

**REPORT ON DISCUSSIONS
DURING UL MEETINGS
WITH ELECTRICAL INSPECTORS
AT THE
2012 IAEI SECTION MEETINGS**





March 5, 2013

TO: Attendees of Underwriters Laboratories Inc. Meetings with Electrical Inspectors at the 2012 IAEI Section Meetings

SUBJECT: Report of Meetings

Underwriters Laboratories held meetings with Electrical Inspectors during the 2012 IAEI Section Meetings. Historically, these meetings have provided for an open exchange between the electrical inspection community and UL regarding any subject of interest to authorities.

UL acknowledges the importance of this feedback. The electrical inspector is an integral part of the UL information loop. It is the inspector, who during the examination of the final installation, can judge under field conditions, the adequacy of the constructions and markings for proper installation. It is the inspector who can pass this installation information to UL for use in modifying product safety requirements.

The questions and answers in this Report present the items discussed during the meetings. This is not a verbatim transcript; only the pertinent points have been recorded. Each question has been identified with the designation of the Section meeting at which the subject was discussed.

UL appreciates all those who took the time to participate in these meetings and provided us with information important for our endeavors and goals toward public safety. I would appreciate hearing from you on any comments or suggestions you have on this Report or the UL/Inspectors meetings.

UNDERWRITERS LABORATORIES INC.

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FROM

UL MEETINGS WITH ELECTRICAL INSPECTORS

AT THE 2012

ANNUAL IAEI SECTION MEETINGS

This report contains questions and answers from the 2012 meetings. Where necessary, the answers have been expanded to include information that may not have been available during the meetings. Where specific actions have taken place in response to the Inspector's input, the status of the actions is indicated. This report may provide insights into UL's intent and efforts that are associated with the certification of electrical equipment so that it meets the purposes of the National Electrical Code® and is installable in accordance with it. The questions have been arranged by subject matter and are identified in the margin with an identifier for the IAEI Section where the question was raised.

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TABLE OF CONTENTS

Topic	Page
1.0 UL Listing, Classification and Field Evaluation Information.....	2
2.0 Service Equipment, Switchboards, Panelboards, and Power Distribution Equipment.....	7
3.0 Circuit Breakers and AFCI's	8
4.0 Distributed Energy Systems	9
5.0 Luminaires and Signs.....	11
6.0 Wiring Systems and Devices.....	15
7.0 Appliances and Utilization Equipment	16
8.0 Counterfeiting and Other Topics.....	18

IAEI Section Identifier Legend

- (E)** Eastern Section
- (NW)** Northwestern Section
- (S)** Southern Section
- (SW)** Southwestern Section
- (W)** Western Section

1.0 UL Listing, Classification and Field Evaluation Information

- 1.1 (SW)** Q. Can jurisdictions get a specific field evaluation (FE) evaluator in order to build a relationship?
- A. Many factors go into determining the specific UL staff that will conduct a field evaluation, including staff technical competency, availability, and location. If there is UL staff located close to your jurisdiction and having multiple competencies, it would be expected that the AHJ would be able to build a relationship with that specific individual. There are several jurisdictions that have built very good relationships with the locally based field evaluation staff and UL encourages the FE staff to foster those relationships. Ultimately for any given project, the staff assigned must have the right competency and also have schedule availability to meet the customer's needs.
- 1.2 (SW)** Q. It is important for us that the field evaluation provider notify us when they will be doing a field evaluation in our jurisdiction and also to tell us which standard they plan to use. What is UL's practice?
- A. It is UL's practice to always notify the jurisdiction before a field evaluation takes place. First is a jurisdictional notification letter sent by email when the project order is placed. In addition, when the field evaluation staff are to be conducting evaluations at the final installation site, we ask them to alert the AHJ to the schedule and also to determine what specific concerns the AHJ has, if any. Sometimes, due to rush projects, this last notification may not be in time for the AHJ to be present. As for the standard, the original notification letter is not sent by UL technical staff and it would not be prudent to have them identify the standard to be used. When the technical staff make contact with the AHJ to notify them of the schedule, we would be happy to indicate the standard or standards to be used to the best of our ability at that time.
- 1.3 (SW)** Q. It is common to want to tap a bus for PV to a panel where the manufacturer may no longer even exist. The contractor says it is going to cost a fortune for an field evaluation. How much are we talking?
- A. The standard cost is approx. \$3,000 for a normal working hours modification of a UL listed switchboard or panelboard. This could end up a little over \$4000 if it involves doing the evaluation in off hours. If multiple switchboards or panelboards are involved there is a great economy of scale and the added units are at a nominal adder per unit. If we have a quote issued, we are willing to share the amount of the actual quote with the AHJ upon request. For a FE quote, please call 877-ULHELPS and select prompt number 2 or online at www.ul.com/field.

