CEEAMA™
Consulting Electrical Engineers Association of Maharashtra

CEEAMA E-NEWS

Published by Consulting Electrical Engineers Association of Maharashtra

CEEAMATECH 2023

10TH JUNE 2023 @ THE DUKES RETREAT, LONAVALA

Supporting Organisations

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ONE DAY CONFERENCE ON

ELECTRIC VEHICLES (EV) CHARGING INFRASTRUCTURE - CHALLENGES AND OPPORTUNITIES

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

CEEAMATECH 23 Inauguration at the hands of dignitories

Electrical Consultants Newsletter
Volume No. 4 Issue #31
July 2023

CEEAMA Governing Council
Directors

Mr. Veejhay Limaye
Hon. President

Mr. Chidambar V Joshi
Hon. Secretary

Mr. Ulhas Vajre
Hon. Treasurer

Directors

Mr. Narendra Duvedi

Mr. Arvind Gadre

Mr. Ambuj Rastogi

Mr. Anil Bhandari

Mr. Subhash L. Bahulekar

Mr. Mohan Kelkar

Mr. Krishna S. Chandavar

From the Editor's Desk,

Greetings to all CEEAMA Members..!!

The recent news were dominated with Monsoon, Maharashtra politics, and off course the change of guards at CEEAMA.

Yes, we have new office bearers for CEEAMA now. In our 75th Governing Council Meeting held on Wednesday, June 28, 2023 in Pune, we elected new President, Secretary & Treasurer as a part of routine rotation every two years.

On behalf of all CEEAMA members, I would like to express our gratitude to the retiring team.

Grateful to our former Hon. President, Mr. Narendra Duvedi for his untiring contribution for the growth of CEEAMA by ensuring increased visibility at IEEMA, ICA, BIS & having built up contacts, which will be useful for CEEAMA. His tenure as Secretary and President for the last 4 years will be intensely remembered.

Grateful to our former Hon. Secretary, Mr. Veejhay Limaye who has shown his capabilities in organising programs at Sangli / Kolhapur and unique skills exhibited in increasing participation for the program, at Lonavala CEEAMATECH. We are fortunate that now he takes over as our new Hon. President.

Mr. Chidambar Joshi is new young blood as the new Hon Secretary of CEEAMA.

Grateful to our former Hon. Treasurer, Mr. M.M. Kelkar who has been carrying the Treasurer's post successfully for several years. His contributions to CEEAMA's well-being is exceptional and difficult to put in words. For the last several years our accounts were successfully prepared, presented at AGMs and EGMs, only because of his silent & effective working.

Mr. Ulhas Vajre, perhaps the only registered Chartered Electrical Safety Engineer (CESE) with CEEAMA is now appointed as the new Hon. Treasurer. We take this opportunity to congratulate Mr. Vajre on becoming Chartered Electrical Safety Engineer as per CEA guidelines.

The new office bearers. Mr. Limaye (President), Mr. Chidambar Joshi (Secretary) and Mr. Vajre (Treasurer) will assume the office from 1st Aug 2023. I congratulate all of them and offer my best wishes for future work for our organization.

This editorial is incomplete without mentioning our gratitude towards our past members and hon. GC members Mr. Gadre Sir and Mr. Rastogi Sir who retire and remain guiding us in their own personal capacity. We wish them good health and long life!

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

Subhash L. Bahulekar
Editor-in-Chief – CEEAMA

Outcome of CEEAMATECH 2023

From the desk of Ex-President CEEAMA.

CEEAMATECH 2023 was yet another successful event by CEEAMA concluded on 10th June 2023. This time we tried a venue between Pune and Mumbai on experimental basis and Dukes retreat Lonavala turned out to be an enviable choice. Over 200 delegates attended the event paying registration fees and total count was 262. Many thanks for those who attended and special thanks to those who propagated the message.

Many thanks for all our co-hosts and supporting organisations who supported us wholeheartedly. Special thanks to all our speakers who whole heartedly contributed and shared their knowledge and expertise with all delegates.

The synopsis of takeaways from the work shop are as follows.

EVs will definitely reduce tail pipe pollutions caused by conventional vehicles in cities and where ever they ply.

Availability of electrical energy at point of use for EV charging needs further debate. Distribution network strengthening may be required at many places

It appears that installed generating capacity is sufficient, however to support predominantly night charging profile may need upscaling of thermal generation unless solar energy harnessing is done with energy storage. Impact of wind plus solar needs to be studied in detail.

