



Hope Foundation's
**Finolex Academy of Management and
Technology, Ratnagiri**

ELECTRICAL ENGINEERING DEPARTMENT

Presents

VOLTVOICE

Ideas Light the Path of Innovation

Issue 1 May 2024

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ELECTRICAL ENGINEERING DEPARTMENT

Ideas Light the Path of Innovation



About Department

This new age, the age of Technology, dawned with the discovery of Electricity and the subsequent development of Electrical Engineering. Equipped with modern infrastructure and supported by a team of competent faculty members, the Electrical Department at FAMT was set up in 1997. FAMT understands the importance of Electrical Engineering and is fully capable of meeting the expectations of young aspiring Engineers.

The Electrical Engineering Department emphasizes rigorous training in analytical and experimental techniques, effectively giving students an integrated approach and a thorough understanding of how to solve problems and, more importantly, equipping them to face the challenges in Industry. These laboratories host a wide range of modern equipment. The Department is also equipped with an advanced computer centre apart from the centralized one, which houses 32 PIV PCs. Modern Engineering simulation software like MATLAB® is used to aid experiments and illustrate the theory.

The Departmental library is an additional academic resource available to students. A separate reading room is also available in the Department for students who wish to access the Departmental library. The success of the Department is reflected in the projects carried out by the students. Some of them, especially the Green House Automation, have received many national awards. Our commitment to holistic development has seen our students perform exceptionally well in many national-level and university examinations and be awarded prizes in various co-curricular activities.

HOD's Desk



I am delighted to share that the Department of Electrical Engineering is coming up with its departmental magazine to showcase our academic journey, technological innovations, student and faculty achievements, workshops, industry interactions, and a wide array of technical and creative pursuits. Since its inception in 1997, the department has consistently upgraded its infrastructure and academic practices to align with emerging trends in Electrical Engineering.

Our well-equipped laboratories and computer centers complement the university curriculum and support hands-on learning. The department is home to qualified and dedicated faculty members with expertise across diverse domains like Power Systems, Control Systems, Electrical Machines, Power Electronics, and Digital Design. To bridge the gap between theory and practice, we regularly organize industrial visits, hands-on workshops (like PLC, Energy Audit, Proteus, PCB Design), and guest lectures by experts from academia and industry. These initiatives aim to enhance our students' practical exposure and make them industry-ready.

This magazine also reflects the creative spirit of our students and faculty through articles, poetry, and artwork. The Alumni Corner connects us with our graduates, whose insights and industry experiences are a valuable resource for current students.

I take this opportunity to congratulate the editorial team for their sincere efforts in compiling this magazine. Their dedication has resulted in a vibrant platform that reflects the talent and hard work of the Electrical Engineering family. Wishing the entire team great success for this wonderful initiative!

Warm Regards,

Dr. Jayant J. Mane
Head of Department



Editorial Board



Greetings from the Editorial Board !!

I am pleased to present the May 2024 issue of the Departmental Magazine – VoltVoice. This edition brings together thoughtful articles that reflect the insights, knowledge, and experiences of our department. Through this publication, we aim to nurture a culture of expression, critical thinking, and academic curiosity among our students and faculty.

Let this magazine serve not only as a platform for sharing information but also as a source of inspiration and motivation for all readers. I extend my heartfelt thanks to the Management of FAMT, our Principal Dr. Kaushal Prasad, HOD Dr. Jayant Mane, and our dedicated student editors for their commendable efforts in making this magazine a meaningful publication. We always welcome your suggestions to help us improve further.

Sincerely,

Prof. Suhas Mhabadi

Assistant Professor

Department of Electrical Engineering

STUDENT EDITORIAL TEAM



Shraddha Rajeshirke



Maithili Shigvan



Rutvik Bhatkar





Institute Vision-Mission



● Vision:

The academy aspires to nurture students as leaders who are in tune with global trends, equipped with engineering knowledge and practical skills, to excel in creativity and innovation in order to play their part in technological advancement of the nation.

● Mission:

M1: To become foremost seat of advanced technical learning as a center of excellence in the region.

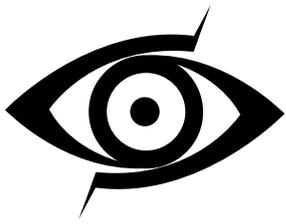
M2: To offer state of the art facilities and quality education at affordable cost.