- 1.4 (SW)** Q. If UL is called in to do a field evaluation (FE) on a modification of a distribution system for a PV application, who should get a report on that field evaluation? Also, for a PV system that has the ability to be expanded later, what does the UL FE label represent?
- A. The report of the field evaluation goes to the customer and also to the AHJ. The evaluation and label on the product represent a snapshot at the time of the evaluation, and does not cover future expansion or modification. What is important for UL is the PV connection to the existing equipment, but any future modifications would be treated the same as modifying Listed equipment and another field evaluation would be required. See page 43 in the 2012 UL White Book for UL's policy on field modifications.

- 1.5 (SW)** Q. Under what conditions can a field inspection be done by UL, and why don't I get a detailed report of this inspection?
- A. A field inspection (FI) can be done on equipment that is less than 1 year old, was eligible for Listing and application of the UL Listing mark at the time of manufacture, and for whatever reason, was not labeled at the factory. Also, the applicant for the Field Inspection must be the owner of the Listing file, generally the manufacturer. For an FI, a detailed report is not completed, as this is considered to be only an inspection of the equipment in accordance with the UL Follow-Up Service Procedure. This is the same inspection that is done at the factory for normal follow-up inspections to ensure the product complies with the Listing file report.

Our inspection is conducted in the field by the UL Field Representative, who witnesses the placement of the UL Listing Mark on the product, if the product is found to be constructed in accordance with the UL description on file. At the conclusion, the customer and the AHJ receive a letter report that a Field Inspection was completed on the identified equipment and the results, either that it was found eligible to have the UL Listing Mark applied or it was not.

- 1.6 (SW)** Q. UL has provided some "UL Pending" letters that have been presented to AHJs. What does this mean?
- A. What you are reporting seems to be an incorrect and unauthorized reference to UL. Please refer future occurrences to UL Regulatory Services staff for review. References to UL can only be made by a manufacturer once an investigation has been completed and they are authorized by UL to use the appropriate UL Mark on their product. UL is also aware of some "UL Pending" references made by manufacturers or distributors on websites, which are also improper.

- 1.7**
(W)
- Q.** Are NFPA 790 and 791 part of OSHA's requirements? What does OSHA permit for field evaluations and by who?
- A.** NFPA 790 and 791 are not part of OSHA's requirements. NFPA 790, Standard for Competency of Third-Party Field Evaluation Bodies and NFPA 79, Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation were adopted by NFPA to provide a guideline to determine competency of field evaluation providers and recommended practices for evaluating unlabeled or Listed products in the field. Since OSHA does not accredit field evaluation providers, these documents provide a good basis for municipalities to adopt so that they can determine a basis of acceptability of the field evaluation providers at work in their jurisdiction to be more certain of the capability and methods for field evaluation providers. OSHA requirements regarding field evaluations as an alternative to a Listed product for electrical products in the workplace is addressed in 29CFR.1910.399 provided the field evaluation provider is acceptable to the OSHA AHJ.
- 1.8**
(W)
- Q** I have a piece of industrial machinery from overseas that I inspected that utilized Listed pumps, however the overall equipment is not Listed. What does OSHA require as far as Listing (certification)?
- A.** Industrial equipment that utilizes Listed components as part of the construction does not make it a Listed (certified) machine. In order for the assembly to be considered a Listed Machine the UL Listing Mark would have to identify that it is a UL Listed Factory Automation Equipment or Industrial Machine. UL Lists industrial machinery under the product category Factory Automation Equipment (GPNY) located on page 167 in the 2012 UL White Book or online at www.ul.com/database and enter GPNY in the category code search field. UL can also perform a field evaluation on the product where it is installed. For more information on field evaluations, please call 877-ULHELPS and select prompt number 2 or online at www.ul.com/field. OSHA requires in 29CFR 1910.303 and .399 that essentially all electrical equipment in the workplace needs to be Listed by a Nationally Recognized testing Laboratory (NRTL) such as UL or field evaluated.

