

Central Arizona Chapter  
IAEI Meeting Minutes  
Saturday, May 9<sup>th</sup>, 2009

The meeting was called to order by President Jim Maldonado at 8:30 a.m. there were 22 members present. Jim started the meeting with the Pledge of Allegiance. He also led the invocation. Once completed Jim began with self introductions. Jim explained that there had been a special meeting by the Board of Directors (BOD) to propose a set of Operating Rules for our Chapter which would be presented to the membership. Jim asked Dave Sanchez if were ready to present the new Operating Rules. Dave explained that during the BOD meeting today we will finalize the document and present the Rules at the next regular meeting for the membership. Jim explained the purpose for having the rules was to make it easier to understand how the Chapter functions day to day and also to comply with the request from the I.O. Once we have them finalized they will be also posted on our website.

Next item of business was committee reports.

**Education Committee:** Robert Detter (Education Chairperson) reported on the last class which was given on April 11<sup>th</sup>, 2009 at the PEJATC which was a success. We do not have any other classes scheduled as of yet but will anticipate additional classes on either the Analysis of Changes on 2008 or another Chapter 1 thru 4 since more jurisdictions are adopting the 2008 NEC we are getting more requests. Also we do have 2008 NEC Code books available for sale at our cost if anyone is interested. Jim notified Bob that he also had some books available for classes and he would give them to Bob after the meeting.

**Public Relations Committee:** David Sanchez (Chairperson) discussed the recent Home Show for Electrical Safety Month held on May 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>. Dave thanked all the volunteers that participated Bill Chase, Mike O'Meara, Brian Jordan, Kevin T. Mason, Jim Maldonado, Gerald Koziol and Joe Kosikowski for giving up the weekend and manning the booth. The Maricopa County Home Show sent us a letter thanking us for our participation and said they had received comments from the attendees whom were pleased to see our presence at the Show and was thankful for the education and resources they received from our group.

Jim Maldonado added that the Maricopa County Home Shows were going to add to their website a link called "Ask the Experts" and were requesting our Chapter to participate by answering any questions the public might have concerning electrical. This would be a good opportunity for IAEI and our Chapter to bond with the community. We could provide a link to our website and then forward the questions to the proper jurisdiction or answer generally as needed. If anyone is interested in participating notify Jim or Dave.

**Fire and Accident:** Jim Maldonado provided a PDF presentation on the April 5<sup>th</sup> rooftop fire at the Target Store in Bakersfield, California which involved a PV system that was only one year old from original installation. Jim explained slide by slide the findings from the Fire Dept as to what they believed caused the fire. In conclusion it appeared as if a 3" run of EMT conduit came apart at a coupling which was not tight which caused an arc between the ungrounded, grounded and equipment grounding conductors. Other factors included the use of an IMC/ RMC expansion fitting which was adapted to be used on the EMT of which it was not listed for, the proximity of

the 3" EMT raceway run to the rooftop which caused expansion and the raceway came apart which caused the conduit to fall on the conductors which were cut on the sharp edge of the compression fitting. Also, the inability of the 1<sup>st</sup> responder not being able to disconnect the power from the arrays which continued to supply power to the arcing conductors contributed to the fire damage. This was a very interesting subject to review which created a lot of discussion and interest.

Jim also reviewed an accident in the City of Phoenix on April 10<sup>th</sup> at 2828 N. Central where a couple of service employees were testing a fire controller when an incorrectly set voltage meter created an arc which caused a flash which burned both employees and damaged the fire pump controller. The owner of the fire pump company was training a new employee on how to test the fire pump equipment when the incident occurred. Unfortunately both employees were burned in the accident and hospitalized.

Jim also discussed the need for further awareness of arc flash protection proper PPE and the common exposure many electricians do not provide for when working on energized equipment. There was a considerable discussion on the lack of knowledge concerning NFPA 70E, CFR 1926 and CFR 1910 which are OSHA requirements.

**Treasurer Report:** Mike O'Meara discussed the increase of revenue which has been a direct result of the classes put on by the Chapter thanks to our Education Committee (Bob Detter and instructors) GREAT JOB!! and the relocation of our meeting to the new location. We have also met our commitment with taxes and I.O. financial report requirements.

**Planning Committee for 2010 Southwestern Section Meeting Report:** Jim Maldonado reported that we have met many times had a lot of email correspondence and have selected a site for the 2010 Southwestern Section Meeting to be hosted by our Chapter. The site selected is the Hilton at Squaw Peak Resort which was chosen over The Hilton Scottsdale Resort & Villas and the Tempe Mission Palms which were the other top candidates. Jim explained the process the committee went thru in selecting the site. He also mentioned that Randy Hunter (Southwestern Section Secretary-Treasurer) would be in the Valley in July for another meeting and would tour the site at that time. Now that we have the site selected we must plan the activities for the meeting. There is still a lot of work to be done. Jim also reminded us of the Section meeting in Hawaii this October.

