



CEEAMA E-NEWS

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Electrical Consultants' Newsletter

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From the President's Desk

Dear All,

Greetings from CEEAMA Governing Council (GC).

Consulting engineering is an important and learned profession.

Services provided by consulting engineers require honesty, impartiality, fairness and equity and must be dedicated to the protection of public health, safety and welfare. In the practice of their profession, consulting engineers must perform under a standard of professional behavior which requires adherence to the highest principles of ethical conduct.

Keeping above in mind CEEAMATECH-2018 - One day conference on electrical Safety and modern Trends is designed to refresh / strengthen relevant capabilities of our members.

In today's scenario, knowing where to find opportunities is one of the biggest struggles for freelance engineering consultants. Networking is today's keyword and CEEAMATECH is an opportunity for meet-ups with people of various backgrounds; that way, you'll connect with more people who may need your skill set.

CEEAMATECH is a better opportunity for interaction of our Life fellow Members/ patron Members with Associate members. This is going to be help for all consulting electrical engineers to keep up with new innovation and trends in the design world.

Hope all of you have registered for CEEAMATECH-2018 .

We are glad to inform you that we are receiving good amount of feedback on CEEAMA-E-News.

Hope to see you at CEEAMATECH-2018.



Thanks & Regards,
Anil Bhandari
Hon. President

What is New?

Grid Modernization and the Smart Grid

America's economy, national security and even the health and safety of our citizens depend on the reliable delivery of electricity. The U.S. electric grid is an engineering marvel with more than 9,200 electric generating units having more than 1 million megawatts of generating capacity connected to more than 600,000 miles of transmission lines.

The electric grid is more than just generation and transmission infrastructure. It is an ecosystem of asset owners, manufacturers, service providers, and government officials at Federal, state, and local levels, all working together to run one of the most reliable electrical grids in the world. The Office of Electricity Delivery and Energy Reliability (OE) is working with its public and private partners to strengthen, transform, and improve energy infrastructure to ensure access to reliable, secure, and clean sources of energy.

Our electric infrastructure is aging and it is being pushed to do more than it was originally designed to do. Modernizing the grid to make it "smarter" and more resilient through the use of cutting-edge technologies, equipment, and controls that communicate and work together to deliver electricity more reliably and efficiently can greatly reduce the frequency and duration of power outages, reduce storm impacts, and restore service faster when outages occur. Consumers can better manage their own energy consumption and costs because they have easier access to their own data. Utilities also benefit from a modernized grid, including improved security, reduced peak loads, increased integration of renewables, and lower operational costs.

"Smart grid" technologies are made possible by two-way communication technologies, control systems, and computer processing. These advanced technologies include advanced sensors known as Phasor Measurement Units (PMUs) that allow operators to assess grid stability, advanced digital meters that give consumers better information and automatically report outages, relays that sense and recover from faults in the substation automatically, automated feeder switches that re-route power around problems, and batteries that store excess energy and make it available later to the grid to meet customer demand.

This exciting transformation of the nation's electric grid creates both challenges and opportunities to advance the capabilities of today's electricity delivery system. A critical component of grid modernization is a coordinated, strategic research, development and demonstration (RD&D) effort that involves both the public and private sectors.

Link: <https://energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid>

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Technical Notes

Subject: 10 Common Causes Of Arc-Flash and Other Electrical Accidents

The most common cause of Arc Flash and other electrical accidents is carelessness. No matter how well a person may be trained, distractions, weariness, pressure to restore power, or over- confidence can cause an electrical worker to bypass safety procedures, work unprotected, drop a tool or make contact between energized conductors. Faulty electrical equipment can also produce a hazard while being operated.

Electrical safety hazards such as exposure to shock and Arc-Flash can be caused by:

- 1 Carelessness
- 2 Worn or broken conductor insulation
- 3 Exposed live parts
- 4 Loose wire connections
- 5 Improperly maintained switches and circuit breakers
- 6 Obstructed disconnect panels
- 7 Water or liquid near electrical equipment
- 8 High voltage cables
- 9 Static electricity
- 10 Damaged tools and equipment



The severity and causes of electrical hazards are varied, but the best protection is **to de-energize equipment before working on it.**

No one has ever been killed or injured from an Arc-Flash while working on de-energized equipment. If equipment cannot be de-energized, **electrical workers must be “qualified”**, trained, wear appropriate personal protective equipment (PPE), and follow all applicable OSHA and NFPA standards.

