



**REPORT ON DISCUSSIONS  
DURING UL MEETINGS  
WITH ELECTRICAL INSPECTORS  
AT THE  
2005 IAEI SECTION MEETINGS**



April 21, 2006

TO: Attendees of Underwriters Laboratories Inc. Meetings with Electrical  
Inspectors at the 2005 IAEI Section Meetings

SUBJECT: Report of Meetings

Underwriters Laboratories held meetings with Electrical Inspectors during the 2005 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 meeting 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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**QUESTIONS AND ANSWERS**  
**FROM**  
**UL MEETINGS WITH ELECTRICAL INSPECTORS**  
**AT THE 2005**  
**ANNUAL IAEI SECTION MEETINGS**

This report contains questions and answers from the 2005 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 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 the Section identifier.

**UL Toll-Free Numbers for Code Authorities**

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**Specific Information for AHJs and  
Regulators on the UL Web Site**

<http://www.ul.com/Regulators>

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### **IAEI Section Identifier Legend**

- (E) Eastern Section
- (NW) North Western Section
- (S) Southern Section
- (SW) South Western Section
- (W) Western Section

## 1.0 UL LISTING, CLASSIFICATION AND FIELD EVALUATION INFORMATION

1.1 (NW) Q. **Expiration of UL Listings.** How long does the UL Listing of a product last?

A. The UL Mark on a product is an indication that the product was found to comply with UL requirements at the time of manufacture. Only products manufactured under UL's Follow-Up Service are eligible to bear the UL Listing Mark. As long as the product is not modified, the Listing is not effected. The effects of any subsequent modification to Listed products cannot be determined with out a Field Evaluation by UL.

For additional information on UL Marks and what they mean see:  
[www.ul.com/mark/index.html](http://www.ul.com/mark/index.html) . For information on Field Evaluations, see:  
[www.ul.com/field/](http://www.ul.com/field/)

1.2 (NW) Q. **Verifying FEP labels.** Is there a way for an AHJ to verify the validity of a Field Evaluated Product label on older pieces of industrial utilization equipment?

A. Yes, UL's Field Evaluated Product label will have a unique serial number on it. This serial number can be used to determine when the equipment was field evaluated by UL. If the field evaluation was within the last 2 years, the record will be available electronically.

For information on equipment with a UL Field Evaluated Product label please contact UL's Field Evaluation customer service at 1-877-UL-HELPS (1-877-854-3577) and select prompt "2".

1.3 (NW) Q. **Modification of Listed equipment.** When Listed electrical equipment is modified in the field, at what point do the modifications trigger the need for UL to conduct a Field Evaluation?

A. Many types of equipment may need small modifications during installation in the field, such as the punching of a knock out. The Authority Having Jurisdiction must make the final determination on the acceptability of modifications to Listed equipment on a case-by-case basis. UL has no way to determine if the modified product continues to meet UL's requirements without further evaluation. If the AHJ believes that the modifications to the electrical equipment are "significant", then a Field Evaluation of the equipment should be required.

For additional information on field modifications to Listed equipment see:  
[www.ul.com/regulators/modification.cfm](http://www.ul.com/regulators/modification.cfm)

1.4  
(W)

**Q. AHJ notification of field evaluations.** Can UL notify the local AHJ when a Field Evaluation is in process and provide ongoing status information? Additionally, can UL notify the AHJs within a given jurisdiction as to what Field Evaluations are in process? This type of communication will enable the local AHJ to stay informed on the status of field-evaluated products in their jurisdiction.

**A.**

When a Field Evaluation is initiated the AHJ will get a notification letter as soon as UL receives the order and authorization to begin a Field Evaluation project. Prior to going to the site, the UL Field Evaluation Engineer will try and make contact with the local AHJ to let them know of the schedule and to ensure that all of the AHJ's concerns are understood. UL will provide Field Evaluation Reports to the AHJ at the conclusion of the preliminary investigation and again when the equipment has had the final inspection and testing. Our goal is to provide these reports no later than five days after completion of the on site inspection.

UL now maintains a database of all Field Evaluation projects and can provide information as to the number of projects in a geographic area. UL is not currently set up to provide this information on a regular basis but will provide it when requested. All US Field Evaluation staff currently report to Chuck Mello to ensure that UL's response provides the consistency and quality that is required for the AHJ to make an informed decision on the acceptance of an installation. Please note that when UL is requested to do a Field Evaluation, only a UL employee can attach the UL Field Evaluation Label to the equipment being evaluated. The builder, supplier, maintenance employee etc. cannot attach a label in the field.

For equipment that was eligible to bear the UL Listing Mark, but for whatever reason left the factory without the UL Mark, a Field Inspection can be performed. If the product is found to comply with UL's Listing requirements, a UL representative will witness the placement of the manufacturer's UL Mark on the equipment in the field.

One last note, when the final Field Evaluation reports are sent out, there is a customer comment form provided to both the client and the AHJ. Please take a moment to give us your feedback, comments or concerns with the Field Evaluation process. Your responses will assist us in identifying what parts of the Field Evaluation program are working and what elements may need improvements. UL's goal is to continually improve the Field Evaluation process.

1.5  
(SW)

**Q. Listing Marks on products.** Why are UL Marks not applied to the actual product in all cases? Some products have only the UL Mark on the packaging, which is usually long gone by the time the AHJ arrives for an inspection. If the UL Mark can be put on the tip of a wire connector, considering today's technology, why can't the UL Mark be applied to any product?

- A. The UL Listing Mark consists of four elements, the UL symbol, the word “Listed”, the control or issue number, and the product identity. The complete UL Mark will appear on the product unless otherwise indicated in the General Guide Information for a specific product category.

When a UL Listed product is of such a size, shape, material or surface texture that, in UL’s opinion, it is impossible to apply legibly the complete marking to the product, the complete UL Listing Mark will appear on the smallest unit container in which the product is packaged. In these cases UL may authorize the use of the UL symbol on the product in addition to the complete UL Mark on the package.

The “UL Mark” information at the end of each Guide Information identifies those products that will have the UL Listing Mark applied to the smallest unit container or packaging. If, in the AHJ’s judgment, the UL Listing Mark could be applied to the product, please report it to UL’s Regulatory Services staff for review.

The General Guide Information for each product category can be found in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database).

- 1.6 (SW) Q. **Difference between Recognized, Listed, Classified.** Can UL provide definitions for Recognized, Listed, and Classified?

- A. Definitions for Recognized, Listed, and Classified are provided in the “Overview of the UL Family of Companies, the UL Mark and Conformity Assessment Services” on page 291 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book). The definitions are also provided on UL’s website at [www.ul.com/mark](http://www.ul.com/mark).

Recognized Components are specifically used as part of a larger product or system. These components may have restrictions on their performance or may be incomplete in construction. The suitability of the use of these components is determined by the UL engineer in the evaluation of the end use application of the product. They are not intended for field installation.

Listed products have been found to comply with appropriate requirements regarding reasonably foreseeable risks associated with the product.

Classified products have been evaluated only with respect to specific properties, a limited range of hazards, or suitability for use under limited or special conditions.

Both Listed and Classified comply with the definition of Listed in Article 100 of the NEC.



1.7  
(SW)

**Q. Listing of complete assemblies.** Does a product created by an assemblage of parts (such as an industrial control panel, sign, or spa skid pack) need to be Listed? How can an AHJ know if there are no parts added in the field to the listed product?

**A.** The AHJ needs to decide whether or not an assembly needs to be Listed. Various jurisdictions have requirements that all electrical equipment shall be Listed and Labeled by an approved third party certifier. UL has not evaluated the assembly of parts unless there is a UL Listing Mark clearly identifying the assembly as Listed, such as an “Enclosed Industrial Control Panel.”