- 1.9** **(S)** **Q.** To comply with the requirements contained within NFPA 790 and NFPA 791, are field evaluation's permitted to be performed at any location or can it only be completed at the final installation site?
- A.** In accordance with NFPA 790 Standard for Competency of Third-Party Field Evaluation Bodies and NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation, the initial evaluation of a product could be completed at the point of manufacturing, some interim distribution point or at the final site. The final evaluation, any remaining testing and the application of the field evaluation label is to be completed at the final installation site. There are some cases where a field evaluation may be completed elsewhere and this is done with the full knowledge and concurrence of the AHJ. These circumstances may be where there are specific hazards to the field evaluation staff at the final site. The field evaluation is still site specific and equipment specific so the final report must document the final installation site without regard to where the evaluation was completed.
- 1.10** **(S)** **Q.** How does the International Code Council (ICC) accreditation work and what does it permit a Field Evaluation Body to evaluate?
- A.** The International Code Council (ICC) International Accreditation Service (IAS) accreditation, which is presently under major revision, will complete an assessment of the Field Evaluation Body (FEB) to the criteria of NFPA 790 Standard for Competency of Third-Party Field Evaluation Bodies and NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation with some additional criteria set forth by the ICC IAS. These additional criteria have been determined by the IAS staff as being necessary for administration and to clarify a few areas where the NFPA documents may not be clear. Once the accreditation is completed, the FEB receives a certificate and their name is posted on the ICC IAS website under the accreditation program. There is a re-evaluation at one year after initial accreditation and then re-evaluation on a two year cycle after that. Presently, the IAS accreditation does not specify what products the FEB is recognized to evaluate. Part of the revisions underway will require the FEB to submit for each of the product categories as specified in NFPA 790 Appendix C and to demonstrate they have the technical expertise and capability to complete such evaluations. When this is implemented, the FEB accreditation certificate and/or web site will indicate the type of products the FEB is recognized to perform field evaluations on.

- 1.11** **Q.** When electrical equipment is imported from outside the United States, does U.S. Customs verify product listing or enforce any commerce laws?
(S)
- A.** No, the U.S. does not have any blanket import limitations where electrical products must bear a valid certification mark from a recognized testing laboratory. This is different from Europe where the European Union does require the products to bear the “CE” mark to be allowed into the EU states or to move between the member states.
- 1.12** **Q.** How long would it take to perform a field evaluation if NFPA 790 and NFPA 791 were used?
(S)
- A.** NFPA 790, the Standard for Competency of Third-Party Field Evaluation Bodies establishes the competency requirements for a Field Evaluation Body and only states that the processes used need to follow NFPA 791 Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation. NFPA 791 provides a general process or practice but is not to be used as a checklist – the applicable product safety standard is where the requirements for the product are to be taken from. The length of time to complete a field evaluation will vary greatly depending on the complexity of the product. A fairly simple fixed wired luminaire that does not need testing (construction only) could be properly done and documented for field data sheets in one to two hours. A complex piece of industrial machinery could take several days to complete the construction evaluation, required testing (off line as well as running safety testing). The time it takes today for a reputable Field Evaluation Body to complete a field evaluation will not be changed by complying with NFPA 790 or NFPA 791 requirements.
- 1.13** **Q.** If a field evaluation was requested and deficiencies are found will it be labeled?
(NW)
- A.** A label will not be applied to the product until it meets all of the requirements. All the applicable requirements from the designated product safety standard(s) including construction, components, and non-destructive performance testing must be completed and found to comply before the UL FEP label will be applied.