M3: To inculcate in students the culture of 'Play Hard and Play Fair'.

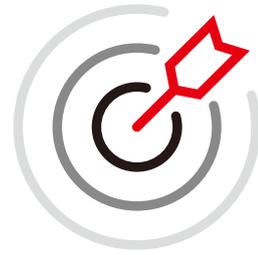
M4: To advance sustainable development in the region through opportunities for entrepreneurship and industry-institute interaction.

M5: To create a generation of young professionals who appreciate in all its aspects the necessity of balance between technological advances and traditional values.





Department Vision, Mission, PEO & PSO



● Vision:

The department shall become foremost seat by imparting advanced and progressive education in Electrical Engineering along with excellent professional skills and character to meet industrial and social challenges.

● Mission:

M1: To ascertain qualitative teaching-learning process through the art of teaching pedagogy and meticulous continual assessment.

M2: To provide a supportive environment that facilitates industrial exposure to produce quality engineers who will excel globally.

M3: To promote the versatile development of students through training of soft skills.

M4: To imbibe moral, ethical and social values among students.

● Program Educational Objectives (PEOs):

PEO1: Students should be able to have successful career or pursue higher studies to meet future challenges of technological development.

PEO2: Students should be able to pursue analytical and logical skills that will enable them to analyse and design Electrical Systems and its Controls.

PEO3: Students should be able to undertake research and development activities in emerging multidisciplinary fields.

PEO4: Students should be able to achieve professional and interpersonal skills by giving an opportunity as an individual as well as a team.

● Program Specific Outcomes (PSOs):

PSO1: Students will be able to design, simulate and analyze electrical systems using software tools.

PSO2: Students will be able to understand, implement concepts of electrical systems through experiments and apply it to solve industry specific problems.

Soaring Demand Powers Growth in Electric Vehicle Insulation Market



The global shift towards electric mobility is not only transforming how we drive but also how we insulate. According to a recent report by ResearchAndMarkets.com, titled “Electric Vehicle Insulation Market – A Global and Regional Analysis: Focus on Application, Propulsion Type, Vehicle Type, Material Type, Insulation Type, and Country-Level Analysis – Analysis and Forecast, 2023–2032,” the electric vehicle (EV) insulation market is on a rapid growth trajectory.

The market, valued at \$2.96 billion in 2022, is projected to skyrocket to \$30.90 billion by 2032, reflecting a remarkable compound annual growth rate (CAGR) of 27.83% over the forecast period.

What’s driving this exponential growth? A growing emphasis on advanced, lightweight, and highly efficient insulation materials tailored specifically for electric vehicles. As EV adoption accelerates across the globe, the need for superior insulation – ensuring thermal management, noise reduction, and safety – has never been more critical.

With innovations in battery technology, increased focus on vehicle range, and stringent safety standards, insulation is emerging as a key enabler of performance and reliability in next-generation electric vehicles.

Amisha Mohite - BE Electrical Engg.

Air Circuit Breaker Market Set to Grow Amid Smart Grid Expansion



The global air circuit breaker (ACB) market is poised for substantial growth, fueled by the rapid evolution of power infrastructure and grid modernization efforts. According to the report titled “Air Circuit Breaker Market by Voltage (Low-Voltage and Medium-Voltage), Type (Air Blast Circuit Breaker and Plain Air Circuit Breaker), Application (Industrial, Commercial, and Residential) and Region – Global Forecast to 2028,” the market is being driven by two major trends: increased investment in smart grid technologies and the replacement of aging electrical infrastructure.

As utilities and industries seek more reliable, safe, and intelligent systems to manage electricity, air circuit breakers are emerging as critical components for protecting power equipment from overloads and faults. Their role in enhancing operational efficiency and reducing downtime makes them vital in the transition toward smarter, more resilient grids.

From industrial plants to commercial buildings and even residential complexes, the demand for advanced circuit protection solutions is only set to rise – ensuring the air circuit breaker market remains an essential focus in the broader electrical systems landscape.

Avanee Athavle - TE Electrical Engg.