Certain assemblies have marking requirements that identify the major components in the listed assembly, to enable the AHJ to know if any components or parts have been added in the field to the listed product. Enclosed Industrial Control Panels are required to be provided with a shop drawing identifying all the components in the panel. Swimming pool and spa equipment assemblies and self-contained spas are required to be marked with a list of the major components, such as the heater, controls, pump, and blower. The list identifies the manufacturer and model number for each component. UL continues to review situations where these lists are necessary for assemblies.

Always cross reference the product identity on the Listing Mark with the Index of Product Categories in the UL General Information for Electrical Equipment Directory, (the White Book). This will identify the Listing product category Guide Information that will detail the scope of the Listing and how to identify products Listed under the product category.

1.8  
(SW)

**Q. Educating manufacturers on listing limitations.** Can UL educate the manufacturers on limitations of their listings? For example, a manufacturer takes a listed equipment enclosure, then fills it up with components, and tries to pass it off as the whole product is listed. Another example is use of a general use Industrial Control Panel for a specific use, such as elevator control. When the AHJ does not approve the use of the product, the AHJ experiences considerable political pressure.

**A.** The scope and limitations of a manufacturer’s product are stated in the Listing and the associated UL Guide Information. UL has developed a variety of educational courses for various industries, which are available through the UL University. UL’s representatives to the various industries are continually providing assistance and education to their respective industries. Also, UL provides specific training, as part of the condition of listing, to manufacturers of specific industries, including industrial control panels and electric signs. UL is continually working to provide AHJs with resources to enable them to do their job.

## 2.0 UL FIELD REPORTS SYSTEM

2.1 (NW) Q. **Field Report follow-up.** When an AHJ submits a Field Report, the AHJ needs to remain informed on the status or outcome of the investigation. What is UL doing to improve the level of communication between UL and AHJs that submit Field Reports?

A. UL's Field Report Department strives to ensure the integrity of the UL Mark and UL product certifications. If an AHJ observes a situation in which the UL Mark has been applied in the field, the UL Mark is being misused, a company's reference to UL is misleading, a UL Listed product appears to conflict with one of the model codes, or a UL Listed product has failed to operate safely, UL asks that you please submit a Field Report. UL's electronic Field Report form can be accessed at: [www.ul.com/regulators/ahjprod.cfm](http://www.ul.com/regulators/ahjprod.cfm)

When a Field Report is submitted the investigation process is as follows:

- Investigation of the validity of the field report;
- Identification of any nonconformity with the relevant requirements;
- Determination of the level of potential hazard;
- Mitigation of the identified potential hazard;
- Determination as to why the nonconformity occurred;
- Identification of means to keep the nonconformity from reoccurring;
- Identification of the appropriate corrective action;
- Verification by objective evidence that the corrective action has been implemented in practice.

Every effort is made to provide exceptional customer service and follow up with the AHJ community. The submitter of the Field Report is sent an acknowledgement when the Field Report is opened including the contact information of the Field Report handler. The submitter is also notified when the Field Report has been completed. If an AHJ has questions concerning the status or outcome of a field report, please contact the Field Report handler or UL's Regulatory Services at 800-595-9844 for assistance.

2.2 (NW) Q. **Why submit a Field Report?** A Field Report was submitted concerning a wall mounted, incandescent bathroom luminaire that had a conductive canopy that was ungrounded. More luminaires with this issue have been found in the field. Is there any reason to submit another Field Report on this same issue?

A. Yes, multiple Field Reports assist UL in determining the root cause of issues or problems. When multiple Field Reports are provided, UL can then ascertain if the apparent noncompliance issues are occurring with a specific manufacturer or if the Standard needs to be reviewed for possible revision. AHJ submitted Field Reports assist UL in maintaining the integrity of our product certifications.

The basic Standard used to evaluate incandescent surface-mounted luminaires is UL 1598, the Standard for Safety for Luminaires. UL Lists this type of luminaire under the product category "Incandescent Surface-mounted

Luminaires (IEZR).” Guide Information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 46, of UL's 2005 General Information for Electrical Equipment Directory, (the White Book).

The metal canopy referred to in the Field Report is required to have provisions for grounding by UL 1598. In some cases, this grounding provision may be accomplished through a mounting crossbar, if the wall-mounted luminaire is intended to mount over a junction box. This mounting crossbar has provisions to terminate the branch circuit equipment grounding conductor and the canopy, in turn, is bonded through its mounting screws.

For additional information on Listed incandescent surface-mounted luminaires, contact Kenneth Kempel in Research Triangle Park, NC by phone at +1-919-549-1525, or by e-mail at [Kenneth.F.Kempel@us.ul.com](mailto:Kenneth.F.Kempel@us.ul.com).

**2.3 (NW)** Q. **UL's response to product problems.** What does UL do when a product is found to have a problem?

- A. UL has a number of different methods to address products that are found to have potential problems. Depending on the seriousness of the problem, UL's response could be:
- Increase the number and frequency for factory follow up inspections;
  - Issue a Corrective Action Report, which can result in the revision of the applicable Standard or a change in the evaluation procedure for the product;
  - If UL believes that continued use of a product could create a potential hazard, then a public notice that identifies the issues or problems with the product, is issued.

If a manufacturer refuses to cooperate in addressing potential safety problems:

- Withdrawal of the manufacturer's authorization to use the UL Mark;
- Take legal action against the manufacturer to force cooperation.

When a public notice is issued concerning a product, the Consumer Product Safety Commission (CPSC) is informed of any potential safety problems or issues. UL works closely with the CPSC to insure that potentially hazardous products are identified.

**2.4 (SW)** Q. **Reporting field problems.** Can .jpg and .gif files be attached directly to the Online Field Report Submittal Form?

- A. Not at this time, because the current system does not have the bandwidth to handle the large files. We are working on upgrading the system. In the meantime, .jpg or .gif files can be sent via email, using the email address provided at the beginning of the online form. We appreciate receiving the pictures to assist in our investigation of the field report.

2.5  
(W)

- Q. Addressing manufacturer's installation instructions.** What happens when a manufacturer provides installation instructions with their Listed product that are not consistent with the NEC? When a manufacturer supplies installation instructions that are not NEC compliant, it causes problems with the relationship with the local AHJ and the installing contractor. How can this be addressed and corrected?
- A.** First, by researching the correct Code sections to determine the installation instructions are in fact, incorrect. Then by calling UL's Regulatory Services at 1-800-595-9844 and informing us that there is a problem with the product or by filing a Field Report online at <https://www.ul.com/regulators/ahjprod.cfm>. That is the correct way to take action to solve a problem.

As a general statement, UL's policy specifies that the product's installation instructions, provided by the manufacturer, meet at least the minimum installation requirements set forth in the NEC. Any manufacturer is permitted to exceed the requirements of the NEC if they choose to do so.

### 3.0 SERVICE EQUIPMENT, SWITCHBOARDS, PANELBOARDS AND POWER DISTRIBUTION EQUIPMENT

3.1  
(NW)

**Q. Shielded medium voltage cable.** Many older pieces of medium-voltage equipment operating at 4,160-volts did not have provisions for the termination of medium-voltage cable shields. Changes to the 2005 NEC now specifically require medium-voltage cable, over 2,400-volts, to be shielded. Where can these medium-voltage cable shields be terminated inside the equipment?