2.0 Service Equipment, Switchboards, Panelboards, and Power Distribution Equipment

2.1 (SW) Q. I was looking at a Listed (certified) distribution switchboard, labeled from the manufacturer, and then sent to another manufacturer and modified. When the equipment was installed, the line-up was marked as follows:

- 1 of 6
- 2 of 6
- No marking
- No marking
- 3 of 6
- 4 of 6
- 5 of 6
- 6 of 6

UL staff have said that this is ok, but we cannot accept with this gap in numbering of the sections. Can you explain the reasoning behind UL's position?

A. We are not aware of the specific circumstances for which you are referring and would like to receive additional specifics on this installation. In general, the lack of markings on those 2 sections not only means that UL did not evaluate them, but the fact that they are not accounted for in the total number of sections means we made no consideration of their impact on the remaining sections (namely the bussing between sections – as a lack of a Listing on a section is usually based on the use of some non-listed controls within the section). A field evaluation would definitely be in order to evaluate those two sections

3.0 Circuit Breakers and AFCI's

3.1
(W)

- Q.** Are there any Listed AFCI receptacles available on the market?
- A.** Yes, there is at least one manufacturer with AFCI receptacles commercially available. Presently, there are at least two manufacturers who have their AFCI receptacles Listed (certified) under the product category Arc-Fault Circuit Interrupters, Outlet Branch Circuit Type (AWBZ) located on page 70 in the 2012 UL White Book and also online at www.ul.com/database and enter AWBZ at the category code search field. As we understand it the manufacturers were intending to have them available by the NEC Report on Comments (ROC) meeting for the 2014 NEC that took place at the beginning of December 2012.

4.0 Distributed Energy Systems

- 4.1 (E) Q.** Article 690 of the NEC requires that certain elements of photovoltaic (PV) systems be listed for use in photovoltaic systems. What are the differences between a Listed PV switch and other types of switches? *The question was later clarified as being directed toward a proposed requirement for the 2014 NEC, and not the 2011 NEC.
- A.** Section 690.4 of the 2011 NEC specifies a list of equipment that shall be identified and listed for the application. Switches are not included in the list.

UL certifies (Lists) switches for use in PV systems under the product categories for Switches, Open Type for Use in Photovoltaic Systems (WHVA), Switches, Enclosed for Use in Photovoltaic Systems (WIBC) and Switches, Dead-front For Use In Photovoltaic Systems (WHXX) located on pages 416, 418, and 419 respectively of the 2012 UL White Book, and also on UL's Online Certification Directory at www.ul.com/database and enter WHVA, WHXX, or WIBC respectively, at the category code search field.

Some of the differences include:

These switches may be provided with fuseholders for PV fuses and may be electrically tripped.

PV switches are intended for use in ambient temperatures between -20 and 50°C.

Unless marked to indicate otherwise, the termination provisions are based on the use of 75°C ampacities.

PV switches are marked with the maximum electrical ratings, including a voltage rating up to 1000 V dc maximum, current rating, and short-circuit-current rating.

PV switches are marked "This switch is suitable for use in a PV system capable of delivering not more than ____ amperes, when protected by ____ PV fuses [type and manufacturer] rated ____ amperes maximum" (or the equivalent).

Unfused PV switches are rated for continuous operation at their marked ampere rating.

Fused PV switches are intended only for use with PV fuses and are rated for continuous load current not to exceed 80% of the maximum ampere rating of the PV fuse marked for use with the device.

- 4.2 Q.** Are there any special requirements for meters used on photovoltaic

(E) systems, or is such equipment the responsibility of the utility?

- A. Section 690.4 of the 2011 NEC specifies a list of equipment that shall be identified and listed for the application. Metering equipment is not included in the list. Meters on the "line side" of the service equipment are the responsibility of the serving utility.

