Happy New Year !

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From the President's Desk

Dear All,

CEEAMA Governing Council (GC) wishes you exciting and magical New Year!

May this Year of 2018 be,

A Year of Health & Happiness,

A Year of Wealth & Wisdom,

A Year of Peace & Prosperity,

A Year of Glee & Glow, and also A Year of Love & Laughter.

We, appreciate the efforts of each and every one of you to support and strengthen CEEAMA.

2017 was a fruitful year for CEEAMA, as an organization.

During the year, we had few initiatives, like starting monthly newsletter - CEEAMA-E-News, Factory visits, Interactions with statutory bodies for accreditation of LFMs as safety engineers, etc.

I am confident that we are in the right direction. Much of the credit of CEEAMA's success goes to our members, for their active participation in the new initiatives taken by Governing Council (GC).

CEEAMATECH-2018 - One day conference on "Electrical Safety and Modern Trends"; was a successful event and another feather in CEEAMA's Cap. The lectures delivered by all our four speakers, Mr. Shirish Deshpande, Mr. Tushar Borole, Dr. A.M. Salsingikar, Mr. Aaneet Sathe were well appreciated by audience. We are very much thankful to them for making the conference most Fruitful. We are also thankful to our Life fellow members and Patron members, for participating in a big way. We are also thankful to our Associate Members and other vendors, who have supported CEEAMATECH-2018, by way of participation as exhibitor during this conference.

Our LFMs, who have participated, other delegates and all the exhibitors have reported that CEEAMATECH-2018, was an excellent opportunity for networking and was very much useful for them. Taking forward this initiative we are glad to announce CEEAMATECH-2019, 3 days exhibition at Pune. We are also planning to have follow-up technical seminars at Mumbai and Pune.

As indicated during my speech at CEEAMATECH-2018, I once again request all of you to insist on Safety and Energy Conservation Means, at design stage, irrespective of statutory requirements. This will not only help us giving our clients a Technically Safe, Clean and Efficient Electrical distribution system, but ultimately it may result into saving few lives.

At the start of New Year all of you must have set some goals for coming year. We request all of you to update your goal by adding one more goal – "contribution to CEEAMA-E-News".

Thanks & Regards,

Anil Bhandari

Hon. President

In This Issue...

What is New?

Wi-Fi Network Breaks Speed Record: 40GB Per Second

Think your network is fast? Getting a gigabyte-sized movie over your local wireless network to your hard drive in a few seconds is old hat. Now there's a network that can push a 2-hour, high-definition movie to a computer a mile away in less time than it takes to read a single word.

At the Karlsruhe Institute of Technology in Germany, a new record has been set: 40GB per second over a distance of about .6 of a mile. That's like sending 10 high-def feature films.

What makes this possible is a combination of better hardware and the use of higher radio frequencies, in this case, 240 gigahertz. That hardware is a set of chips developed at Karlsruhe that can process signals at higher frequencies. Higher frequencies mean smaller components, since a shorter wavelength can be picked up by a smaller antenna (which is why FM and AM radios need relatively large antennas, while Wi-Fi receivers can use small ones). These chips were only a few millimeters on a side.

The high frequencies are necessary for moving lots of data — the number of bits that can travel over the airwaves is inversely proportional to the wavelength. The shorter the wavelength, the more data that can go in a given time.

A Wi-Fi network operates at 2.4 or 5 GHz, and tens of megabytes per second is not uncommon. Smart-phones on the latest networks work at frequencies somewhat below that, and it's no accident that they struggle to hit 10MB per second.

At some high frequencies moisture in the air can cause the signal to fade, but 240 GHz seems to be in a sweet spot where there's little interference from moisture. Since transmissions can go much further than a Wi-Fi router can manage, there's a possibility this type of transmitter would work well for rural areas where laying down fiber-optic cable — the gold standard of transmission speed — is too expensive to justify.

Link:http://techandall.com/wi-fi-network-breaks-speed-record-40gb-per-second/

By **Mangesh Shirgaonkar**

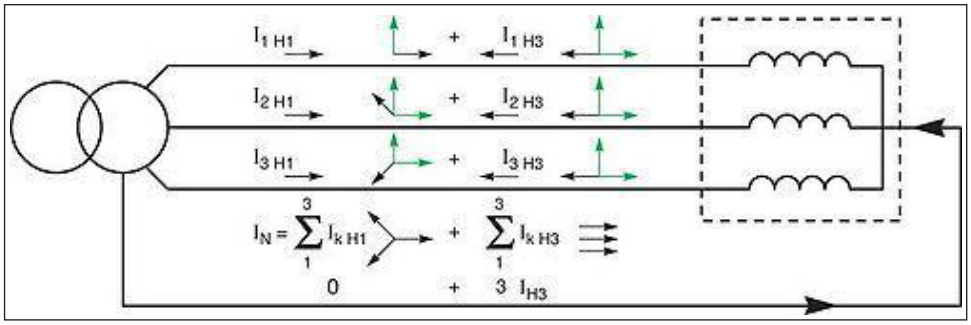
Technical Notes

Which cable to use for LT Distribution 3.5 core or 4 core?

