ELECTRICAL SAFETY – STRATEGIC SOLUTIONS 2

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Chairman, Electrical Safety and ESEA committee

Backgrounder

- Electricity is an essential part of our development
- No nation can survive the present developmental challenges without POWER

Backgrounder

- Electric power should not only be available, realiable and affordable, but above all SAFE.
- One of the primary advocacies of IIEE is ELECTRICAL SAFETY!

Backgrounder

- Engineering is all about safety. One of IIEE Safety Program is the signing of a MOA with our industry partners. e.g. The International Copper Industry Association of Southeast Asia (ICASEA)

Backgrounder

- **This brought about the creation of ESEA (Electrical Safety Enforcement and Awareness)**
- **Presidential Executive Order # 193 declares that *every month of every year is ELECTRICAL SAFETY MONTH.***

2nd Electrical Safety Summit

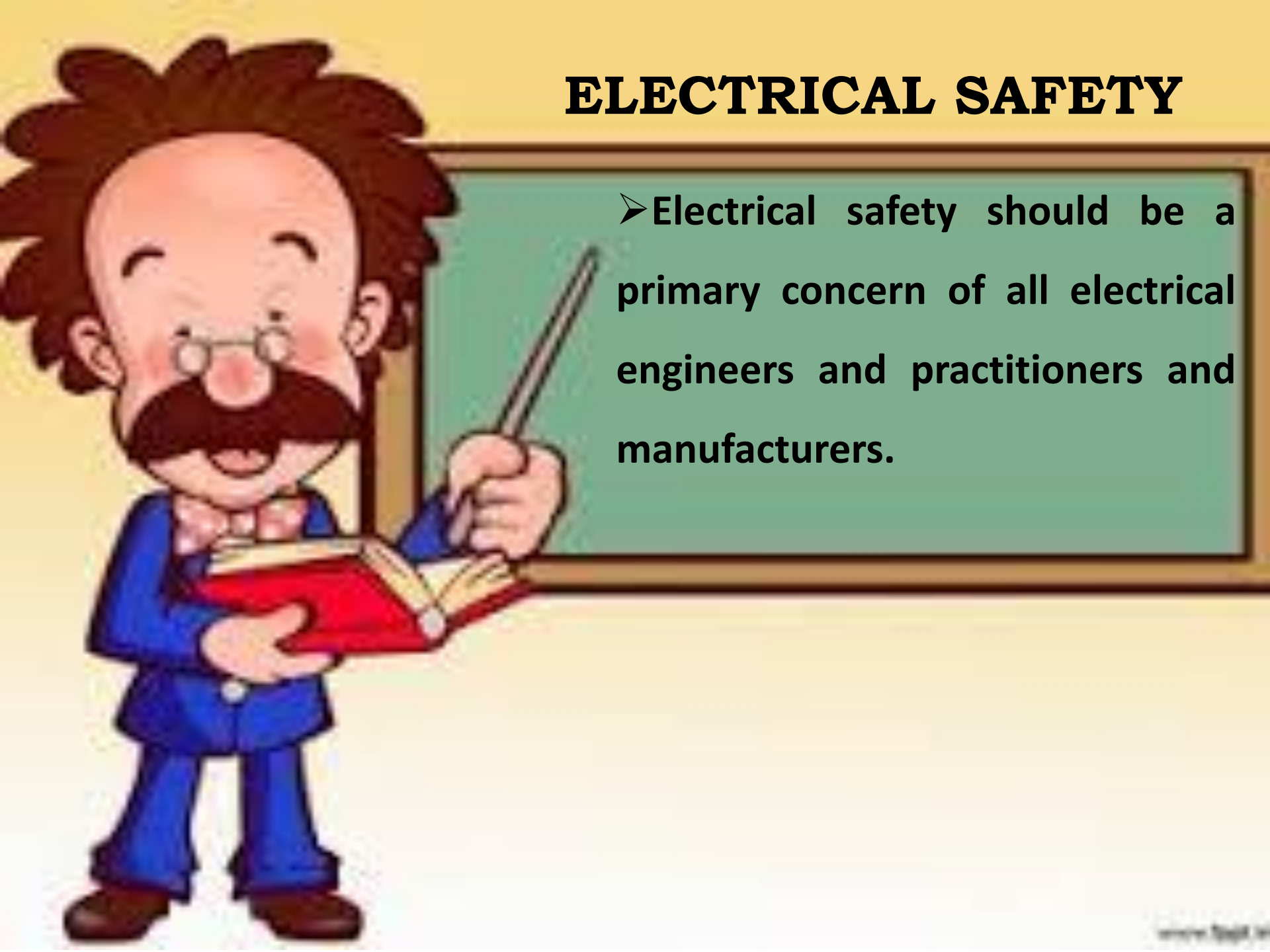
- On May 28, 2015, a joint project of IIEE and MERALCO will conduct the 2nd Electrical Safety Summit
- The event highlighted the concerted effort of IIEE, MERALCO and other government agencies of the importance of electrical safety to our citizen.

FIRE CAUSES

- Statistic from the Bureau of Fire of the Philippines (BFP) shows that 29% of the cause of fire is electrical related.

FIRE CAUSES

- Though their reason is **"FAULTY ELECTRICAL WIRING"**
- Need regular electrical inspection of work places and residences.



ELECTRICAL SAFETY

- Electrical safety should be a primary concern of all electrical engineers and practitioners and manufacturers.

