



# CEEAMA E-NEWS

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Electrical Consultants' Newsletter

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## From the Secretary's Desk



Dear All,

First of all, I thank all of CEEAMA Associate members, patron Members, Life fellow Members and well wishers, who contributed to make CEEAMATECH 2018 a successful Conference & Exhibition.

Friends, this has shown all of us

the topics of future importance and they are,

1. Electrical Safety at work places.
2. Electrical Rules and Regulation in force.
3. Design Changes to be carried out for the future as per electricity rules and regulations.
4. Need of certifying experienced personnel in electrical field to act

as electrical safety engineer, as per the new electricity act.

In one day conference CEEAMA has touched all the above topics briefly and also there was display of products, in connection with above.

CEEAMA intends to take these topics further and carryout seminars imparting knowledge to the consultants.

These seminars will be held in Mumbai & Pune.

I appeal all to come forward and support CEEAMA. This support can be in the form of sponsoring the program, become a member of CEEAMA, promote CEEAMA to friends and ask them to become member. This year target of membership is 300 nos. this can be very easily achieved if every member brings one member only.

I am sure this will be achieved by March 2018 only.

In my next write-up, I will be communicating to the goal of CEEAMA and the proposed path to achieve the goal.

I will request all of you to send your valuable suggestions to me on my email address: [suhas.keskar@ceeama.org](mailto:suhas.keskar@ceeama.org)

Please do visit our site regularly and update the information of your own. CEEAMA is effectively using the website to communicate the message & important information. I personally will be writing about the latest amendment in electricity act 2003, the changes taken place, implementation of the changes while designing the electrical system, etc. This will follow in next few months. Do write to me your suggestions about E-News. I look forward for the same.

Thanking you all once again.

Best Regards,  
**Suhas Kesar**  
Hon. Secretary

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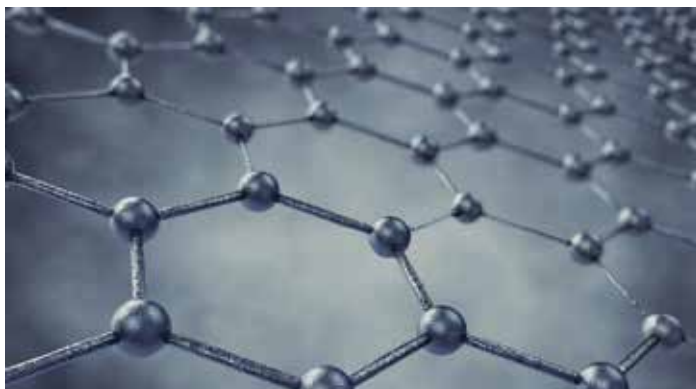
How safe do we think our electrical panels really are?

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## What is New?

### Graphene

As electrical engineers reach the performance constraints caused by the fundamental properties of matter, advances in materials science become essential. Graphene is perhaps the most important recent innovation. Graphene consists of a single layer of carbon atoms one million times thinner than paper. It's so thin that it is actually considered two-dimensional.



<http://www.laptopmag.com/articles/graphene-tech-uses>

Graphene's unique characteristics make it the strongest known material on Earth. It can stretch by 20%, making it as pliable as rubber. It will provide immense gains in battery life for portable devices and is uniquely well-suited for wearable technology that collects biometric information from the user. In short, it may be essential to the future of electrical engineering.



By Mangesh Shirgaonkar

## Article

### How safe do we think our electrical panels really are?

There are many types of Electrical Cabinets within an organisation and they are there to maintain and control all kinds of vital processes throughout the business. Whether they are Machinery Control Cabinets (MCC's), Switchgear, Substations or simple Fuse Boxes, they are vital to the continued operation of a business and the loss or damage of such a piece of equipment could have devastating consequences.

Fire is one of the major causes of damage to these items of essential equipment and the ability to prevent such losses, through simple fire protection engineering can mean the difference between business success and failure.

