conformance of a product shall provide the FEB with a report of findings as to the conformity with all the applicable requirements of the standard(s).

11.3 Notification of Applicant. The full report on the outcome of the evaluation shall be brought to the applicant's notice by the FEB, identifying any nonconformity that has to be corrected in order to comply with the applicable requirements of the standard(s).

11.4 Corrective Actions. The report shall further state what additional activities are required to complete the evaluation.

11.5* Format and Content. The format and content of the field evaluation technical report shall follow accepted industry guidelines.

11.6* Accuracy. Field evaluation reports, as well as all information needed to understand and interpret them, shall be reported correctly, accurately, and clearly.

11.7 Review. A process of checking completed reports shall be established to confirm that this requirement has been met.

Chapter 12 Decision to Issue an FEB Statement of Conformity

12.1 Conformity Decision. The decision as to whether to issue an FEB statement of conformity for a product shall be made by the FEB based on the information gathered during the evaluation process and any other relevant information.

12.2 Evaluator Decision. The decision to issue a statement of conformity shall be made by the FEB employee responsible for the completion of the evaluation process.

12.3 Delegation. The FEB shall not delegate authority for issuing or withdrawing a statement of conformity to an outside person or body, except as specified under the subcontracting procedures in Section 5.4.

Chapter 13 Use of FEB Statement of Conformity

13.1 Control of FEB Statements of Conformity. The FEB shall exercise proper control over the ownership, use, and display of FEB statements of conformity.

13.2 Improper References. Incorrect references to the field evaluation system or misleading use of licenses, certificates, or marks found in advertisements, catalogs, and so forth, shall be dealt with by corrective action.

Chapter 14 Test and Measuring Equipment

14.1 Calibration Program. The FEB shall have a program to ensure that all test and measuring equipment is, at a minimum, calibrated and traceable to NIST standards or equivalent.

14.2 Operator and Maintenance Instructions.

14.2.1 All equipment shall include operator instructions required for the correct performance of the testing and measuring equipment.

14.2.2 Maintenance procedures for the equipment shall be documented.

14.3 Suspect Test Equipment. Equipment that has been subject to overloading or mishandling or that gives suspect results shall be taken out of service until repaired, calibrated, and tested to confirm satisfactory performance.

14.4 Trace Back Process. The FEB shall examine the effects of such defects on previous evaluations conducted with the suspect equipment.

14.5 Calibration Marking. Equipment shall be marked identifying the calibration status and date of calibration.

14.6 Equipment Records. Records of all equipment shall be maintained as follows:

- (1) Name of the equipment
- (2) Manufacturer, type identification, model, and serial number
- (3) Date received and date placed in service
- (4) Condition when received (e.g., new, used, reconditioned)
- (5) Copy of manufacturer's instructions
- (6) Dates and results of calibrations and date of the next calibration
- (7) Certificate of calibration
- (8) Details of maintenance performed on equipment to date and those planned for future
- (9) History of any damage, malfunction, modification, or repair
- (10) Current location of equipment, if applicable

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many

circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.4 Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

A.3.3.1 Electrical Equipment. The term *electrical equipment* is used in this document to clearly indicate that the coverage for a field evaluation is inclusive of products that generate, transmit, distribute, control, or utilize electrical energy.

A.3.3.7 Nationally Recognized Standard. Most of these standards are also established as American National Standards by the American National Standards Institute (ANSI).

Examples include but are not limited to the following:

- (1) Underwriters Laboratories (UL)
- (2) National Fire Protection Association (NFPA)
- (3) National Electrical Manufacturers Association (NEMA)
- (4) Institute of Electrical and Electronics Engineers (IEEE)
- (5) ASTM International (ASTM)
- (6) Insulated Cable Engineers Association (ICEA)
- (7) Canadian Standards Association (gas) (CSA)

A.4.2 An example of an application form is provided in Annex B.

A.5.1.4 Requirements and information not stated in this standard could be additionally required by the authority having jurisdiction or entity using this standard in the assessment of an FEB's competence and of promoting safety, protection of life, and property.

A.5.2.1(3) Registration with the state or province as a legal sole proprietorship, partnership, or corporation and providing a certified copy of a State Certificate of Corporation or other appropriate business registration certificate is considered suitable documentation to show an FEB as being a legally identifiable organization. Organizations having only registration of a "fictitious business name" and no other documentation as a business entity are not considered legally identifiable.

A.5.2.1(5) The rights and responsibilities for the FEB can be shown by review of the contract documents the FEB uses with its clients.

A.6.1.3.2 One criterion for determining suitable experience for the technical manager is a minimum of 5 years' experience in product testing or certification in the same or similar technical field.

A.8.1 The terms *applicant* and *application* refer to the interaction between the FEB and those requesting its evaluation services.

A.11.5 The report format and content as found in NFPA 791, *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*, should be used for all field evaluation technical reports.

A.11.6 This review is to ensure that the documentation being issued is clear, complete, and understandable by the users and to provide technical feedback to the individual performing the evaluation. This review is not for the purpose of making a decision on granting the field evaluation statement of conformity, nor must this review take place prior to issuance of the statement of conformity.

Annex B Application for Recognition as a Field Evaluation Body (FEB)

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1 Application. Third parties seeking recognition as field evaluation bodies (FEBs) apply for recognition by submitting one copy of the application form [see Figure B.1(a)] and any other required information to the designated individual or office for the authority having jurisdiction (AHJ) where recognition is being sought. Applicants are to complete all sections and attach additional separate pages or documents, where necessary, to the application form with the information specified. Where separate pages are provided to complete any of the sections in the application form, applicants must ensure that the applicable section is adequately identified to provide correlation to the application form.

Annex C Electrical Product Groups

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

C.1 Electrical Product Groups.

C.1.1 This annex is to be used by FEBs applying for recognition for field evaluations of electrical products, equipment, or materials.

C.1.2 The following electrical product groups are identified as those requiring similar skills and technical knowledge to properly complete a field evaluation:

- (1) Power distribution equipment under 600 volts, including switchboards, panelboards, motor control centers, transformers, and switches
- (2) Power distribution equipment over 600 volts (medium and high voltage), including switchgear, motor control, transformers, and switches

- (3) Industrial control and utilization equipment, including industrial control panels, factory automation and equipment, industrial process equipment, motor-operated tools, and machinery such as air compressors, pumps, and so forth
- (4) Commercial utilization equipment and appliances, including commercial cooking equipment, motor-operated commercial cooking equipment, refrigeration and cooling equipment, heating equipment, laundry and dry cleaning equipment, HVAC units, and fan units
- (5) Luminaires (lighting fixtures) and signs, including neon, LED, and messaging-type signs
- (6) Medical and dental equipment
- (7) Information technology equipment, including UPS systems and electronic control equipment
- (8) Wet location equipment, including pools, spas, hot tubs, and fountain equipment
- (9) Hazardous location equipment that has listed components for the area or is purged pressurized or ventilated in accordance with NFPA standards to be changed to unclassified status
- (10) Other similar electrical equipment

Annex D Informational References

D.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

D.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 791, *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*, 2014 edition.

D.1.2 Other Publications. (Reserved)

D.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

ISO/IEC 17000, *Conformity assessment— Vocabulary and general principles*, 2004.

ISO/IEC Guide 65, *General requirements for bodies operating product certification systems*, 1996.

ISO/IEC 17020, *Conformity assessment - Requirements for the operation of various types of bodies performing inspection*, 2012.

D.3 References for Extracts in Informational Sections. (Reserved)

APPLICATION FOR RECOGNITION AS A THIRD-PARTY FIELD EVALUATION BODY (FEB)

Corporation or Company Information

Legal name: _____

Mailing address (for main office): _____

City: _____ State: _____ ZIP: _____ County: _____

Street address (if different from mailing address): _____

City: _____ State: _____ ZIP: _____ County: _____

Attach addresses for all other locations on a separate page.

Corporation or Company Legal Entity Information

Provide a certified copy of Registration, or other appropriate document, with a State or Province as a legal sole proprietorship, partnership, corporation, or LLC. Organizations having only a registration of a "fictitious business name" or no other documentation as a business entity are not considered legally identifiable.

Attach separate documentation showing legal status in the form of the company's Articles of Incorporation or Registration, as registered with the State or Province in which the company is operating.

Provide the names, titles, and business affiliations of principal officers affiliated with the FEB.

Corporation or Company Organization

Submit on a separate page the FEB Organizational Chart showing the organizational elements involved, key positions, relationships between components from the chief executive officer, or equivalent, to the project-handling individuals. Provide the names and titles of specific key individuals, including Technical Manager, Operations Manager, and any other supervisory personnel directly related to Field Evaluation operations.

First name: _____ Last name: _____ Title: _____

Business affiliation: _____

FIGURE B.1(a) Application for Recognition as a Third-Party Field Evaluation Body (FEB).

**APPLICATION FOR RECOGNITION AS A
THIRD-PARTY FIELD EVALUATION BODY (FEB) (continued)**

Corporation or Company Organization (continued)

Provide evidence of independence from any manufacturers, suppliers, distributors, or installers of the products to be evaluated (attach separate pages as necessary).