PEC

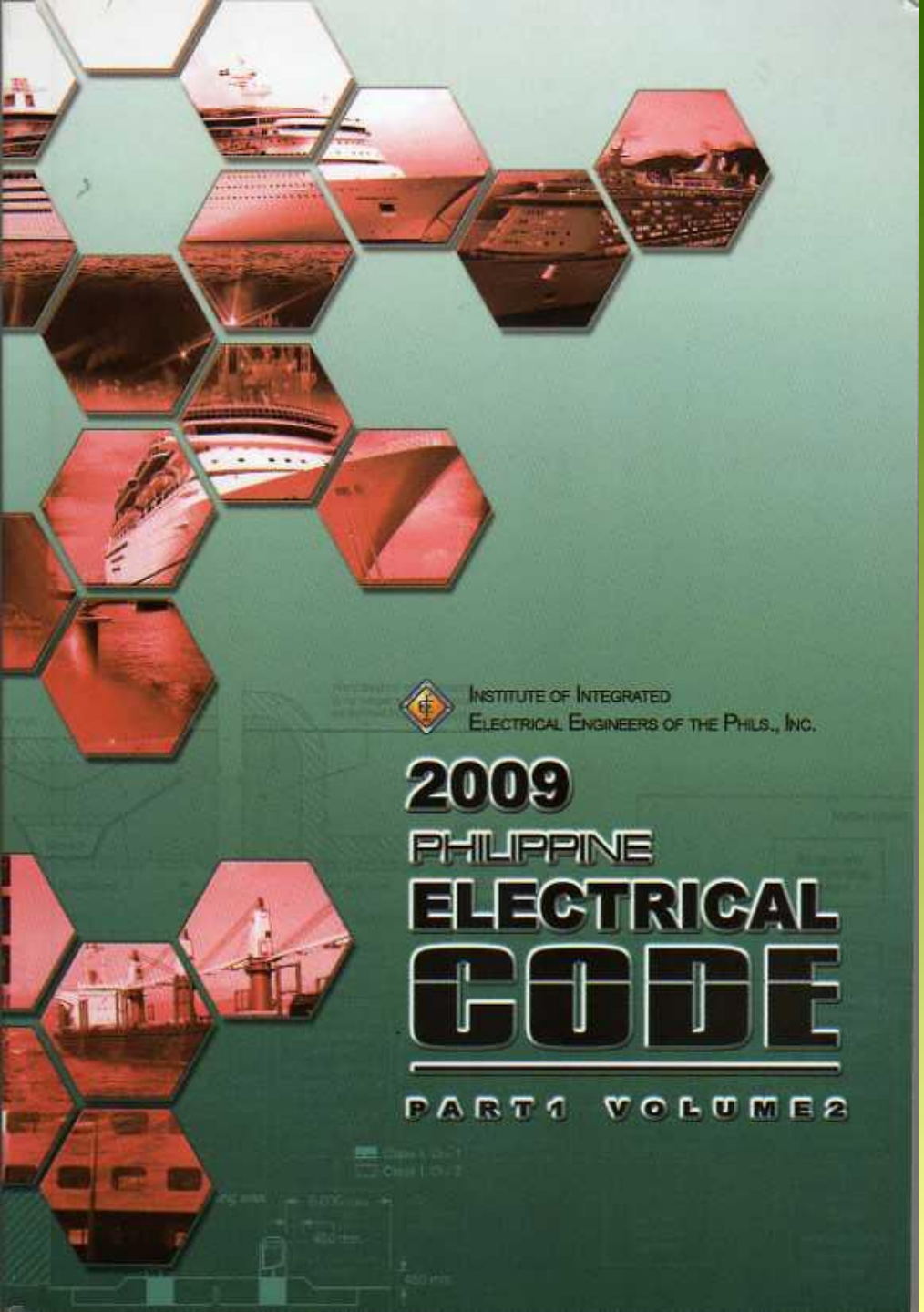
- **Philippine Electrical Code (PEC) should at all time be followed and impose!**


“ELECTRICAL SAFETY
STARTS WITH ME”

ELECTRICAL INSPECTION STRATEGY AND GUIDE

- Republic Act 7920

  An act providing for a more responsive and comprehensive regulation for the practice, licensing, and regulation of electrical engineers and electricians



ELECTRICAL SAFETY – STRATEGIC SOLUTIONS

The Philippine Electrical code is used nationally as the basis for safeguarding persons, buildings and its contents from hazards that may arise from the use of electricity.

This code contains provisions which is considered necessary for safety and thus is used as basis for the legal enforcement agency in the government regarding electrical installation

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Electrical Safety Enforcement and Awareness

ESEA Profile

- **June 27, 2011 –** President Aquino signed **Proclamation No. 193** declaring the Month of May of every year thereof as the **Electrical Safety Month.**

PRESIDENTIAL PROCLAMATION NO. 193

- DECLARING THE MONTH OF MAY OF EVERY YEAR AS THE ELECTRICAL SAFETY MONTH

WHEREAS, many lives and properties are lost due to fires and electrocution

PRESIDENTIAL PROCLAMATION NO. 193

- WHEREAS, most of these fires and incidents of electrocution are attributed to “faulty electrical wiring”

PRESIDENTIAL PROCLAMATION NO. 193

- WHEREAS, economic losses brought about by fires contribute to reduced productivity and therefore affect the economy of the country

PRESIDENTIAL PROCLAMATION NO. 193

- WHEREAS, there is a real need to increase public awareness on electrical safety and educate our people in the safe use of electricity.

ESEA Profile

- **MISSION - To ensure electrical safety is properly enforced by improving the local inspectors' capacity and to increase the public's awareness on electrical safety.**

ESEA Profile

- **VISION - To be a major organization that leads the public towards an electrically safe environment.**

ESEA Profile

- **Objectives**
  - **designed to enhance the enforcement of the Philippine Electrical Code (PEC);**
  - **provide capacity building to improve the skills of local inspectors**
  - **increase the awareness of and educate the public on the importance of electrical safety**

ESEA Profile

- and strengthen the institutional cooperation between government and industry such as the local government units, developers, and contractors association, among others.

