CEEAMA™
Consulting Electrical Engineers Association of Maharashtra

CEEAMA E-NEWS

Published by Consulting Electrical Engineers Association of Maharashtra

THIS MONTH

CEEAMATECH - One Day Conference is back.

CEEAMATECH 2023

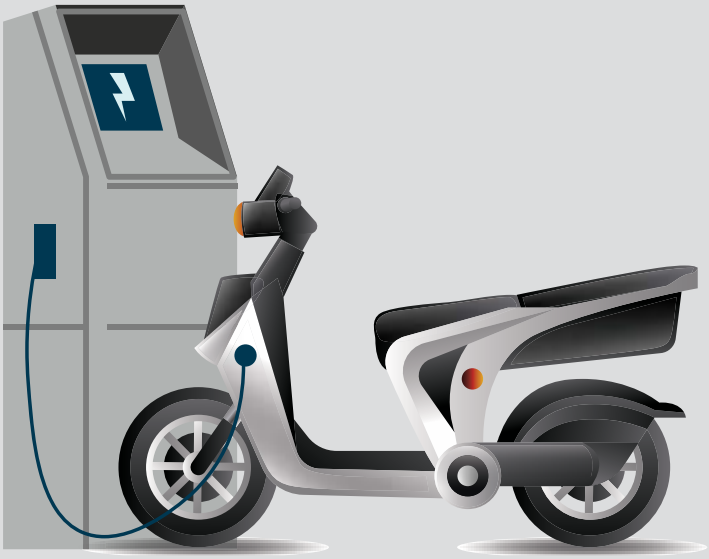
10TH JUNE 2023 @ THE DUKES RETREAT, LONAVALA

ONE DAY CONFERENCE ON

ELECTRIC VEHICLES (EV) CHARGING INFRASTRUCTURE - CHALLENGES AND OPPORTUNITIES

A comprehensive knowledge sharing meet for Electrical Designers, Consultants, Industries and Students.

Registration details inside



Electrical Consultants Newsletter
Volume No. 4 Issue #28
April 2023

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From the Editor's Desk,

Greetings to all CEEAMA Members..!!

The financial year 2022-23 ended rather peacefully or probably it's notional due to comparison with terrifying years of lockdowns. Unfortunately, the virus seems to be sending jitters again accompanied with continued standoff between Russia & Ukraine.

Humble request to government authorities to prevent any form of lockdowns. People have learnt enough and have also developed enough immunity to face any unforeseen calamities. Rather, now the authorities must be more humane while handling any natural disasters. Aftermath of treatments in the form of side-effects would be prominent even though some may blame it on the virus!

As we said in the previous editorial, life becomes cheaper not only by natural calamities but also by man-made ones especially due to ignorance and complacency of authorities. Incidences keep occurring. Now new impending threat is that of EV charging accidents. Yet India govt. sanctions Rs. 8 billion to IOCL, BPCL, & HPCL for setting up 7,432 public fast charging stations under EV scheme.

Just like fire, this is a necessary evil, and thus, we must learn how to handle it. CEEAMA has been relentlessly working on this important subject. In order to spread the awareness, CEEAMA is coming up with series of seminars and workshops. The immediate one in the form of CEEAMATECH 2023 is coming up on 10th June 2023 at The Dukes Retreat, Lonavala. What a place! Only CEEAMA can make you feel relaxed & feel cool about this fiery subject! So do register urgently before the seats get filled!!!

There will also be a joint program of CEEAMA and BAI Nagpur chapter on "Electrical Safety for High Rise Buildings". Our Hon. President & Secretary would be the respective speaker and co-ordinator. This will be our first program outside Mumbai/ Pune/Kolhapur. Earnest request for your hearty support.

CEEAMA's GC meeting was conducted with quorum on 18th March 2023 at Hotel Shangri-La, Pune. Many important resolutions were brought up and approved. We also celebrated our foundation day on Gudhi Padva on 22nd March this year. We would like to express our hearty gratitude to the many veterans, founding members who made this journey happen with their tireless efforts and vision! First president – Mr. Surjit Singh, First secretary – Mr. Bua, & First treasurer – Mr. Ambuj Rastogi in 2004. Self also was the member then.

Our E-NEWS letter is catching attention. Do spread the word!

Wishing you all a very electrifying but safe journey in your life!