Decades back if one asked for the number of cores to be used for 3 phase LT distribution, without batting an eyelid the answer would be 3.5 core, the size of conductor depending on the load current and de rating factors. Now the scenario has changed, it forms important to know the loads which the cable feeds, and use of 4 core and in some cases 5 core is the requirement of the day.

3.5 Core cables were sufficient when the loads were linear and nearly balanced, with neutral current being low. It is not likely in such cases that the loads will be identical, so the neutral will carry the out-of-balance current of the system. Generally in the case of **linear loads**, the neutral only carries the current due to imbalance between the phases.

The **non-linear loads** such as switch-mode power supplies, computers, office equipment, lamp ballasts, solid state controls of elevators, UPS, drives in industries and transformers on low loads produce third order harmonic currents, which are in the phase of all the supply phases. These currents do not cancel at the star point of a three-phase system as do normal frequency currents, but add up, so that the neutral carries very heavy third harmonic currents. That is why the neutral of the cable feeding the equipment are not reduced and made with cross sectional area same as that of the main conductor to carry this high amount of current. So we need to use **4 core or 5 core** cable.



Triplen harmonics of the three Phases are always positioned in the same manner with respect to their own fundamental, and are in phase with each other.

Last year when I visited my Engineering college in Bengaluru (after 36 years) and discussed the issue of **Power Quality & 3rd harmonics**, in the present scenario of electric distribution. The HOD Electrical was quick enough to point out that in the recent past the neutral of the Transformer within their premises got heated up leading to fire in the Transformer. They had added during the years non- linear loads without looking into the ill effects of triplen harmonics. Neither the neutral was strengthened, nor the cable was changed to 4 core or 5 core based on non- linear loads.

Prepared by
A V Prasanna

CEEAMA Activity

TECHNICAL SEMINAR BY ESENNAR TRANSFORMERS PVT LTD

ESENNNAR Transformers has organised "Technical Seminar" on Distribution and Power Transformer on 24th November 2017 at Tarawade Clark's Inn, Pune. The seminar was organized with support of CEEAMA for Electrical Consultants.

Seminar was indented to provide a platform for exchange of best practices in the implementation of IS 1180 from Bureau of Indian Standard for Distribution transformers, technical topics of Solar Inverter duty Transformer and CRT Transformer.

In all 62 persons attended the Seminar.

Article

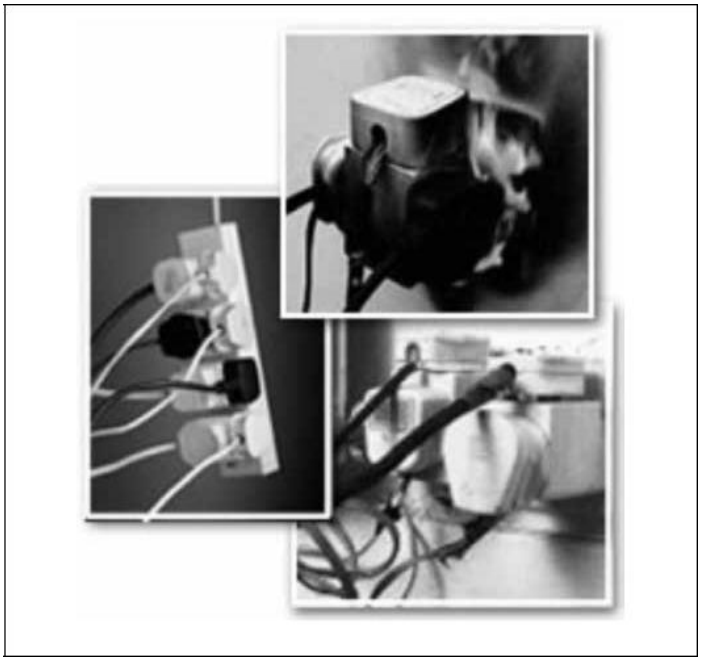
Electric Fire "Causes and Prevention"

Executive Summary

Increase of dependency in Electricity and the rampant use of electrical apparatus, have given way to the dangers of Electric Fires. Use of modern construction materials have also added fuel to fires originating from electrical appliances, which gets heated beyond their operating temperatures. This paper covers in brief the Causes and Prevention of Electric Fire.