FEB Personnel

Provide the educational background, training experience, professional licenses, registrations or certificates, and other applicable qualifications for each of the following key personnel: Technical Manager, direct Supervisor of FEB operations, and individual(s) managing the management system defined in Section 5.5 of NFPA 790.

Provide the minimum competency for personnel completing Field Evaluation projects, including educational background, experience, training, and professional registration.

Provide a complete description of the training program and the auditing process to ensure continued accuracy, validity, and uniformity for performing evaluations.

Provide records, including dates of the observation or examination, of the performance or personnel performing evaluations.

Indicate any involvement the FEB will have in the design, promotion, or sale of the products being tested; engineering of projects where equipment could be specified; and contracting of any project where the project could be used. Provide a copy on policy for limiting conflict of interest in the evaluation of products per 5.2.6 of NFPA 790.

FIGURE B.1(b) *Continued*

APPLICATION FOR RECOGNITION AS A THIRD-PARTY FIELD EVALUATION BODY (FEB) *(continued)*

Products Requested for Recognition

In the following section, indicate the product or products the FEB is applying for recognition. Use Annex C of NFPA 790 or indicate the reference standard(s) as the basis for this list. The FEB is to be prepared to substantiate qualifications to complete Field Evaluations for each of the product categories listed.

Product identification: _____

Reference standards: _____

Management System

Submit a copy of the FEB management system manual as described in 5.5.2 of NFPA 790.

Procedures and Test Equipment

Submit documentation on the procedures and practices the FEB utilizes to complete Field Evaluations. This is to be in the form of the detailed process to be followed; references only to standards or practices is not acceptable (attach separate pages as needed).

Provide an inventory list of test and measurement equipment used for evaluations and include the calibration schedule; see Chapter 13 of NFPA 790. Provide calibration reports on all test and measurement equipment used for evaluations for the past 5 years or, for companies with less than 5 years of records, since the beginning of operations.

Submit calibration procedures for test and measurement equipment used for evaluations when in-house calibration is used. Submit name(s) of outside calibration laboratories used for calibrating equipment used for evaluations and provide a copy of accreditation for such equipment. Outside calibration laboratories are accredited by the following third-party organizations: National Voluntary Laboratory Accreditation Program (NVLAP), American Association for Laboratory Accreditation (A2LA), or equivalent.

FIGURE B.1(c) *Continued*

**APPLICATION FOR RECOGNITION AS A
THIRD-PARTY FIELD EVALUATION BODY (FEB) (continued)**

Procedures and Test Equipment (continued)

Where an outside calibration organization is not accredited by NVLAP, A2LA, or equivalent for the test and measurement equipment they are contracted to calibrate, provide the FEB's audit procedures to ensure that the procedures of the outside calibration organization meet minimum requirements for test and measurement equipment calibration and traceability to recognized national or international standards.

Records

Describe the key records that are maintained and the retention period, including a minimum; inspection, testing, and evaluation data sheets; evaluation reports; test and measurement calibration records; personnel qualifications; and training records.

Sample Report

Provide one sample evaluation report of the type the FEB produces or intends to produce. The sample report should contain the element as identified in NFPA 791, *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*.

Authorized Representative

The following information is for identifying the authorized representative for contacting and coordinating the recognition.

First name: _____ Last name: _____ Position: _____
Phone: _____ Fax: _____ E-mail: _____

FIGURE B.1(d) *Continued*

Index

Copyright © 2013 National Fire Protection Association. All Rights Reserved.

The copyright in this index is separate and distinct from the copyright in the document that it indexes. The licensing provisions set forth for the document are not applicable to this index. This index may not be reproduced in whole or in part by any means without the express written permission of NFPA.

-A-	
Administration.....	Chap. 1
Application.....	1.3
Purpose.....	1.2
Scope.....	1.1
Competent FEBs.....	1.1.2
Establishing Competence.....	1.1.1
Appeals, Complaints, and Disputes.....	Chap. 7
Appeals, Complaints, and Disputes Procedures.....	7.1
Documentation and Subsequent Actions.....	7.2
Application for Evaluation.....	Chap. 8
Application.....	8.2
Information on Procedures.....	8.1, A.8.1
Application for Recognition as a Field Evaluation	
Body (FEB).....	Annex B
Approved	
Definition.....	3.2.1, A.3.2.1
Authority Having Jurisdiction (AHJ)	
Definition.....	3.2.2, A.3.2.2
-D-	
Decision to Issue an FEB Statement of Conformity.....	Chap. 12
Conformity Decision.....	12.1
Delegation.....	12.3
Evaluator Decision.....	12.2
Definitions.....	Chap. 3
-E-	
Electrical Equipment	
Definition.....	3.3.1, A.3.3.1
Electrical Product Groups.....	Annex C
Equipment	
Definition.....	3.3.2
Evaluation.....	Chap. 10
Evaluation Locations.....	10.2
Evaluation Standards.....	10.1
Evaluation Report.....	Chap. 11
Accuracy.....	11.6, A.11.6
Corrective Actions.....	11.4
Format and Content.....	11.5, A.11.5
Notification of Applicant.....	11.3
Personnel.....	11.2
Review.....	11.7
Technical Reports.....	11.1
Explanatory Material.....	Annex A
-F-	
FEB Application for Recognition.....	Chap. 4
Application.....	4.1
Contents of Application.....	4.2, A.4.2
FEB Organization.....	Chap. 5
Conditions and Procedures for Field Evaluations.....	5.6
Confidentiality.....	5.10
Disclosure to Third Party.....	5.10.2
Safeguarding Confidentiality.....	5.10.1
Documentation.....	5.8
General Provisions.....	5.1
Nondiscrimination.....	5.1.1
Internal Audits and Management Review.....	5.7
Management System.....	5.5
Operations.....	5.3
Organization and Management.....	5.2
Management Structure.....	5.2.2
Ownership and Conflicts of Interest.....	5.2.6
Records.....	5.9
Record Retention.....	5.9.2
Record System.....	5.9.1
Subcontracting.....	5.4
FEB Personnel.....	Chap. 6
General.....	6.1
Instructions.....	6.1.2
Technical Manager.....	6.1.3
Qualification Criteria.....	6.2
Qualifications Records.....	6.2.3
Field Evaluation	
Definition.....	3.3.3
Field Evaluation Body (FEB)	
Definition.....	3.3.4
Field Evaluation Body Statement of Conformity	
Definition.....	3.3.5
Field Labeled (as applied to evaluated products)	
Definition.....	3.3.6
-I-	
Informational References.....	Annex D
-L-	
Labeled	
Definition.....	3.2.3
Listed	
Definition.....	3.2.4, A.3.2.4
-N-	
Nationally Recognized Standard	
Definition.....	3.3.7, A.3.3.7
-P-	
Preparation for Evaluation.....	Chap. 9
Assignment of Qualified FEB Personnel.....	9.2
Evaluation Preparation.....	9.1
-R-	
Referenced Publications.....	Chap. 2
General.....	2.1
NFPA Publications. (Reserved).....	2.2
Other Publications.....	2.3
References for Extracts in Mandatory Sections.....	2.4
-S-	
Shall	
Definition.....	3.2.5
Should	
Definition.....	3.2.6
Standard	
Definition.....	3.2.7
-T-	
Test and Measuring Equipment.....	Chap. 14
Calibration Marking.....	14.5

Calibration Program 14.1
Equipment Records 14.6
Operator and Maintenance Instructions 14.2
Suspect Test Equipment 14.3
Trace Back Process 14.4

-U-

Use of FEB Statement of Conformity..... Chap. 13
Control of FEB Statements of Conformity 13.1
Improper References 13.2

Copyright © 2013 National Fire Protection Association®. All Rights Reserved.

NFPA® 791

Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation

2014 Edition

This edition of NFPA 791, *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*, was prepared by the Technical Committee on Electrical Equipment Evaluation and released by the Technical Correlating Committee on National Electrical Code®. It was issued by the Standards Council on July 5, 2013, with an effective date of July 25, 2013, and supersedes all previous editions.

This edition of NFPA 791 was approved as an American National Standard on July 25, 2013.

Origin and Development of NFPA 791

The Technical Committee on Electrical Equipment Evaluation was organized in 2008 by NFPA in recognition of the need for requirements for the qualifications and competency of third-parties performing field evaluations on electrical products and assemblies and to guide the process for field evaluations.

One means to demonstrate conformance of products to an applicable product safety standard is through certification. Historically, certification was accomplished through a laboratory investigation of a prototype or initial sample to determine compliance with the standard, with a system of ongoing follow-up inspections conducted to continue certification. The result was a "Certification," "Listing," "Recognition," or "Classification" of the product as defined by various standards, including NFPA 70®, *National Electrical Code*®. These processes were formalized in several international standards, including ISO/IEC Guide 65, *General Requirements for Bodies Operating Product Certification Systems*, and ISO/IEC Standard 17020, *General Criteria for the Operation of Various Types of Bodies Performing Inspection*.