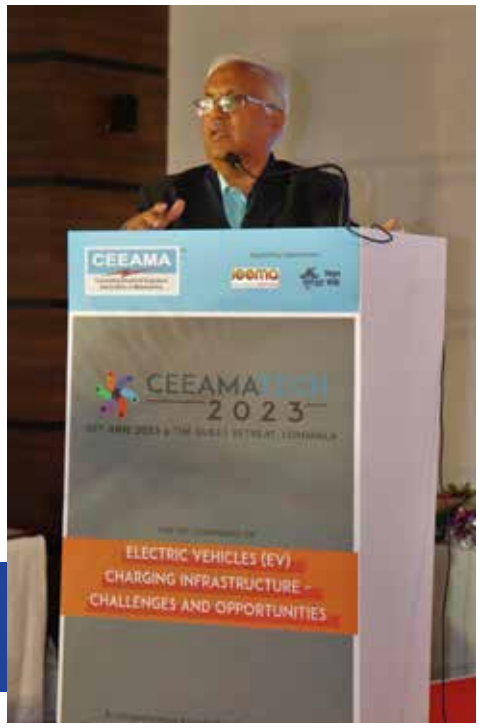
Refining above solutions along with tariff modulation are required to force users to charge their vehicles using green energy and outcome of this will decide whether the EV revolution will lead to sustainable future.

Lithium ion batteries will have good buy back value so battery replacement will not be as costly as it looks today.

AC chargers supply AC power to Onboard chargers mounted inside vehicles using standard connectors. They offer slow / top up charging.

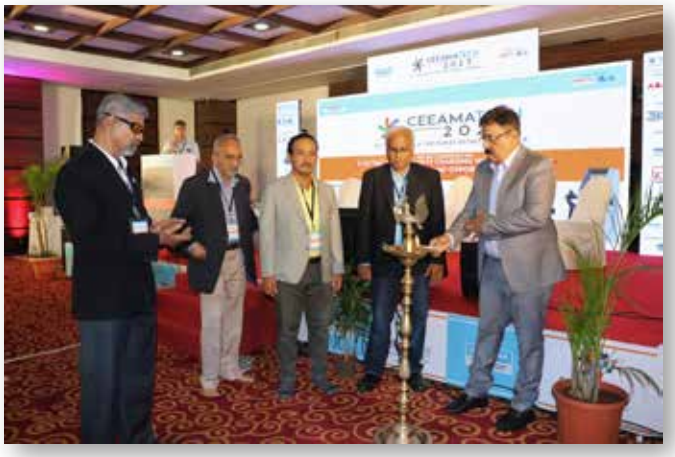
DC chargers are high power chargers and available with different power outputs and can offer fast charging.

CEEAMA made genuine efforts to cover many aspects of EV infrastructure. Your feedback and suggestions are most welcome.. Requesting all members and associates to send them on admin@ceeama.org.



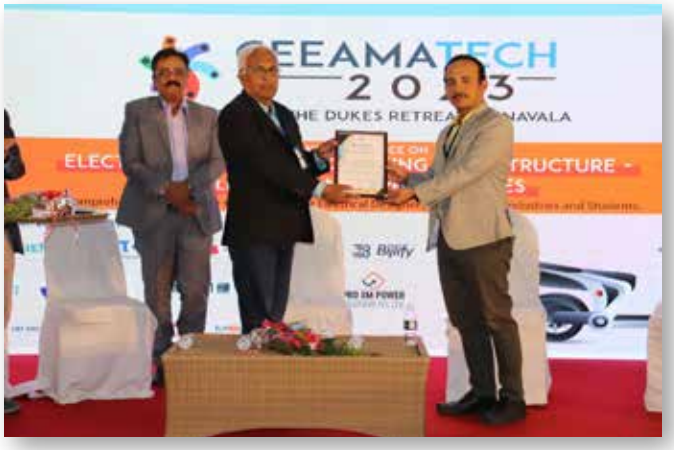
Mr. Narendra Duvedi,
Hon President CEEAMA (2022-23)
addressing the audience at CEEAMATECH 23

CEEAMATECH 2023 Inauguration Ceremony



Guest of Honor Mr. Shashi Ameen lighting the lamp

President Mr. Narendra Duvedi lighting the lamp



President welcoming Mr. Santosh Patni

Left to Right - Mr. Mohan Kelar (Treasurer), Mr Narendra Duvedi (President), Mr. Shashi Ameen, Mr. Santosh Patni, Mr. Veejhay Limaye

Felicitation - Mr. Ambuj Rastogi

Felicitation - Mr. Arvind Gadre

Felicitation - Mr. Mohan Kelkar

Intelligent MCCs for Industries

Progress and growth seems to be the buzzword of the Industry. As Industries grow, the more complex are the processes associated with it. Co-ordination between various processes becomes more and more critical and difficult. Every process forms an important part and the smallest downtimes can cause huge monetary losses.