UL certifies (Lists) sub-metering equipment under the product category Energy Usage Monitoring Systems (FTRZ), located on page 161 of the 2012 UL White Book, and also on UL's Online Certification Directory at www.ul.com/database and enter FTRZ at the category code search field.

These requirements also cover revenue meters that are intended for factory installation as components within the enclosure of complete equipment and that are not socket mounted (Type S) or bottom connected (Type A) meters.

UL provides a service for the Classification of watt-hour meters for use in metering of utilities that not only meet the appropriate requirements of UL but also have been investigated in accordance with standards or parts detailed below from the American National Standards Institute (ANSI):

1. ANSI/NEMA C12.1-+, "Code for Electricity Metering"
 2. ANSI/NEMA C12.10-+, "Physical Aspects of Watthour Meters"
 3. ANSI/ NEMA C12.11-+, "Instrument Transformers for Revenue Metering, 10 kV BIL through 350 kV BIL (0.6 kV NSV through 69 kV NSV)"
 4. ANSI/NEMA C12.20-+, " Electricity Meters - 0.2 and 0.5 Accuracy Classes"
- + Issue date of standard or latest addendum

5.0 Luminaires and Signs

5.1 (W) Q. We have encountered monument signs in our area that were retrofitted a few months after installation with LEDs powered by a solar photovoltaic (PV) module to power the LED's. Is this permitted?

A. Yes, UL Listed (certified) signs may be powered by a photovoltaic (PV) source if they have been evaluated and Listed with the sign or LED sign conversion retrofit kit.

UL Lists signs under the product category Signs (UXYT), located on page 399 in the 2012 UL White Book. UL Lists (certifies) sign retrofit kits under the product category Sign Conversions, Retrofit (UYWU) located on page 401 in the 2012 UL White Book. The Guide Information and Listings for these categories can be found online at www.ul.com/database and enter either UXYT or UYWU at the category code search field.

The retrofit kits will be marked on one of the major subassemblies with the UL Classification Mark and the following RETROFIT SIGN CONVERSION LED KIT FOR USE ONLY IN ACCORDANCE WITH KIT INSTRUCTIONS or for use in a specific sign.

The kit will also come with specific installation instructions that must be followed in accordance with NEC 110.3(B).

5.2 (W) Q. Are all LED drivers and power supplies required to be marked as Class 2?

A. No. LED drivers are evaluated for compliance with the Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products, ANSI/ UL 8750. LED driver outputs are evaluated for Class 2 limits based on manufacturer's request. UL Lists LED drivers under the product category- Drivers for Light-emitting-diode Arrays, Modules and Controllers (FKSZ), located on page 148 in the 2012 UL White Book. The Guide Information for FKSZ states LED drivers marked "Class 2" indicate that the output meets the voltage, current, and isolation criteria specified in ANSI/UL 1310, "Class 2 Power Units," or Article 725 of the NEC, and that Class 2 wiring methods may be used. A driver may have one or more outputs marked "Class 2." The Guide Information and Listings for this category can be found online at www.ul.com/database and enter either FKSZ at the category code search field.

5.3 (E) Q. I have had a contractor retrofit hazardous location fixtures by installing compact florescent lamps in lieu of the marked lamp replacement type. Does the UL listing cover this? If not, does UL intend to cover such a retrofit?

A. No, compact florescent lamps have only been evaluated for use in unclassified ordinary locations in accordance with ANSI/NFPA 70, the "National Electrical Code" (NEC).

UL certifies (Lists) compact florescent lamps under the product category Lamps, Self-ballasted and Lamp Adapters (OOLR) located on page 278 of the 2012 UL White Book, and also on UL's Online Certification Directory at www.ul.com/database and enter OOLR at the category code search field.

UL Classified Luminaires for use in Hazardous Locations (IFUX) requires that the luminaires be provided with a lamp replacement marking, and an enclosure operating temperature. Therefore, only the lamp(s) included as part of the lamp replacement marking, are addressed by the UL Classification.

