Electrical

Proposed Code Modifications

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TAC: Electrical

Sub Code: Building

Total Mods for Electrical: 5

E4005

Date Submitted	3/28/2010	**Section**	1405.11.4	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IBC) language as it provides the same direction as the FBC section.

Rationale

It is not necessary to require a Florida specific code amendment when the base code provides the same direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No change

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Eliminates an unnecessary revision to the base code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1405.11.4 Grounding.** Grounding of metal veneers on buildings shall comply with the requirements of Chapter 27.~~

1405.11.4 Grounding. Grounding of metal veneers on buildings shall comply with the requirements of Chapter 27 of this code.

Date Submitted	3/1/2010	**Section**	2705	**Proponent**	Bryan Holland
Chapter	27	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

No.

Summary of Modification

Delete the section in total.

Rationale

There is no special circumstance specific to Florida that would necessitate reducing the nationally recognized standard. Data compiled by the CPSC clearly shows a need for GFCI protection. Operation of the device does not present an additional hazard, whereas not having the gfci protection allows for a lethal condition to occur with no protection provided. Most pool pump motor manufacturers currently require GFCI protection as outlined in their installation instructions or product labeling.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None.

Impact to building and property owners relative to cost of compliance with code

Very minor cost increase per pool installation.

Impact to industry relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

YES. GFCI protection provides provides protection of persons from the hazards of electrical shock.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

YES.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

YES.

Does not degrade the effectiveness of the code

YES.

Alternate Language

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Jennifer Hatfield **Submitted** 6/1/2010 **Attachments** Yes

E3450-A1

Rationale

This revised text clarifies that only the removal of the GFCI requirement on direct connection pump motors should occur; retaining the GFCI protection on receptacle pump motors. This was the original intent of the glitch proposal for the 2007 code. Evidence is lacking that any cases of injury have occurred on a properly bonded and grounded hardwired pump motor; therefore, requiring a GFCI in this case does not create a safer environment. Rather, it provides an opportunity for other hazards due

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

The alternative language will eliminate owners from having to purchase a GFCI for hardwired pumps and from the costs associated with the service calls that would result if this unnecesary device was required.

Impact to industry relative to the cost of compliance with code

No adverse impact.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The alternative language provides for GFCI protection on receptacle pool pump motors where it is necessary to provide for public safety and welfare, but removes the direct connection requirement where it is not warranted and where it could cause other safety hazards.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by clarifying that GFCI protection is required for receptacle pool pump motors and not those with a direct connection.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate against materials, products, methods, or systems.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code and clarifies the original intent of the 2007 supplement change.

~~Section 2705 GFCI Protection~~

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~~2705.1 NFPA 70—08: National Electric Code, Article 680 (Swimming Pools, Fountains, and Similar Installation), Section 680.22(B), GFCI Protection, is amended to read as follows:~~

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~~(B) GFCI Protection. Outlets supplying pool pump motors from branch circuits with short-circuit and ground-fault protection rated 15 or 20 amperes, 125 volt or 240 volt, single phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit interrupter protection for personnel.~~

~~Exception: One and two family dwellings.~~

Section 2705 GFCI Protection

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ground-fault circuit-interrupter protection for personnel.

~~Exception: One-and two-family dwellings.~~

Additional Rationale for Alternative Language Comment for Proposed Modification E3450

- The initial GFCI exemption language in the supplement to the 2007 Florida Building Code was incorrect and the alternative language comment submitted clarifies that it was not the intent to remove GFCI protection for plug in/receptacle pump motors. The intent was to remove GFCI requirements for only hardwired installations.

- When it comes to the direct connection/hardwired pumps, they are already required to comply with the bonding and grounding requirements of the 2008 NEC, so there is no reason to require additional devices.

- A GFCI does not provide any added safety where there is a properly bonded and grounded hardwired pump motor. There are no reported injuries involving properly bonded and grounded hard wired pump installations, for want of a GFCI.

- Upon review of a *"Compilation of Data from the U.S. Consumer Product Safety Commission National Injury Information Clearinghouse,"* it appears that out of all the incidents on record, **only one** possible incident was attributable to a hardwire pool pump motor and the data available on this one incident is too vague to draw a positive conclusion. Further, this one incident occurred **over 20 years ago** and what was apparent was that it had bad wires in the control box and was not grounded at all.

- There are MILLIONS of hard wired pool pump motors without GFCI protection out there and the CPSC data clearly proves that there have never been even occasional occurrences of incidents. The only report associated with a hardwired pump motor clearly shows the problem was it did not meet proper grounding requirements.

- The ONE possible incident occurred OVER 20 YEARS AGO – and in that time no action by the code panel was taken to respond to this incident and the incident has since never been repeated. Further, pump motor technology has changed tremendously in the last 20 years.

- Plug-in motors should have GFCI protection due to possible mishandling of the cord and plug by a consumer, but a hardwired pump motor requires a maintenance service disconnect and the threat of consumers messing with such is clearly not there.