➢ **"Electrical Safety Starts With Me!" – ESEA Slogan**

Electrical Safety Flyer

Electrical Safety Key Result Areas

- Compliance with National/International Standards
  - Safety
  - Workmanship
- Improve Power Quality
  - Voltage Stability
  - Arrest Surges
  - Harmonics
- Attain Flexibility
  - Reduce/Add Loads
- Maintain Reliability
  - Interruption Frequency
  - Interruption Duration
- Ensure Cost Effectiveness
  - Effective Budget Cost
  - Efficient Maintenance Program/Enercon/man
  - Energy Savings

Electricity- The Dangers

- **12,301** Fires recorded nationwide- source BFP as of 2013

WHAT IS AN ELECTRICAL INSPECTION & AUDIT?

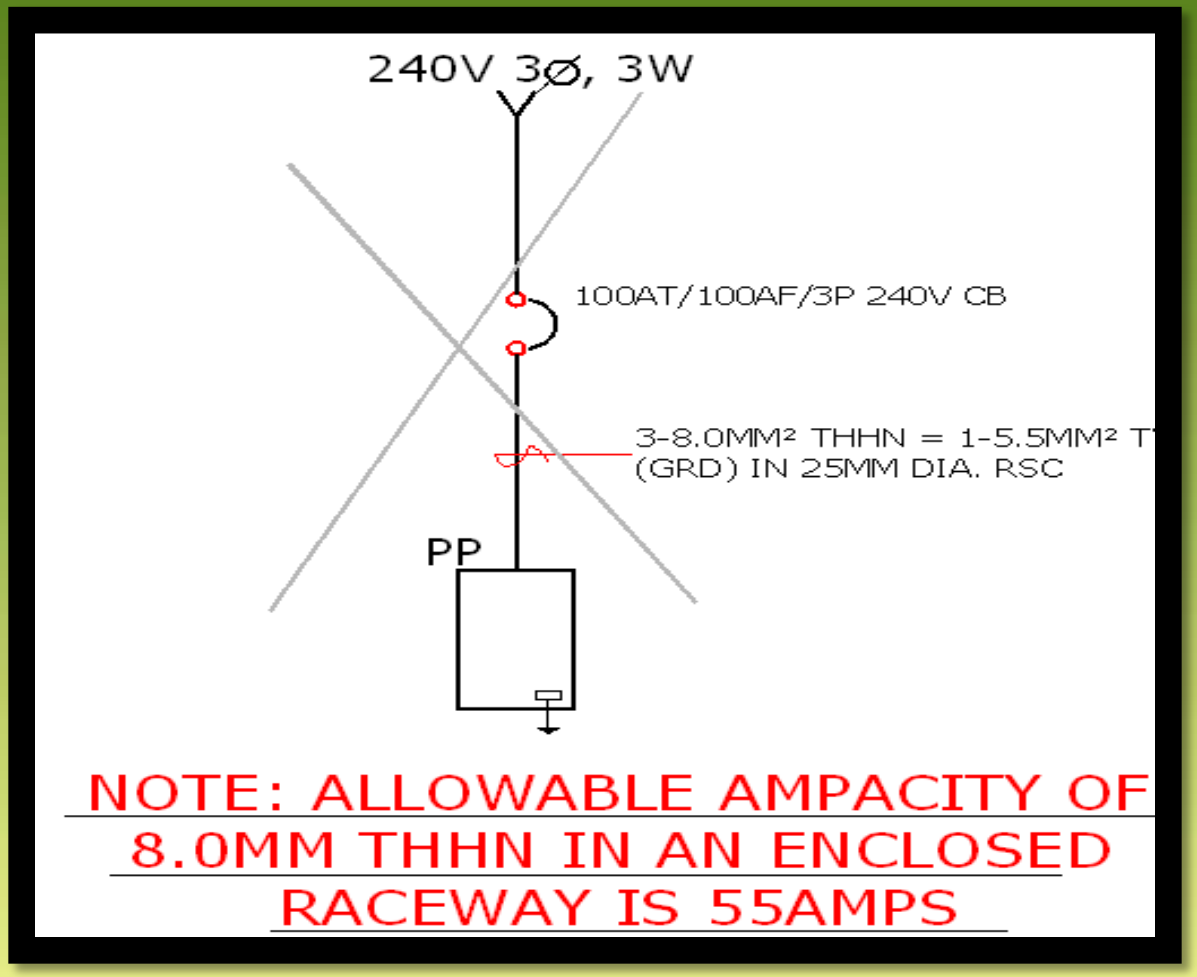
- An electrical audit is a thorough survey/ inspection, review and evaluation of an electrical system which is already in operation for several years.

WHAT IS THE PURPOSE OF AN ELECTRICAL INSPECTION & AUDIT?

- The purpose of an electrical safety inspection or audit is to identify potentially hazardous electrical situations and provide corrective actions for these situation.

- So what would be the samples of electrical violations or errors that you should be mindful of when you do your electrical audit/ inspections?