The UL Mark applies to the product as it is originally manufactured when shipped from the factory. Authorized use of the UL Mark is the manufacturer's declaration that the product was originally manufactured in accordance with the applicable requirements. UL does not know what the effect of a modification may have on the safety of the product or the continued validity of the UL certification mark unless the field modifications have been specifically investigated by UL. Unless UL investigates a modified product, UL cannot indicate that the product continues to meet UL's safety requirements.

The only exception for a field modification authorized by UL is when the product has specific replacement markings. Presently, UL does not have any plans to cover such a retrofit/ field modification as a general practice. However, manufactures can submit their luminaires with the lamps of their choosing. If the UL evaluation results are determined acceptable, such luminaires could be marked to include such lamps as part of the lamp replacement marking.

5.4
(E)

Q. Where can I find if a dimmer is suitable for dimming an LED fixture?

A. UL certifies (Lists) general-use dimmers for mounting in flush or surface device boxes, under the product category Dimmers, General-use Switch (EOYX), located on page 136 of the 2012 UL White Book, and also on UL's Online Certification Directory at www.ul.com/database and enter EOYX at the category code search field.

These dimmers are intended only for the control of permanently-installed luminaires.

Dimmers are rated maximum 600 V ac (120 V ac for touch dimmers) and are intended for installation on a 20 A or less branch circuit. The basic standard used to investigate products in this category is ANSI/UL 1472, The Standard For Safety for Solid-State Dimming Controls. Although UL1472 has not yet been revised to include such requirements, a Certification Requirement Decision (CRD) has been published by Underwriters Laboratories Inc. (UL) for the following:

A dimmer shall be permanently marked on a part that is not readily removable with the statement, "For Control Of Permanently Installed _____ Lamp Fixtures Only" or the equivalent. The blank is to be filled in with the appropriate type of lighting load (incandescent, fluorescent, low voltage or LED); and

A dimmer, intended for control of a self ballasted fluorescent lamp, or LED with integral driver light source, shall be marked with the manufacturer's name and model number of the a self ballasted fluorescent lamp(s), or LED lamp(s) with integral driver(s) with which the dimmer is intended to be used. The marking shall be on the dimmer or provided with the dimmer on the packaging or stuffer sheet.

A dimmer, intended for control of an electronic or magnetic ballast, or transformer load, shall be marked with the manufacturer's name and model number of the electronic or magnetic ballast(s) or transformer with which the dimmer is intended to be used. The marking shall be on the dimmer or provided with the dimmer on the packaging or stuffer sheet.

5.5
(NW)

Q. Now that some types of incandescent lamps are being phased out in the United States. I have noticed that incandescent lamps imported from other countries are not listed. Should the AHJ turn down an installation based on the lack of a third party safety evaluation?

A. Incandescent Lamps are not required to be listed in the U.S. nor do any manufacturers submit their incandescent lamps for Listing (certification).

5.6
(NW)

- Q. I have noticed some recessed luminaires with very small apertures, for which it is impossible to reach the junction box and ballast through the aperture. What is the evaluation criteria for being able to access these luminaires? .
- A. UL certifies (Lists) recessed luminaires under the product category for Incandescent Recessed Luminaires (IEZX), located on page 177 of the 2012 UL White Book, and also on UL's Online Certification Directory at www.ul.com/database and enter IEZX at the category code search field.

These Luminaires are evaluated for compliance with UL 1598, the Standard for Safety for Luminaires. UL 1598 requires that branch circuit connections shall be accessible for visual inspection from the room side of the luminaire, unless:

The luminaire is marked to restrict its use to installations where there is ready access to the ceiling side of the luminaire or access to branch circuit connections is provided. The branch circuit connections are considered accessible from the room side of the luminaire if: the center of the wiring compartment cover is visible through the access opening; and all parts that are required to be removed to gain access are easily removed and replaced from the room side of the luminaire; and the luminaire construction is such that the diameter of the access opening is not less than 150 mm (6 in); or it complies with the splice inspection test or the diameter of the access opening is less than 150 mm (6 in) as determined by specific dimensions plugged into a formula detailed in UL 1598.