Automation is making process control smoother and can reduce or even eliminate human errors. Thus, integration of various processes with the best automation systems can give a massive boost to productivity and reliability. Power Control/ Motor Control centers have been efficiently performing the task of Protection and Control. However, in the complex industries, another task of Management (Load/Power Flow) is also needed. Thus it is now time for conventional switchboards to be elevated to Intelligent (I-PCC/ I-MCC) to manage various Industrial processes.

As motors form the heart of Industrial processes, the focus is on advantages of I-MCC over conventional MCC. Conventional motor control centers (MCC) are made of individual motor control units (feeders). The main circuit of these typically contains a MPCB/SDF(S/C), relay (O/L) and Contactor (Switch).

The control circuit shall have relays and timers for individual control. The individual feeders are controlled through local PBs or through PLC/DCS for remote operation. Thus, there shall be one cable for every parameter control from every feeder. All these cables shall be collected in a Marshalling Tier and then taken to the Automation device by means of Multi-core Cables. The disadvantages of the method can be listed as below:

1) High installation times.
2) Larger FSI due to marshalling tier
3) Low reliability.
4) Slow fault detection and higher downtimes.
5) High maintenance cost
6) Higher inventory due to number of control devices.

In an I-MCC, we add Intelligence to the system by providing a Motor Management device. This device replaces all the control devices (Relays/Timers) by a single product. It acts as a local management device by collecting all the control data and communicating it to the Automation level. By using various communication protocols like PROFIBUS/MODBUS, we can have a very fast response times. This completely eliminates Marshalling tiers and Multi-core cables. A single device can cover multiple functions like Motor Protection, Intelligent Control, Data Communication as well as Data Evaluation. Thus it gives following value additions to the system:

1) Extended protection functions for Motor (Under voltage/Locked Rotor/Earth Fault and more)
2) Intelligent control with in-built functions like Logics, Timers, Counters, etc.
3) Motor data management (PF/Current/Load flow) for diagnostics.
4) High speed of Communication.
5) Easy to use with Customized Software.

Using an I-MCC provides benefits to all functions in an Industry. With improving technology, Cost of I-MCC has come closer to a conventional system. With very short payback periods, I-MCC can offer significant reductions in Life Cycle costs.

Many leading Switchgear and Automation manufacturers are now offering customized solutions for I-MCC in Industries.

Article by

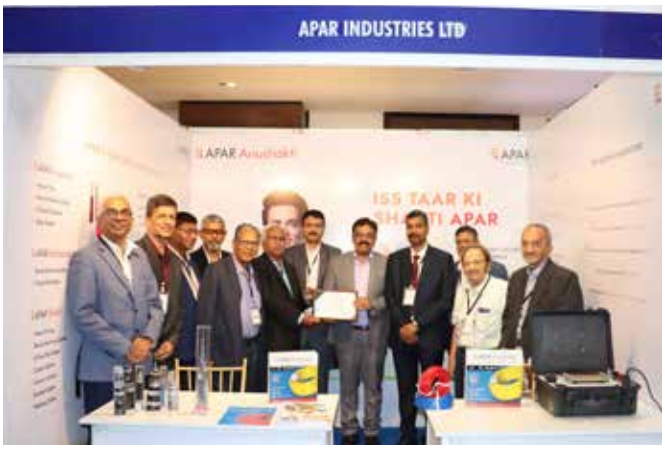
Abhijeet V Limaaye

V. L. Engineers

CEEAMATECH 2023 Exhibition Stall holders Felicitation

Mr. Ambuj Rastogi, Mr. Arvind Gadre and Mr. Mohan Kelkar inaugurating the Exhibition Stalls