1. THE USE OF HIGHER RATED CIRCUIT PROTECTION . . . THIS IS A RAMPANT VIOLATION!

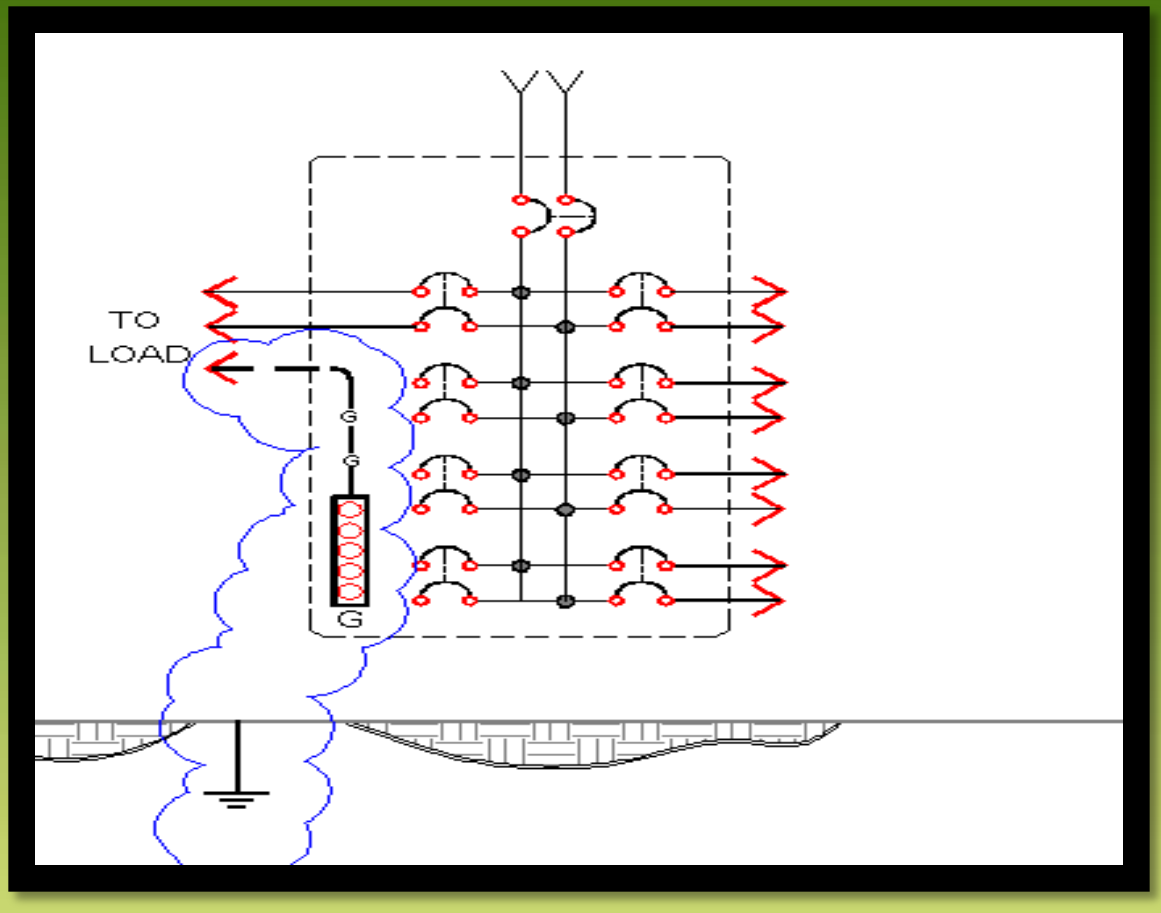


1-A. ANOTHER CASE OF USING VERY HIGH RATING OF PROTECTION..

THE IIEE ESC/ESEA VOLUNTEER TEAM IN 2012 REPLACED IT WITH 100-AMPERE FUSES.

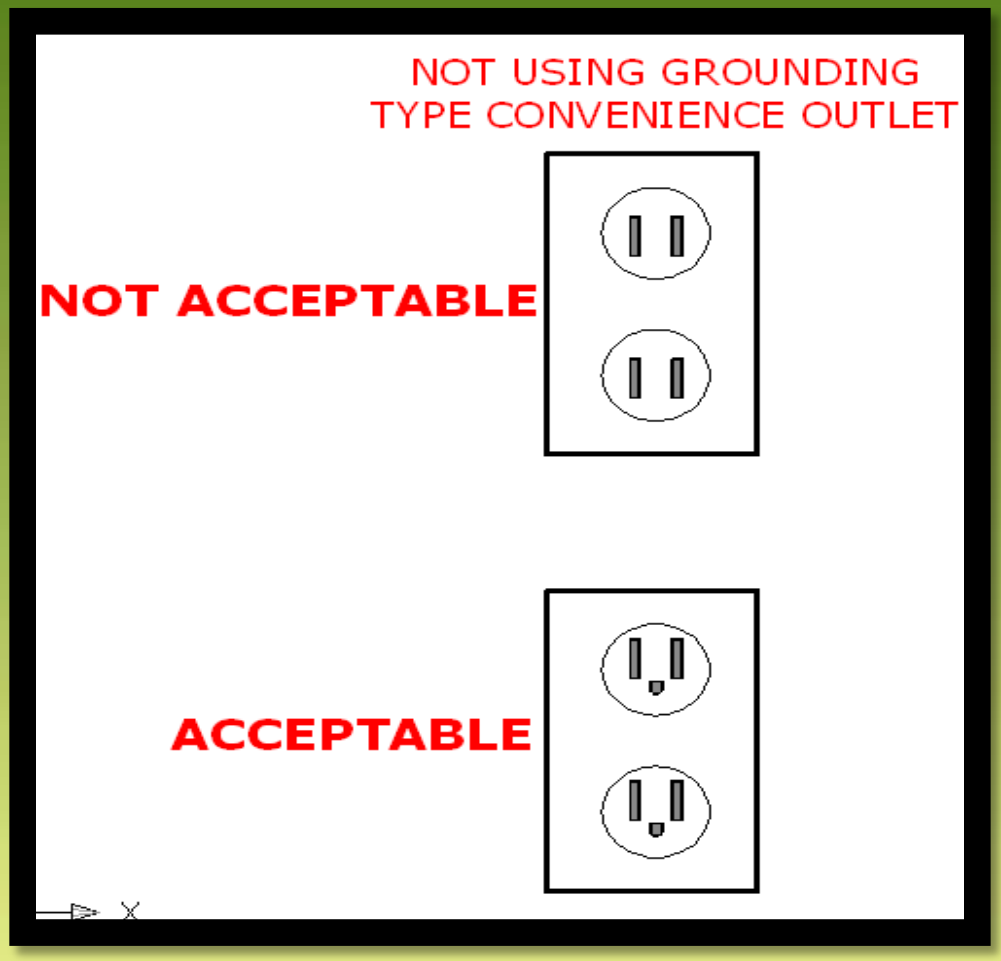
AS INSPECTED IN 2011, THE SIZE OF THIS SERVICE ENTRANCE FEEDER IS 2 – 14 SQUARE MM IN A PVC CONDUIT, SO THAT THE ALLOWABLE AMPACITY IS 70 AMPERES BUT THE PROTECTION IS 200-AMPERE FUSES!