Causes of Electric Fire

Whenever Fires due to Electricity is reported by authorities or press, they attribute it to Short Circuit. The term Short Circuit is a misnomer as a electric short always results in tripping of protective devices, be it a circuit breaker or a fuse. Exceptions are shorting of terminals in a fully charged Battery or a Capacitor. So what causes Electric fire? Well it is failure of insulation due to overheating of the wires or appliances. In most cases the overheating takes place at the plug, if the plug is loose and is not tight in the socket. There is always a tell tale mark which needs to be noticed for prevention of Electric fire. It can be discoloration of the plug, or the pins or the socket. Improper size of current carrying wires also result in electric fire.

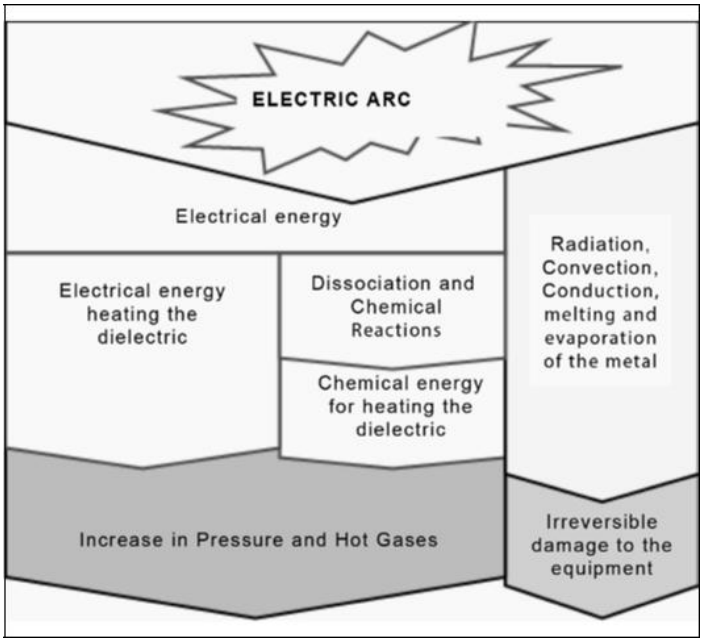


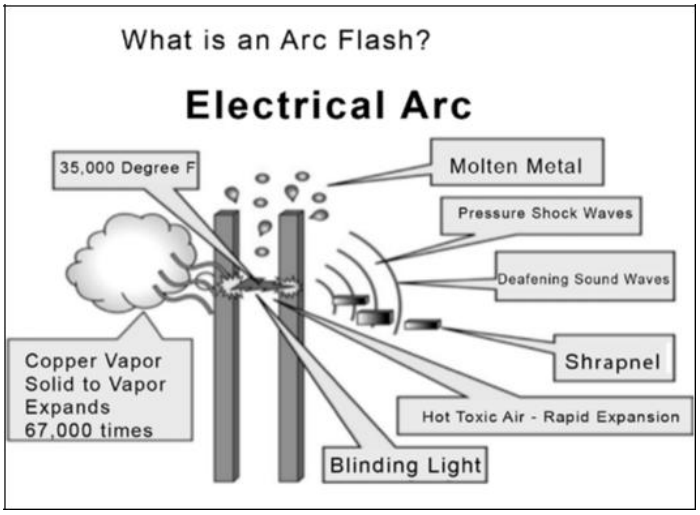
1. Short Circuits

- One example of an electrical heat source is a short circuit. There exists two main types of short circuits; a dead short circuit and a limited short circuit.
- A dead short occurs when a live wire comes in contact with a common or ground wire (or the positive and negative wires are connected in a DC circuit) and the circuit is subsequently energized. In properly fused circuits this will cause the fuse to blow and the circuit to de-energize. This type of situation does not create sufficient heat to ignite combustibles. However, it is possible that the circuit is not fused properly. If this occurs, the current can continue to pass through the wires causing them to significantly overheat. This type of situation can ignite surrounding combustibles causing a fire.
- The other type of short circuit is a limited short circuit. In this case, wires come in contact such that the volume of material through which the current flows is smaller than the fusible link. This will create a spark or flash and result in melting of the copper of the wiring. Characteristic beading of the copper wire is normally observed. This situation can also cause ignition of combustibles provided the mass of the combustibles contacting the heat source is small enough that the heat source can cause it to reach ignition temperatures and initiate a self-sustaining exothermic oxidation reaction or fire.