CEEAMA Directors visiting and Felicitating the Stall holders



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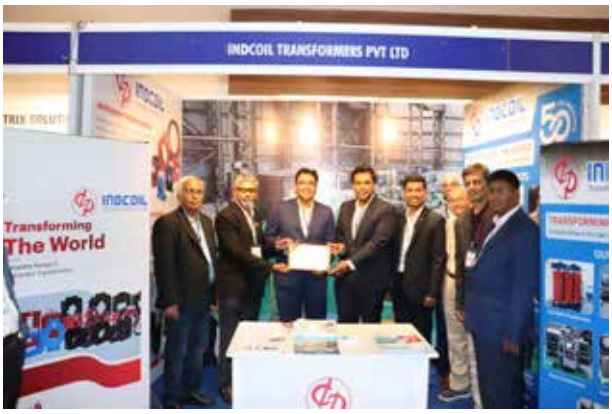
CEEAMATECH 2023 Exhibition Stall holders Felicitation



Operation of Switchgear under extreme operating conditions

As Industries have grown, the world has started shrinking. We are now entering the era of Global Village. Areas once considered inhospitable are now turning into neo-modern industrial hubs. Hence, all electrical equipment are now expected to operate under extreme ambient temperatures.

The Electrical standards define certain conditions as standard and all switchgear are expected to operate at their rated capacities in those limits. IEC 60947 defines following parameters :

Temperature: -5 to 40 deg C

Altitude: Less than 1000m above sea level

Let us try and understand effects of extreme ambient conditions on switchgear performance.

1. High Temperature: The insulation for switchgear is subject to thermal stresses. At a specified ambient, the temperature rise is limited by insulation classes. Hence, as ambient temperature rises, temp. rise allowed decreases. Hence, the switchgear has to be derated to achieve permissible temp. rise.

2. High altitude: As we know, switchboards use air as a cooling medium. As the altitude increases, air becomes rarer and cannot provide the same cooling effect. Hence, derating with altitude becomes necessary.

3. Low Temperature: We have all read about superconductors. At low temperatures, insulators lose their insulating properties. There is possibility of breakdown in Air as well as other insulating mediums at low ambient temperatures. Hence, proper care must be taken.

The question that now arises is how we can tackle the adverse conditions to ensure a smooth operation. Using following methods a standard environment can be maintained inside the switchboards.

1. Forced cooling: This has to be used in case of high temperature conditions if derating is not permissible. By using fans and louvers, ventilation can be improved to limit temperature rise.

2. Space heating: Space heaters perform a dual task of tackling high humidity as well as low temperature. Anti condensation heating will ensure standard operating environment inside the switchboard.

3. Protected Installation: By providing a high degree of protection like IP65, we can have strong resistance against wind, snow and precipitations. By using anti-corrosive methods, we can cover a wide range of protection.

Please note that the above limits as well as methods suggested are only guidelines. With improved engineering, manufacturers are extending their operating ranges and new methods are being developed to tackle the adverse conditions.

Article by

Abhijeet V Limaaye

V. L. Engineering

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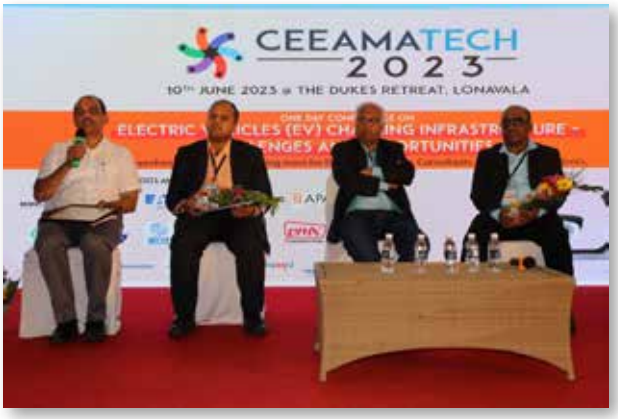
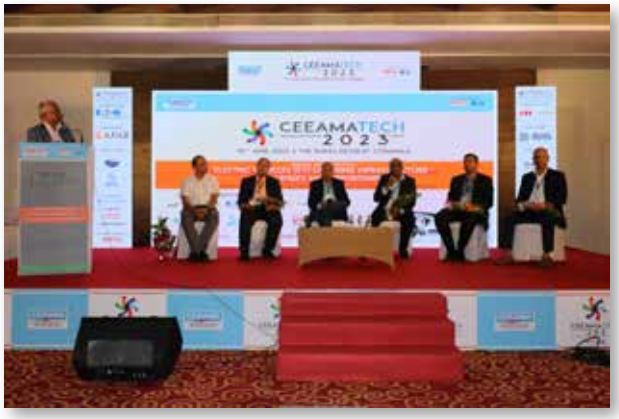
CEEAMATECH 2023 Panel Discussion





