**Florida Building Commission**

**Swimming Pool Electrical Safety Project**

**Phase II: Development**

**Note: Proposed code modifications and the fact sheet/training educational module as detailed in this document are for information and not for discussion.**

**Recommendations as approved by The Commission October 15, 2015**

**Grounding**

The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission charge staff to work with the TAC chairs and in consultation with stakeholders to formulate a code amendment requiring that all electrical circuits feeding equipment that could potentially energize a pool have GFCI protection for new residential and commercial swimming pools (the goal is to fill in any gaps in the current Code).

**Code amendments/Progress to date:**

**6th Edition (2017) FBC, Buildings**

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| **(E6452)**  **454.1.4.2.3 Underwater lighting.** Underwater luminaires shall comply with Chapter 27 of the Florida Building Code, Building. ~~Underwater lighting shall utilize transformers and low-voltage circuits with each underwater light being grounded. The maximum voltage for each light shall be 15 volts and the maximum incandescent lamp size shall be 300 watts.~~ The location of the underwater ~~lights~~ luminaires shall be such that the underwater illumination is as uniform as possible. ~~and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter. All underwater lights which depend upon submersion for safe operation shall have protection from overheating when not submerged.~~ Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface. ~~Alternative lighting systems which use 15 volts or less, or use no electricity in the pool or on the pool deck, such as LED (light emitting diode) fiber-optic systems, may be utilized if the manufactures specifications provide for the equivalency in watt output.~~  **(E6531)**  **454.1.4.1 Electrical equipment and wiring.** Electrical equipment wiring and installation, including the bonding and grounding of pool components shall conform with Chapter 27 of the Florida Building Code, Building. Outlets supplying pool equipment and underwater luminaires connected to single-phase, 120 volt through 240 volt branch circuits, rated 15 or 20 amperes, whether by receptacle or by direct connection, shall be provided with ground-fault circuit interrupter protection for personnel.  **454.2.16 Electrical.** Electrical wiring and equipment shall comply with Chapter 27 of the Florida Building Code, Building. Outlets supplying pool equipment and underwater luminaires connected to single-phase, 120 volt through 240 volt branch circuits, rated 15 or 20 amperes, whether by receptacle or by direct connection, shall be provided with ground-fault circuit interrupter protection for personnel.  **(E6530)**  **R4501.16 Electrical.** Electrical wiring and equipment shall comply with the *Florida Building Code*. Outlets supplying pool equipment and underwater luminaires connected to single-phase, 120 volt through 240 volt branch circuits, rated 15 or 20 amperes, whether by receptacle or by direct connection, shall be provided with ground-fault circuit interrupter protection for personnel. |
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**Recommendations as approved by The Commission October 15, 2015**

**Existing Swimming Pools**

The Electrical TAC voted 6-2 in favor (75%), to recommend the Commission charge staff to work with the TAC chair and in consultation with stakeholders to formulate a code amendment requiring existing commercial and residential swimming pools to have GFCI protection for replacement pool pump motors, if not already in place; to provide GFCI protection for the replacement of 120 volt pool lights when they are replaced; and, as part of the close out inspection ensuring that the existing bonding system is complete and terminated properly.

Swimming Pool TAC 5-3 (63%)

**Code amendments/Progress to date:**

**6th Edition (2017) FBC, Buildings**

**(CA6498-A3)**

**Move the proposed modification from "110.9" to "110.3 Required Inspections, Electrical" and add the following:**

**4. Existing Swimming Pools. To be made after all repairs or alterations are complete, all required electrical equipment, GFCI protection, and equipotential bonding are in place.**

**(E6496)**

**Section 454.1.10.4 Swimming Pool - Electrical**

**454.1.10.4.1 GFCI Protection.** Ground-fault Circuit-interrupter shall be provided as follows:

1. Where alteration work includes replacement of pool pump motors, a ground-fault circuit-interrupter shall be provided, if one is not already in place.
2. Where alteration work includes replacement of 120-volt pool lights, a ground-fault circuit-interrupter shall be provided, if one is not already in place.

**6th Edition (2017) FBC, Existing Building**

**(6493)**

Section 413 Add to read as follows:

Section 413 Swimming Pool - Electrical

413.1GFCI Protection. Ground-fault Circuit-interrupter shall be provided as follows:

1. Where alteration work includes replacement of pool pump motors, a ground-fault circuit-interrupter shall be provided, if one is not already in place.

2. Where alteration work includes replacement of 120-volt pool lights, a ground-fault circuit-interrupter shall be provided, if one is not already in place.

**(E6494)**

Section 709 Add to read as follows:

**Section 709 Swimming Pool - Electrical**

**709.1GFCI Protection.** Ground-fault Circuit-interrupter shall be provided as follows:

1. Where alteration work includes replacement of pool pump motors, a ground-fault circuit-interrupter shall be provided, if one is not already in place.
2. Where alteration work includes replacement of 120-volt pool lights, a ground-fault circuit-interrupter shall be provided, if one is not already in place.

**Recommendations as approved by The Commission October 15, 2015**

**Education**

The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission support a comprehensive educational effort to ensure there is a consistent message to enhance pool electrical safety issues for existing and new pools by working with existing resources including educational providers and associations. The effort should include defining the problems, identifying solutions and communicating a consistent message to stakeholders (contractors, consumers, home inspectors, pool maintenance providers, etc.) through training courses, flyers, brochures, websites, etc. Key issues for education messaging include lighting, bonding, grounding, GFCI, maintenance of existing pools, and monitoring devices to detect stray currents in the pool water, etc.

**Progress to date:**

**Swimming Pool Electrical Safety**

**Factsheet and Educational Training Module Content Outline**

**As approved by the TACs – April 29, 2016**

1. **Informational/Educational Fact Sheet (4-6 pages)**

***Target Audience***: Professionals installing, maintaining, repairing or replacing luminaires or related equipment in and around public and private swimming pools.

***Content Outline***:

1. Licensing, permit requirements and relevant definitions/safety issues.
2. Relevant codes and standards, review to include:
   1. FBC, Building Chapter 4, Section 454.1.4 Electrical systems
   2. FBC, Residential Chapter 42 Swimming Pools [Electrical Provisions]
   3. NEC Article 680 Swimming Pools, Fountains, and Similar Installations
   4. UL 676**:** Underwater Luminaires and Submersible Junction Boxes *(NEMA resources)*
   5. Technical amendments to FBC
   6. U.S. Consumer Product Safety Commission provisions/recommendations
3. Underwater luminaires and related equipment - Low voltage lighting, bonding (equipotential bonding), grounding (wet-niche, no-niche luminaire), field wiring (dry niche luminaire), GFCIs, stray voltage.
4. UL 676 and 1081 standards.
5. Maintenance and Repair – preventative maintenance, retrofitting/replacement, safety precautions.
6. Appropriate reference and relevant local, state, and industry contacts.
7. **Training Module (~ 1- hour presentation)**

***Target Audience:*** Professionals involved with swimming pool design, construction, maintenance and repair.

***Content Outline***:

1. Current issues/status of code amendments
2. Summary of relevant FBC and NEC codes and standards (UL)
3. Overview of proper ground and luminaire bonding, GFCIs, stray voltage
4. Review of proper maintenance/servicing, repair and retrofitting
5. Self-assessment question/answer *(handout)*
6. Training Evaluation *(handout)*

For comments/feedback/questions, please contact Craig Miller, UF/PREC, (352)392-1513 or [craigmil@ufl.edu](mailto:craigmil@ufl.edu)