If you encounter UL Listed luminaires that you feel do not comply with this requirement, please file a Product Incident Report (PIR) at www.ul.com/ahjreport and UL's Field Reports Department will investigate.

6.0 Wiring Systems and Devices

6.1 (SW) Q. Is UL aware of any backlash regarding tamper-resistant receptacles, because they are hard to engage? I have also found them to be hard to use if you're using a polarity checker.

A. No. UL technical and Market Surveillance staff have not received similar complaints. Tamper-resistant receptacles are required to comply with the same requirements for insertion and withdrawal of attachment plugs as traditional receptacles. In addition, for tamper-resistant receptacles, testing is conducted on each outlet slot to evaluate the receptacle's ability to resist bypass of the tamper-resistant mechanism.

If you encounter UL Listed receptacles that you feel do not comply with these requirements, please file a Product Incident Report (PIR) at www.ul.com/ahjreport and UL's Field Reports Department will investigate.

6.2 (E) Q. I was told by a wire manufacturer that type UF cable cannot be used inside a building. Is this true?

A. UL certifies (Lists) type UF cable under the product category Underground Feeder and Branch-Circuit Cable (YDUX) located on page 457 of the 2012 UL White Book, and also on UL's Online Certification Directory www.ul.com/database and enter YDUX at the category code search field.

UL Lists UF cable for use in accordance with Article 340 of the NEC and consistent with NEC 340.2, in both single and multi-conductor versions.

NEC 340.10 (4) indicates that where UF is installed as nonmetallic-sheathed cable, the installation and conductor requirements shall comply with Parts II and III of Article 334 and shall be of the multiconductor type.

NEC 340.112 indicates that when UF is installed as a substitute wiring method for NM cable, the conductor insulation shall be rated 90°C (194°F). The UL Listing specifies the use of a "-B" suffix to indicate compliance.

In summary, for a UF cable to be eligible as a substitute for NM cable, it is necessary that the UF cable be:

- Listed
- a multi-conductor type
- Have a "-B" suffix
- be installed in accordance with the requirements of Article 334 (with particular adherence to NEC 334.80)

7.0 Appliances and Utilization Equipment

7.1 **Q.** Is it required that HVAC equipment be marked with a short-circuit current rating?
(S)

A. UL certifies (Lists) HVAC equipment under the product category for Heating and Cooling Equipment (LZFE), located on page 239 of the 2012 UL White Book, and also on UL's Online Certification Directory at www.ul.com/database and enter LZFE at the category code search field.

In accordance with the Standard for Safety for Heating and Cooling Equipment, UL 1995, there are requirements for this type of equipment to be marked with a short-circuit rating. UL 1995, Clause 37.3 requires that this equipment be marked in a permanent manner with specific information. One of those required markings is that the short-circuit current rating of the motor controllers, equipment control panel, overall equipment panel, or industrial control panel when employed with multi-motor and combination-load equipment. The only exception to this required marking is equipment intended for use in one- and two-family dwellings, cord-and-attachment-plug connected equipment, or equipment supplied from a branch circuit protected at 60 ampere or less overcurrent protective device is not required to be marked with a short-circuit current rating.

The short-circuit current rating required by Clause 37.3 shall include the following marking or the equivalent as specified for the motor controllers, equipment control panel, overall equipment panel or industrial control panel: "Short-circuit current: ____kA rms symmetrical, ___V maximum".

7.2 **Q.** Are all general use motors Listed (certified)?
(W)

A. No, UL offers certification (Listing) for general use motors under the product category Motors (PRGY), located on page 296 in the 2012 UL White Book and online at www.ul.com/database and enter PRGY at the category code search field. This category presently covers three-phase motors rated 5 hp and larger intended to be field installed in accordance with Article 430 of the NEC, where the motor over temperature protection required by Part III of Article 430 is intended to be provided by a separate overload device or control.