It is important to remember that proper selection and application of overcurrent protective devices (OCPD) {[hyperlink:http://electrical-engineering-portal.com/an-example-of-the-effectiveness-of-directional-overcurrent-relays-ansi-67-67n](http://electrical-engineering-portal.com/an-example-of-the-effectiveness-of-directional-overcurrent-relays-ansi-67-67n)} will also substantially reduce the hazards.



Both **OSHA** and **NFPA 70E** {[hyperlink: http://electrical-engineering-portal.com/14-terms-of-particular-importance-when-discussing-arc-flash-hazards](http://electrical-engineering-portal.com/14-terms-of-particular-importance-when-discussing-arc-flash-hazards)} require an Electrical Hazard Analysis prior to beginning work on or near electrical conductors that are or may become energized.

The analysis must include all electrical hazards:

1. *Shock,*
2. *Arc-Flash,*
3. *Arc-Blast, and*
4. *Burns.*

NFPA 70E Article 110.8(B)(1) specifically requires Electrical Hazard Analysis {[Hyperlink http://electrical-engineering-portal.com/download-center/books-and-guides/electrical-engineering/understanding-arc-flash-hazards](http://electrical-engineering-portal.com/download-center/books-and-guides/electrical-engineering/understanding-arc-flash-hazards)} within all areas of the electrical system that operate at 50 volts or greater. The results of the Electrical Hazard Analysis will determine the work practices, protection boundaries, personal protective equipment, and other procedures required to protect employees from Arc-Flash or contact with energized conductors.

Prepared by:
ULHAS VAJRE

Article

HARMONICS – FACTS & MISUNDERSTANDINGS

Harmonics is becoming a buzz word in industrial and commercial sector as MSEDCL has started issuing notices to both industrial and commercial establishments for Harmonics presence and possible penalty / disconnection of supply .

Generally the letter issued by MSEDCL states that “During visit of testing team harmonics found in the system are more than 5%. As per MERC supply notification 2005 it has to be within 5%. You are advised to take necessary action to limit harmonics below prescribed limits otherwise supply can be disconnected”.

FACTS

1. What MERC notification 2005 says:-

There is no magic figure of 5% in the notification. The notification requires units using power to keep harmonics in accordance with provisions of IEEE519 clauses 12.1 and 12.2.

2. What are limits in IEEE 519-2014:-

IEEE 519-2014 give two different norms one for voltage distortion and one for current distortion that need to be followed. Voltage distortion limits have been prescribed for different voltage levels as below.

Voltage	Individual Harmonics %	THD %
$V \leq 1.0\text{kV}$	5.0%	8.0%
$1.0\text{kV} < V < 69\text{kV}$	3.0%	5%

Current Harmonic limits are based on ratio of Ish (short circuit current) and IL (Full load current) for all voltages from 120V to 69kV

Current harmonics are major cause of concern as these induce lot of problems in the system and also distort voltage wave form.

	Maximum distortion % of IL		
Ish/ IL	3rd to 11th	13th to 17th	THD
< 20	4.0	2.0	5.0
$20 < 50$	7.0	3.5	8.0
$50 < 100$	10.0	4.5	12.0

Input side harmonic are also cause of higher values and are not being measured by MSEDCL.

MSEDCL notice is general and does not take in to cognizance provisions for current harmonic and Ish/ IL ratio. This ratio will define the permissible current THD in the system. If this is considered and checked many units may have THD within limits. Hence CEEAMA sincerely advises MSEDCL to base observations and notices based on Ish/IL ratio record and harmonics observed.

CEEAMA does not advocate ignoring harmonics issue. Harmonics, both current and voltage are bad for the system and need to be mitigated at the source and CEEAMA members are ready to support technically for finding appropriate solution for mitigation of Harmonics.

However units where harmonics are within limits prescribed by IEEE519 -2014 should not be forced to undertake mitigation exercise which is added and substantial cost to them.