As the marketplace evolved, more and more products needed to be evaluated differently from the above system because they were already installed at the installation site. Another condition that did not fit the normal process and required some other process of evaluation was that some products needed to be evaluated but were not produced in quantities that fit the traditional certification model economically. The alternative process to meet the needs for evaluation of unique, modified, or other equipment beyond the manufacturing process became known as a "field evaluation." The process used for field evaluations, by the nature of the work, is a blend of ISO/IEC Guide 65 and ISO/IEC Standard 17020.

In 2008, a task group identified the need to create two documents covering the performance of field evaluations of electrical equipment and used the following document as the basis for development: *Recommended Competency Guidelines for Third Party Field Evaluation Bodies*, which was developed by the American Council for Electrical Safety (ACES), a division of the American Council of Independent Laboratories (ACIL) (first edition, November 17, 2005).

The ACES document provided guidelines regarding the competency of firms that perform field evaluations. NFPA 791 and its companion document, NFPA 790, *Standard for Competency of Third-Party Evaluation Bodies*, provide their users with the ability to qualify who can complete field evaluations and how field evaluations specifically for electrical products are to be completed.

No changes were made to the 2014 edition of NFPA 791 other than updating the reference of NFPA 70®, *National Electrical Code*®, from the 2011 edition to the 2014 edition.

Technical Correlating Committee on National Electrical Code®

Michael J. Johnston, Chair
National Electrical Contractors Association, MD [IM]

Mark W. Earley, Nonvoting Secretary
National Fire Protection Association, MA

Kimberly L. Shea, Recording Secretary
National Fire Protection Association, MA

James E. Brunssen, Telcordia, NJ [UT]

Rep. Alliance for Telecommunications Industry Solutions

Merton W. Bunker, Jr., U.S. Department of State, VA [U]

William R. Drake, Actuant Electrical, CA [M]

William T. Fiske, Intertek Testing Services, NY [RT]

Palmer L. Hickman, National Joint Apprentice & Training Committee, MD [L]

Rep. International Brotherhood of Electrical Workers

David L. Hittinger, Independent Electrical Contractors of Greater Cincinnati, OH [IM]

Rep. Independent Electrical Contractors, Inc.

Daniel J. Kissane, Legrand/Pass & Seymour, NY [M]

Rep. National Electrical Manufacturers Association

John R. Kovacik, UL LLC, IL [RT]

Neil F. LaBrake, Jr., National Grid, NY [UT]

Rep. Electric Light & Power Group/EEI

Danny Liggett, The DuPont Company, Inc., TX [U]

Rep. American Chemistry Council

Richard P. Owen, Oakdale, MN [E]

Rep. International Association of Electrical Inspectors

Alternates

Thomas L. Adams, Engineering Consultant, IL [UT]

(Alt. to N. F. LaBrake, Jr.)

Lawrence S. Ayer, Biz Com Electric, Inc., OH [IM]

(Alt. to D. L. Hittinger)

James T. Dollard, Jr., IBEW Local Union 98, PA [L]

(Alt. to P. L. Hickman)

Stanley J. Folz, Morse Electric Company, NV [IM]

(Alt. to M. J. Johnston)

Ernest J. Gallo, Telcordia Technologies, Inc., NJ [UT]

(Alt. to J. E. Brunssen)

Alan Manche, Schneider Electric, KY [M]

(Alt. to W. R. Drake)

Robert A. McCullough, Tuckerton, NJ [E]

(Alt. to R. P. Owen)

Michael E. McNeil, FMC Bio Polymer, ME [U]

(Alt. to D. Liggett)

Mark C. Ode, UL LLC, AZ [RT]

(Alt. to J. R. Kovacik)

James F. Pierce, Intertek, OR [RT]

(Alt. to W. T. Fiske)

Vincent J. Saporita, Cooper Bussmann, MO [M]

(Alt. to D. J. Kissane)

Nonvoting

Richard G. Biermann, Biermann Electric Company, Inc., IA [IM]

(Member Emeritus)

Timothy J. Pope, Canadian Standards Association, Canada [SE]

Rep. CSA/Canadian Electrical Code Committee

D. Harold Ware, Libra Electric Company, OK [IM]

(Member Emeritus)

Mark W. Earley, NFPA Staff Liaison

Committee Scope: This Committee shall have primary responsibility for documents on minimizing the risk of electricity as a source of electric shock and as a potential ignition source of fires and explosions. It shall also be responsible for text to minimize the propagation of fire and explosions due to electrical installations.

Technical Committee on Electrical Equipment Evaluation

Julian R. Burns, Chair
Quality Power Solutions, Inc., NC [IM]
Rep. Independent Electrical Contractors, Inc.

Nancy W. Chilton, Schneider Electric, NC [M]
Ron B. Chilton, North Carolina Department of Insurance, NC [E]
Rep. International Association of Electrical Inspectors
Keith D. Gershon, Electrical Safety Institute, CA [SE]
Gordon Gillerman, National Institute of Standards & Technology, MD [C]
Joseph P. Halferty, Jr., United Inspection Agency, Inc., PA [L]
Rep. International Brotherhood of Electrical Workers
Mark L. Lewandowski, The Procter & Gamble Company, OH [U]
Rep. American Chemistry Council
Charles F. Mello, UL LLC, WA [RT]

Russell J. Nichols, SGS North America Inc., Consumer Testing Services, NJ [RT]
Shawn Paulsen, CSA Group, Canada [RT]
Kenneth J. Rempe, Siemens Industry Inc., GA [M]
Rep. National Electrical Manufacturers Association
John E. Staires, City of Tulsa, Oklahoma, OK [E]
Andras Szende, TÜV Rheinland of North America, Inc., NY [RT]
Lawrence E. Todd, Intertek Testing Services, KY [RT]
Richard S. Trainor, TÜV SUD America Inc., MA [RT]
John J. Whipple, Battelle Energy Alliance/Idaho National Laboratory, ID [U]
Ron Widup, Shermco Industries, TX [IM]
Rep. InterNational Electrical Testing Association

Alternates

Peter E. Bowers, Satellite Electric Company, Inc., MD [IM]
(Alt. to J. R. Burns)
Michael J. Farrell III, Lucas County Building Regulation, MI [L]
(Alt. to J. P. Halferty, Jr.)
Gary T. Flom, Intertek, GA [RT]
(Alt. to L. E. Todd)

Amy Phelps, National Institute of Standards and Technology, MD [C]
(Alt. to G. Gillerman)
Christopher G. Walker, Eaton Corporation, PA [M]
(Alt. to K. J. Rempe)

Richard J. Roux, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This committee shall have primary responsibility for documents covering the performance of field evaluations of electrical equipment. This committee shall also have primary responsibility for documents on the competency of companies and individuals within those companies conducting field evaluations. This committee shall have primary jurisdiction, but shall report to the Association through the National Electrical Code Technical Correlating Committee.

Contents

Chapter 1 Administration	791- 5	5.11 Markings	791- 7
1.1 Scope	791- 5	5.12 Grounding	791- 7
1.2 Purpose	791- 5	5.13 Distances Between Exposed Energized Parts	791- 7
1.3 Application	791- 5		
Chapter 2 Referenced Publications	791- 5	Chapter 6 Electrical Testing	791- 7
2.1 General	791- 5	6.1 Application	791- 7
2.2 NFPA Publications. (Reserved)	791- 5	6.2 Electrical Tests	791- 8
2.3 Other Publications	791- 5		
2.4 References for Extracts in Recommendations Sections	791- 5	Chapter 7 Reporting and Documentation	791- 8
Chapter 3 Definitions	791- 5	7.1 Report	791- 8
3.1 General	791- 5	7.2 Discrepancies and Nonconformities	791- 8
3.2 NFPA Official Definitions	791- 5	7.3 Engineering Report Documentation	791- 8
3.3 General Definitions	791- 6	7.4 Summary	791- 8
Chapter 4 Pre-Site Preparation	791- 6	7.5 Conditions of Acceptability	791- 8
4.1 Pre-Site Information	791- 6	7.6 Standards	791- 8
4.2 Used Equipment	791- 6	7.7 Equipment Identification and Nameplate	791- 8
4.3 Standard(s)	791- 6	7.8 Evaluation Procedures	791- 8
4.4 Jurisdictional Notification	791- 6	7.9 Evaluation	791- 8
		7.10 Appendices or Attachments	791- 8
Chapter 5 Construction Inspection	791- 6	Chapter 8 FEB Label	791- 8
5.1 General	791- 6	8.1 Label Application	791- 8
5.2 Electrical Code Considerations	791- 7	8.2 Label Contents	791- 9
5.3 Construction of Enclosures	791- 7	8.3 Label Location	791- 9
5.4 Disconnecting Means	791- 7	8.4 Label Control	791- 9
5.5 Main Overcurrent Protection Device (OCPD)	791- 7	Annex A Explanatory Material	791- 9
5.6 Field Terminations	791- 7	Annex B Multiple Units of Same Equipment	791-10
5.7 Components	791- 7	Annex C Informational References	791-10
5.8 Overcurrent Protection	791- 7	Index	791-11
5.9 Maintenance Receptacles and Lighting	791- 7		
5.10 Wiring	791- 7		

NFPA 791

Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation

2014 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notices and Disclaimers Concerning NFPA Documents." They can also be obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in the recommendations sections of this document are given in Chapter 2 and those for extracts in the informational sections are given in Annex C. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text should be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration

1.1 Scope.

1.1.1 This document covers recommended procedures for evaluating unlabeled electrical equipment for compliance with nationally recognized standards and any requirements of the authority having jurisdiction (AHJ).