Subhash L. Bahulekar
Editor-in-Chief – CEEAMA

Enhancing the Insulation Life of Distribution Transformer using 'K' Class Natural Ester Oil - bioTRANSOL

Savita Oil Technologies Limited, Mumbai

INTRODUCTION: Transformer is a soul of both Transmission and Distribution systems. Transformer is an important link of the distribution system without which the utility would not be able to supply electricity to consumers. Due to continuously increase in commercial and residential buildings, industries and others types of load, demand of linear and non-linear load is also sharply increasing. Therefore, the numbers of Power & Distribution Transformers are now continuously increasing. Now in the event of failure of Distribution Transformer, apart from the loss of capital to the utility, the consumer suffers due to inconvenience caused by the interruption of power supply. Power supply utility also suffers loss of revenue due to supply outage period. In India, the failure rate of Distribution Transformers is very high, around 15-20% per annum vis-à-vis around 1-2% in developed countries. Statistical data indicates that over 20% failures of Distribution Transformers (mainly 25kVA to 100 kVA) are within the warranty period of five years and this causes an immense capital loss for the transformer manufacturers.

As the numbers of Distribution Transformers are very large in quantity as compared to power transformers, fault analysis of distribution transformers has not been given proper attention as they are not as expensive as power transformers. Due to their low cost, distribution transformers are removed after failure and replaced with new / repaired ones without investigating the causes of failure. Therefore, an investigation of the causes of failure of distribution transformer becomes essential.

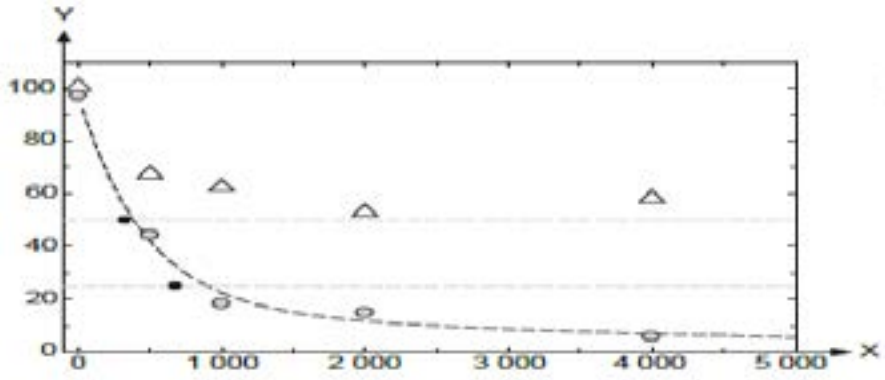
A fixed overload factor, typically 100% to 120% of rated capacity, is commonly used. However, experience suggests that the typical overload factors are conservative as premature distribution transformer failures due to insulation thermal degradation are relatively very high. Transformer rating selections based solely on peak load do not adequately account for the true relationships between transformer loading, type of load, harmonics effect, ambient temperature and expected insulation lifespan. Transformer insulation thermal degradation is a cumulative function of winding temperature, and winding temperature is a dynamic function of loading plus ambient temperature. It is important to note that operating a transformer at its rated load does not cause aging in the nominal rate. Short periods of overheating due to overloading can indeed cause imbalances in the net transformer insulation life. This means that the insulation in some areas of the transformer may age faster than others, leading to an overall reduction in the transformer's lifespan.

In this paper, we will discuss that how we can reduce the rate of degradation of the insulation life of the transformer by using 'K' Class Natural Ester Oil, bioTRANSOL.

THERMAL BEHAVIOR OF TRANSFORMER:

Solid insulation, made of cellulose based products such as press board and paper, is used between the windings for electrical isolation. Cellulose consists of long chain of glucose rings which degrades with time, temperature and moisture leading to shorter chains. Condition of paper is indicated by degree of polymerization (DP) as average number of these rings in the chain. New paper has DP between 1200-1400 whereas DP < 200 means that the paper has a poor mechanical strength and may no longer withstand short circuit and other mechanical forces. This solid insulation is the weakest link in the transformer insulation system.