2. INADEQUATE EQUIPMENT GROUNDING . .

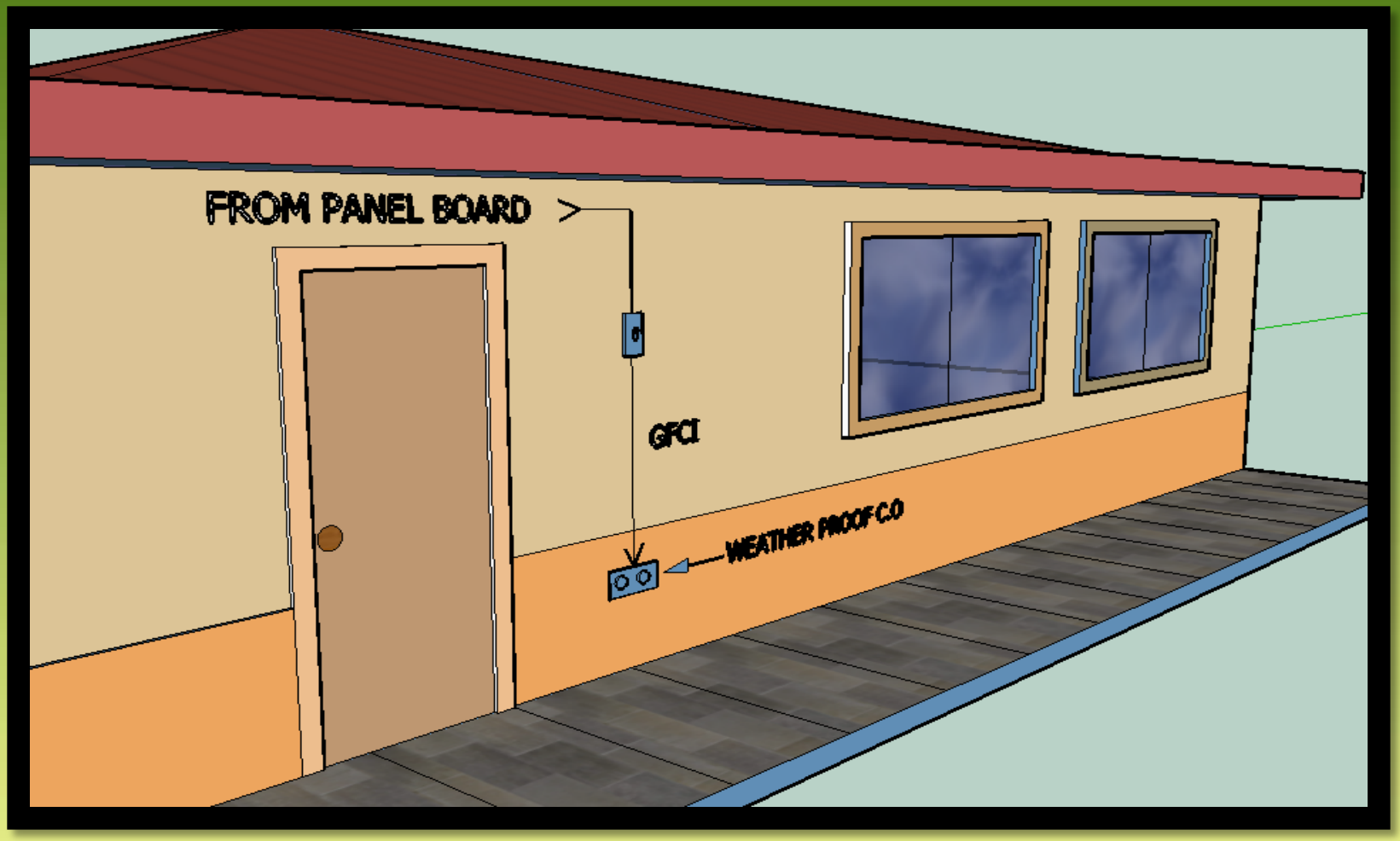


WHAT WOULD BE THE MAXIMUM GROUNDING RESISTANCE? IS IT 25 OHMS?5 OHMS?1 OHM? THE LOWER THE VALUE, THE SAFER! WHY? GROUND FAULT CURRENT SEEKS THE PATH OF LOWER RESISTANCE.