Variable Frequency Drives - Possibilities and Considerations

Motors form the heart of industrial processes. Hence, a significant part of growth in industrial engineering can be attributed to advances in Motor control technology. The impact of Intelligent MCCs has already been discussed in the earlier sections. We shall now discuss the effect of Variable frequency drives on energy savings as well as industrial process optimization.

Variable Frequency Drives are primarily used for motor speed control (predominantly replacing throttle in pumps). However, following possibilities are overlooked many a times:

1) Soft start – Conventional soft starters can achieve soft starting by reduced voltage method. However, this also causes a significant reduction in starting torque which eventually leads in high acceleration times. Reduction in mechanical stress is achieved at the expense of increase in electrical stresses. On the other hand, VFD utilizes V/F method for speed control wherein a constant torque can be maintained with lower inrush currents. Thus, acceleration is smoother with lesser electrical stresses. This is typically important in loads with high starting torques (e.g. Ball mills, Crushers, Centrifuges).

2) Soft stop – In applications requiring high braking torque like hoists and conveyors, an abrupt stop is undesirable and will result in mechanical shocks and hazard to equipment and personnel. Also in case of water pumps, we have to take into consideration 'water hammer' effect. Hence, we have to ensure a smooth deceleration with precise control. A VFD with V/F control can provide us accurate control for stopping times customized to load requirement.

3) Regeneration –In cases when load inertia can overhaul the motor while braking, we can make the motor run as a generator wherein it can be used to feedback excess energy back to the utility. This is known as regenerative braking. With precise control with VFD, the deceleration time can be adjusted to provide us the best possible energy savings. This is typically true in case of heavy loads like Cement Mixers, Hoists and Cranes.

4) Position Control- Some of the delicate machines like CNC and Packing need precise position control. By using a VFD in the system, the best motion control can be achieved.

5) Energy saving through speed control – This is one of the most common and primarily sought after benefit of VFDs. A lot of research has been done into it. I would like to sum up the various possibilities as below :

Sr.no.	Type of Load	Power	Torque	Application	Potential for Energy Saving
1	Variable Torque	Varies as cube of speed	Varies as Square of speed	Pumps/Centrifugal Fans	Lower speed operation drastically reduces energy consumption
2	Constant Torque	Varies directly with speed	Constant	Mixers/Conveyors/ Compressors	Moderate energy savings at lower speed operation
3	Constant Power	Constant	Varies in-versely with speed	Machine tools/Lathe	Precise control is achieved by selecting optimum operating speed

While using a VFD can provide us with multiple benefits as listed above, some of the following considerations need to be made before using it in the system:

1) Capital investment – Integrating a VFD into any process will result in additional capital investment. Though VFD might provide us with energy savings, careful payback calculations should be made before taking any decision.

2) Power Quality – VFD works on PWM (Pulse Width Modulation) technology thus injecting non-linear current harmonics in the system. This will result in electrical stresses on the motor as well as voltage harmonic distortion at supply end. It will also result in lowering of Power Factor. Deterioration of Power Quality results not only in additional costs but also penalties from utility. Hence, THD levels as well as PF variation with load needs to be studied carefully before selecting suitable drive.

Thus, before selecting a drive, one should balance out the benefits and application possibilities against capital and loss of power quality wherein we can achieve best possible solution for our industries.

Article by

Abhijeet V Limaaye

V. L. Engineers

CEEAMATECH 2023 Presentation Sessions by Co-Hosts

Thank You

We extend our warmest gratitude to the Chief Guest, Guest of Honor, the Honorary Speakers and all the Co-Hosts for your dedication and involvement in the grand success of CEEAMATECH 23. Your contribution has not only benefited the participating delegates but has also elevated the reputation of our organization as a platform for thought-provoking discussions. We would be thrilled to collaborate with you again in the future and continue fostering insightful dialogues.

To all the Delegates, your participation has made a difference, and we are truly grateful for your support.