**A.** Nearly all medium voltage equipment includes a ground bus. Medium voltage cable shields may be terminated at this ground bus, but care must be taken when routing the ground conductors to prevent reduction of electrical spacings. Where a ground bus was not provided in the original equipment, it would be necessary to install a bus or other provisions for terminating the cable shields. Installation of an additional ground bus or other provisions for grounding could adversely affect the performance of the equipment with respect to dielectric withstand or basic impulse level tests, and will require additional investigation of the modified equipment. UL can Field Evaluate such a modification in the field. If you would like to initiate a Field Evaluation, please contact UL's Customer Service at (877) 854-3577 and select prompt number 2, or visit [www.ul.com/field/](http://www.ul.com/field/)

For additional information on Listed medium voltage equipment, contact Paul Barnhart in Research Triangle Park, NC by phone at +1-919-549-1446, or by e-mail at [Paul.D.Barnhart@us.ul.com](mailto:Paul.D.Barnhart@us.ul.com).

3.2  
(W)

**Q. Modifying switchboards and panelboards.** When ventilation openings are part of a panelboard or switchboard enclosure, can these openings be relocated to prevent burns from arc flash and arc blast during fault conditions and still be in accordance with the product standard, the NEC and NFPA 70E?

**A.** UL Listed Panelboards and Switchboards are marked with short circuit current ratings. Requirements related to the construction of the enclosure, including requirements for any ventilation openings are found in the Standards of Safety for Panelboards (UL 67) and Switchboards (UL 891). Construction and performance requirements in these Standards determine the suitability of any ventilation openings as they relate to accessibility of live parts, environmental integrity of the enclosure, containment of any arcing or arcing parts under short circuit conditions and thermal performance of the equipment. UL does not know what the effect of a field modification, such as the relocation of ventilation openings, would have on the safety of the product or the product's continued compliance with the Standard. To ensure the continued validity of the UL certification mark, such field modifications would need to be specifically investigated by UL.

Please remember, when working on energized circuits NFPA 70E, Standard for Electrical Safety in the Workplace, provides assistance in determining severity of potential exposure, planning safe work practices and selecting personal protective equipment (PPE). Initial equipment construction,

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installation and connections should be completed with the equipment in a deenergized condition, and therefore the use of gloves and other personal protective equipment (PPE) is not required.

For additional information on field modifications to Listed equipment see: [www.ul.com/regulators/modification.cfm](http://www.ul.com/regulators/modification.cfm)

For additional information on switchboards or panelboards contact Robert Osborne in Research Triangle Park, NC, by phone at +1-919-549-1559, or by e-mail at [Robert.D.Osborne.us.ul.com](mailto:Robert.D.Osborne.us.ul.com).

For information on UL's Field Evaluation Program please contact UL's Field Evaluation customer service at 1-877-UL-HELPS (1-877-854-3577) and select prompt "2", or visit [www.ul.com/field/](http://www.ul.com/field/)

3.3  
(W)

- Q. Verification of torque values.** In switchboards rated over 600 amperes there are some issues with the configuration and clearance of the wire terminals for final inspection purposes. With many manufacturers it is impossible to get a torque wrench with an allen set or regular socket wrench on the wire termination lugs for validation of torque values. The terminals are simply too close together. Many times loose terminals are overlooked without this important step in the inspection process and can later develop into a heat problem and potential failure of the terminal or conductor. Final review of torque values on terminals is a vital part of the inspector's job. Can this be further addressed within the product standard to alter the terminal clearance dimension requirements to permit field torque values to be reviewed by the AHJ during inspection?
- A.** Switchboards are Listed under the product category, Deadfront Switchboards, (WEVZ) located on page 123 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). Switchboards are evaluated for compliance with UL 891, the Standard of Safety for Switchboards. The minimum clearance dimensions for buss separation (A, B, and C phases) is defined in UL 891 and is based on the voltage rating. In addition, short circuit current ratings are based on tested designs or constructions manufactured in accordance with the dimensions that are clearly defined in Annex G of UL 891. These considerations usually involve minimum clearances between live parts of opposite polarity and between live parts and grounded metal that are increased over those required by the voltage rating. If an AHJ feels there are misapplications of these minimum spacings during manufacturing then a field report should be filed so the issue can be addressed.

The Field Report form is available on the UL Regulators page at [www.ul.com/regulators/ahjprod.cfm](http://www.ul.com/regulators/ahjprod.cfm). Digital photos can also be accepted which will assist in resolving the problem.



3.4  
(W)

**Q. Transformer “alarm contacts.”** Previously, Listing requirements for fan forced air-cooled dry-type distribution transformers required remote annunciation to an attended location and that provisions for load shedding be provided. Manufacturers included a set of dry contacts in these transformers that could be utilized for this purpose. The UL Guide Information for these transformers no longer includes this information. So the question is, has the standard changed or the application changed to eliminate this requirement?

**A.** The Guide Information for XPFS was revised in the 2003 UL White Book because the previous wording required remote annunciation and load shedding, yet neither the NEC nor the ANSI/IEEE standard used as the basis for the evaluation of these transformers had these requirements. Since these provisions were not required, the Guide Information was changed to accurately reflect Listing requirements.

Transformers of this type are Listed under the category Transformers, Distribution, Dry Type, Over 600-Volts (XPFS). Guide information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 135 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book). The Guide Information now states: “Transformers provided with forced-air (fan cooled) ratings are provided with alarm contacts for remote indication of over temperature.”

For more information on UL Listed Dry Type Distribution Transformers Over 600-Volts, contact Kenneth McKinney, in Research Triangle Park, N.C., by phone at +1-919-549-1516; or by e-mail at [Kenneth.L.McKinneyJr@us.ul.com](mailto:Kenneth.L.McKinneyJr@us.ul.com).

3.5  
(W)

**Q. Over 600-volt equipment access.** Unit Substations Over 600-volts have an exposure category marking (A, B or C) that identifies where the equipment may be installed, in terms of access. It is a little bit confusing when it comes to the difference between authorized personnel or qualified personnel in terms of access to the equipment. Can you tell us where this comes from and what it means?

**A.** UL Lists these substations under the category “Unit Substations Over 600-Volts (YEFV).” Guide information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 140 in 2005 UL General Information for Electrical Equipment Directory, (the White Book).

The Guide Information for YEFV explains the enclosure markings. The exposure category markings on Unit Substations Over 600-volts address access to the equipment, based on how the enclosure is constructed. Enclosures marked “Category A” are intended to be installed in areas accessible to the unsupervised general public; enclosures marked “Category B” are intended to be installed in areas accessible to authorized personnel only; and enclosures marked “Category C” are intended to be installed in areas accessible to qualified personnel only.

The term “authorized” would relate to someone who would not be the general public, but not a qualified person that may have access to the area where the equipment is located. The term “qualified” is defined in Article 100 of the NEC as one who has skills and knowledge related to the construction and operation of the electrical equipment and installation plus has received safety training on the hazards involved. This also follows the OSHA requirements as well.

For additional information on Listed Unit Substations Over 600-Volts, contact Paul Barnhart in Research Triangle Park, NC by phone at +1-919-549-1446, or by e-mail at [Paul.D.Barnhart@us.ul.com](mailto:Paul.D.Barnhart@us.ul.com).

**3.6**  
**(W)**

**Q. Meter disconnect switches.** Section 230.82(3) in the 2005 NEC is new and permits a disconnect switch, rated not in excess of 600-volts, having a short-circuit current rating equal to or greater than the available short-circuit current, to be installed ahead of the service disconnecting means. Is there any product, such as a meter socket with lever bypass switch that is rated over 10,000 AIC.

**A.** Yes. First, one must understand that the internal bypass switch of a meter socket is not intended as a meter disconnect switch and does not meet the intent of Section 230.82(3). The most common type of meter disconnect switch that is permitted to be located ahead of the meter and the service disconnecting means, for isolation and protection of the metering installation (i.e., “cold sequence”), is an Enclosed Switch (WIAX), located on page 126 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). Enclosed Switches are evaluated to the Standard of Safety for Enclosed and Dead-Front Switches, UL98 and can be either fused or non-fused.