3. NOT USING GROUNDING TYPE CONVENIENCE OUTLETS . . .



4. NOT USING GFCI DEVICE FOR CIRCUITS IN DAMP LOCATIONS OR EXTERIOR AREAS . .



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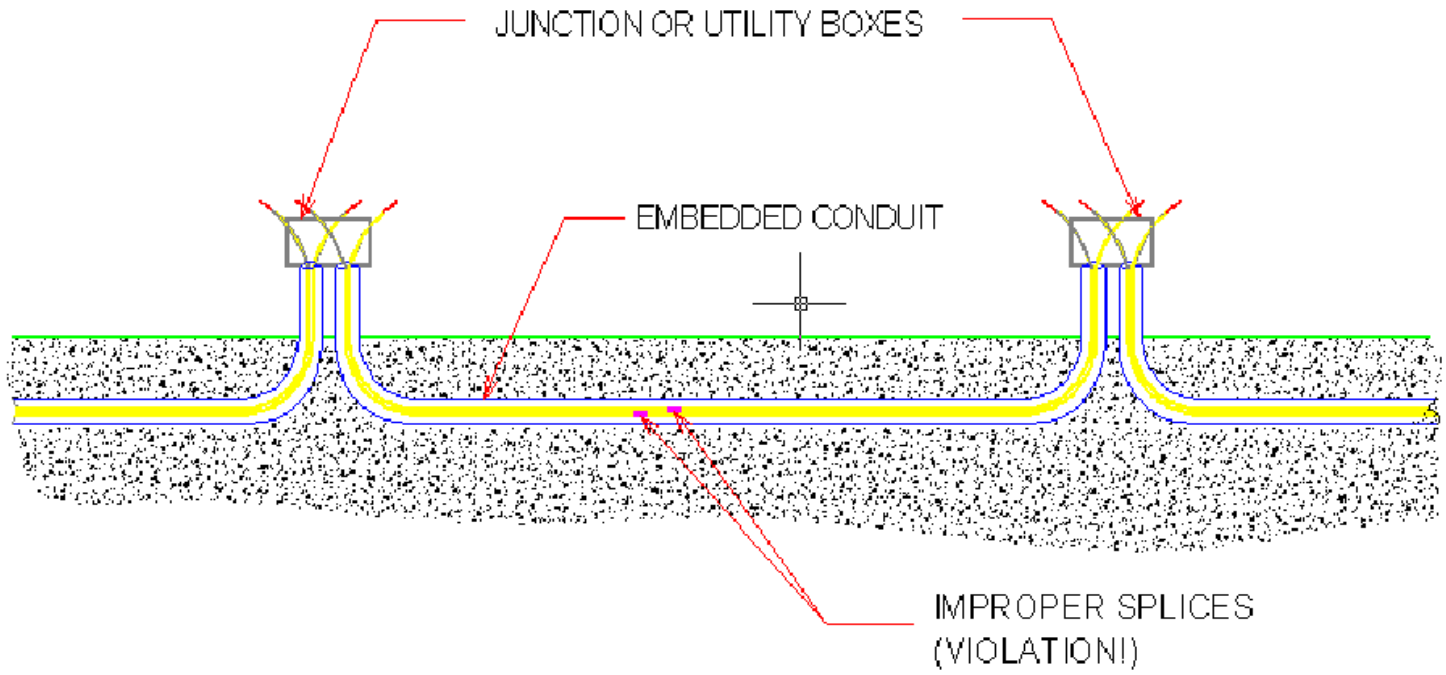
7. USING IMPROPER SPLICES



NOTE: POSSIBLE LOOSE CONNECTION ON THE SPLICES TO BURN THE PLASTIC/RUBBER TAPE INSULATIONS AND CAUSE EVENTUAL SHORT CIRCUIT

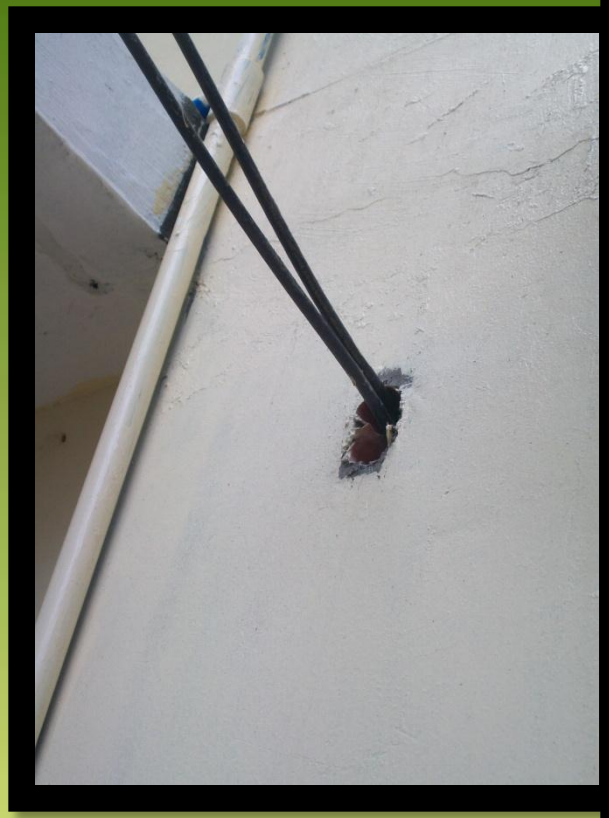
9. LACK OF SUPERVISION DURING CONSTRUCTION...

THESE INAPPROPRIATELY/POORLY SPLICED WIRES INSIDE A BADLY BURNT FLEXIBLE PVC CONDUIT. THE ELECTRICAL SUPERVISOR/FOREMAN MISSED THIS.

10. TEMPORARY WIRING ALLOWED TO BECOME TEMPORARY-PERMANENT

THE FLYING WIRES/CABLES WHICH INCLUDE POWER & COMMUNICA-TION LINES ARE INSTALLED TEMPORARILY.. UNTIL AN UNTOWARD INCIDENT HAPPEN AGGRAVATING MATTERS – ACCIDENTS.

