



## **MINUTES**

Orange Empire Division  
International Association of Electrical Inspectors

Date: 06 July 2010.

Location: Santa Ana Elks Lodge, 212 S. Elk Lane, Santa Ana, California.

Called to order by Randy Buck at 11:38 a.m.

Acceptance of Minutes: After no discussion, the minutes were approved without dissent.

### **Treasurers Report**

The Treasurer's Report was given by Randy Buck. John Shanahan moved for acceptance and the motion was approved unanimously

### **Membership Comm. Rep.**

The Membership Committed Report was given by Randy Buck who stated that there are 123 *current* Division members.

### **Old Business**

At our last meeting Randy had asked for volunteers to bring up Code issues at today's meeting and members responded with the following.

Chuck Richards spoke about using plenum wire within duct work. Chuck noted that NEC Article 725 limits the length of plenum wire within duct work. He also cautioned the group that contractors are using white-jacketed thermostat cable, which is not plenum rated, for plenum wiring. He added that the Electrical Code addresses open plenums rather than that in sheet metal. He opined that mechanical inspectors are not catching this.

410.73 Doug Miller of Laguna Beach began a discussion around the application of the thermal-protection requirement of section 410.73. He asked if such protection needed to be provided for exit signs. Scott Davis opined that exit signs are designed for a special purpose, i.e., the section did not apply to such signs. Scott also pointed out that no thermal protection is allowed

on ballast-connected egress illumination [*energized during failure of normal power*]. Scott also spoke about the requirement for two sources for egress illumination as described in the second paragraph of NEC (2005) section 700.16: emergency lighting shall be designed so that no place is "in total darkness" if a single lamp burns out. e.g. in a bathroom or around a corner of a corridor.

Randy Buck of the City of Costa Mesa interjected that their City's ordinance requires a minimum of one ft-candle in all areas. Saum Nour of Absolute Consulting Engineers cautioned the group that courts look for a minimum of one ft-candle value rather than an average value. Scott Davis added that the City of Santa Ana contains minimum lighting levels, at grade level, in its Security Ordinance; higher floors are per Bldg Code.

In a related matter, an attendee mentioned to the group that elevators don't always work properly when main power is shut off.

### **New Business**

Gary Gluck with Siemens told the group of a 700' elevator-supply circuit, at a city-run airport, where cables vibrate severely when the elevator starts. He mentioned that  $V_d$  is 3.75% at FLA. He added that the building inspector has asked them to "fix" it. Randy Buck said that he would seek assurance from the electrical engineer that the system was designed for this. Scott Davis mentioned that the forces on the cable could be calculated; he mentioned that the American Electrician's Handbook has a "walk through" for that. Randy Denton with CH2M HILL suggested that we cannot get rid of the forces which may eventually chaff the wire. He and Scott also suggested that a smaller conduit would reduce the amount of movement/vibration. Randy Sink at ETI suggested that the owner do regular re-torquing.

*I misspoke. I should have mentioned the Standard Handbook for Electrical Engineers. There is a section titled "Forces acting on conductors" in chapter two on the topic. It discusses the pinch effect of conductors. I had only a dim memory that the right-hand screw rule could predict the direction a conductor would move under an extreme current-carrying condition. –Scott Davis*

### **Code Questions**

Scott Davis posed a question to the group: For an ambulatory surgical center, the National Fire Protection Association (NFPA) Handbook talks about how to route the equipment, emergency, and life-support systems with one transfer switch for all three. California OSHPD has a similar diagram in their guidelines as well. Is the introduction of a main circuit breaker between the transfer switch and the three sub systems problematic? A consulting engineer said that he would not want it there because all systems would shut down if that extra main were to open.

Scott added that the code required a selective-coordination study for the system circuit breakers. Discussion followed.

**Consultant Time**

None taken.

**Testing Lab Time**

None taken.

**Contractor Time**

None taken.

**Manufacturer Time**

Gary Gluck with Siemens announced that Siemens has introduced a new disconnect switch for photovoltaic systems. Rated 30 Amps to 100 Amps, allows one to disconnect up to 3 sep 600-V circuits, d.c., negative – grounded system. Contains magnets to allow for temperature issues.