Now we will discuss the composite DP ageing results referring the **Figure C.5 Tensile strength ageing results of kraft paper in mineral oil and natural ester liquid** at 150 °C of IS 2026 (Part: 14) & IEC 60076-14: 2013.



a) 150 °C

Key

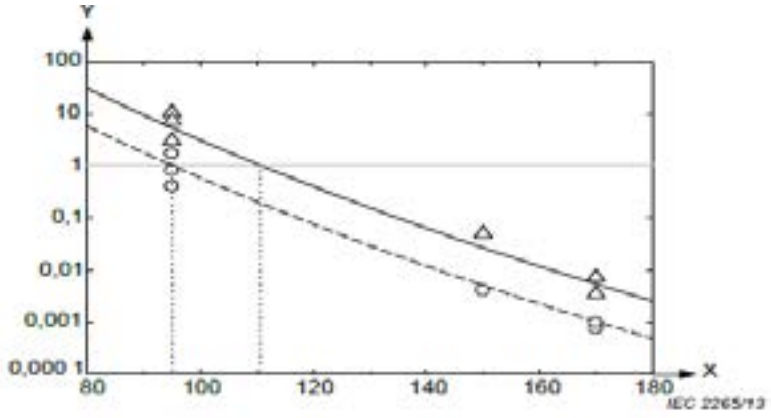
X axis	time (h)		
Y axis	tensile strength (% unaged)		
△	natural ester	150 °C	[4]
○	mineral oil	170 °C	[17]
•	IEEE C57.91-1995		

Figure C.5 – Tensile strength ageing results of kraft paper in mineral oil and natural ester liquid

From the above graph it is very clear that the Tensile strength in Mineral Oil filled Insulation paper and Natural Ester Oil filled Insulation paper in Transformer varies immediately at 150 °C. And over the period of time, it increases rapidly (5-8 times).

Now, we will refer the **Figure C.11** - Unit life versus temperature of

kraft paper ageing data (least squares fit) of IS 2026 (Part: 14) & IEC 60076-14: 2013.



Key

X axis	temperature (°C)		
Y axis	unit life		
△	natural ester	——	$a = 1{,}06 \times 10^{-17}$
○	mineral oil	– – –	$a = 2{,}00 \times 10^{-15}$ (IEEE 95°C hot-spot)

Figure C.11 – Unit life versus temperature of kraft paper ageing data (least squares fit)

From the above graph it is very clear that NE filled insulation systems can be run 15 °C warmer without degrading life of distribution transformer i.e. transformer can be overloaded up to 20% without sacrificing the life of transformer insulation and existing transformers can be potentially upgraded, provided additional load capacity or additional remaining life of the transformer.

CELLULOSE AGEING: MINERAL OIL AND NATURAL ESTER LIQUIDS:

Three factors are responsible for such improvement of Paper Insulation life-

1. **Less Moisture in Insulation Paper:**

   The solubility limit (saturation point) of water in natural ester liquids is much higher: about 16 times higher at room temperature, and about 4 times higher at 100 °C, than that of mineral oil. Therefore, a greater amount of moisture will migrate from the insulation paper into the liquid in order to reach the same relative saturation, leaving less moisture in the paper.

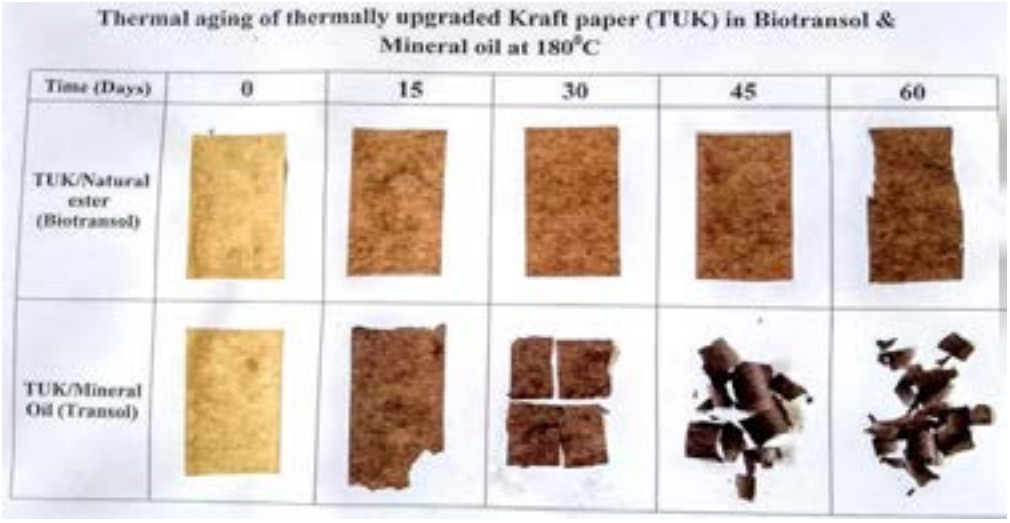
2. **Chemical interaction of water and liquid:**