Before the meeting was suspended for the education portion Jim passed around a new product which had been circulated to different jurisdictions as a support for raceways on rooftops. The product appeared to be made of recycled rubber tires. It did not appear to be a listed product for the application and he was wondering what we thought of the product. There were many concerns that the group attending the meeting expressed. After some discussion Jim began the education portion of the meeting.

Jim began by announcing that the scheduled presenter from Safewire Energy a distributor of KVAR Energy Savings had a last minute change of plans and would not be able to attend today's meeting. Jim explained that he was able to see the product as it was advertised at the Home Show because they had a booth across from ours. It appeared as if they were using a capacitor for power factor correction on motor loads in residencies. Perhaps they will be able to reschedule

because there were many questions on how it might work from the group. A short break was taken before the education program started.

Jim Maldonado introduced his presentation on Basic Plan Review. As Jim explained a few months ago we received an email from Mark Ptashkin from the City of Glendale asking the group to address the need for consistency in plan review methods as a topic of discussion. Because of the interest in the topic Jim put together a presentation on Plan Review which would cover the basic fundamentals. Items which will not be covered include fault current calculation or voltage drop calculation the intent is to discuss general applications. In our different jurisdictions you will find different levels of plan review and different levels of expertise. You may find that plan review may be conducted by previous inspectors that may have had experience as a structural, plumbing mechanical or electrical background or by non inspection personnel. One comment that Jim was once told, *“the more you know the more you have to enforce”*. Unfortunately, sometimes plan review is done by personnel who are not qualified nor have proper certifications for what they are reviewing. On the other extreme some jurisdictions may have engineers which are highly qualified in their field. Because of the variables with each jurisdiction it is difficult for a designer to know what type of information and to what degree of detail to include on their plans when submitted. Jim showed an example of a detail on a stair and discussed how the detail could be interpreted many different ways by a plan reviewer. He also discussed the following Arizona court decision ...

***“Public officials may not violate the plain terms of a statute because in their opinion better results will be attained by doing so. They have but one duty and that is to enforce the law as it is written, and if the effect of their action is disastrous, the responsibility is upon the legislature, and not upon them. But, if they knowingly, even though with the best intentions in the world, violate the law, they and their bondsman must take the consequences.”***

#### **Button vs. Nevin 44 Ariz. 247,257**

Jim covered the following key points with his presentation:

- Doing a plan review is quite different than Inspecting an electrical project.
- A Plan Reviewer has to look at plans in a two dimensional plan and visualize it in the three dimensional view of what it is to become. Very similar to what the designer has to do in creating the plan, except the Plan Reviewer only has a few hours to review what the designer had days to research and draw.
- When looking at plans the Plan Reviewer has to ask himself, “Will this installation work and does it comply with the code?” “What is the use of this installation?”
- It is sometimes assumed that Plan Reviewers and inspectors open the plans and start looking for things that are wrong.
- Doing plan review is Hazardous to your health. Sitting behind the desk all day takes a toll as you age. But I haven’t had to do a plan review in 115 degree weather.

#### **Basic Plan Review Procedure**

##### **Preliminary Review of Plans**

- Review the Scope of Work to determine what the project consists of.

- Review the cover sheet to determine the intended occupancy type, size and construction type of the building.
- Note whether the electrical sheets are listed in an index and verify that all sheets are in the set.
- Note the [intended use](#) for the project. Ask yourself if there are special requirements based on the proposed use or function. Review the architectural site plan to familiarize yourself with the layout of the building as it sits on the property.
- Verify the physical location of the project. Use this information to determine the utility company serving the power to this project. This information may also be available on the electrical site plan.
- Briefly review the architectural floor plan sheets to familiarize yourself with the building floor plan.
- This is usually where you will find room designations, dimensions, and references to details for interior elevations, building cross sections, area separations, etc.
- For large projects with several panel schedules, it is helpful to sketch a small grid in pencil at the bottom of the panel schedule sheets.
- Draw enough squares to write in the panel designation for each panel and use this as an index for the sheet.
- For large projects with several plan sheets, it helps to use "sticky notes" to mark the one-line, panel schedules, lighting and power sheets, and any sheets with related details.

### **Review the One-line**

- Review the [one-line diagram](#).
- After reviewing the one-line diagram and panel schedules, review the electrical site plan.
- Compare approximate feeder lengths with fault calculations.