12.LACK OF SAFETY SENSE…



NOTICE THE SERVICE ENTRANCE WIRES, NO ENTRANCE CAP OR DRIP LOOP – THIS ALLOWS WATER TO ENTER CONDUIT AND MAY EVEN REACH PANELBOARD INSIDE, CAUSE DAMAGE, OR GROUND FAULT. THERE IS ALSO NO GROUND WIRE.

13.NOT USING BOLT-ON TYPE MAINS

THE 60A PANEL MAIN CBs ARE PLUG-IN TYPE, SHOULD BE BOLT-ON TYPE..

THE PLUG-IN MAINS WILL RESULT TO LOOSE CONNECTION, LOCALIZE HEATING..

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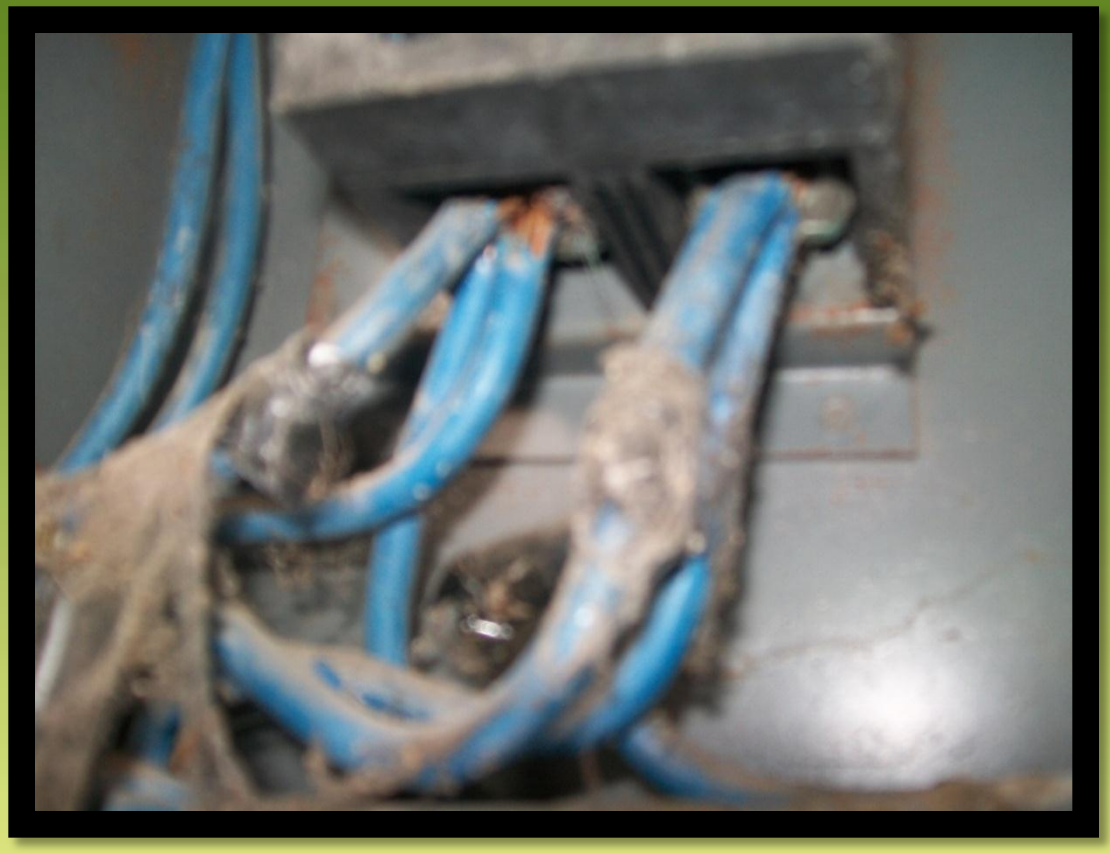
14. LACK OF MAINTENANCE

REGULAR CLEANING REQUIRED.

CABLE TERMINATIONS ARE VIOLATIONS.

COLOR CODING OF WIRES MUST BE FOLLOWED.



15. JUNCTION BOX COVER MISSING ..

THE ABSENCE OF THE COVER FOR THE JUNCTION BOX EXPOSES THE CONDUCTORS NOT ONLY TO WATER BUT ALSO TO THE ULTRA-VIOLET (UV) RAYS OF THE SUN, CAUSING THE DETERIORATION OF THE INSULATION OF THE CONDUCTORS FASTER.

16. Panel Cover & Power CBs Not Fitted Properly…

In a big manufacturing plant, during the retrofitting or replacement of the main circuit breaker of the Low Voltage Switchgear, the panel opening is so big where in there is a large clearance between the front face of new power breaker and the panel opening. This may allow foreign bodies such as dust, and even live creatures to possibly enter inside the switchgear and cause a shutdown. A control wire is even left not tied properly.

17. Old Fused Disconnects Still in Use?

The use of **old fused disconnect switches** where in the load side feeder wires are too small in their ampacities as matched to the rating of the fuses. The fuses may protect the small wires from high magnitude short circuit current but not on an overload current or during a low magnitude line-to-ground fault. These installations must be replaced with bus bar type panel board of power distribution to various load circuits.

18. Cables Not Provided w/ Raceways..

Would you believe that this kind of cable installation still exists? If you are the electrical practitioner assigned to supervise the electrical works, how would you have provided for a better job?By providing flexible metallic conduits? By a cable duct?Or by extending the cable trench?