   The chemical interaction of the moisture and liquid is one of the important factors for Insulation life of the paper. One product of the cellulose ageing process is the generation of moisture/water. It is therefore expected that the moisture content of the cellulose increases during the ageing process, causing moisture to migrate from the paper into the liquid to equalize the relative saturation. This is exactly what happens in the case of mineral oil. Because of the higher saturation limit, more water will move into the natural ester oil. Three Water Molecule are needed to add –H & -OH group to break the Ester Bond i.e. reduction of Water PPM level in Insulating Oil. The result gives one molecule of glycerol and three molecules of long chain fatty acids.

3. **Trans-esterification:**

   As per IS 2026 (part 14)/IEC 60076-14, Trans-Esterification is defined as that long chain fatty acids then bond to the cellulose structure via a process, which is described by *Chauvelon et al* and *Liao et al* state in their paper (C.4.4 page 39) that the long chain fatty acids attached to the cellulose appear to form a barrier to water ingress and with that a decline in the rate of deterioration of the cellulose insulation.

   Being the largest manufacture of Natural ester oil, bioTRANSOL in India, Savita Oil Technologies Limited also did the same test at our NABL accredited lab and the results are as below –



According to IEEE Std. C57.91, experimental evidence indicates that the relation of insulation deterioration to time and temperature follows an adaptation of the Arrhenius reaction rate theory. Aging acceleration factor (FAA) was determined. For a given hot-spot temperature, the rate at which transformer insulation aging is accelerated is compared with the aging rate at a reference hottest-spot temperature.

$$F_{AA} = \exp[\,15000 \times (\frac{1}{T_{HS1} + 273} - \frac{1}{T_{HS2} + 273})]$$

Real Life = normal insulation life/F_{AA}

Where T_{HS1} = 50+45 = 95 °C, average winding temperature rise has been considered as per IS 1180 Part 3 for Type A dielectric system. (Section 6.10.3)
From the below table we can see the degradation of insulation life with rise in winding temperature.

Average Winding temperature rise (THS2-50°C)	Normal Insulation Life	F_{AA}	Real Insulation Life with Mineral Oil(Yrs)	Real Insulation Life with Natural Ester Oil (Yrs)
45	20.55 Yrs	1	20.550	102.750
47		1.246487	16.486	82.432
50		1.727011	11.899	59.496
52		2.140136	9.602	48.011
54		2.646058	7.766	38.831
56		3.26426	6.295	31.477
58		4.018026	5.114	25.572
60		4.935128	4.164	20.820

Now, if we consider insulation aging factor 5 times with Natural Ester Oil bioTRANSOL, we can see that even at average winding temperature at 60 °C the insulation life is more than 20 Yrs.

CONCLUSION:

This paper shows that Distribution Transformers can be loaded substantially, exceeding the transformer's nameplate rating without deteriorating the insulation life. It has also elaborated that the operational life of transformer filled with natural ester oil bioTRANSOL is much more than conventional transformer filled with mineral oil. And when we use natural ester oil bioTRANSOL in Distribution transformer the same will be Green in Nature (biodegrading rate > 95%) and Fire safe (Fire Point>300 °C). These properties make it an excellent alternative for use in high-risk environments, where the risk of fires and explosions is higher. Therefore, the adoption of 'K' class natural ester oil can significantly improve the reliability and safety of Distribution Transformers, resulting in cost savings for power utilities and greater peace of mind for consumers. As a result, the use of Natural Ester Oil is likely to become more widespread in the years to come. Therefore, it is a very good initiative towards reduction of the failure rate of Distribution Transformer. We can use the Indian Standard IS 1180 (part 3): 2021 for Transformers filled with Ester Oil and IS 16659 for Transformers filled with Natural Ester Oil.