- In reviewing past NEC panel member comments on this subject it appears the concern has been with plug-in motors and this revised text addresses this concern accordingly.

- Requiring a GFCI on hardwired pump motors is unnecessary and redundant. Rather than increasing safety, it actually creates potential health and safety hazards, which while not electrical in nature, cannot be ignored. False tripping can occur, because of grass, weed or insect presence, or even from lightning strikes, resulting in a complete shut down of pool filtration and sanitization. In many cases, especially in seasonal or second residences, the shut down may go undetected for days, weeks or even months, creating a potentially **significant health hazard** not only on the affected property but for surrounding residences. The ability of untreated pool water to serve as a breeding ground for West Nile Virus and to affect entire neighborhoods is well documented by the

Center for Disease Control, in an article titled "Delinquent Mortgages, Neglected Swimming Pools, and West Nile Virus, California."

> **"Careful examination of service requests for mosquito control made to the Kern Mosquito and Vector Control District (KMVCD) and an aerial survey of Bakersfield showed an extensive number of green or neglected pools, most of which were producing mosquitoes.** ****Kern County was especially affected, with a 300% increase in notice of delinquency in the spring quarter of 2007 compared with that of 2006. Associated with home abandonment was the expanding number of neglected swimming pools, Jacuzzis (hot tubs), and ornamental ponds. **As chemicals deteriorated, invasive algal blooms created green swimming pools that were exploited rapidly by urban mosquitoes, thereby establishing a myriad of larval habitats within suburban neighborhoods that were difficult to locate from the ground. These pools frequently were located within new housing tracts and not confined to old neighborhoods.** An aerial photograph of a representative Bakersfield neighborhood shows the extent of the problem, with 17% of the visible 42 pools and Jacuzzis appearing green and likely producing mosquitoes.

- When a pump stops, whether it is from a GFCI trip or another operation, the algae GROWS – this can lead to serious health and safety hazards.

Both the Florida Swimming Pool Association and the Association of Pool & Spa Professionals recognize that life safety is an utmost concern of this body. In this case the GFCI requirement for hardwired pump motors not only fails to provide any additional safety, but rather it creates health and safety risks that must be considered. Furthermore, the data is simply not there to justify this requirement.

We ask the FBC for positive reconsideration of this alternative language comment that clarifies GFCI protection is required on receptacle outlets.

Sub Code: Building

E3453

Date Submitted	3/1/2010	**Section**	2706	**Proponent**	Bryan Holland
Chapter	27	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Yes. Mod # 3451

Summary of Modification

New Section for Lightning Protection

Rationale

See attachment.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None.

Impact to building and property owners relative to cost of compliance with code

Very Minimal. See Attachment.

Impact to industry relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Yes.

Does not degrade the effectiveness of the code

Yes.

2706.1 Lightning Protection. A lightning protection system shall be provided for all new buildings and additions in accordance with NFPA 780, Standard for the Installation of Lightning Protection Systems.

2706.2 Where additions are constructed to existing building, the existing building's lightning protection system, if connected to the new lightning protection system, shall be inspected and brought into compliance with current standards.

2706.3 Surge protection devices shall be installed for all normal and emergency electrical systems in accordance with NFPA 70, National Electrical Code.

Exceptions:

1. One- and two-family dwellings

2. Lightning protection shall not be required for any building or addition where shown unnecessary by evaluation using the Risk Assessment Guide in NFPA 780, Standard for the Installation of Lightning Protection Systems or an alternative method approved by the authority having jurisdiction.

Substantiation:

1. According to the National Weather Service:
    a. The are an average of 20 Million lightning strikes in the US each year
    b. The average lightning strike delivers between 100 Million and 1 Billion volts of electricity
    c. The average lightning strike delivers between 10,000 and 200,000 amperes of electricity.

2. According to the National Weather Service:
    a. Between 1959 and 1993, 53.1% of all deaths in the state of Florida related to weather were due to lightning. This is more than drowning, tornadoes, hurricanes, wind and, cold combined.
    b. During these same years, a total of 449 persons died in the state of Florida from lightning, another 1788 were injured. In comparison, the average number of deaths during this period nationwide is only 48.
    c. The number of lightning deaths and injuries in the state of Florida outpaces every other state in the nation by 3:1.