For additional information on enclosed switches contact Robert Osborne in Research Triangle Park, NC, by phone at +1-919-549-1559, or by e-mail at [Robert.D.Osborne.us.ul.com](mailto:Robert.D.Osborne.us.ul.com).

**3.7**  
**(E)**

**Q. Arc flash labels.** Are UL Listed panelboards mandated to have an arc flash warning marking?

**A.** No, the marking, to which you are referring, is a field applied label and can be found in NEC 110.16 Flash Protection. “Switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential electric arc flash hazards...”

The responsibility for installing the arc flash warning marking is on the installer. This is a NEC requirement and not a Listing requirement. However, the manufacturer may choose to provide such marking labels with their products.



- 3.8 (E) Q. **Arc flash labels.** Square D has a marking similar to the NEC required arc flash warning marking. Is that adequate?
- A. Presently, the only requirement specified by the NEC is that the equipment shall be field marked to warn qualified persons of potential electric arc flash hazards. Specific guidance regarding arc flash warning markings are not provided, however, FPN #1 and 2 refer to NFPA-70E and ANSI Z535.4-1998, Product Safety Signs and Labels.
- 3.9 (E) Q. **Over 42 circuit breakers installed.** We are finding many instances of too many circuit breakers (twins, piggy back, etc.) being installed in a panelboard. The problem is worse with older, non Class CTL panelboards. With Class CTL panelboards, the interference fit provides some relief. What can be done to address this situation?
- A. Product abuse and misuse is certainly a problem. We have even found some molded-case circuit breakers where the enclosure was broken so that the interference mechanism could be defeated.

In an effort to address this situation, UL Listed Class CTL panelboards incorporate physical features which, in conjunction with the physical size, configuration, or other means provided in Class CTL circuit breakers, fuse holders, or fusible switches, are designed to prevent the installation of more overcurrent protective poles than that number for which the device is designed and rated. UL also Lists type CTL circuit breakers to function in conjunction with Class CTL panelboards. Only the circuit breaker types identified on the panelboard itself or circuit breakers specifically UL Classified for use in a specific panelboard are to be used.

Guide information on “Panelboards (QEUY)” can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 92 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book). Class CTL panelboards are identified by the words “Class CTL” on the Listing Mark. UL 67, the Standard for Safety for Panelboards is the basic Standard used to evaluate these products.

For additional information on panelboards contact Robert Osborne in Research Triangle Park, NC, by phone at +1-919-549-1559, or by e-mail at [Robert.D.Osborne.us.ul.com](mailto:Robert.D.Osborne.us.ul.com).

Guide information on “Circuit Breakers, Molded-Case and Circuit Breaker Enclosures (DIVQ)” can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 14 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book). UL 489, the Standard for Safety for Circuit Breakers, Molded-Case and Circuit Breaker Enclosures is the basic Standard used to evaluate these products.

Molded-case circuit breakers that are not provided with a means to prevent

their installation in Class CTL assemblies are marked, "For Replacement Use Only, Not CTL Assemblies." These types of circuit breakers are for use in old style, non-Class CTL equipment only.

For additional information on molded-case circuit breakers contact John Kovacik in Northbrook, IL, by phone at +1-847-664-2972, or by e-mail at [John.R.Kovacik@us.ul.com](mailto:John.R.Kovacik@us.ul.com).

## 4.0 CIRCUIT BREAKERS AND AFCIs

4.1  
(W)

- Q. Circuit breaker interchangeability.** How do you know what panels a circuit breaker such as a Homeline, GE, Seimens or Cutler Hammer can be used in or interchanged with and are they listed to be interchanged?
- A.** Molded-case circuit breakers are Listed by UL for use in specific panelboards. The manufacturers of these circuit breakers submit them to UL for testing and evaluation with their particular panelboards. Listed circuit breakers are not intended to be interchanged between panelboards that are produced by another manufacturer.

Additionally, UL “Classifies” molded-case circuit breakers that have been investigated and found suitable for use in place of other Listed circuit breakers in specific Listed panelboards. Information on these Classified circuit breakers can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and in the 2005 UL General Information for Electrical Equipment Directory, (the White Book), on page 15, under the product category “Circuit Breakers, Molded-Case, Classified for Use in Specific Equipment, (DIXF).” There are specific voltage, amperage and short circuit current limitations with these Classified products. The product literature or stuffer sheet that comes with each Classified circuit breaker will specify any limitations and identify which panelboard it was evaluated with. The stuffer sheet provides the installation instructions for each circuit breaker and panelboard combination. Following these instructions provides conformity with NEC Sections 110.2 and 110.3(B).

For additional information on Classified molded-case circuit breakers contact John Kovacik in Northbrook, IL, by phone at +1-847-664-2972, or by e-mail at [John.R.Kovacik@us.ul.com](mailto:John.R.Kovacik@us.ul.com).

4.2  
(W)

- Q. Information on series-combination rated systems.** When UL Listed panelboards are used as part of an overall coordination scheme that includes a series connected rating, are information sheets from the manufacturer identifying the acceptable series connected combinations required to be shipped with the panelboards?
- A.** Yes. If the information is not marked directly on the panelboard, information sheets are required to be supplied by the manufacturer as part of the end use product Listing. Manuals, pamphlets or instructions sheets that contain the specific combination of devices that are acceptable for a series-connected combination are required to be located on or in the panelboard in a pocket provided specifically for the purpose. This requirement assures that series-connected overcurrent protective devices are compatible with the testing procedures outlined in UL 489, the Standard for Moded Case Circuit Breakers. It also ensures that the main and branch breakers are in fact series rated as an assembly and suitable for use as an assembly in the specific panelboard.

When provided in the form of an information sheet, then the panelboard is required to be marked with a statement indicating that the manual, pamphlet,

or instruction sheet should be consulted before installation of the panelboard. In addition, the panelboard must be provided with a marking indicating the location of the pocket containing the information and where a replacement manual, pamphlet, or instruction sheet may be obtained should the original become lost.

Series-connected combination ratings are not intended to be used in field applications to determine proper coordination and protection of load side circuit breakers in installations where the available fault current exceeds the marked interrupting rating of the load side circuit breaker. These ratings are applicable only when the series-connected devices have been investigated by UL in combination with the end-use equipment and the equipment in which these devices are used is marked with the series-connected rating.

For additional information on series-connected combination ratings contact John Kovacik in Northbrook, IL, by phone at +1-847-664-2972, or by e-mail at [John.R.Kovacik@us.ul.com](mailto:John.R.Kovacik@us.ul.com).

4.3  
(W)

**Q. AFCI indicator problems.** We have encountered some problems in the past with a particular AFCI indicator, and that problem continues. While in use there could be a flash or puff of smoke from the units when plugged into a receptacle and the units would heat up in the hands of the user. These devices are still under warranty in some cases so it might be difficult to send them in for testing. Have you had any opportunity to look into this problem at all?

**A.** If the device is used in accordance with the manufacturer's operating instructions, the case of the unit should contain any failed part or contain any excessive heat generated by the failure and not injure the user. The unit may fail, but the unit must fail in a safe condition with out presenting a hazard to the user. If the unit fails you should contact the manufacturer, the product may be covered by the product warranty. However, the user should file a Field Report so the proper notification can be made to the manufacturer and corrective action taken. The Field Report form is available on the UL Regulators page at [www.ul.com/regulators/ahjprod.cfm](http://www.ul.com/regulators/ahjprod.cfm).