Few Installations with bioTRANSOL Natural Ester fluid

a. Schneider Electric make 55 MVA GT filled with 'bioTRANSOL' installed in one of the major petrochemicals industry in Eastern India. This along with other 09 nos. Power & Distribution Transformers are installed in the project.

b. Danish Electric Limited make 315 kVA, 11/0.433 kV sealed Distribution Transformer installed at Jaipur, Rajasthan, India. This was India's first largest project with Natural Ester filled Distribution Transformers by Jaipur Vidyut Vitaran Nigam Nigam Limited, Indian Distribution Utility (total 250 Nos).

c. Transformers & Rectifiers (India) make 20 MVA, 66/11 kV Power Transformer installed at Gujarat Energy Transmission Corporation Limited (State utility in India) substation filled with bioTRANSOL Natural Ester fluid. This is India's first largest project with Natural ester fluid filled Power Transformers. Savita has supplied bioTRANSOL Natural Ester fluid for total 110 Nos. 15 & 20 MVA Transformers to Transformer OEMs. We have been monitoring the fluid condition and till date more than 1000 fluid samples have been taken from operational transformers in different periods and were tested with satisfactory results.

d. d. Atlanta Electric make 25+, 72.5 kV Class Power Transformers and first 100 MVA, 220 kV Class EHV Power Transformer supplied to GETCO filled with bioTRANSOL.

REFERENCES

1. Transformer Oil Application aspects: By C. S. Narasimhan, Research Consultant, Savita Oil Technologies; Publisher: Merit Media, Croatia, 2022.
2. CPRI workshop to reduce the transformers failure rate , on November 22, 2019.
3. IEC 60076-14:2013 Standard - Liquid-immersed power transformers using high-temperature insulation materials
4. IS 2026: Part 14: 2018 - Power Transformers Part 14 Liquid-Immersed Power Transformers Using High-Temperature Insulation Materials.
5. IS 16659: 2017 - Fluids for Electro Technical Applications - Unused Natural Esters for Transformers and Similar Electrical Equipment
6. IS 1180 (Part 3): 2021 - Natural/Synthetic Organic Ester Liquid Immersed Outdoor/Indoor Type Liquid Immersed Distribution Transformers Up to and Including 2 500 kVA, 33 kV.
7. C57.91-2011 - IEEE Guide for Loading Mineral-Oil-Immersed Transformers and Step-Voltage Regulators

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Contributer

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SAVITA OIL TECHNOLOGIES LIMITED
AGM - SALES & MARKETING

CEEAMATECH 2023

10TH JUNE 2023 @ THE DUKES RETREAT, LONAVALA

ONE DAY CONFERENCE ON

ELECTRIC VEHICLES (EV) CHARGING INFRASTRUCTURE - CHALLENGES AND OPPORTUNITIES

A comprehensive knowledge sharing meet for Electrical Designers, Consultants, Industries and Students.

As you know, CEEAMA has been a rich knowledge sharing platform since 2004 and is always on fore front to provide platform for upcoming technologies and Industry needs. There was an unfortunate break in physical meetings due to unprecedented pandemic situation the world went through. Now we are back and have arranged a ***ONE DAY SEMINAR*** on a very interesting upcoming topic – ***ELECTRIC VEHICLES (EV) Charging Infrastructure - Challenges and Opportunities)***. Slowly but surely Electric Vehicles are becoming part of our life.

All of us are trying to update ourselves with authentic technical inputs on many related topics as below on ELECTRIC VEHICLES

- ✓ Choice of electric vehicle purchase
- ✓ Safety in Charging electric vehicles in public places.
- ✓ Understand specifications of an electric vehicle and its charger
- ✓ Match the specifications with a particular usage pattern.
- ✓ Design small and large charging stations
- ✓ Understand national and international standards on electric vehicles, chargers and batteries.
- ✓ Understand EV batteries.
- ✓ Understand statutory provisions at local civic, state, and central level.

ABOUT THE CONFERENCE

Meet experts one on one – listen to their experiences – know views of utilities – talk to charging companies – EV manufacturers. Come join us on ***10th June 2023 @ The Dukes Retreat Lonavala*** for one day meet. Opportunity to meet charging experts and understand various charger technologies and commercial models of creating charging infrastructures. Opportunity to visit stalls displaying state of the art Electrical Equipment

CEEAMATECH 2023 CONFERENCE SESSIONS

Sessions	Speakers
1 Key note address - "**Electric Vehicles and Charging Infrastructure**"	Eminent Speakers from EV Industry
2 Understanding EVs and infrastructure demands.	
3 Challenges and opportunities in developing infrastructure	
4 Panel discussion Q and A with experts and electrical consultants	

CEEAMATECH 2023 DELEGATE FEES AND PAYMENT

CEEAMA Life and Patron Members	Associate Members	Others
INR 1000/- + GST@18% Per Delegate	**INR 1500/-** + GST@18% Per Delegate	**INR 2000/-** + GST@18% Per Delegate

DELEGATE REGISTRATION AND PAYMENT INSTRUCTIONS

To Register for CEEAMATECH 2023, Please scan the given QR code or click on the below given link.