3. According to the National Fire Protection Association:
    a. There is an average of 70 to 100 thunderstorm days per year in the state of Florida. (National Weather Services)
    b. There is an average of 8 to 14+ lightning strikes in the state of Florida for every square kilometer per year. (U.S. National Lightning Detection Network)

4. According to the National Lightning Safety Institute:
    a. In 2008 alone, there were 246,200 insurance claims on residential structures in the US. Insured loses on residential properties exceed $1 billion dollars annually. (Insurance Information Institute, NY, press release, 6/22/09)
    b. Lightning is responsible for more than $5 billion dollars in total insurance losses annually. (Hartford Insurance Co. – TMCNet Newsletter, Sept 14, 2006)
    c. During 2002-2004, fire departments responded annually to about 31,000 fires caused by lightning with $213,000,000 in direct property damage. (NFPA Report, January 2008)
    d. Looking specifically at storage and processing facilities, lightning accounts for 61% of the accidents initiated by natural events. 16 out of 20 accidents involving petroleum products storage tanks were due to lightning strikes. (Journal of Hazardous Materials 40 (1995) 43-54
    e. 30% of U.S. businesses suffer damage from lightning storms. (Carnegie Mellon Report, 02/06)
    f. 30% of all power outages annually are lightning-related, on average, with a total cost of $1 billion dollars. (Ralph Berstein, EPRI; Diels, et al (1997))

5. According to the National Oceanic and Atmospheric Administration
    a. The average cost of lightning-caused damages in the US is between $5,000 and $50,000. (Storm Data)
    b. Between 1959 and 1994, there were 17 lightning losses of over $5 million dollars. (Storm Data)
    c. During these same years, 92 lightning losses exceed $500,000 dollars.

6. According to the Factory Mutual System:
    a. Lightning related private sector property damage costs for the 1990-1992 period averaged $27 million annually.
    b. Information complied by the nation's fire chiefs indicate structural lightning losses at $138.7 million as average over 1989-1993.
    c. There were 20,000 lightning-caused residential annually during that same period.
    d. During the period of 1973-1982, there were 2,926 lightning claims for a total cost of $385 million dollars. Lost time from an idle workforce was not included therein.

Cost:

1. The average cost of a complete lightning protection system, including deign, materials, installation, and maintenance is approximately 1% to 5% of total construction cost of the building.

2. The average cost to renovate a building with lightning protection after completion of construction is approximately 10 times that of a new building under construction.

3. The cost of the lightning protection system can be off-set as much as 80% by insurance deductions and rebates.

4. Lightning risk assessment calculations are readily available free online and take approximately 15 minutes to complete.

Enforcement:

1. Standard and reference materials are readily available. The NFPA 780 is already a referenced standard in the FBC and mandated by section 419, 420, and 423.

2. Underwriter's Laboratories offers lightning protection education for design professionals, installers, and enforcement officials. Systems installed under the provisions of NFPA 780 must be in compliance with UL96 and 96A.

3. UL has been testing and certifying lightning protection equipment since 1908. UL issues inspection certificates for systems by inspecting system components and checking completed installations. Installations are required to comply with UL's internationally recognized Standards for lightning protection systems.

E3451

Date Submitted	3/1/2010	**Section**	Section 35	**Proponent**	Bryan Holland
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Mod #3453

Summary of Modification

Update reference NFPA 780.

Rationale

Most current version of adopted reference.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None.

Impact to building and property owners relative to cost of compliance with code

None.

Impact to industry relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes. New updates provide for safer installations.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Yes.

Does not degrade the effectiveness of the code

Yes.

780 - ~~04~~ 08 Installation of Lightning Systems.

Sub Code: Residential

E4268

Date Submitted	4/1/2010	**Section**	New section -E3901.1	**Proponent**	Lorraine Ross
Chapter	39	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Mod # 4148 adds definition for photovoltaic modules/shingles
Mod #4151 adds new standard for photovoltaic modules/shingles
Mod #4269 adds reference standard UL 1741 for electrical aspects of photovoltaic modules/shingles.

Summary of Modification

Adds new section regarding electrical installation of of photovoltaic modules/shingles as roof covering materials.

Rationale

Photovoltaic roofing materials are becoming an important part of achieving energy efficiency goals in Florida. This code modification adds a new section to the residential electrical chapter that outlines electrical installation aspects for use of these products and systems. Please see related mods for proposed definition for photovoltaic modules/shingles and addition of new reference standard.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There is no financial impact of the proposed code modification. This code mod will improve the enforceability of the code by adding in clear fire, wind and installation requirements for photovoltaic roofing products and systems.

Impact to building and property owners relative to cost of compliance with code

There is no fiscal impact to building and property owners. There is a benefit in assuring that these photovoltaic products and systems are installed safely and in accordance with these new code requirements.

Impact to industry relative to the cost of compliance with code

There is no fiscal impact of this code mod. There is a benefit in that it does add additional choices for roofing materials, as well as increasing energy efficiency of the home.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

With the growing attention to energy efficiency, this code mod will assure the public that photovoltaic roofing products and systems are installed safely.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This code mod strengthens and improves the code by putting into place code requirements for new roofing technology. While the energy efficiency benefits of PV products and systems are well know, this code change establishes electrical aspects for installation of these products.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This code change does not discriminate against materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This code mod improves the effectiveness of the code.

Add new text as follows:

Chapter 39 Power And Lighting Distribution. Reserved except as shown below:

E3901.1 Photovoltaic panels and modules. Photovoltaic panels and modules shall be listed and labeled in

accordance with UL 1703

E3901.2 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid

shall use inverters listed for utility interaction.