1.1.2 This document does not cover procedures for evaluations relating to product certification systems that result in listed and labeled products.

1.2 Purpose.

1.2.1 The purpose of this document is to inform AHJs about recommended evaluation procedures for unlabeled electrical equipment and to aid in determining acceptability of evaluation results reported by recognized third-party field evaluation bodies (FEBs).

1.2.2 The purpose of this document is to recommend procedures for third-party FEBs to perform evaluations of unlabeled electrical equipment in a consistent and reliable manner, thereby facilitating acceptance of the results.

1.2.3 The purpose of the evaluation is to assist regulating authorities who make product and related installation approval decisions.

1.3 Application.

1.3.1 New or used electrical equipment not listed or labeled as a complete unit or assembly is considered to be unevaluated

by a third party and will be subject to an evaluation as required by the AHJ.

1.3.2 Products undergoing this evaluation process do not acquire product certification or listing, nor should evaluation of a product imply a determination of conformance of similar existing or any subsequently produced or altered product(s) or system(s).

1.3.3 Only units or assemblies undergoing this process should be considered eligible to bear the FEB label and have an FEB statement of conformity. (Refer to Annex B for the procedures for multiple units of the same product.)

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this recommended practice and should be considered part of the recommendations of this document.

2.2 NFPA Publications. (Reserved)

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Recommendations Sections.

NFPA 70[®], National Electrical Code[®], 2014 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter apply to the terms used in this recommended practice. Where terms are not defined in this chapter or within another chapter, they should be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, is the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Recommended Practice. A document that is similar in content and structure to a code or standard but that contains only nonmandatory provisions using the word "should" to indicate recommendations in the body of the text.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Clearance Distance. Shortest distance through air between two conductive parts.

3.3.2 Creepage Distance. Shortest distance along the surface of the insulating material between two conductive parts.

3.3.3* Critical Component(s). Electrical components or assemblies used in a power or safety circuit whose proper operation is essential to the safe performance of the system or circuit.

3.3.4* Electrical Equipment. Any device, appliance, or machine that generates, conducts, or utilizes electrical energy.

3.3.5* Emergency Stop (EStop). An emergency operation intended to switch off the supply of the electrical energy to all or part of the equipment.

3.3.6 Equipment. A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation. [70, 2014]

3.3.7* Field Evaluation. The process used to determine conformance with requirements for one-of-a-kind, limited production, used, or modified products that are not listed or field labeled under a certification program.

3.3.8 Field Evaluation Body (FEB). An organization, or part of an organization, that performs field evaluations of electrical or other equipment.

3.3.9 Identified (as applied to equipment). Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular *Code* requirement. [70, 2014]

3.3.10 Nationally Recognized Testing Laboratory (NRTL). A laboratory that performs testing per nationally recognized standards and certifies products as stipulated in the *Code of Federal Regulations* and is recognized by the United States Occupational Safety and Health Administration (Fed OSHA).

Chapter 4 Pre-Site Preparation

4.1 Pre-Site Information.

4.1.1 General. The following information should be provided for all evaluations:

- (1) Layout drawings showing components with designators that match the schematic and actual marks on, or adjacent to, the components
- (2) Electrical schematic drawings for all power, control, and safety circuits
- (3) A bill of material that includes certification details for all critical components
- (4) Limitations or conditions of acceptability for critical components

4.1.2 The information in Section 4.1.1 should be requested by the evaluator prior to or upon arrival on site.

4.2 Used Equipment. Evaluating used equipment should include additional consideration and preparation. Normal wear, intentional modification, and abnormal events that can cause mechanical and electrical changes and affect conformity should be considered.

4.2.1 Before the evaluation, a review of service history and construction changes should be performed to resolve common noncompliant items.

4.2.2 Common issues that should be considered can include:

- (1) **Damaged Components.** Inspection of mechanical components, such as enclosures, conduit, and fittings, and electrical devices should be completed to identify any visible damage or deformity that could render a product noncompliant or require replacement. Those items known to be damaged should be reviewed with the evaluating body in advance when possible.
- (2) **Suitability for Use.** An assessment of the environment surrounding equipment should be completed to observe changes that have occurred over time. Changes to building construction, moving the equipment, and installing other equipment close by should be reviewed for any effect on compliance in the changed environment. Enclosure ratings, devices that penetrate enclosures, and the environment surrounding the equipment should be reviewed in advance when possible.
- (3) **Availability of Drawings.** Availability of technical drawings or schematics should be ensured in advance when possible. Because a lack of technical drawings or schematics can increase the complexity or hinder an evaluation, accurate drawings should be produced.
- (4) ***Availability of Manufacturer or Technical Support.** Availability of the manufacturer's technical information or technical support should be ensured in advance where possible.

4.3 Standard(s). The FEB should select appropriate standards based on the design and application of the equipment under evaluation.

4.3.1 General. Where no single standard applies to the equipment, applicable portions of related standards for subassemblies and supplementary standards should be applied.

4.3.2* 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 or Factory Mutual Research Corporation.

4.4 Jurisdictional Notification. The FEB should notify the electrical AHJ in writing when an evaluation is initiated and about to commence.

Chapter 5 Construction Inspection

5.1 General. This chapter provides typical construction requirements that should be considered in the evaluation.

5.1.1 The actual requirements to be used for the construction inspection should come from the applicable primary product safety standard and electrical installation codes.

5.1.2 Some common elements of construction requirements should include but are not limited to those identified in Sections 5.2 through 5.13.

5.2 Electrical Code Considerations. Ensuring that the product can be installed in accordance with the electrical code should include but is not limited to the verification of the following:

- (1) Presence of complete equipment nameplate(s)
- (2) Equipment construction provides for a code-compliant installation
- (3) Installation instructions include sufficient detail (showing raceway entry points, supply conductor wiring methods, supply conductor types, field wiring torque values, and installer supplied overcurrent protection)
- (4) Adequate wire bending space for all field wiring terminals

5.3 Construction of Enclosures. Enclosure inspections should include but not be limited to the following:

- (1) Suitable use of metallic and nonmetallic construction materials
- (2) Enclosure-type rating (e.g., 1, 3R, 4X) suitable for the intended application or installation environment
- (3) Methods of corrosion protection for internal and external parts
- (4) Methods of fastening doors and covers
- (5) Hinged doors open at least 90 degrees
- (6) Bonding methods of dead metal parts likely to become energized
- (7) Accessibility of live parts

5.4 Disconnecting Means. The means to disconnect equipment should be reviewed for suitability and compliance with installation codes.

5.5 Main Overcurrent Protection Device (OCPD). Main overcurrent protection supplied by the manufacturer or field installed should be verified as suitable for the loads involved, voltage, and interrupting rating.

5.6 Field Terminations. Field wiring terminals should be identified.

5.7 Components. Component inspections should include but not be limited to the following:

- (1) Accuracy of and correlation between component identification in drawings, the bill of material, and marking within equipment
- (2) Critical components listed or recognized and labeled by a nationally recognized testing laboratory (NRTL)
- (3) Critical components used in accordance with their listing or the "conditions of acceptability" defined by an NRTL
- (4) Suitability of mounting methods
- (5) Suitability of components to perform as intended considering the critical/safety function of the device, mechanical and electrical loads, and other factors affecting the immediate environment or performance of the component

5.8 Overcurrent Protection. Overcurrent inspections should consider suitability of applications that include but are not limited to the following:

- (1) Overcurrent protection of conductors per the conductor ampacity
- (2) Power supply overcurrent protection
- (3) Transformer overcurrent protection for power and control
- (4) Motor overcurrent protection, including short circuit, ground fault, and overload protection, provided and properly rated
- (5) Maintenance receptacle overcurrent protection
- (6) Heater load overcurrent protection
- (7) Plug strips and portable power taps overcurrent protection

5.9 Maintenance Receptacles and Lighting. Maintenance receptacles and lighting should be inspected for the following:

- (1) Separate circuit(s) identified
- (2) Class A ground fault circuit interrupter (GFCI) protection as applicable

5.10 Wiring. Wiring should be inspected for the following:

- (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) Correct use of flexible cords
- (7) Correct use and physical protection of flexible cables
- (8) Separation of low voltage, Class 2 or Class 3 conductors from power conductors

5.11 Markings. Markings should be inspected for the following:

- (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

5.12 Grounding. Grounding/bonding provisions should be inspected for the following:

- (1) 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 identified by color coding (green or green with one or more yellow stripes) or by other suitable markings
- (4) All conductive enclosure doors and panels correctly bonded

5.13 Distances Between Exposed Energized Parts. Distances between exposed energized parts should be inspected for adequate creepage distance and clearance distance for the voltage involved.