Registeration Form Link : https://ceeama.org/CeeamaTech_2023.aspx

Tel: +91 9765150066 / 9822916302 (Prabha Enterprises)

Email: admin@ceeama.org

CEEAMATECH 2023

10TH JUNE 2023 @ THE DUKES RETREAT, LONAVALA

CEEAMATECH 2023 CO-HOSTING FACILITIES & BENEFITS

Platinum Co-Host

Co-Hosting Amount

INR 3,50,000/-

* Logo on the backdrop, standies.
* Logo on the branding material.
* 1 Display Stall (6 by 3 mtrs) on the venue.
* 15 mins session for presentation.
* Advertisement space in CEEAMA E-Newsletter and website for 12 months.
* Visitors Data will be shared.

Gold Co-Host

Co-Hosting Amount

INR 2,50,000/-

* Logo on the backdrop, standies.
* Logo on the branding material.
* 1 Display Stall (3 by 3 mtrs) on the venue.
* 10 mins session for presentation.
* Advertisement space in CEEAMA E-Newsletter and website for 9 months.
* Visitors Data will be shared.

Silver Co-Host

Co-Hosting Amount

INR 1,25,000/-

* Logo on the backdrop, standies.
* Logo on the branding material.
* 1 Display Stall (3 by 2mtrs) on the venue.
* 5 mins session for presentation.
* Advertisement space in CEEAMA E-Newsletter and website for 6 months.
* Visitors Data will be shared.

Venue / Food Co-Host

Co-Hosting Amount INR 1,00,000/-

* Logo on the branding material.
* Advertisement space in CEEAMA E-Newsletter and website for 3 month.
* Visitors Data will be shared.

Kit Co-Host

Co-Hosting Amount INR 50,000/-

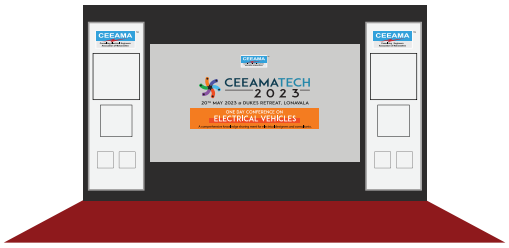
* Logo on the welcome kit.
* Advertisement space in CEEAMA E-Newsletter and website for 1 month.
* Visitors Data will be shared.

Stall Details

Stall Price INR 75,000/-

* Stall dimensions - 3mtrs by 2mtrs
* 1 Table, 2 Chairs, 2 Spotlights per Stall.

Stage Setup



Stall Setup

* GST 18% extra on above amounts
* 5 Amps 230V single phase connection will be available in each stall
* Two representatives from each stall will be allowed to attend the program free of cost along with food. Please enquire with the organisers if more persons are to be accommodated.
* Other category wise facilities are lists in detail forwarding letter attached.

ORGANISED BY

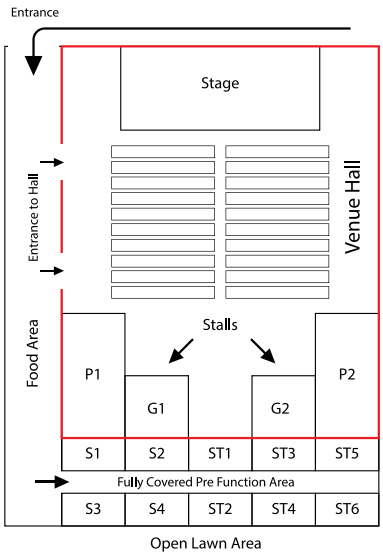
Consulting Electrical Engineers Association of Maharashtra

Incorporated under Indian Companies Act 1956

CEEAMA CIN No. : U91990MH2011NPL212166

Registered Office : A Wing, Office No.103, Sanpada Station Complex, Navi Mumbai 400705

Tentative Venue Layout for Event and Stalls



FEES PAYMENTS

Online Transfer :

Bank Name :	Bank of Maharashtra, Tardeo Road Branch, Mumbai 400007
Account Name :	CEEAMA
GSTIN No. :	27AAECC2687C1ZR
Account No. :	60063072475 (for RTGS/NEFT/ECS No)
IFSC Code :	MAHB0000155
Swift Code :	MAHBINBBOVM

NEWS THIS MONTH

TY | PUNE

Aerial bunch cables to plug power theft

TIMES NEWS NETWORK

Pune: After exposing as many as 1,400 illegal power connections in Anandnagar area of Chinchwad earlier this week, Maharashtra State Electricity Distribution Company Limited (MSEDCL) has decided to install aerial bunch cables to curb any further power theft incidents.