CEEAMA requests all recipients of notices from MSEDCL to check facts based on above requirements and email notices and observations of their units to suhas.keskar@ceeama.org or vinayak.vaidya@ceeama.org . CEEAMA plans to send a petition to MERC/MSEDCL MD & regional director with supporting on this matter. Based on the result of petition CEEAMA and its members can advice correct line of action.

by **Vinayak Vaidya**

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CEEAMA Activity

M/s. CEEAMA visit to Siemens Digital factory, Kalwa

Digitalization has been a buzz word for quite some time now & each one is keen to know how it will revolutionize industry process and standards. Global technology leader, Siemens has already set a firm footprint in Digitalization by setting up its first



ever Digital Factory at their Kalwa works in India.

With an objective to increase awareness of their partners and stakeholders on Digitalization, Siemens had organized Digital factory visit for M/s. CEEAMA, Maharashtra on 17th Nov'17. Thanks to Mr. S.V. Iyer, Hon. Member, CEEAMA committee & Mr. Rajesh Mangtani, Business Development Manager, Siemens who took the lead to arrange this visit, a total of 31 CEEAMA members from multiple locations of Maharashtra joined for this



visit.

Mr. Anil Bhandari, President, CEEAMA; set the tone of the event with his thoughts on importance of such factory visits & Siemens presence in Industry over multiple decades. The visit began with a showcase tour to low voltage switchgear digital factory. Mr. Karunakararaju Vysyaraju, Process Planning & Industrial Engineering Manager and Mr. Sanjay Bhopatkar, Production Manager carried out factory tour and illustrated how Siemens switchgear products are manufactured with a very high degree of precision and quality that can be achieved only through digitalization. It was indeed a fascinating experience to watch the various machines work in tandem to produce about 180 variants at the rate of one product every 9 seconds. The factory tour also included visit to the Siemens state of the art low voltage R&D Lab and test center & switchgear final assembly shop. Mr. Titus Basil, Research professional at R&D Lab demonstrated series of tests that each Siemens LV switchgear product goes through to achieve the remarkable quality and conformity to applicable Indian & International standards.

Mr. Gautam Shetye, Products & Solutions Development Team Leader at final assembly shop explained highly organized process for component selection and assembly of breakers. The team also got a chance to witness the various stringent tests conducted on breakers for its outstanding quality before its final dispatch to customers.

Along with factory tour, Siemens had organized knowledge sharing sessions on medium voltage & low voltage switchgear products. Mr. Shreyas Pitale and Mr. Rajagopalan from Siemens medium voltage team; shared thoughts on MV products like Compact substation, Air insulated switchgear & Gas insulated switchgear. Mr. Yogesh Prabhu & Mr. Prasad Adiwarekar from Siemens low voltage business development team, shared information on basics of low voltage switchgear followed by new updates in Siemens low voltage switchgear products &



solutions.

This was followed up by an interactive Q&A session where the participation by the CEEMA members was exquisite. Also, Siemens team had handled each and every question with detailed technical explanation.

Mr. Muralidharan Prakash, Technical sales & support Manager concluded the session with a thank you note & applauded CEEAMA for this opportunity. Mr. Prakash added that, Siemens will always look forward keenly to organize similar events in future. Mr. Anil Bhandari, President, CEEAMA concluded the session with a closing speech and appreciated Siemens for such wonderful technology day. Also, he invited to Siemens to actively participate in CEEAMA future events including the new initiative of CEEAMA E-News.

Mark your Diary

CEEAMATECH 2018 Conference & Exhibition

Date: 6th January 2018

Venue: Bombay Convention & Exhibition Centre, Mumbai

Seminar Topics:

- "Electrical safety - statutory requirements and implementation in design"
- "Modern trends in electrical design process driven by energy optimization and cost competitiveness"

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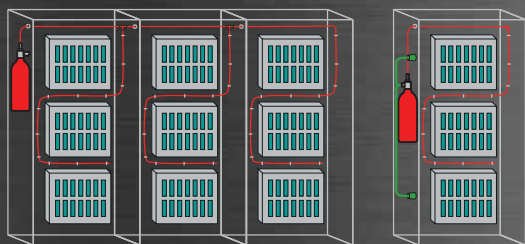


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