4.4  
(W)

**Q. AFCI indicator compatibility.** Are there any AFCI testers that are UL Listed and compatible with the AFCI devices?

**A.** Yes, AFCI Indicators are Listed under the product category Outlet Circuit Testers (QCYU), located on page 91 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). AFCI indicators produce a waveform that is similar to an arc fault. Since these devices cannot produce an actual arc fault, an AFCI indicator may not trip every AFCI. AFCI indicators are provided with markings or instructions that state the following or equivalent: **"CAUTION:** AFCIs recognize characteristics unique to arcing, and AFCI indicators produce characteristics that mimic some forms of arcing. Therefore the indicator may provide a false indication that the AFCI is not functioning properly. If this occurs, recheck the operation of the AFCI using the test and

reset buttons. The AFCI button test function will demonstrate proper operation.”

- 4.5 (W)**
- Q. Markings on molded-case circuit breakers.** Can the printed information such as AIC ratings on molded-case circuit breakers be increased in size so that it is easier to read?
- A.** The required information that is printed on molded-case circuit breakers is in accordance with UL 489, the Standard of Safety for Molded-Case Circuit Breakers. Based on the required markings in the Standard, the physical size of some single pole breakers and the type fonts used, these markings can be small and unfortunately difficult to read.

- 4.6 (SW)**
- Q. Classified circuit breakers in UL Listed panelboards.** Are Classified circuit breakers permitted in Listed panelboards? Are they compatible? How does the use of these circuit breakers affect the warranty on the panelboard?
- A.** Circuit breakers that have been evaluated for use in other manufacturers specific panelboards are UL Classified under the product category of Circuit Breakers, Molded-case, Classified for Use in Specified Equipment (DIXF), located on page 15 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). This category covers Classified molded-case circuit breakers rated 15 to 50 A, 120/240 V maximum that have been investigated and found suitable for use in place of other Listed circuit breakers in specific Listed panelboards, with ratings not exceeding 225 A, 120/240 V ac and a short-circuit current of 10 kA. The circuit breakers are Classified for use in specified panelboards in accordance with the details described on the circuit breaker or in the publication provided therewith.

In addition, Classified molded-case circuit breakers may also be Listed with additional features such as a ground-fault trip element, ground-fault circuit interrupter, arc-fault circuit interrupter, secondary surge arrester, transient voltage surge suppressor, and the like.

The compatibility of the circuit breakers and the panelboard is addressed as part of the evaluation, and there is an established internal procedure to review the Classification of the circuit breakers if the panelboard construction ever changes.

UL does not address warranty issues. Warranty issues should be addressed with the manufacturers.

For additional information on Classified molded-case circuit breakers contact John Kovacik in Northbrook, IL, by phone at +1-847-664-2972, or by e-mail at [John.R.Kovacik@us.ul.com](mailto:John.R.Kovacik@us.ul.com).

## 5.0 DISTRIBUTED ENERGY SYSTEMS

5.1 (SW) Q. **Photovoltaic bonding methods.** What is the acceptable bonding means for photovoltaic module frames?

A. While grounding a product is normally fairly straight forward, photovoltaic (PV) module features and functions make this challenging to do correctly. Most PV modules have aluminum frames with or without anodization. As a result, creating a grounding connection that will be physically and electrically reliable over the products' expected 30-year life span is challenging. These frames are located in wet locations leading to the potential for electrochemical corrosion with dissimilar metals. The anodization must be penetrated to ensure electrical bonding, however, areas without anodization will naturally form a non-conductive aluminum oxide layer if exposed to air.

UL is working with our Standards Technical Panel for UL 1703, the Standard for Safety for Flat-Plate Photovoltaic Modules and Panels, industry experts and NEC CMP 13 to expand and reinforce the PV module grounding requirements to more thoroughly address the proper installation of PV modules. It is anticipated this work will be concluded soon. Once completed, UL will publish an article through UL's TCA Electrical Connections newsletter and the IAEI News.

For additional information on photovoltaic (PV) modules contact Timothy Zgonena in Northbrook, IL, by phone at +1-847-664-3051, or by e-mail at [Timothy.P.Zgonena@us.ul.com](mailto:Timothy.P.Zgonena@us.ul.com).

## 6.0 INDUSTRIAL CONTROL EQUIPMENT

6.1  
(NW)

- Q.** Motor controller short-circuit current ratings. Section 430.8 of the 2005 NEC requires, with some exceptions, that the short-circuit current rating be marked on motor controllers. Are UL Listed motor controllers required to be marked with their short-circuit current rating?
- A.** The Standard used to evaluate motor controllers is UL 508, the Standard of Safety for Industrial Control Equipment. UL 508 requires that the short-circuit current rating be marked on enclosed equipment and may be either be marked on open type equipment or marked in the information provided with open equipment.

UL Lists several different types of motor controllers under the Main product category "Motor Controllers (NJOT)." Additionally, specific Listing information on magnetic motor controllers can be found under the product category "Magnetic (NLDX)." Guide Information for these categories can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on pages 69 and 70, respectively, of the 2005 UL General Information for Electrical Equipment Directory, (the White Book).

The short-circuit current rating for motor controllers and magnetic motor controllers that incorporate thermal cutouts or overload relays is identified in the Motor Controllers (NJOT) Guide Information.

For additional information on Motor Controllers and Magnetic Motor Controllers, contact Jeffrey Desjarlais in Northbrook, IL by phone at +1-847-664-3218 or by e-mail at [Jeffrey.A.Desjarlais@us.ul.com](mailto:Jeffrey.A.Desjarlais@us.ul.com).



## 7.0 LUMINAIRES AND SIGNS

7.1  
(NW)

**Q. Use of Listed luminaire clips.** Many “lay-in” or “troffer” type luminaires intended for installation in suspended ceilings have integral clips for attachment to the ceiling grid. Additionally, clips are available, separately, for attaching “lay-in” or “troffer” type luminaires to the ceiling grid. Do these fixture support clips comply with NEC 410.16(C) for securing the luminaire to the grid? What about clips that are marked “For Positioning Only”, do these also comply with the NEC?

**A.** UL Lists luminaire clips under the product category “Luminaire Fittings (IFFX).” Guide Information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 51, of the 2005 UL General Information for Electrical Equipment Directory, (the White Book). When installed in accordance with their installation instructions are intended to comply with NEC 410.16(C).

Recessed fluorescent luminaires are Listed under the product category Fluorescent Recessed Luminaires (IEVV) located on page 44 in the 2005 White Book and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). The Guide Information for IEVV indicates that when these luminaires are marked with the particular grid systems and provided with instructions on using the clips to secure the luminaire to the specific type grid, they are intended to be comply with NEC 410.16(C) .

The Standard used to evaluate both types of luminaire clips is UL 1598, the Standard of Safety for Luminaires. The UL Listing for both types require that four luminaire support clips be used, one on each corner. Testing consists of attaching the luminaire to the suspended ceiling system using four clips. The suspended ceiling system is then inverted and the total weight of the luminaire is applied to the support clips for 1-minute. The luminaire support clips successfully pass this test if the luminaire remains attached to the grid. Luminaire support clips are not evaluated for compliance with building code requirements for seismic restraint, which is why the marking, “For Positioning Only” or equivalent language, is used.

For additional information on Listed luminaire clips, contact Kenneth Kempel in Research Triangle Park, NC by phone at +1-919-549-1400, extension 11525 or by e-mail at [Kenneth.F.Kempel@us.ul.com](mailto:Kenneth.F.Kempel@us.ul.com).

7.2  
(E)

**Q. Portable luminaire wiring methods.** I have seen UL Listed lighting fixtures in hotels and motels, which are mounted on the wall adjacent to the bed's headboard. These fixtures are cord & plug connected and include a raceway connected to the bottom, which houses the cord. This seems to be in conflict with NEC 400.8(6), which indicates that flexible cord cannot be run in a raceway. Please explain.

**A.** The construction you describe appears to be a “Portable Luminaire” and is a relatively common one. The raceway, as you describe, is provided as part of



the end product and is actually a component of the overall luminaire's enclosure. UL Lists these luminaires under the product category, "Luminaires, Portable (QOWZ)." Guide information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 244 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book).