A recent drive found that many people were hooking electricity through live wires. The aerial bunch cables have no access to live wires, reducing chances of power loss.

MSEDCL Pune zone chief engineer, Rajendra Pawar, told **TOI** that the installation work will be completed on priority in the next 15 days.

A transformer developed a technical snag here under MSEDCL Bhosari division this week. It was later found overloaded due to theft.

After the theft was exposed with the help of the police, residents were lining up at local offices for new household electricity connections. In the two-day operation, around 1,400 household electricity thefts were detected by direct meter readings and other methods.

If defaulters are found using electricity from neighbours or other sources via wires or cables, action is being taken against the neighbours and the related defaulters.

Electricity pole collapses on two, 14-yr-old girl dies

TIMES NEWS NETWORK

Vadodara: A 14-year girl died after an electricity pole fell on her in the Timbi village of Halol taluka in Panchmahal district on Monday night. The incident took place due to heavy winds in the region on Monday accompanied with rains at some places. According to sources, the incident took place outside a dwelling in Timbi where Raman Nayak and his daughter Sonal Nayak (14) were visiting a relative. The family was preparing dinner outside the hutment when two poles collapsed.

Sources said that a tree fell on the electricity line near the dwelling due to which the two poles also collapsed. One of the poles fell on Raman and Sonal. While Raman sustained injuries on his leg, the pole fell on Sonal's chest.

The injured duo was rushed to hospital where Sonal died after a brief treatment.

Maha's installed power generation max in India

Mumbai: Maharashtra has the highest share in installed capacity (10.8%) of electricity generation in India, as per the state economic survey report.

The total installed capacity of electricity generation as on March 31, 2022 was 37,240 MW, of which the share of private sector was 50.9%, that of public sector was 34.8% and of public private partnership (PPP) (Ratnagiri Gas Power Project Ltd.) was 5.3%.

Share of renewable energy in installed capacity of private sector was 40% and renewable installed capacity increased by 7% in a year.

"Total electricity generated in state was 1,51,602 million units (MU) during 2021-22. During 2022-23, up to December, total electricity generated was 1,06,281 MU. The generation may go up with capacity addition for thermal power," the report says.

Mahagenco, the state power generator, has accorded approval for installation and commissioning of projects for capacity addition at various thermal power stations.

ECO SURVEY REPORT

Source-wise installed capacity for electricity generation in Maharashtra

Source	2020-21	2020-21	2021-22	2022-23 (till Dec)
Thermal	21,170	21,170	20,966	
Renewable	9,599	9,846	10,502	11,408
Hydro	3,061	3,061	3,061	3,061
Natural gas	2,819	2,819	2,819	2,819
Central allocation	7,831	7,944	7,944	7,944
Total	36,644	36,902	37,340	38,246

Source: Economic Survey of Maharashtra 2022-23

"Capacity addition of 660 MW in the project at Bhusawal is in progress. For the project with capacity of 1,320 MW at Koradi, process of acquiring statutory clearances is in progress," the report states.