Chapter 6 Electrical Testing

6.1 Application. The electrical testing program should follow the applicable standards as closely as practical, considering the limits of a nonlaboratory setting and the need for the equipment to perform all required functions after the test. The following typical tests and measurements on complete units or subassemblies should be completed as specified in the applicable standard:

- (1) Insulation resistance test on power circuit with all sensitive electronic components such as line filters and Rf filters disconnected
- (2) Ground continuity of bonded parts to supply equipment grounding conductor termination point

- (3) Measurement of the input voltage while under maximum design load
- (4) Measurement of the input full load current while at the maximum design load normal operation
- (5) Temperature rise testing of terminals and heat producing devices (transformers, power supplies, coils, heaters) and components that could be affected by an elevated ambient caused by other heat producing components
- (6) Safety interlock circuit function testing
- (7) Emergency stop

6.2 Electrical Tests. The following electrical tests should be completed as required by the applicable product standard where identified as production or routine tests:

- (1) Leakage current on cord and plug-connected equipment
- (2) Dielectric withstand (hi-pot) on power circuits
- (3) Other production tests

Chapter 7 Reporting and Documentation

7.1 Report. Each evaluation should result in a complete report detailing the results of the evaluation and a statement of conformity made from the results.

7.2 Discrepancies and Nonconformities.

7.2.1 Discrepancies and nonconformities that have to be resolved in order to comply with requirements should be promptly brought to the client's attention.

7.2.2 Where successful correction of nonconformance occurs, the report should include detail of the corrective action.

7.2.3 Discrepancies and nonconformities brought to the client's attention, per Section 7.2, should be brought to the AHJ's attention.

7.2.4 A copy of the report, per Section 7.1, should also be provided to the AHJ.

7.3 Engineering Report Documentation. The title page should include the following items:

- (1) The identification of the company performing the evaluation
- (2) A general description of the equipment that was evaluated
- (3) The identity and location of the site where the evaluated equipment is or will be installed
- (4) The identity and location of the AHJ where the evaluated equipment is or will be installed
- (5) A report date
- (6) The project number or identifier
- (7) The identity of the person preparing the report, typically the evaluator

7.4 Summary. The report contents should include a summary containing the following information:

- (1) The individual who initiated the project and company affiliation
- (2) The location of the preliminary inspection
- (3) The location of the final inspection and testing if different from the preliminary site location
- (4) Name(s) of the evaluator(s)
- (5) The date(s) of the preliminary inspection
- (6) The date of the final inspection, testing, evaluation, and application of the label
- (7) A summary statement of the findings

- (8) The name of the AHJ responsible for the final approval

7.5* Conditions of Acceptability. A statement or series of statements establishing specific conditions of acceptability to be adhered to in order to maintain the label as valid should be included.

7.6 Standards.

7.6.1 The complete citations of the primary and any contributing support standards used to complete the evaluation should be included.

7.6.2 The citation should be complete so that any subsequent audit can clearly identify the exact edition and revision of the standard(s) used.

7.7 Equipment Identification and Nameplate. The equipment nameplate information should be documented for each manufactured unit that was evaluated, as follows:

- (1) Product name
- (2) Product manufacturer's name
- (3) Model identification
- (4) Serial number for each unit evaluated
- (5) Electrical ratings
- (6) Mechanical ratings as applicable
- (7) FEB label serial number

7.8 Evaluation Procedures.

7.8.1 The detailed procedures used to inspect, test, and evaluate the product should be documented.

7.8.2 The evaluation procedures should be separated into the major category areas as detailed in Chapters 6 and 7 with sufficient explanation for clear understanding to all parties involved, including the client, the AHJ, and the end user.

7.9 Evaluation. The evaluation section should include the following:

- (1) A brief product description of the equipment function and its intended operation
- (2) Construction evaluation results found acceptable
- (3) Electrical testing results found acceptable
- (4) Discrepancies for each item found nonconforming, including a description of the nonconformance, an explanation of the hazards, the standards citation, the remedial action to resolve the nonconformance, and the final resolution
- (5) Test instrumentation calibration information

7.10 Appendices or Attachments. The following details should be included as appendices or attachments to the report:

- (1) Reference drawings used for the evaluation
- (2) Data sheet(s) documenting the test results from each of the electrical tests
- (3) The bill of material (critical components list)
- (4) Photographs of the discrepancies found, the resolution, and the overall equipment
- (5) Field notes, checklists, or other supporting data that would benefit the client

Chapter 8 FEB Label

8.1 Label Application. After all identified issues have been fully resolved, all electrical testing has been satisfactorily completed, and the evaluation has determined that the equipment meets the applicable requirements of the standard(s), a label should be affixed to the equipment.

8.2 Label Contents.

8.2.1 The label should contain the registration mark of the evaluation company.

8.2.2 The label should have some means of unique identification or serialization.

8.2.3 The label should have a means to identify if the equipment has more than one major assembly and therefore has more than one serialized label applied.

8.2.4 The label should clearly differentiate the field evaluation from the "listing" or "recognition" of components.

8.3 Label Location.

8.3.1 The evaluation label should be in the area of the equipment nameplate.

8.3.2 Consideration should be given if expected environmental or operating conditions could cause deterioration of the label.

8.4 Label Control.

8.4.1 The label should be applied exclusively by the FEB.

8.4.2 The label should not be handled by anyone other than the FEB.

8.4.3 In no case should a label be applied to a product that has not been evaluated by the FEB. (See Annex B for information on how multiple units can be handled.)

8.4.4 The evaluator should enter the label serial number(s) into the field data work sheets.

8.4.5 The label information should be recorded in the report and into a label control system set up by the FEB.

Annex A Explanatory Material

Annex A is not a part of the recommendations of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory

authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.3 Critical Component(s). Electrical components or assemblies include but are not limited to the following:

- (1) All electrical components acting as protective device to interrupt current in an abnormal condition, such as circuit breakers, circuit protectors, fuses, and overload or thermal relays
- (2) All components and wiring for the emergency stop system, including power supply, emergency stop contactor, or interrupting device and pushbuttons
- (3) All hardware or firmware components and wiring for safety interlock circuits
- (4) All devices that are in an area that is classified as a Hazardous Location with the appropriate rating for the area, such as Class I, Division 1 or Class I, Division 2, unless listed as intrinsically safe
- (5) Those components that upon evaluation present a risk of fire or shock in their use or application

Note that it is possible and understood that like components can exist on equipment where one is required to be approved (listed) since it is used in a safety circuit or other device as described in the preceding list, and the other is not used in such a circuit. In these cases, like components are treated differently.

A.3.3.4 Electrical Equipment. The term *electrical equipment* is used in this document to clearly indicate that the coverage for a field evaluation is inclusive of products that generate, transmit, distribute, control, or utilize electrical energy.

A.3.3.5 Emergency Stop (EStop). In this document, the term *emergency stop* includes but is not limited to the following industry recognized terms, all of which can be configured as Category 0, Category 1, and/or Category 2 stop functions:

- (1) Emergency Power Off (EPO)
- (2) Emergency Machine Off (EMO)

Numerous variations of devices perform the emergency/safety function of disconnecting electrical energy to all or part of equipment using electromechanical or solid state components. There are various types of control actuator switches used that range in scope from pushbutton maintained contact latching function, momentary contact action for control sequence interlock, specialized interface with life safety monitoring equipment, and computerized logic control programs.

A.3.3.7 Field Evaluation. The field evaluation process is an alternative to the typical requirements for a manufacturer's quality assurance program and the laboratory follow-up program corroborating the listings. If the manufacturer chooses to apply labels, the manufacturer should be directed to complete an application for the equipment with a requisite follow-up program established.

A.4.2.2(4) Availability of the original equipment manufacturer's data simplifies the evaluation process. At times the manufacturer can supply information needed to determine conformance. Without the original manufacturer's support, extra time and testing could be necessary to complete an evaluation.

A.4.3.2 The primary standards are generally adopted by the American National Standards Institute. Supplementary standards can include ones from manufacturing organizations such as the National Electrical Manufacturers Association or general safety bodies such as the National Fire Protection Association.

A.7.5 For example, the equipment should be suitable for an indoor dry location only, or the equipment is stated by note as being suitable only for installation in a hazardous location.

Annex B Multiple Units of Same Equipment

This annex is not a part of the recommendations of this NFPA document but is included for informational purposes only.

B.1 Introduction. There are cases where multiple units of the same equipment are evaluated. In that case, at least one unit will be completely evaluated according to this procedure and be labeled.

B.1.1 The following procedures are not intended for use for "lot" inspection or evaluations. The remaining units can be assessed in one of the methods provided in B.1.1.1 through B.1.1.3.

B.1.1.1 Each additional unit is to be inspected, tested, and evaluated by the FEB as needed to ensure that each unit is built the same as the "accepted" prototype unit. This process will result in an issuance of an evaluation label on each subsequent unit, and the FEB becomes in essence the manufacturer's quality assurance inspectors.

B.1.1.2 With prior AHJ approval, the process involves evaluating the first unit according to this recommended practice, then inspecting a representative sampling of additional units to determine with a reasonable degree of assurance that all the remaining units are constructed the same as the "accepted" sample(s).

B.1.1.3 With prior AHJ approval, the prototype is evaluated, and the manufacturer declares that all the remaining units are constructed to the same standard as the "accepted prototype." The evaluation company labels only the prototype and does not extend label coverage to any other units. With the labeled unit and the declaration from the manufacturer, the AHJ completes the approval of the installation.