2. Electric Arc

- Electric fire due to arc is noticed in switchgears.
- Happens when insulation fails, and protection devices, delay opening of remote breakers.
- Normally this takes place after maintenance of breakers or switchgear, where in screw drivers or spanners are left behind inadvertently.





3. Overloaded Circuits

- Another electrical heat source can be created when a circuit is over fused. Over fusing of a circuit can result in high current flow through the wires overloading the circuit. Although electrical wiring is designed to carry current at much higher than its rated capacity, increasing current above this rated capacity causes the wire to generate excess heat.

This is not a problem as long as the heat can be dissipated from the wire. However, if the wire is enclosed within a small insulated space, such as the holes through which wires run through floor joists in a home, the heat in these areas may not be able to dissipate as quickly as it is being generated. As a result, the surrounding combustibles can pyrolize and eventually ignite, causing a fire.

4. Leakage Current

- Fires can also be caused electrically through what is called leakage current. Leakage current occurs when water is in the presence of electricity. Exposed wiring, which exists primarily at connectors and switches, can come in contact with water. Since water conducts electricity, a current will flow through the water between contacts or from the live to ground or common. Over time, the water will accumulate salts which increases its ability to conduct a current. This current can eventually develop to a point where it generates a significant quantity of heat which begins to pyrolize and carbonize the combustibles in the area. This can eventually result in a situation where a carbon bridge is formed, creating a continuous arc or significant generation of heat. Ignition of surrounding combustibles can result in a fire.

5. Electrical Contacts

- Electrical contacts can also fail resulting in uncontrolled heating. Each time a contact is opened or closed, a small spark is generated. This causes degradation of the surface of the contact. Contacts can fail "open" in which case the circuit simply becomes inoperable. However, they can also fail "closed" and weld together resulting in uncontrolled heating.

6. Electrical Spark

- A simple spark can initiate a fire or devastating explosion if a combustible gas/air mixture is located at the position of the spark. As discussed previously, a spark is usually created whenever a contact is opened or closed. For this reason, specially designed switches and contacts are required for installation in an environment in which you can reasonably expect combustible gaseous mixtures to be present.

Prevention of Electrical Fire

1. Maintenance checks may be carried out at least once a year, or when abnormalities are noticed.
2. Check the condition of your electrical system.
3. Check the natural gas/LP gas system in your home. Replace the rubber hose as advised by the gas company or when surface cracks are noticed.
4. Whenever gas leak is smelt, do not switch ON the light to investigate, use a torch instead. Switch OFF the Electric mains and open all the windows, and doors for trapped gas to escape. Isolate the gas cylinder and call the gas company for rectification.
5. Check the air conditioning and heating unit in your home.
6. Check your appliances.
7. Be very careful with space heaters.
8. Never use extension cords for air conditioners. An overheated cord is like an out-of-control electric heater.
9. Never store flammable liquids near ignition sources.

Inspect your home. You may need to recruit, or even hire, someone experienced in home electrical wiring, plumbing (gas), heating, and air conditioning to ensure that it is thoroughly inspected. You can also do the checks outlined in the following steps.

1. Look in the attic and crawl spaces for wiring which has been damaged by pests or insects. Some old wiring is insulated with a material which insects eat or chew on.
2. Look for overloaded circuit breakers, panel boxes, or fuse boxes. Check for breakers or fuses which may have circuits "back to back" on them. These are rated for single circuit protection, but sometimes in outdated or undersized panel boxes, people will put two or even more wires in the terminal of a single breaker or fuse.
3. Notice flickering lights, or intermittent power surges. These conditions may be caused by outside influences, but if they occur often, they may indicate a bad connection or a short in the circuit.
4. Note breakers which "trip", or fuses that "blow" frequently. This is almost always a sign of an overloaded circuit or other wiring problem, usually of a most serious nature
5. Be especially careful to notice any connections in wiring other than copper. Installed correctly, and with tight connections, aluminum wire is not excessively dangerous, but when connections are made to copper wires, an electrolytic reaction may occur, causing increased resistance in the connection which will generate excessive heat. If you are able to apply an antioxidant compound to aluminum connections, it will help decrease the risk of oxidation causing a short circuit at these locations.

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