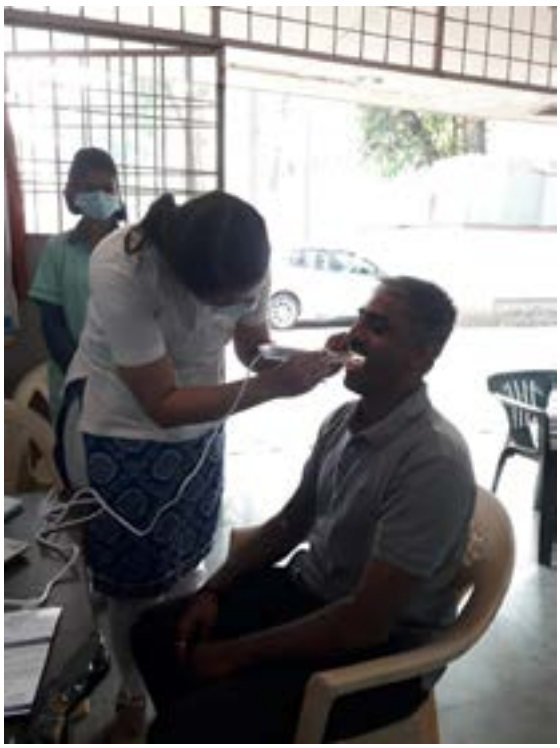
The report said, "The state being one of the developed and populated, demand for energy is increasing due to industrialisation, urbanisation, digitalisation and electrification of transport sector. It has succeeded in meeting increasing demand. "The share of private, public and public-private partnership in total electricity generation in 2021-22 was 50.2%, 45.4% and 4.4% respectively.

The report says renewable sources are promoted for sustainable development.

"The Centre launched the programme in 2016 for installation of rooftop solar by consumers... Phase-II is... for residential consumers for installation of rooftop solar... 40% subsidy is provided for up to capacity 3 kW..." it states.

ACTIVITIES THIS MONTH

CEEAMA helped in organising a Blood Donation and free Dental Checkup Camp in association with Saraswati Mahila Nagari Sahakari Patsanstha, Pune.



WINNERS OF QUIZ
MARCH 2023

SUJIT LANDE

(LFM-130)
PRODAIR AIR PRODUCTS INDIA PVT.LTD

DINESH REDEKAR

(LFM - 186)
YASHADA CONSULTANTS

DEEPAK BABAR

ASSISTANT ENGINEER MSEDCL

Congratulations

QUIZ APRIL 2023

1) DSM traditionally aims reducing electricity demand to:

1. Defer Building further capacity
2. Mitigate electrical system emergencies
3. Reduce Emissions
4. All of them

2) In the flux constant zone, voltage can be increased by maintaining V/F constant.

1. TRUE
2. FALSE
3. Can't say
4. Both A & B

3) The maximum allowed soil resistance for lightning protections is:

1. 2Ω
2. 5Ω
3. 10Ω
4. 20Ω

4) Hermetically sealed transformer has _____.

1. Conservator
2. Pressure Relief Valve
3. Full Filled Oil Tank
4. Detachable radiators

5) Residential energy consumers amount to _% in Dubai.

1. 7.9%
2. 49.60%
3. 49.6%
4. 22%

6) CFM & CFH units express:

1. Transformer Oil capacity
2. Ventilation fan sizing capacity
3. Fire Fighting water capacity sizing
4. Structure weight carrying capacity design

7) Cable conductor material:

1. Copper
2. Nickel
3. Silver
4. All of the above

8) Standards followed in USA?

1. NEC, ANSI, IEEE, NFPA
2. IEC, CENELEC and ATEX
3. NEC or IEC
4. NEC, CEC, IEEE, GOST

9) Current limiting reactor in series with capacitor:

1. Provides earthing point
2. Prevents over-compensation
3. Limits transient over currents
4. None of the above

10) Autonomy time of battery is referred to as _____.

1. Back up time of battery
2. Mean time of battery
3. life span of battery
4. Auto recharge time

Rules for the QUIZ:

- The Quiz will be open for 10 days from the date of EMAIL.
- Each correct answer received on DAY 1 will get 100 points
- Next days the points will reduce as 90 – 80 – 70 and on 10th day points will be ZERO even if the
- answer is correct.
- All participants will receive E certificate signed by CEEAMA President with the points earned
- mentioned on the same.

Please use following google form link to participate in the QUIZ.

https://forms.gle/XXcFByD75AeddjZF7

"Thank you all for the overwhelming response to the E-NEWS in general and E-Quiz in particular. MCQ based quiz is always tricky and surprisingly can take us aback when we realise our conceptions (misconceptions) about the subject / system / product.

The aim of the feature was to create inquisitiveness in your mind and help you check your technical quotient

quickly. The response will also help us to present articles and webinars on subjects which are important, but which

lack enough awareness / knowledge in general.

It can open a pandora box for our discussions and arguments and probable solutions. Engineering evolves with conception. It gets fuelled with community discussions and capitalist actions. All stakeholders start realising the need to take a closer look and help improve standards as we have seen in the past century. Surely it makes the world a better place.

Wish you all a better luck this time.

Do spread the word.

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