Annex C Informational References

C.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this recommended practice and are not part of the recommendations of this document unless also listed in Chapter 2 for other reasons.

C.1.1 NFPA Publications. (Reserved)

C.1.2 Other Publications. (Reserved)

C.2 Informational References.

C.2.1 ASQ Publications. American Society for Quality, P.O. Box 3005, Milwaukee, WI 53201-3005.

ASQ Z1.4, *Sampling Procedures and Tables for Inspection by Attributes*, 2008.

C.3 References for Extracts in Informational Sections. (Reserved)

Index

Copyright © 2013 National Fire Protection Association. All Rights Reserved.

The copyright in this index is separate and distinct from the copyright in the document that it indexes. The licensing provisions set forth for the document are not applicable to this index. This index may not be reproduced in whole or in part by any means without the express written permission of NFPA.

	-A-			-I-	
Administration		Chap. 1	Identified (as applied to equipment)		
Application		1.3	Definition		3.3.9
Purpose		1.2	Informational References		Annex C
Scope		1.1			
Approved				-L-	
Definition		3.2.1, A.3.2.1	Labeled		
Authority Having Jurisdiction (AHJ)			Definition		3.2.3
Definition		3.2.2, A.3.2.2	Listed		
	-C-		Definition		3.2.4, A.3.2.4
Clearance Distance					
Definition		3.3.1		-M-	
Construction Inspection		Chap. 5	Multiple Units of Same Equipment		Annex B
Components		5.7			
Construction of Enclosures		5.3		-N-	
Disconnecting Means		5.4	Nationally Recognized Testing Laboratory (NRTL)		
Distances Between Exposed Energized Parts		5.13	Definition		3.3.10
Electrical Code Considerations		5.2			
Field Terminations		5.6		-P-	
General		5.1	Pre-Site Preparation		Chap. 4
Grounding		5.12	Jurisdictional Notification		4.4
Main Overcurrent Protection Device (OCPD)		5.5	Pre-Site Information		4.1
Maintenance Receptacles and Lighting		5.9	General		4.1.1
Markings		5.11	Standard(s)		4.3
Overcurrent Protection		5.8	General		4.3.1
Wiring		5.10	Primary Standard		4.3.2, A.4.3.2
Creepage Distance			Used Equipment		4.2
Definition		3.3.2			
Critical Component(s)				-R-	
Definition		3.3.3, A.3.3.3	Recommended Practice		
			Definition		3.2.5
	-D-		Referenced Publications		Chap. 2
Definitions		Chap. 3	General		2.1
			NFPA Publications. (Reserved)		2.2
	-E-		Other Publications		2.3
Electrical Equipment			References for Extracts in Recommendations Sections		2.4
Definition		3.3.4, A.3.3.4	Reporting and Documentation		Chap. 7
Electrical Testing		Chap. 6	Appendices or Attachments		7.10
Application		6.1	Conditions of Acceptability		7.5, A.7.5
Electrical Tests		6.2	Discrepancies and Nonconformities		7.2
Emergency Stop (EStop)			Engineering Report Documentation		7.3
Definition		3.3.5, A.3.3.5	Equipment Identification and Nameplate		7.7
Equipment			Evaluation		7.9
Definition		3.3.6	Evaluation Procedures		7.8
Explanatory Material		Annex A	Report		7.1
			Standards		7.6
	-F-		Summary		7.4
FEB Label		Chap. 8			
Label Application		8.1		-S-	
Label Contents		8.2	Should		
Label Control		8.4	Definition		3.2.6
Label Location		8.3			
Field Evaluation					
Definition		3.3.7, A.3.3.7			
Field Evaluation Body (FEB)					
Definition		3.3.8			

Item 4:

Electrical Contractors Licensing Board specialty licensing option for the Bi-Directional Amplifier profession update

BDA Licensing Option Discussion with the Electrical Contractors Licensing Board, November 16, 2018.

Discussion was opened by Board Director Ruthanne Christie as to what license categories would be able to contract in addition to a Bi-Directional Amplifier certification in Florida. A proposed addition to "Know Your Scope" matrix was provided which included a new column for Bi-Directional Amplifiers. The Board was asked which current license categories were to be checked off that coincided with the proposed BDA license. The Board voted to check off license categories EC (Electrical Contractor), EF (Fire alarm Contractor) and EY (Registered Fire Alarm Contractor) that are other license categories able to contract BDA work.

Ms. Christie continued with the next item of discussion. Ms. Christie informed the Board that she had contacted the Bureau of Education and Testing and asked them to approximate a cost to develop an exam to license Bi-Directional Amplifier contractors. The Bureau submitted an estimate and a timeline as to when a license would be developed and available to the public for its use. The cost would be approximately \$27,440.00 and the exam could be available by August 1st, 2019. After a minor discussion with the public and among themselves, the board members voted and approved funding for the testing for a BDA license certification. Ms. Christie explained that the Bureau of Education and Testing were going to schedule workshops in Broward County and invite Florida Registered Engineers who design BDA'S to provide test questions for use on the BDA exams. I was asked by Ms. Christie to reach out to Florida Engineers who could volunteer their time to the Testing Bureau for the purposes of constructing a new exam. I agreed to provide the names that I could refer to the Testing Bureau and to the Board before the next Board meeting in January 2019.

KNOW YOUR SCOPE

KEEP IT LEGAL

WORKING WITHOUT A PROPER LICENSE IS AGAINST THE LAW

Electrical Contractors' Licensing Board LICENSE CATEGORIES		Statewide Contractor	Limited to Specific Jurisdiction	Electrical -All Types-	Electrical Excluding Alarms	Fire Alarms, Burglar Alarms	Burglar Alarms ONLY	Specific Specialties See Definition 61G6-7,FAC	Residential Burglar See Definition 489.505,F.S.	Limited Energy & CCTV Central Music VAC, Intercom, Electric Locks and Fiber Optic	Bi-Directional Amplifier Systems (BDA)/Distributed Antenna System (DAS)
	Certified = State Examination Registered = Local License										
EC	Certified Electrical Contractor	✓		✓		✓		✓		✓	
ER	Registered Electrical Contractor		✓		✓			✓		✓	
EF	Certified Alarm System Contractor I	✓				✓				✓	
EG	Certified Alarm System Contractor II	✓					✓			✓	
EJ	Registered Residential Alarm System Contractor (489.537)		✓					✓		✓	
EY	Registered Alarm System Contractor I (489.537)		✓			✓				✓	
EZ	Registered Alarm System Contractor II (489.537)		✓				✓			✓	
ES 043	Residential Electrical Specialty	✓						✓			
ES 068	Utility Line Electrical Contractor	✓						✓			
ES 065	Lighting Maintenance Specialty	✓						✓			
ES 067	Sign Specialty	✓						✓			
ES 069	Limited Energy System Specialty (Formerly known as Low Voltage)	✓						✓		✓	
ET 043	Residential Electrical Specialty		✓					✓			
ET 065	Lighting Maintenance Specialty		✓					✓			
ET 067	Sign Specialty		✓					✓			
ET 068	Utility Line Electrical Contractor		✓					✓			
ET 069	Limited Energy System Specialty (Formerly known as Low Voltage)		✓					✓		✓	

* When allowed by specific jurisdiction.

Electrical Contractors' Licensing Board (850) 487-1395

Jonathan Zachem, Secretary

Rick Scott, Governor

Cost Estimate & Proposed Timeline For Developing Bi-Directional Amplifiers Examination

Activity	People	Number of Hours	Hourly Rate	Number of Test Items	Cost	Timeline*
Job Analysis	2 Staff	32	-	-	-	
Develop Test Specification	8 Subject Matter Experts	24	\$30.00	-	\$5,760	February 28, 2019
Create Item Bank	2 Staff	16	-	-	-	
Item Writing & Item Review	8 Subject Matter Experts	24	\$30.00	100	\$5,760	April 30, 2019
Reference Materials	-	-	-	-	\$500	
Subject Matter Expert & Staff Travel	2 Staff 8 Subject Matter Experts	-	-	-	\$12,000	
Translation of Exam Items to Spanish	-	-	-	-	\$1,500	May 31, 2019
Create Examinations	2 Staff	8	-	-	-	May 31, 2019
Pilot Testing (Modified Angoff) & Cut Score Study	2 Staff 8 Subject Matter Experts	16 8	- \$30.00		- \$1920	July 1, 2019
QC forms for Delivery to Vendor	2 Staff	18	-	-	-	July 16, 2019
Examination Administration Begins						August 1, 2019
TOTAL					\$27,440	

* Noted Timeline Indicate Dates of Estimated Completion

Item 5:

Discussion on enforcing the code in effect

1.3.3.2 When a conflict between a general requirement and a specific requirement occurs, the specific requirement shall apply.

1.3.4 Multiple Occupancies. Where two or more classes of occupancy occur in the same building or structure and are so intermingled that separate safeguards are impractical, means of egress facilities, construction, protection, and other safeguards shall comply with the most restrictive fire safety requirements of the occupancies involved.