Raising the Bar: Safer Standards for Low Voltage Wires and Cables in India



India's low voltage wires and cables market is a dynamic mix of both organized and unorganized players. However, recent regulatory reforms are setting the stage for a much-needed transformation. Updated technical and safety standards governing insulated electrical cables and cords – particularly those used in homes, offices, and commercial spaces – are now being implemented to enhance quality and ensure greater fire resistance.

These revised standards aim to mitigate the risks of electrical fires, which are often caused by the use of substandard or counterfeit wiring. By enforcing stricter flame-retardant and durability benchmarks, regulatory bodies are working to ensure that only safe, high-performance cables make their way into Indian households and workplaces.

As consumer awareness grows and compliance strengthens, the market is expected to gradually shift toward organized, quality-focused manufacturers – fostering a safer and more reliable electrical ecosystem across the country.

Aditya Gaikwad - TE Electrical Engg.

India Accelerates Toward a Greener Future: EV Charging Market on the Rise



India, one of the largest contributors to global greenhouse gas emissions, has set an ambitious goal: to phase out petrol and diesel vehicles by 2030. This bold move by the Indian government is expected to significantly boost the demand for electric vehicles (EVs) and the development of supporting EV charging infrastructure across the country.

According to a new market research report by MarketsandMarkets, the electric vehicle charging stations market is projected to grow from USD 5.30 billion in 2018 to USD 30.41 billion by 2023, registering a remarkable CAGR of 41.8% during the forecast period.

Several factors are fueling this growth – including government subsidies and incentives, rising environmental awareness, and substantial investments by leading EV manufacturers. As the nation gears up for a cleaner, more sustainable transportation landscape, the expansion of charging networks will be pivotal in supporting this electric revolution.

Additionally, urban planning and smart city initiatives are being aligned to accommodate EV infrastructure. Public and private partnerships are expected to play a crucial role in accelerating deployment and accessibility across India.

Vihang Phadake - BE Electrical Engg.

Micro Inverter (DMMI) With Four US Patents



Havells India Limited has recently unveiled its revolutionary product – the Dual Mode Micro Inverter (DMMI), backed by four U.S. patents. This innovation is poised to transform the solar power industry by addressing key limitations associated with traditional inverters and microinverters.

The DMMI is equipped with an MPPT-based Solar Charge Controller, which efficiently converts DC current from solar panels into AC current. Available in two models – DMMI-800 and DMMI-1600 – these inverters can seamlessly transition between On-Grid and Off-Grid modes, catering to various grid scenarios. Both DMMI models are compatible with all types of solar module technologies. Traditional solar inverters and microinverters are highly dependent on a reference grid voltage. In the event of a power outage, they become non-operational, resulting in the wastage of valuable solar energy during daylight hours.

Havells has effectively addressed this issue with its patented Dual Mode Micro Inverter (DMMI) – a game-changer in the world of solar energy.

The DMMI functions both as an On-Grid inverter, supplying power directly to connected loads and exporting excess energy to the grid, and as an Off-Grid inverter, supporting connected loads without exporting power to the grid. In Off-Grid mode, the DMMI ensures anti-islanding, preventing any back-feed to the grid and enabling safe and uninterrupted power consumption by connected loads only.

Devdatta Chavan - BE Electrical Engg.

Sterlite Power Takes Over Beawar Transmission Limited Project From REC



Sterlite Power has recently acquired Beawar Transmission Limited, a Special Purpose Vehicle (SPV) from REC Power Development and Consultancy Limited, a wholly owned subsidiary of Rural Electricity Corporation. The project was awarded to Sterlite Power through the Tariff-Based Competitive Bidding (TBCB) process in August 2023.

Through the Beawar Transmission Limited SPV, the company will build the Green Energy Corridor project on a BOOT (Build, Own, Operate, Transfer) basis, for a period of 35 years. This is Sterlite Power’s nineteenth power transmission project in India under the TBCB process. With this project, Sterlite Power has ~INR 12,000 cr of projects under management.