AS-BUILT PLANS

- **After your thorough electrical inspection & audit, you will now prepare/ update your electrical drawings:**

  * Lighting Layouts * Power Layouts * Panel Arrangements * Single Line Diagram/ Riser Diagram * Load Schedules and Computations * Service Entrance * Substation * Meter Center * Grounding system * Lightning Protection system * Other electrical details of the electrical system

Note down all observations of non-compliance/ Code violations, unsafe situations, inefficient system/ equipment, etc…


FIRE TRAGEDIES
When Would We Learn
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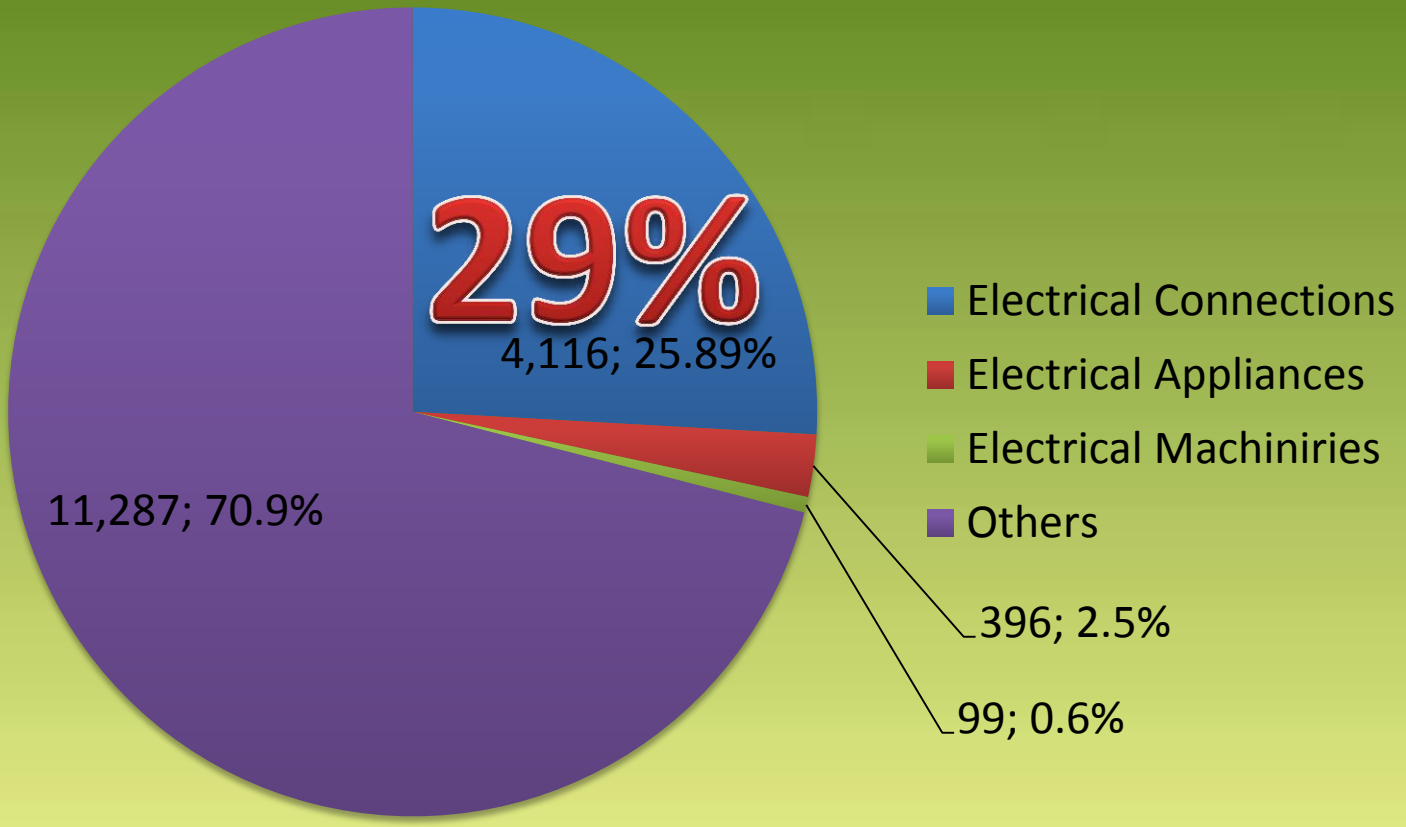
2014 Total Fire Incidents in the Philippines – 15,897



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Damage to Properties –

Php 3,373,240,786.16

- 37.8% (2008) causes of fire – due to electrical in nature such as:

Defective Electrical Device, Sub-standard electrical appliances and wires, circuit overloading, short circuits, arcing, overheating and malpractice of electricity.

- 'Working together towards an electrical safety conscious nation' – 2013 Theme of Electrical Safety Month

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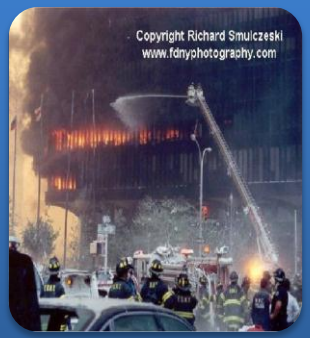
250 Civilians died

645 were injured



2 Firefighters died

and 100 were injured

Total of 252 fatalities

and 745 were injured

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Fire exit at the 3rd Floor without stairs

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Ozone Disco Fire

Electrical Malfunction (overloading)

Location : 57-A Timog Ave., Quezon City

Date/Time : 19 2405H March 1996

Cause of Fire: Electrical Malfunction (overloading)

Casualty : 162 persons

Injured : 100 persons m/l

Est. Damages: 15 Million m/l

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OZONE DISCO FIRE

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Be electrically safe, not sorry!

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“ENGINEERING
WITHOUT SAFETY IS
A FAILURE”

Thank you!

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The Electrical Safety Committee/ESEA is presently recruiting volunteers to be electrical safety advocates from IIEE Chapters.

For inquiries, please contact:
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