1.3.5 Vehicles and Vessels. Vehicles, vessels, or other similar conveyances, when in fixed locations and occupied as buildings, as described by Section 11.6 of NFPA 101, *Life Safety Code*, shall be treated as buildings and comply with this *Code*.

1.3.6 Buildings.

1.3.6.1 Buildings permitted for construction after the adoption of this *Code* shall comply with the provisions stated herein for new buildings.

1.3.6.2* Buildings in existence or permitted for construction prior to the adoption of this *Code* shall comply with the provisions stated herein or referenced for existing buildings (see 10.3.2).

1.3.6.3 Repairs, renovations, alterations, reconstruction, change of occupancy, and additions to buildings shall conform to this *Code*, NFPA 101, and the building code.

1.3.6.4 Newly introduced equipment, materials, and operations regulated by this *Code* shall comply with the requirements for new construction or processes.

1.3.7 Severability. If any provision of this *Code* or the application thereof to any person or circumstance is held invalid, the remainder of the *Code* and the application of such provision to other persons or circumstances shall not be affected thereby.

1.4 Equivalencies, Alternatives, and Modifications.

1.4.1 Equivalencies. Nothing in this *Code* is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety to those prescribed by this *Code*, provided technical documentation is submitted to the AHJ to demonstrate equivalency and the system, method, or device is approved for the intended purpose.

1.4.2 Alternatives. The specific requirements of this *Code* shall be permitted to be altered by the AHJ to allow alternative methods that will secure equivalent fire safety, but in no case shall the alternative afford less fire safety than, in the judgment of the AHJ, that which would be provided by compliance with the provisions contained in this *Code*.

1.4.3 Modifications. The AHJ is authorized to modify any of the provisions of this *Code* upon application in writing by the owner, a lessee, or a duly authorized representative where there are practical difficulties in the way of carrying out the provisions of the *Code*, provided that the intent of the *Code* shall be complied with, public safety secured, and substantial justice done.

1.4.4 Buildings with equivalency, alternatives, or modifications approved by the AHJ shall be considered as conforming with this *Code*.

1.4.5 Each application for an alternative fire protection feature shall be filed with the AHJ and shall be accompanied by such evidence, letters, statements, results of tests, or other supporting information as required to justify the request. The

AHJ shall keep a record of actions on such applications, and a signed copy of the AHJ's decision shall be provided for the applicant.

1.4.6 Approval. The AHJ shall approve such alternative construction systems, materials, or methods of design when it is substantiated that the standards of this *Code* are at least equaled. If, in the opinion of the AHJ, the standards of this *Code* shall not be equaled by the alternative requested, approval for permanent work shall be refused. Consideration shall be given to test or prototype installations.

1.4.7 Tests.

1.4.7.1 Whenever evidence of compliance with the requirements of this *Code* is insufficient or evidence that any material or method of construction does not conform to the requirements of this *Code*, or to substantiate claims for alternative construction systems, materials, or methods of construction, the AHJ shall be permitted to require tests for proof of compliance to be made by an approved agency at the expense of the owner or his/her agent.

1.4.7.2 Test methods shall be as specified by this *Code* for the material in question. If appropriate test methods are not specified in this *Code*, the AHJ is authorized to accept an applicable test procedure from another recognized source.

1.4.7.3 Copies of the results of all such tests shall be retained in accordance with Section 1.11.

1.5 Units.

1.5.1 International System of Units. Metric units of measurement in this *Code* are in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 Primary and Equivalent Values. If a value for a measurement as given in this *Code* is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement. A given equivalent value could be approximate.

1.6 Enforcement. This *Code* shall be administered and enforced by the AHJ designated by the governing authority. (See Annex C for sample wording for enabling legislation.)

1.7 Authority.

1.7.1 Administration. The provisions of this *Code* shall apply without restriction, unless specifically exempted.

1.7.2* Minimum Qualifications to Enforce this Code. The AHJ shall establish minimum qualifications for all persons assigned the responsibility of enforcing this *Code*.

1.7.3 Interpretations.

1.7.3.1 The AHJ is authorized to render interpretations of this *Code* and to make and enforce rules and supplemental regulations in order to carry out the application and intent of its provisions.

1.7.3.2 Such interpretations, rules, and regulations shall be in conformance with the intent and purpose of this *Code* and shall be available to the public during normal business hours.

1.7.4 Enforcement Assistance. Police and other enforcement agencies shall have authority to render necessary assistance in the enforcement of this *Code* when requested to do so by the AHJ.

1.7.5 Delegation of Authority. The AHJ shall be permitted to delegate to other qualified individuals such powers as necessary for the administration and enforcement of this *Code*.

61G15-32.008 Design of Fire Alarms and Detection Systems.

(1) Fire alarms and detection systems include fire protection supervision, emergency alarm circuits, activation of life safety system controls and remote signaling of emergency conditions.

(2) The design specifications shall be based on the Florida Building Code, the Florida Fire Prevention Code, or as required by the local authority having jurisdiction. The Florida Building Code and the Florida Fire Prevention Code are incorporated by reference in Rule 61G15-18.011, F.A.C.

(3) For fire alarm plans on small systems below the threshold requirements for mandatory use of professional engineering services, the Engineer of Record shall specify the minimum system requirements.

(4) To ensure minimum design quality of Fire Alarm and Detection Systems Engineering Documents, said documents shall include as a minimum the following information when applicable:

(a) The documents shall be clear, with a symbols legend, system riser diagram showing all initiation and notification components, and cabling requirements. The documents shall indicate locations where fire ratings are required as determined by the system's survivability requirements, and shall identify the general occupancy of the protected property and each room and area unless it is clear from features shown.

(b) Locate initiation and notification devices and connections to related systems on the floor plans and sections when needed for clarity. Related systems include elevator controls smoke control systems, dampers, and doors.

(c) Strobe intensity and speaker output ratings for all notification devices.

(d) Identify the Class of circuits as listed in NFPA 72, which is contained within and incorporated into the Florida Fire Prevention Code.

(e) Identify the functions required by the alarm and control systems including the transmission of emergency signals being monitored or annunciated.

(f) Indicate whether the fire alarm is conventional or addressable, and indicate all zoning.

(g) Locate surge protective devices and required protective features.

(h) Locate system devices that are subject to environmental factors, and indicate requirements for the protection of equipment from temperature, humidity or corrosive atmospheres, including coastal salt air.

(i) The documents shall include a site plan of the immediate area around the protected building, structure or equipment when alarm devices are required outside the structure.

(j) In buildings where smoke detection will be obstructed by walls, beams or ceiling features, the Engineer of Record shall provide applicable design and details to direct the installer to mitigate the obstructions. In buildings with smoke detection under a pitched roof, the plans shall indicate the roof pitch and a building section shall be provided as part of the Engineering Design Documents.

(k) For fire detection systems utilizing smoke detection in situations where smoke stratification is anticipated, the design shall provide the necessary criteria to mitigate the detection problems.

(l) Systems designed using Performance Based criteria shall be identified and referenced to design guides or standards approved by the local authority having jurisdiction consistent with standards adopted by the Florida Fire Prevention Code and the Florida Building Code.

(m) The system design must indicate if the system is to provide a general evacuation signal or a zoned evacuation for all high-rise buildings or multi-tenanted properties as defined in section 2 of the Florida Building Code, Building.

(n) Wiring requirements for underground, wet locations, campus style wiring, protection against damage and burial depth shall be specified or indicated on the engineering design documents.

(o) Requirements for operations and maintenance procedures, manuals, system documentation, and instruction of Owner's operating personnel, as needed to operate the systems as intended over time.

(5) In the event that the Engineer of Record elects to specify specific equipment and to show the required wiring, battery and voltage drop (circuit analysis) calculations shall be completed. The calculations shall be completed using the equipment manufacture's data and applicable NFPA 72 procedures.

(6) System test requirements shall be noted on the Engineering Design Documents.

(7) When the engineer determines that special requirements are required by the owner, insurance underwriter or local fire code amendments these requirements shall be documented or referenced on the Engineering Design Documents.

Item 6:

Approved Engineer. FBC 118.1.4

Ch. 1, Broward County Administrative Provisions for the 2017 FBC (6th Edition)

repairs, corrections, construction or demolition which may be required, nor shall any Building Official, board member or employee give to anyone the location of any property or the names of owners thereof on which repairs, corrections or demolition have been ordered, except as otherwise directed hereinafter, until after the owners have been formally advised at which time such shall become a matter of public record.

Section 116.16 Alternative Board. As an alternative to use of its own Unsafe Structures Board, any municipality in Broward County may utilize by means of an applicable inter-local agreement, the Unsafe Structures Board of Broward County or that of another municipality located within Broward County.

SECTION 117

POWERS AND DUTIES OF THE FLOODPLAIN ADMINISTRATOR; DELEGATION, ADMINISTRATION, ENFORCEMENT, AND VARIANCES.

117.1 Scope. In accordance with F.S. sec. 553.73, the appointing Authority of Broward County or the Municipalities may delegate the authority to enforce the floodplain provisions of the Florida Building Code to a Floodplain Administrator, the Building Official, or any other appropriate agency or combination thereof.