### **One-line Diagram**

- **Start at Utility Company transformer.**
- Determine the available fault per Utility Company chart.
- Use either the architectural or the electrical site plan to determine which utility company serves this project.
- Single or multiple service disconnecting means (NEC 230.Part VI)
- Voltage, amperage, system phases and AIC rating of service entrance equipment (NEC 110.9)
- [Grounding](#) ( [NEC 250.Part III](#) , [Part IV](#) )
- [Bonding](#) ( [NEC 250.Part V](#) )
- Continue in linear manner from the source to the last service main, one feeder at a time.
- Overcurrent device size and type (NEC 230.Part VII, NEC 240, NEC 310.15)
- Feeder conductor size and type. (NEC 230.Part VII, NEC 240, NEC 310.15)
- Panel or equipment rating. Voltage, amperage, single-phase or three-phase and AIC rating of service entrance equipment (NEC 110.9)

### **Review Site Plan**

- Review the site plan for types of fixtures shown.

- Verify that they correspond with the fixture schedule or lighting detail on the site plan sheet.
- Verify the circuits and conductor sizes.
- When conductor sizes are increased due to longer runs in parking lots etc., verify compliance with [NEC 250.122\(B\)](#).
- All branch circuits and feeders should have panel and circuit designations, conductor sizes and types, equipment grounding conductor sizes, and conduit types and sizes.
- Verify that there are working clearances around exterior electrical equipment. If there is a detail for pole mounted site lighting fixtures, note whether the height will be acceptable to the Site Reviewer.
- Pools, spas, and other water features should be on the site plan and circuits for them should be reviewed at this time. NEC 680

### **Review the Lighting Plan**

- One of the most important issues for lighting plans is the circuiting for emergency and exit lighting.
- Verify that the circuiting complies with NEC 700.12(F) or the Exception.
- Review the symbols on the plan and verify the definitions in the symbol legend.
- Review the light fixture schedule to determine whether the emergency and exit fixtures are backed up with internal batteries or will be fed from a generator.
- Review the fixture types shown on the plan and verify the descriptions shown in the fixture schedule. Check to see if there are any "HID" fixtures to be installed and verify whether the emergency lighting scheme will comply with NEC 700.16.
- Verify the fixture voltage matches system voltage.
- Verify lighting circuits and loads correspond with panel schedules.
- Note locations of all lighting panels and verify clearances per NEC 110.26
- For track lighting, determine total length of the track shown and verify that the load shown on the panel schedules complies with NEC 220.43.
- Note whether exhaust fans located in bathrooms are connected to the local area lighting circuits. If not, the fans should be shown on the power plans. Review any interior signage shown. Some interior neon or LED lighting may be included in the lighting plan.
- Note the connection of any specialty lighting and verify how it is controlled. Check to see if there are any "HID" fixtures to be installed and verify whether the emergency lighting scheme will comply with NEC 700.16.
- Verify the fixture voltage matches system voltage.
- Verify lighting circuits and loads correspond with panel schedules.
- Note locations of all lighting panels and verify clearances per NEC 110.26
- For track lighting, determine total length of the track shown and verify that the load shown on the panel schedules complies with NEC 220.43.
- Review any interior signage shown. Some interior neon or LED lighting may be included in the lighting plan.
- Note the connection of any specialty lighting and verify how it is controlled.
- Dimming Panels may control some lighting. Verify that the dimming panels are shown on the one-line and a Panel schedule and calculations are provided.

Because of lack of time Jim was not able to cover his whole presentation but did provide a web site which included a lot of good plan review information.

[http://www.garciacomputers.com/wiki/index.php?title=Basic\\_Plan\\_Review\\_Procedure](http://www.garciacomputers.com/wiki/index.php?title=Basic_Plan_Review_Procedure)

Anyone wanting a copy of the PowerPoint presentation Jim would be happy to email. Jim also recommended using Firms Fast Finders and having various NEC tables commonly used as quick reference materials. Other items include:

- PLAN REVIEW CHECK LISTS
- GOOD MAGNIFYING GLASS
- WELL LIGHTED WORK AREA
- PLENTY OF RED PENS
- A WELL USED APPROVAL STAMP

In review of comments and discussion during the presentation the following were key points of discussion:

- There are different levels of plan review by jurisdictions because of the different experience levels of plan reviewers.
- During review of electrical plans sometimes not all the plans are given to the reviewer and key information is not available that might be found elsewhere such as on architectural, site or mechanical drawings.
- Often addresses are not known which could be helpful for determining utility or site requirements.
- Often instead of design build it becomes build then design because of the scheduling requirements.
- Out of State designers often are not aware of local requirements by jurisdiction and utilities.
- Often revisions to plans are not submitted as created.
- Some discussion on how other locations across the country handle plan review.
- Also concerns over building safety vs. energy code requirements.
- Design community concerns on how to comply with 2008 NEC requirements of 408.4

Jim asked if there was any old business to discuss. There was no response. He asked if there was any new business. Herbie Moulton brought in a new terminal that can be used with High Voltage splice boxes that was listed for two conductors which he shared with everyone. No other new business the meeting was adjourned.