Typically fires in electrical panels start from loose connections and faulty wires, when there is power running through them the electricity can arc. This arced electricity is extremely hot and causes the plastic coatings on the wires to burn and spread to other components. One thing to note is that low voltage and high voltage connections and equipment are both fire risks and deserve equal amounts of protection

Financial Loss, Operational Downtime or even the complete destruction of your operation can be a frightening reality, with around 40% of all organisations experiencing a fire, never recovering.

#### • Other most common sources of fire in electrical enclosures include

- Wire fatigue
- Equipment failures
- Improper installation
- Overloaded circuits
- Other environmental causes

Although technological advancement does ensure that, fire would ignite only in worst case scenarios. It still seems wise to have an active fire suppression system dedicated for the panels which is targeted to the hazard.

#### • National building codes of India: NBCI clause for electrical panel protection states as below

6.4.8.6. Manual panel gas flooding Electric panels should have provision of manual gas flooding. Alternatively panels can be provided with linear heat sensing tubes with Co2 cylinder. This required to be provided only in main power panels i.e. HT panel, main LT panel, main LT distribution board and essential power panels and other such major panels.

Although the clause states CO2 as an extinguishing medium, one can choose from more advanced green gases such as 3M's Novec 1230, which is non-toxic, highly volatile, and has a shelf life of 20 years! Thus limits damage only to ones caused due to fire.

#### • Insurance Benefit:

Moreover, by installing a Fire suppression system dedicated for Electrical panels, users can avail insurance premium reduction!

The amounts saved on insurance premium will itself finance the cost of installing a fire suppression system.

Linear Heat sensing tube installed within an electrical enclosure ensures that detection happens across the panel's Length Dept and Height. By running the tubing directly above any connections and components such as switches and transformers you will minimize the time it takes to detect and suppress the fire, thus keeping damage to the minimal. Firetrace is the Pioneer and Inventor of this technology with worldwide approvals and listing for its product line including, UL, FM, CE, LPCB etc.

#### Why Use Firetrace?

Firetrace Systems have been installed on thousands of electrical control cabinets all over the world, from pumping stations in Qatar to Airport Control Cabinets in Delhi. Whether they are

high or low-voltage enclosures, Firetrace Systems are ideal for the early detection and protection against fire in these environments, being automatic, clean and safe for use on electrical equipment and with a choice of system sizes available, able to protect many different types of application.

The Firetrace Systems used on electrical control cabinets consist of a small, pressurized container using either FM200 or 3M™ Novec™ 1230 as the extinguishing medium. This is connected to a length of Firetrace Detection Tube (FDT) that is appropriately routed all around the compartment(s) to provide linear, pneumatic detection in a 360 degree environment.

In the event of a fire, or high temperature rise, the FDT will burst and discharge the extinguishing agent directly on to the



fire at its source, rapidly knocking down any fire.

The agent quickly fills the compartment, rapidly knocking down the flame and suppressing the fire within a matter of seconds. Suppression is by means of cooling, with some chemical reaction with the flame and both types of agent are clean, non-toxic and confirmed as suitable for use on electrical fires.

Unlike some other technologies there is no delay in the build-up of an extinguishing concentration or a delay caused because the extinguishing gas must find a way into the cabinet and to the

source of the fire from the outside. Firetrace systems localises the fire and prevent fire damage to the cabinet components.

Systems that discharge through pipe work and nozzles have the difficulty in delivering the extinguishing agent

rapidly onto the fire source. Electrical Cabinet manufacturers are hesitant about maintaining warranty and type

test certificates on Electrical / Machinery Control Columns that might be installed with electrically conductive (metal) pipe work.

Firetrace Detection Tubing is ideal for fire detection in electrical control cabinets, as it is treated just like another cable. It is electrically non conductive, flexible, easy to install and will not affect any rating of the

cabinets and their compartments. It is also suitable for use in all environments, be they clean or dusty and is not affected by high air-flow or low temperatures.

Following a system discharge, no clean-up of the agent is required, as they are clean, non-toxic gases when discharged in a fire situation.