117.2 Intent. A Floodplain Administrator, the Building Official, or any other appropriate agency or combination thereof, as designated, is authorized and directed to administer and enforce the flood provisions of the FBC and any adopted flood hazard ordinances. The designated authority shall delegate such duties and assignments as may be deemed necessary to carry out provisions of the FBC and any adopted flood hazard ordinances, to render interpretations consistent with the intent and purpose of these codes and may establish policies and procedures in order to clarify the application of their provisions including the application of the variance procedures of any adopted flood hazard ordinances to the flood provisions of the FBC. The variance procedures herein shall not apply to section 3109 of the FBC, Building.

117.3 General. Where, in any specific case, different sections of the FBC or adopted flood hazard ordinances specify different materials, methods of construction or other requirements, the most restrictive shall govern.

SECTION 118

TWO-WAY RADIO COMMUNICATION ENHANCED PUBLIC SAFETY SIGNAL BOOSTER SYSTEMS

118.1 GENERAL:

118.1.1 The Two-Way Radio Communication Enhancement Public Safety Signal Booster System shall be installed as per NFPA 1-11.10, NFPA 70, and NFPA 72. Any such system installed on or after April 1st, 2016 shall be adaptable for both 700/800 MHz p25 (association of public safety communication officials, project 25).

118.1.2 The Authority Having Jurisdiction (AHJ), in Broward County, for the Two-Way Radio Communication Enhancement Public Safety Signal Systems has two (2) permitting entities and

multiple frequency licenses as follows:

1. The Installation and Wiring shall comply with the local municipality Building and Fire Departments permitting process and shall be approved by the local and county FCC Licensee prior to installation.

2. The FCC Licensees are:

Broward County ORCAT

City of Coral Springs

City of Fort Lauderdale

City of Hollywood

City of Plantation

118.1.3 The AHJ shall determine if a new building or existing building shall require that a two-way radio communication enhanced public safety signal booster system be installed to comply with NFPA 1-11.10.1. The Building owner shall install a public safety signal booster to meet this requirement if so directed.

118.1.4 DESIGN: For new buildings, a certificate of occupancy shall not be issued until the AHJ determines that the building is in compliance with NFPA 1-11.10.1. It is recommended that the local Development Review Committee (DRC) notify the new building owner, architect, and engineers of this requirement in writing before the building is designed. A design package, comprising block level diagrams, materials submittals, and coverage measurements and predictions are required. Sufficient and substantial engineering design and support information and data shall be submitted with the application. A sealed submittal from an Engineer, with training and experience in electrical engineering, shall also be required.

118.1.5 To the extent authorized by law, Distributed Antenna Systems Integrators with Public Safety and/or Communication installation and repair experience, as a sub-contractor in association with qualified electrical contractors, and Fire Alarm contractors, may install or repair Two – Way Radio Communication Enhancement Systems. Should the contractor of record fail to have radio communications installation and repair experience with Distributed Antenna Systems, the contractor of record shall sub-contract the installation or repair of non-fire alarm function to a qualified company, having knowledge of Radio communications installation and repair

118.2 PERMIT DOCUMENTATION:

118.2.1 The following documentation shall be required for permitting a “Two-Way Radio Communication Enhancement System”:

Page 56 of 59

Ch. 1, Broward County Administrative Provisions for the 2017 FBC (6th Edition)

1. City and County FCC Licensee shall approve proposed installation of Two-Way Radio Communicating Enhanced Systems prior to installation in writing or by sealing documents submitted for review.

2. City and County written approval or sealed documents shall be provided to the local Fire Prevention Bureau office at the time of plan submittal and prior to plan review.

3. Plans shall comply with FBC 107, NFPA 1, 1.7, NFPA 70, and NFPA 72.

4. Sealed floor plans showing radio coverage for critical and general areas using industry standard radio frequency computer generated propagation modeling.

5. Schedule of signal strength as per NFPA 72 or as agreed to by the Fire Code Official in consultation with the FCC licensee in writing.

6. Schedule of the system radio frequencies or band of frequencies.

7. Notation that the system is upgradable for frequency band coverage changes including at a minimum both 700/800 MHz

8. Plans shall show that the BDA enclosure shall be painted red. A sign affixed next to or stenciling on the enclosure shall be provided in high contrasting letters over a red background, weatherproof plaque and shall include the following information:

a) Fire Department Signal Booster

b) Permit Number: _____

c) Serviced by: Vendor name and telephone

118.3 SYSTEM NOTIFICATIONS:

118.3.1 The AHJ's for the FCC licensee and Broward County Office of Regional Communications and Technology (ORCAT) shall be notified in writing of the following events by the permit holder, the system vendor, and/or the building owner. The AHJ for the FCC Licensee shall approve the date and time and may request that the AHJ shall be present during the following events:

1. Initial system testing, with date and time start and finish.

2. Periodic system testing, with date and time start and finish.

3. System placed in operation with date and time.

118.4.2 PRIOR TO THE INITIAL TESTING:

1. The vendor shall provide the system's settings prior to the initial system testing as accepted by the AHJ, FCC Licensee and ORCAT. The AHJ may ask for additional information prior to testing.

2. The system shall remain "off the air" until the initial testing with AHJ, FCC Licensee, ORCAT, and the Fire Code Official are ready to begin and provide their approval.

118.5 ANNUAL TEST

118.5.1 In addition to the annual fire alarm test, an annual test and report, in compliance with NFPA 72 Chapter 14, shall be completed by a qualified company having the knowledge of RF installation with training and experience of two – way radio communication enhanced radio systems to ensure that the original installed system is still in compliance.

118.5.2 ANNUAL TEST REPORT:

The annual test report shall be maintained with the fire alarm log book and copies shall be submitted to the local AHJ and to City and ORCAT for review. All problems found, with any corrective action(s), shall be noted in the test report, along with the name and license number of the Fire Alarm Contractor and sub-contractor Inspection Company.

118.6. SYSTEM MONITORING AND MAINTENANCE:

1. Any Public Safety Signal Booster system installed in a premise shall be tied into a fire alarm system for

monitoring.

2. In case of failure, the building owner shall be notified within two (2) hours and he/she shall cause to occur an inspection of the system. If a trouble condition is found the system shall be repaired within 48 hours of notification. If such repair proves to be longer in time or impossible to perform, a notification to the Fire Marshal shall be made indicating the failure of the system, so that in case of emergency the system shall not be relied upon by the First Responders.

Any system installed shall have a service level agreement with a responsible company. Once the system is repaired the service company shall notify both the building owner and the fire marshal.

End

of Broward County Administrative Provisions for the
2017 FBC (6th Edition)

Item 7:

Lightning Protection, 9.6.3 NFPA 1221, 2016

Discussion on the use of Lightning Protection, NFPA 1221, 2016

9.6.3* Lightning Protection. Systems shall have lightning protection that complies with NFPA 780.

A.9.6.3 U.S. Army Technical Manual TM 5-811-3, Electrical Design: Lightning and Static Electricity Protection, provides additional guidance.

Item 8:

Surge Arrestor, NFPA 701, 2014, 810.6

Surge Arrestors for Antennas

810.6 Antenna Lead-In Protectors Where an antenna lead-in surge protector is installed, it shall be listed as being suitable for limiting surges on the cable that connects the antenna to the receiver/transmitter electronics and shall be connected between the conductors and the grounded shield or other ground connection. The antenna lead-in protector shall be grounded using a bonding conductor or grounding electrode conductor installed in accordance with 810.21(F).

Informational Note: For requirements covering protectors for antenna lead-in conductors, refer to UL Subject 497E, Outline of Investigation for Protectors for Antenna Lead-In Conductors

810.21

(F) Electrode. The bonding conductor or grounding electrode conductor shall be connected as required in (F)(1) through (F)(3). (1) In Buildings or Structures with an Intersystem Bonding Termination. If the building or structure served has an intersystem bonding termination as required by 250.94, the bonding conductor shall be connected to the intersystem bonding termination.

Informational Note: See Article 100 for the definition of Intersystem Bonding Termination. (2) In Buildings or Structures with Grounding Means. If the building or structure served has no intersystem bonding termination, the bonding conductor or grounding electrode conductor shall be connected to the nearest accessible location on the following: (1) The building or structure grounding electrode system as covered in 250.50 (2) The grounded interior metal water piping systems, within 1.52 m (5 ft) from its point of entrance to the building, as covered in 250.52

For more information on the use of a metal water piping system, see the commentary following 250.52(A)(1). (3) The power service accessible means external to the building, as covered in 250.94 (4) The nonflexible metallic power service raceway (5) The service equipment enclosure, or (6) The grounding electrode conductor or the grounding electrode conductor metal enclosures of the power service

A bonding device intended to provide a termination point for the bonding conductor (intersystem bonding) shall not interfere with the opening of an equipment enclosure. A bonding device shall be mounted on non-removable parts. A bonding device shall not be mounted on a door or cover even if the door or cover is non-removable.

(3) In Buildings or Structures Without an Intersystem Bonding Termination or Grounding Means. If the building or structure served has no intersystem bonding termination or grounding means as described in 810.21(F)(2), the grounding electrode conductor shall be connected to a grounding electrode as described in 250.52.