Section 400.8(1) of the NEC, does not permit flexible cord as "a substitute for the fixed wiring of the structure." The cord in question is part of the integral wiring of the product, therefore, NEC 400.8(1) and (6) are not applicable. The concept is easier to visualize if one pictures a torch type portable lamp where the Power Supply Cord enters the base of the lamp, but does not terminate at the lampholder until it reaches the top.

For additional information on Listed portable luminaires, contact Kenneth Kempel in Research Triangle Park, NC by phone at +1-919-549-1400, extension 11525 or by e-mail at [Kenneth.F.Kempel@us.ul.com](mailto:Kenneth.F.Kempel@us.ul.com).


**7.3 (SW)** **Q. Portable cabinet luminaires.** Can portable cabinet luminaires be fixed in place?

**A.** Yes, there are luminaires that are designed to attach to mounting means under and within cabinets. The intended use and mounting directions are required by the Standard to be included in the portable cabinet luminaire installation instructions. According to the Guide Information for Portable Cabinet Luminaires (QOVJ), these luminaires have been investigated to UL 153, the Standard of Safety for Portable Electric Luminaires, for mounting in accordance with the clearances marked on the product. Portable cabinet luminaires not marked with clearances may be mounted as close to any surface as permitted by the housing, an integral mounting flange, bracket, or spacer. In addition, the supply cord should not pass through any structure or be concealed. Guide Information for (QOVJ) can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 244, of the 2005 UL General Information for Electrical Equipment Directory, (the White Book).

For additional information on Listed portable cabinet luminaires, contact David Belt in Research Triangle Park, NC by phone at +1-919-549-1400, extension 11628 or by e-mail at [David.M.Belt@us.ul.com](mailto:David.M.Belt@us.ul.com).

**7.4 (E)** **Q. Use of Recognized Components.** I have come across an LED lighting unit, which had a plug in power supply. The only marking on the product was the UL Recognized Component Mark, located on the power supply. Is this right?

**A.** The Recognized Component Mark does not provide evidence of listing or labeling which the National Electrical Code® or other installation codes or standards may require.

The Recognized Component Mark  is applicable to components that are incomplete in construction features or limited in performance capabilities where

the acceptability gets evaluated by the UL engineer conducting the end use product Listing investigation. Recognized components are not intended for field installation.

The UL Listing Mark on the overall end use product provides evidence of listing or labeling and that the manufacturer has demonstrated the ability to produce a product that complies with appropriate safety requirements regarding reasonably foreseeable risks associated with the product.

Additional information on UL Recognized Component markings is provided on UL's website at [www.ul.com/mark](http://www.ul.com/mark) and on page 292 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book)

- 7.5 (E)**
- Q. Luminaires for commercial cooking hoods.** If I'm presented with a commercial cooking hood including a light, does it have to have a UL Label?
- A.** The Type 1 commercial cooking hood may or may not be evaluated by UL and include a Label. The NEC requirements for luminaires in ducts and hoods are outlined in Section 410.4(C), which focuses on the luminaire and prohibits exposed wiring methods within the hood. The luminaire shall be identified for use within a commercial cooking hood.

UL Lists such luminaires under the Main product category, "Luminaires and Fittings (HYXT)." Guide information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 41 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book). The basic Standard used to investigate these luminaires is UL 1598, the Standard of Safety for Luminaires.

Luminaires for use above cooking equipment are marked "SUITABLE FOR USE WITHIN COMMERCIAL COOKING HOODS" and "MOUNT A MINIMUM OF 1.2 M (4 FT) ABOVE COOKING SURFACE." Such luminaires are for installation in accordance with NFPA 96, "Standard for Ventilation Control and Fire Protection of Commercial Cooking Equipment," and Section 410.4(C) of ANSI/NFPA 70, "National Electrical Code" (NEC).

For additional information on Listed luminaires for use above cooking equipment, contact Kenneth Kempel in Research Triangle Park, NC by phone at +1-919-549-1400, extension 11525 or by e-mail at [Kenneth.F.Kempel@us.ul.com](mailto:Kenneth.F.Kempel@us.ul.com).

## 8.0 WIRING SYSTEMS AND WIRING DEVICES

8.1  
(W)

**Q. HDPE conduit Listing.** Are there any Listings for the High Density Polyethylene (HDPE) conduit that is referenced in NEC Article 353?

**A.** UL does List HDPE conduit under the category Rigid Nonmetallic Underground Conduit, Plastic (EAXX), located on page 26 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). Currently, there are many manufacturers that have Listing under this product category.

For additional information on HDPE conduit, contact George Walbrecht in Northbrook, IL by phone at +1-847-664-3126 or by e-mail at [George.F.Walbrecht@us.ul.com](mailto:George.F.Walbrecht@us.ul.com).

8.2  
(W)

**Q. Performance of electrical tape adhesive.** What is the expected longevity of Listed electrical tape when used as insulation for a joint or splice? The issue concerns failure of the adhesive on the tape. Once applied, the adhesive sometimes fails and starts to loosen on a splice resulting in splice or joint failure.

**A.** UL Lists electrical tape under the product category "Insulating Tape (OANZ), located on page 73 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database)." The basic Standard used to investigate these products is UL 510, the Standard for Insulating Tape. As part of the evaluation of UL Listed electrical tape, an adhesion test is conducted in accordance with the ASTM D 1000 Standard, both before and after the conditioning parameters outlined in accordance with UL 510.

Up until this comment there have been no reported problems with the adhesion of Listed electrical tapes, when used at or below their 80°C temperature limit. UL has however just formed a Standards Technical Panel for Insulating Tapes and this matter will be discussed to determine if any adjustments to the current Standard's requirements are necessary.

For additional information on UL Listed electrical tape, contact Thomas Mayerhofer in Northbrook, IL by phone at +1-847-664-2903 or by e-mail at [Thomas.L.Mayerhofer@us.ul.com](mailto:Thomas.L.Mayerhofer@us.ul.com).

8.3  
(W)

**Q. Markings on Listed ground rods.** Can the manufacturers name, file number and UL Mark that appears in the first 12 inches of a UL Listed ground rod be stamped larger and deeper so it is easier to see and read?

**A.** UL Lists ground rods under the product category "Grounding and Bonding Equipment (KDER)." Guide Information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 64 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book). The basic Standard used to evaluate ground rods is UL 467, the

Standard for Safety for Grounding and Bonding Equipment.

Section 16.9 of UL 467 requires the marking on Listed ground rods to include the manufacturers name, trade name or both, or any other distinctive marking whereby the organization responsible for the product can readily be identified, a catalog number or equivalent and the rod length within 12 inches of the top of the rod. There are no specifications relative to font size or marking depth, this is left up to the manufacturer. If you would like to make a specific proposal to the standard to require minimum size markings, please see the UL Collaborative Standards Development System (CSDS) website at <http://csds.ul.com/Home/Default.aspx>.

For additional information on UL Listed ground rods, contact Jacob Killinger in Northbrook, IL by phone at +1-847-664-2018 or by e-mail at [Jacob.Killinger@us.ul.com](mailto:Jacob.Killinger@us.ul.com).

**8.4 (SW)** **Q.** **Use of type NM Cable.** Can Type NM cable be used, instead of building wire, in the raceways created by a prefabricated patio enclosure?

**A.** The NEC does not specifically prohibit the installation of Type NM Cable as described. If the raceways are normally dry locations and provide the fill area required by NEC Table 1 of Chapter 9, then the installation should be NEC compliant. However, since the final determination of acceptability resides with the Authority Having Jurisdiction, the AHJ should be consulted prior to installing Type NM Cable in the raceways created by a prefabricated patio enclosure.