General use motors smaller than 5 hp as well as all single phase motors may be covered as UL Recognized Component (identified by a backwards UR) motors where they have been evaluated on a limited basis or are incomplete in construction where they are intended to be evaluated in the end use certification (Listing) of the overall equipment. They are not intended for field installation and do not comply with the definition of Listed in the NEC.

If there are installations of non-Listed motors in uncertified equipment, UL can perform a field evaluation on the equipment. Further, UL is open to collaboratively discussing potentially expanding the scope of the Listed motor program.

For more information on field evaluations, contact UL's Customer Service at 877-ULHELPS and select prompt number 2, or online at www.ul.com/field.

8.0 Counterfeiting and Other Topics

8.1
(W) Q. Are rebar grounding clamps dual rated for rebar and ground rods?

A. They may be, it depends on how they are marked. UL Lists (certifies) grounding clamps under the product category Grounding and Bonding Equipment (KDER) located on page 217 in the 2012 UL White Book and also online at www.ul.com/database and enter KDER at the category code search field.

The Guide Information for KDER states that ground clamps intended for use with ground rods and/or pipe electrodes in accordance with the NEC are marked with the size of electrode and electrode grounding conductor with which the clamp is intended to be used. Clamps suitable for use on copper water tubing are marked "Copper Water Tubing," or the equivalent, preceded or followed by the size of tubing. Ground rods, pipe electrodes and water tubing trade sizes are stated in fractions, such as 1/2, 5/8, etc.

Ground clamps intended for use with re-bar are marked with the size of re-bar with which the clamp is intended. Re-bar sizes may be specified in fractions, such as 1/2, 5/8, etc., or a number, such as 3, 4, 5, etc., where the number represents the numerator of the fraction when stated in eighth-inch increments, e.g., 4 = 4/8.

If they were Listed for use with both rebar and ground rods they would incorporate both the markings for rebar specifying a number such as 3, 4, 5, etc., where the number represents the numerator of the fraction when stated in eighth-inch increments, e.g., 4 = 4/8, and ground rods stating in in fractions, such as 1/2, 5/8, etc.

8.2
(W) Q. Are UL Knowledge Services online e-learning classes free of cost to AHJ's?

A. It depends on the training course, however, for most of the AHJ courses the answer is yes, if you are a code authority. Go to www.ulknowledgeservices.com, select your country location, then click on **eLearning** and then click on Code Officials. The courses geared for AHJ's will appear. Click on any of the courses and read the descriptions, most of the courses will be free or there will be a note for AHJ's to receive a special discount to call a specific phone number.

8.3
(E) Q. Does UL have any product categories that address seismic concerns?

A. UL certifies (Lists) earthquake related equipment under the product categories for Earthquake-actuated Equipment (FFPC), and Earthquake-actuated Shutoff Systems (FFPH), located on pages 142 and 143 of the 2012 UL White Book, and also on UL's Online Certification Directory at

www.ul.com/database and enter FFPC or FFPH, at the category code search field.

UL also certifies (Lists) Intrusion-detection Units (ANSR), and Sway-brace Devices, Rigid Type for Sprinkler Systems (VGMY), located on UL's Online Certification Directory at www.ul.com/database and enter ANSR, or VGMY, in the category code search field.

8.4 Q. Is UL aware of any documented field failures of fire resistive cables?
(E)

A. None to date
For the status of UL certification of Listed fire resistive cables, go to www.ul.com/codeauthorities and click on Fire Code Authorities in the left margin.

8.5 Q. Architects are specifying trimless receptacles that require the cover and
(NW) receptacle to be installed, then it is sheet rock taped and painted over, leaving only the receptacle face visible. This product also requires that a special tool to be used to remove the single receptacle for maintenance. When the single receptacle is removed, the hole is too small to get the splices through for maintenance. How can a third party safety evaluation company possibly approve such a product?

A. These receptacles are not Listed (certified) by UL and do not sound as if they would comply with the Standard for Safety for Attachment Plugs and Receptacles UL 498 nor the NEC.