Speaking on the development, Pratik Agarwal, Managing Director, Sterlite Power, said, “Sterlite Power is proud to be building the green energy corridor that will enable the flow of 20 GW of renewable energy. We are committed to delivering this critical infrastructure project on time and to the highest standards of quality and safety.” Beawar Transmission Limited will entail the construction of three integral components –

1) a 350 km 765kV transmission corridor connecting the renewable energy zone of Fatehgarh III to the substation at Beawar, 2) Construction of a 3000 MVA 765/400kV Substation at Beawar, 3) Construction of two LILO lines, covering approximately 120 km. Sterlite Power will be the first private transmission infrastructure developer in the country to implement a STATCOM.

Jay Deepak Chavan - BE Electrical Engg.

The Energy Source of Tomorrow

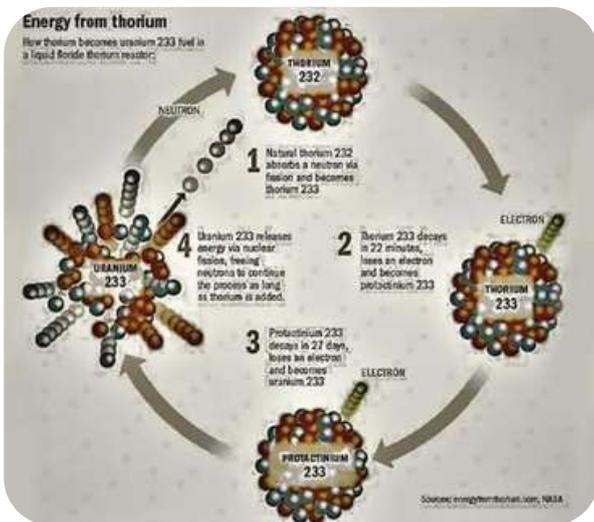


Fig. 1: Thorium fuel cycle

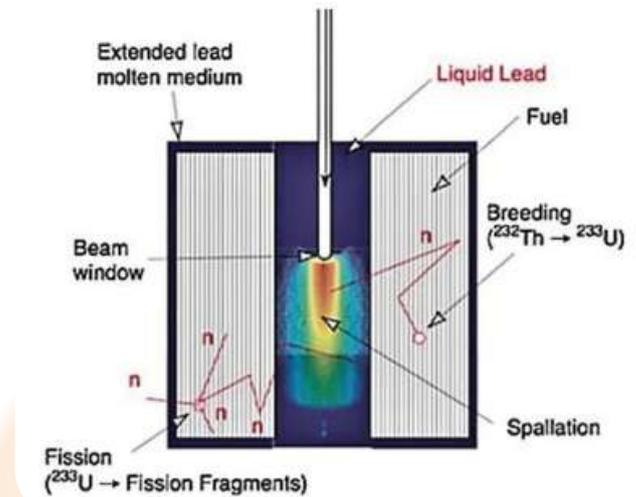


Fig. 2: Scheme showing spallation event in ADSR reactor

For many years, there has been interest in utilising thorium-232 as a nuclear fuel since it is three to five times as abundant in the Earth's crust as uranium. The cost of nuclear power generation in the conventional way is on the rise. There is great pressure from the international community to reduce carbon emissions. After disasters in Chernobyl, Fukushima, Windscale, Kysthym, etc., nuclear energy carried a dreaded stigma. So many countries are looking for a path to generate distinctly different energy that pays off in the long run. More abundantly available in India than uranium, thorium is cheaper, safer, and greener. Thorium is fertile, which means it cannot sustain a chain reaction of its own like uranium or plutonium, yet it can produce fissile material if neutrons are provided from an external source.

A thorium reactor would work by having Th-232 capture a neutron to become Th-233, which decays to uranium-233, which can undergo fission as shown in Fig. 1. The process creates energy, and once the process starts, it sustains on its own, turning more thorium-232 nearby into the same nuclear fuel. This route is very attractive to India, as India has meager reserves of uranium, but the known reserve of Indian thorium in the form of monazite in Kerala placer sand and other deposits of India is about 12.47 Mt (against the world reserve of 16 Mt) – which contains about 1 Mt of thorium dioxide.

Prachi Baghel - SE Electrical Engg.



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Recognized by : Director of Technical Education (DTE) Govt. of Maharashtra
Affiliated to : University of Mumbai

P-60, P-60/1, MIDC, Mirjole Block, Ratnagiri – 415639
Tel: 02352 228361 / 229657 / 228445 Fax: 02352 228436
www.famt.ac.in

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