UL Classifies prefabricated patio enclosures for compliance with specific versions of model codes such as the NEC under the product category Composite Panels (QRSY), located on page 268 in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) and in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database).

Type NM Cable is Listed by UL under the product category "Nonmetallic Sheathed Cable (PWVX)." Guide Information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 84 of UL's 2005 White Book. This category covers Types NM-B and NMC-B nonmetallic-sheathed cable, rated 600-volts, intended for use in accordance with Article 334 of the NEC. The basic Standard used to evaluate Type NM Cable is UL 719, the Standard for Safety for Nonmetallic-Sheathed Cables.

Please be aware that the only method to determine if NM Cable is Listed by UL and is covered by our Follow Up Service is to verify that the UL Listing Mark appears on **BOTH** the cable **AND** on the attached tag, coil, reel or smallest unit container in which the NM Cable is packaged.

For additional information on type NM Cable, contact Austin Wetherell in Melville, NY by phone at +1-631-271-6200, ext. 22818 or by e-mail at [Austin.Wetherell@us.ul.com](mailto:Austin.Wetherell@us.ul.com).

**8.5 (E) Q. Evaluation of service-entrance heads.** We have found weather heads that permitted the entrance of insects and birds. Does UL evaluate these products for such situations?

**A.** Weather heads or service-entrance heads, of the type that are used with conduit, are found in the 2005 UL General Information for Electrical Equipment Directory, (the White Book) on page 91 under the product category “Outlet Bushing and Fittings (QCRV)” and in UL’s Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database). The basic Standards used to investigate products in this category are UL 514B, the Standard for Safety for Conduit, Tubing and Cable Fittings and UL 651, the Standard for Safety for Schedule 40 and 80 Rigid PVC Conduit and Fittings.

The focus of UL’s evaluation of these products is directed at providing a smooth, non-damaging contact surface for the conductors, and a component which when properly installed will prevent the entry of rainwater into the raceway. Close fitting openings are typically provided to assist in preventing the entrance of rain. This may provide some benefit with keeping out insects, however that is not part of the evaluation.

For additional information on service-entrance heads, contact George Walbrecht in Northbrook, IL by phone at +1-847-664-3126 or by e-mail at [George.F.Walbrecht@us.ul.com](mailto:George.F.Walbrecht@us.ul.com).

**8.6 (E) Q. Receptacles located above suspended ceilings.** I have noted receptacles installed above dropped or suspended ceilings. I am not aware of NEC 400.8 allowing this. Has UL Listed receptacles for this use?

**A.** UL Lists receptacles under the product category “Receptacles for Plugs and Attachment Plugs (RTRT).” Guide Information for this category can be found in UL’s Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 109 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book). This category covers general use receptacles for use in wiring systems recognized by the NEC, and outlets for use in appliances and fixtures.

NEC Section 400.8 prohibits flexible cords and cables to be used:

(2) Where run through holes in walls, structural ceilings, suspended ceilings, dropped ceilings, or floors;

(5) Where concealed by walls, floors, or ceilings or located above suspended or dropped ceilings....

NEC Article 406 does not prohibit receptacle outlets from being installed above a dropped or suspended ceiling. UL does not List receptacles specifically for use above a suspended ceiling.

For additional information on receptacles, contact Charles Kurten in Melville, NY by phone at +1-631-271-6200, ext. 22244 or by e-mail at [Charles.S.Kurten@us.ul.com](mailto:Charles.S.Kurten@us.ul.com).

**8.7 (E) Q. Raised covers Listed for grounding.** Are there any UL Listed receptacle and raised cover combinations that meet the requirements of NEC 250.146(A)?

**A.** NEC 250.146(A) specifically states; "...This provision shall not apply to cover-mounted receptacles unless the box and cover combination are listed as providing satisfactory grounding continuity between the box and receptacle."

To date, no box and cover combinations have been submitted for evaluation and Listing. Additionally, note that Section 250.146(A) addresses all cover mounted receptacles, not just raised cover-mounted receptacles. Guide Information for "Receptacles for Plugs and Attachment Plugs (RTRT)" can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 109 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book).

For additional information on receptacles, contact Charles Kurten in Melville, NY by phone at +1-631-271-6200, ext. 22244 or by e-mail at [Charles.S.Kurten@us.ul.com](mailto:Charles.S.Kurten@us.ul.com).

**8.8 (E) Q. Unlisted fiberglass conduit.** We have had approximately 3.5 miles of unlisted fiberglass resin conduit installed in our area. Can UL field certify this conduit?

**A.** Unfortunately, UL's Field Evaluation program would not be able to conduct adequate product testing in the field. Since the unlisted conduit is already installed, our Field Evaluation engineer would only be able to test relative samples and could not provide confirmation of product consistency throughout the entire length. The local AHJ will need to determine if relative sample testing would adequately meet his/her needs for product evaluation.

UL does List fiberglass resin conduit under the product category "Reinforced Thermosetting Resin Conduit (DZKT)." Guide Information for this category can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 25 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book). This category covers reinforced thermosetting resin conduit and fittings intended for installation in accordance with NEC Article 352.

For additional information on reinforced thermosetting resin conduit and fittings, contact George Walbrecht in Northbrook, IL by phone at +1-847-664-3126 or by e-mail at [George.F.Walbrecht@us.ul.com](mailto:George.F.Walbrecht@us.ul.com).

**8.9 (E) Q. Package limitations for ENT.** I have been unable to get Electrical Nonmetallic Tubing in trade size 2-inch in lengths over 100 feet. Why is there a restriction to this maximum packaging of 100 feet?

**A.** The restriction is not a UL requirement. The marketing methods used by manufactures and/or distributors are of their own choosing. Listing information for "Electrical Nonmetallic Tubing (FKHU)" and "Electrical Nonmetallic Tubing Fittings (FKKY)" can be found in UL's Online Certifications Directory at

[www.ul.com/database](http://www.ul.com/database) and on pages 33 & 34 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book).

For additional information on electrical nonmetallic tubing and fittings, contact George Walbrecht in Northbrook, IL by phone at +1-847-664-3126 or by e-mail at [George.F.Walbrecht@us.ul.com](mailto:George.F.Walbrecht@us.ul.com).



## 9.0 APPLIANCES AND UTILIZATION EQUIPMENT

9.1 (NW) (W) Q. **Medical system “assembly” evaluation.** What is the best method for an AHJ to determine if a medical systems, such as X-ray or MRI unit, has been evaluated and Classified by UL as a complete assembly?

A. When medical systems are evaluated and Classified by UL as a complete assembly, the specific components comprising the system will be identified in the installation instructions and in UL’s published listings. While the unit that connects to the main service typically has a Classification Mark, each of the medical system’s components may or may not have an individual UL Classification Mark, at the system suppliers’ discretion. Note that system components may have more than one UL Mark.

The basic Standard used to evaluate medical equipment is UL 60601-1, generally. It is important to note that one or more collateral and/or particular Standards may also be applicable. One of the collaterals is a systems Standard that is used in addition to individual product Standards to evaluate systems. The Standards to which specific products were evaluated by UL are part of the product’s Classification Mark detail, as noted in the guide information. UL Classifies medical equipment under the product category “Medical Equipment (PIDF).” Guide Information for this category can be found in UL’s Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on page 242 of the UL’s 2005 White Book. If an AHJ has questions concerning the overall evaluation and Classification of the medical equipment components being installed, please contact UL’s Regulatory Services at 800-595-9844 for clarification.

UL is working to improve how medical systems are labeled and striving to make identification of the overall Classified medical system’s components easier for AHJs. For additional information on Classified medical equipment, contact Joseph P Murnane in Melville, NY by phone at +1-631-271-6200, ext. 22247 or by e-mail at [Joseph.P.MurnaneJr@us.ul.com](mailto:Joseph.P.MurnaneJr@us.ul.com).