Should you be unlucky enough to experience a fire in your equipment, you'll find you can be operational in only a short space of time. By only having to maybe repair a small part of your unit and



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by Warrier Electronics

## Technical Notes

### Selection and Sizing of DG sets

The concept of DG set requirement should be clearly understood, that it is required for feeding emergency power requirement, when utility power supply fails. Very rare the requirement will be for 100% standby. Before sizing the DG set, it forms essential to segregate the essential loads and non essential loads. If this is not done, then one ends up with oversizing the DG set. So the load panel also needs to get segregated. With increase in non linear loads, the rating of DG set is different compared to the linear loads.

Salient points to be considered in sizing a DG set in addition to other design requirement:

- A fully loaded generator performs better. Running a light loaded generator can lead to engine damage reducing reliability.
- Duty cycle is important as size of DG set varies when used for Standby power, Prime power, or Utility paralleling.
- When DG set is feeding non linear loads such as VFD, UPS, Battery charger, Elevators, Cranes, Hoists, furnaces, welding sets etc., DG set rating will be higher, as the non linear loads on the generator must be less than 50%, to prevent heating of stator coils due to harmonics.

- Load step sequencing : In many application the DG set is sized to pick up all loads at one go. It would be better to start the load which would cause the largest surge first and then other loads in sequence. By this the DG set size can be optimized.

- It is preferable to have smaller DG set run

ning when required, instead of big one. Availability is more in this case.

- Future loading needs to be considered, while sizing the DG set. Provision to be made for additional DG set when required.

- All DG set should be specified to have load sharing module & load speed governor control, so that dissimilar sets can be paralalled.

If the DG set is for 100% standby requirement, the entire connected load in KVA to be added. A sample simple sizing for a 500KW connected load will be,

Connected load	=	500KW,
Diversity factor	=	0.54
Demand factor	=	$500 \times 0.54 = 270KW.$
% loading	=	70.
Set Rating	=	$270 / 0.7 = 386KW.$
At 0.8pf DG set	=	482.5KVA say 500KVA

### Case study in brief:

When I worked for ETA PPD, at Abu Dhabi, ADDC in coordination with palace authorities, released a project of shifting various sizes of DG set between the palaces, based on the present requirement. In one such palace one no 11KV 1MVA DG set & one no 11KV 500KVA DG set were re located. Neither ADDC, ADWEA or the consultant ( PB Power) failed to check the **absence of load sharing module & load speed governor control** in both the units. When the unit was run for the first time after commissioning and paralalled, the smaller unit took all the load and in addition ran the bigger unit as Synchronous motor (Electrical protection did not operate). Rotor of 1MVA DG set burnt fully as a result, also there was rubbing of stator coil insulation. In many cases such as this, too many brains miss the finer practical details. Even though I was not part of this project, I got involved after the burn out and did rectify the 1MVA DG set.

Prepared by

**A V Prasanna**



## BECOME A MEMBER A TODAY!

CEEAMA is a section 25 "Not for Profit Company" registered with Registrar of Companies

### MAIN OBJECTIVE:

Our Main Purpose to bring all consulting electrical engineering professionals on one platform.

Knowledge and Experience sharing  
Exposure of members to latest Codes and Practices

### OUR PRESENCE:

Mumbai, Pune, Satara, Sangli, Nashik, Miraj, Kolhapur, Aurangabad, and Nagpur and Intends to expand its operations and activities in different regions outside Maharashtra in the coming days.

**CEEAMA**<sup>TM</sup>

Consulting Electrical Engineers  
Association of Maharashtra

### OUR ACTIVITIES:

- CEEAMATECH Conference
- CEEAMA E-NEWS.
- CEEAMATECH Exhibition
- Technical Seminars
- Factory Visits

### 350+ MEMBERS

with three major categories:

- Life Fellow Member
- Patron Member
- Associate Member

For more details Kindly Contact: Admin@ceeama.org or Visit [www.ceeama.org](http://www.ceeama.org)

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