**Utility Time**

Taken after the Education Program (below).

**Inspector Time**

Randy Buck reminded all that, for CEUs, attendees must sign in at the table by the door.

**Education Program: Swimming Pools, by Scott Davis.**

Scott touched on the following.

A hydromassage tub gets drained after use, a spa or hot tub is not normally drained. A spa with jets is not a hydromassage tub.

Storable Pools have max depth of 42".

Wet-niche luminaires.

Normal NEC rules still apply, e.g., min of two conduits supporting the pool-light j-box.

Sometimes at issue in fountains or deck boxes.

Cords (680.7) limited to 3' unless for underwater luminaires.

No underground wiring within 5 ft of the pool or spa, or in conduit if not enough room; (680.10), otherwise normal depths for conduit.

680.11 drain required at equipment if lower than grade.

680.12 Maintenance disconnect switch required.

680.21 insulated ground wire required unless special, e.g., NM cable in a dwelling.

(A)(2) allows exterior-type MC cable. EMT okay indoors; bonding conductor still required.

Same for sealtight. Sealtight cannot be used for a ground when it is installed for flexibility (which is pretty much always).

Cord for spa or hot tub must be GFCI protected. Separation/distance/clearance dimensions may all have changes in upcoming 2010 California Electrical Code.

680.22 Area Lighting, Receptacles and Equipment.

Restricted Dwelling Spaces: pool within 10 feet of the building. Clearances are straight rather than horizontal.

Ground-fault circuit-interrupter protection for a receptacle is required at a pool pump. No matter how far from pool edge.

Can't use low-voltage within 10 feet of water edge. The Malibu type of light is not allowed any closer because they use autotransformers.

Switches to be minimum of 5 ft away.

680.23 xfmers must be listed for swimming-pool lighting. >15 V needs GFCI.

White Book 2010 is free for authorities having jurisdiction on line.

<http://www.ul.com/global/eng/pages/offering/perspectives/regulator/electrical/publications/>

680.24(A) for light junction box. Aluminum wire not allowed.

Equipotential-plane equipment. For double-insulated pumps, loop the bond wire at the pump for future use if pump is changed.

The bond inside PVC to a wet-niche forming shell does not negate the need for an exterior bond to the grid.

680.25 Feeders require an insulated equipment ground conductor. See limited exceptions for existing.

LFNC type B allowed for feeders, type A is only good up to 6 ft.

680.26 Equipotential Bonding. All items bonded together.

Russ Helmick added that body resistance is highly variable, so different effects will be experienced in similar situations.

Deck structures must be bonded.

Soares book has very good information on equipotential bonding.

Buried or encased ground clamps must always be DB rated.

Bond wire must be solid except for the #8 in the PVC to the light niche.

Randy Denton of CH2M Hill: Pool water is much more conductive than drinking water because of salts and chlorine.

Russ Helmick: the water in the pool becomes a capacitor plate for fiberglass or coated rebar pools.

Inspectors should do a sketch on the permit of what is bonded at the time of inspection; have the owner sign the sketch.

Coated rebar cannot be used for a bond. 680.26(C) requires 3-ft bonding plane around the pool.

680.41 Spas and Hot Tubs; relay can act as a disconnect. No limit on the indoor wiring method.

680.43(C) Switches must be 5 feet from spa or hot-tub.

680.44 J-boxes in a fountain must be secured.

680.57 covers signs in a fountain.

680.70, 71, 72, & 73 covers Hydromassage Bathtubs

680.71. Cannot have a duplex receptacle; from definition of an individual circuit.

680.73 is an electrical accessibility section. Not for human accessibility to tubs.

680.74 Bonding.

Russ Helmick: above-grade aquariums going in; divers occupying the aquarium must be protected by applying the pool rules.

Russ Helmick: cannot alter the encapsulated rebar to attach bonds.

Deck will include other than pavements.

680.26(C) Bonding of Pool Water to deck.

### **Announcement**

August class is EVs.

### **Utility Time**

SCE rep showed a double-meter socket for EV applications.

Adjourned at 2:15 p.m.

(Cell phones were turned back on)

Respectfully submitted,

Dan Vaughan