9.2 (E) Q. **Hot tub installation & use instructions.** I reviewed the manufacture’s instructions for a Spa/Hot Tub and noted that a statement appeared that the GFCI must be tested each time you enter the tub. Is this requirement from the manufacture or UL?

A. The basic Standard used to evaluate spas and hot tubs is UL 1563, the Standard of Safety for Electric Spas, Equipment Assemblies, and Associated Equipment. UL 1563 includes a requirement that Spas and Hot Tubs which include an integral GFCI must provide the following statement as part of their installation and use instructions:

“...6. (For units with a GFCI)

WARNING – This product is provided with a ground-fault circuit-interrupter (give location). The GFCI must be tested before each use. With the product



operating, open the service door. When the product stops operating, this merely indicates that the door is equipped with an electrical interlock. Next, push the test button on the GFCI and close the service door. The product should not operate. Now open the service door, push the reset button on the GFCI and close the service door. The product should now operate normally. When the product fails to operate in this manner, there is a ground current flowing indicating the possibility of an electric shock. Disconnect the power until the fault has been identified and corrected....”

Guide Information for “Hot Tub and Spa Equipment Assemblies (WBYQ)” and “Self Contained Spas (WCZW)” can be found in UL's Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) and on pages 121 & 122 of the 2005 UL General Information for Electrical Equipment Directory, (the White Book).

For additional information on UL Listed spas and hot tubs, contact Gary Siggins in Silicon Valley, CA by phone at +1-408-754-6594, or by e-mail at [Gary.L.Siggins@us.ul.com](mailto:Gary.L.Siggins@us.ul.com).

## 10.0 COUNTERFEITING AND OTHER TOPICS

10.1 Q. **Counterfeiting awareness.** How can we get information about the counterfeit  
(W) UL label issue in front of the public to better educate them on this problem?

A. Each year, over 20 billion authentic UL Marks appear on products that have been evaluated by UL for safety from fire, electric shock and injury to persons hazards. While incidents of counterfeiting represent only a fraction of a percentage point of all the legitimate UL labels used annually, UL is totally committed to aggressive anti-counterfeiting activities. UL has taken many rigorous steps, including the introduction of holographic labels, color schemes specific to each product category, and overt or covert security coding, to maintain the integrity of our Marks.

Training the public is a sensitive topic. Training must be done carefully so not to alarm the public and prevent them from buying products that carry the UL Mark and are in fact legitimate. For nearly ten years, UL and the U.S. Customs Service have partnered in extensive and unprecedented nationwide anti-counterfeiting efforts. UL's anti-counterfeiting program has increased in its effectiveness and is being felt where it hurts the most, in the bank accounts of those who apply counterfeit UL Marks. US Customs agents, US Marshals and other law enforcement agencies have made raids that have resulted in the seizure and destruction of millions of products bearing these counterfeit labels. In addition to this, many individuals have been tried, convicted and are now serving time in prison for their actions.

UL's Regulatory Services with UL Anti-counterfeiting Team offer presentations on our anti-counterfeiting program, which can be scheduled depending on staff availability, meeting and travel schedules. These presentations are available to inspectors and contractors so they can become better informed on the issue of counterfeit UL Marks and how to recognize them.

For additional information or to schedule a presentation, please contact Regulatory Services at 1-800-595-9844 or by email at [ulregulatoryservices@us.ul.com](mailto:ulregulatoryservices@us.ul.com).

10.2 Q. **Listing Mark requirements.** If there is a counterfeit label on a product it may  
(W) be caught by customs at the port of entry or perhaps later once inside the country, but what if there is no UL Mark on the product? What then?

A. If a product does not have a UL label or UL certification mark applied then there is no violation or trademark infringement. However, if the product is hazardous or unsafe, and UL is made aware of it, we may contact the Consumer Product Safety Commission (CPSC) and work with them to institute a public notice for recall of the item. UL can only take legal action if there is a mark on the product and that mark is there illegally. There is no legal requirement for a UL Mark to be on a product.

10.3  
(W)

**Q. Donation of counterfeit products.** This question is in regards to the UL's presentation on counterfeiting and the events of hurricane Katrina. I have heard that some counterfeit products or "knock off" items that were seized by US Customs are being passed out to the hurricane victims, have you heard anything like this? Was there anything that was UL marked that might be hazardous to consumers?

**A.** The United States Customs and Border Protection Service has indeed donated certain types of counterfeit apparel and clothing items to victims of Hurricane Katrina. These items are all non-electrical products and are donated with the consent of the legitimate trademark holder, who in most cases will have their trademark or logo removed. US Customs would first seek authorization from UL before they could or would release any counterfeit electrical products and of course UL would not release any product that was determined to be unsafe.

10.4  
(SW)

**Q. Counterfeiting in Mexico.** What is UL doing to address counterfeit products that are coming into the United States from Mexico?

**A.** UL continues to work tirelessly to combat counterfeiting of the UL Mark. Examples of our anti-counterfeiting initiatives include the introduction of holographic labels, color schemes specific to each product category, and overt or covert security coding, to maintain the integrity of our Marks. Additionally, UL and the U.S. Customs Service have partnered in extensive and unprecedented nationwide anti-counterfeiting efforts. UL has a "zero-tolerance" policy concerning anti-counterfeiting and our anti-counterfeiting program has increased in its effectiveness resulting in increased seizures of products with counterfeit labels and destruction of these items. As a direct result of UL increased emphasis on anti-counterfeiting, many individuals have been tried, convicted and are now serving time in prison for their actions.

If you come across a suspicious product referencing UL, or would like more information on UL's anti-counterfeiting or U.S. Customs programs, contact Brian Monks in Melville, NY, by phone at +1-631-271-6200, ext. 22856; or by e-mail at [Brian.H.Monks@us.ul.com](mailto:Brian.H.Monks@us.ul.com).

10.5  
(SW)

**Q. CE Marking.** Can UL stop shipments into the U.S. of products bearing the CE Mark? Where can I find information regarding the CE Mark? My boss (the building official) tells me to accept the CE Mark. What information is available regarding the CE Mark?

**A.** UL does not have control over the shipment of products bearing a mark other than a UL Mark. Information on the CE Mark can be found on the UL Regulator's Page at [www.ul.com/regulators/CEmarkinfo.cfm](http://www.ul.com/regulators/CEmarkinfo.cfm).

A CE Marking is a European marking of conformity that indicates that a product complies with the essential requirements of the applicable European Laws or Directives with respect to safety, health, environmental and consumer protection. Generally, this conformity to the applicable Directives is done

through self-declaration. The CE Marking is required on products in the countries of the European Economic Area (EEA) to facilitate trade between the member countries. The manufacturer or their authorized representative established in the EEA is responsible for affixing the CE Marking to their product. The CE Marking provides a means for a manufacturer to demonstrate that their product complies with a common set of laws required by all of the countries in the EEA to allow free movement of trade within the EEA countries.

Unlike the UL Mark, the CE Marking:

- Is not a safety certification mark,
- Is generally based on self-declaration rather than third party certification, and
- Does not demonstrate compliance to North American safety standards or installation Codes.

Please keep in mind that a product that bears a CE Marking may also bear a certification mark such as UL's Listing Mark, however, the CE Marking and the UL Mark have no association. The UL Mark indicates compliance with the applicable safety requirements in effect in North America and is evidence of UL certification, which is accepted by Model North American Installation Codes such as the National Electrical Code and the Canadian Electrical Code.

The CE Marking on products is not a certification mark. AHJ's should continue to look for the UL Mark on products in order to determine if a product complies with applicable safety requirements for North America.