Team CEEAMA

Eaton

ABB VIVID

APAR

Bijlify

CEEAMATECH 2023 Presentation Sessions by Co-Hosts

Pro SM Power

Belectriq

Graycell

PMX

INDCOIL

WINNERS OF QUIZ
JUNE 2023

SATISH SAWANT
LFM - 131
PETROFAC ENGINEERING INDIA P. L.

ANANT KUMBHAR
LFM - 125
JACOBS ENGINEERING (I) PVT. LTD.

RUPESH JOSHI
M/S SWATI ENTERPRISES

OMKAR RAMDAS JAGTAP
BVJNIOT

Congratulations

WINNERS OF QUIZ
JUNE 2023

JAYWANT S THORAT
M/S VISION VIDYUT ENGINEERS PVT LTD

JIVAN GANGAWANE
M/S PRAJ ELECTRICALS

AMAYE ABHAYKUMAR GATALAWAR

ONKAR MADHUKAR KULKARNI
GHRIET (STUDENT)

Congratulations

WINNERS OF QUIZ
JUNE 2023

ASHISH KORDE
M/S- GRAYCELL

SNEHA SURESH PIMPARE
ZEAL POLYTECHNIC (STUDENT)

PRADIP PARMAJ
STUDENT

SAMIT THORA
TATA MOTORS LIMITED

Congratulations

QUIZ JULY 2023

1) Cable glands can be of
   A. Aluminium
   B. SS
   C. Plastic
   D. Any of these

2) When the rotor of 3 phase induction motor run at synchronous speed, its rotor frequency will become
   A. equal to supply frequency.
   B. half of supply frequency.
   C. zero.
   D. very high.

3) When rotor resistance of a three-phase induction motor become equal to its rotor reactance, its starting torque will be
   A. zero.
   B. maximum.
   C. unity.
   D. Minimum

4) DSM programs and initiatives include
   A. Energy reduction programmes
   B. Load conservation program
   C. Load shedding in off-peak period
   D. All of these

5) AC/DC Drives are used to
   A. Act as Coupler between Load & motor
   B. Drive mechanical load directly
   C. Act as Motor starter
   D. All of the above

6) Busduct choice depends upon
   A. Load current
   B. Distance from power source
   C. Termination suitability
   D. All of the above

7) 37.5kW Induction motor, 4p, Eff.-0.92, p.f.-0.87, V-415V 3ph. - I=?
   A. 50.5
   B. 65.18
   C. 45.15
   D. 60.82

8) Fire Alarm System
   A. Centrally monitored at Control room
   B. Detects fire
   C. Both A & C
   D. Detects Smoke

9) Earth Fault monitor
   A. Detects leakage
   B. Detects fault current
   C. Detects fault voltage
   D. None of the above

10) Types of Relays
   A. Digital
   B. Electro-Mechanical
   C. Static
   D. All of the above

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/vy2s4ZVo7FfqFG2r6

"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.

June 2023 Quiz Answers

1. D – Any of these
2. A – Zero
3. B – Maximum
4. A - Energy reduction programs
5. A - Act as Motor starter
6. D - All of the above
7. B - 65.18
8. D - Both A & C
9. A - Detects leakage
10. D - All of the above

NEW REGISTERED CEEMA MEMBERS in 2023

Welcome

LFM

DR. GEETANJALI ABHIJIT VAIDYA
M/S SAS POWERTECH PVT LTD

AM

M/S DIGVIJAY INDUSTRIES
SHRIRAM SHINDE
MAHESH MANE
NITIN MOHARIL

M/S EETAMAX ENERGY SOLUTIONS PVT LTD
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M/S INFINITY ENGINEERING COMPANY
CHARUDATTA VASANTRAO PATIL

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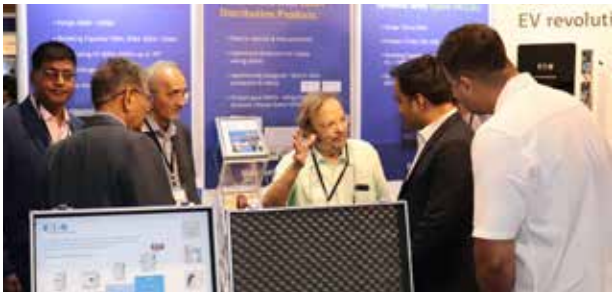
CEEAMATECH 2023 Team behind the Success



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A-103. Sanpada Railway Station Building, 1st floorSanpada East, Navi Mumbai – 400705
Email: admin@ceeama.org