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1.0 Flash News

New President of ERDA

Mr. Tapan Tripathy



Mr. Tapan Tripathy has been appointed as the new President of Electrical Research and Development Association (ERDA) Management committee. Mr. Tripathy is currently the Chief Innovation Officer of Schneider Electric, India, spearheading the Innovation initiatives, exploration of new energy Landscape & partnership with external eco-system (Start-ups, Academia, Research organisations etc.) for Schneider Electric in India.

He has earlier worked as the Vice-President & Head of R&D and Product Development for L&T Electrical & Automation and Schneider Electric India Pvt Ltd. His expertise are in

Technology development, New product design, Certification, testing, Standardisation, Product Industrialisation, Engineering Tooling and New Manufacturing Technology development. He has over 34 years of rich experience in various facets of Product & Technology development. He had established State of art, modern & fully digitalised testing laboratories for L&T Electrical & Automation.

He has been very closely associated with ERDA since 1990 as a customer and subsequently served in various ERDA committees.

New Vice President of ERDA

Mr. Srinivasan S



Mr. Srinivasan S has been appointed as the new Vice President of Electrical Research and Development Association (ERDA) Management committee. Srinivasan. S graduated from Thiagarajar College of Engineering in Madurai, Tamil Nadu in 1983 with Distinction in Electrical & Electronics.

Mr. Srinivasan has worked in various fields of engineering related to Power Generation, both conventional and Renewables, Transmission and Distribution as well as Oil & Gas sectors, in a career spanning 40+ years. He has been part of Larsen & Toubro - Power Transmission & Distribution for a large part of his career and has been heading the Engineering team for their Global operations spanning more than 25 countries.

Mr. Srinivasan has also worked overseas for more than 17 years, taking up different roles & responsibilities in Contracting, Consulting etc. He is an accomplished Electrical Engineer with experience in Engineering, Project Management and Leadership. He has managed

multi-disciplinary teams and taken up senior management positions for engineering deliveries of major projects.

He has led teams of Multi-National Organizations in Senior Management roles in his varied experience.

2.0 R&D and Expert Services

2.1 Patent Granted

Title: Voltage Presence Indicator For Safety Application in Electrical Panel

Patent No: WO 2023/195017 A1

Application number: PCT/IN2022/050950

Date of grant: 12/10/2023

This invention provides a voltage presence indicator (VPI) circuit (100) for electrical safety application in electrical panel to indicate the presence of electrical potential of one or more electrical power input lines of an AC or DC Circuit.

2.2 Expert Services

2.2.1 Root Cause Analysis of Defects in Solar Panels

Study on root cause analysis of defects observed in solar panels installed on roof top of a manufacturing plant was carried out. The problems in PV panel were observed after 1 year of installation against their expected service life of minimum 25 years. The investigation of PV panel defects was carried out using various analysis techniques such as visual examination, electroluminescence and electrical test, material analysis by Fourier Transform Infrared Spectroscopy, Stereo Microscopy, Scanning Electron Microscope and Energy Dispersive X-ray Spectroscopy.

The visual examination and electroluminescence test of solar panels indicated the discoloration defect at the bottom edge of all panels, grey colour and damaged back sheet in some panels. No corrosion or other abnormalities observed inside the diode box of any of the five panels. The performance of defect free PV panel at standard condition was observed lower than the specified (approximately 2 % reduction) range.

FTIR analysis of damaged EVA with grey color defect did not show degradation. Visual and stereo examination of grey color defect confirmed the delamination of EVA layer at defect region. The damaged back sheet showed void formations and multiple fine cracks at higher magnifications in SEM indicating the damage due to overheating.

It was inferred from the detailed analysis that the

defects in solar panels caused due to following reasons;

- i) Cracks in solar cells: The cracks in solar cells can occur due to manufacturing defect. Fragile solar cells can crack during solar wafer preparation. The high temperature heating and cooling during encapsulation process can induce thermal stresses on cells to initiate cracks.
- ii) Discoloration was observed at the bottom side of most of installed panels at site. The stagnancy of water (after cleaning/during rainy season) on panel due to low angle (5°) installation with respect to roof surface might have caused the discoloration. Although discoloration has slight impact on power reduction of panels, long term exposure can lead to degradation.
- iii) Delamination of EVA encapsulation layer: The grey color defect observed in some of the panels was possibly due to delamination of EVA encapsulation layer. Improper encapsulation which can allow water/water vapor might have resulted in delamination along the interconnect ribbons (weak adhesion regions in panels).

In order to prevent defects and further degradation in solar panels, it was recommended for;

- Thermography of panels for identification of hot spots and necessary action to replace the panel
- Frequent visual inspection and cleaning of solar panels
- Identify the panels with manufacturing defects prior to installation through thermography/electroluminescence test



Figure 2.2.1 (a) Photograph of grey colour defect in PV panels striations (a) before removal of glass (b) after removal of glass

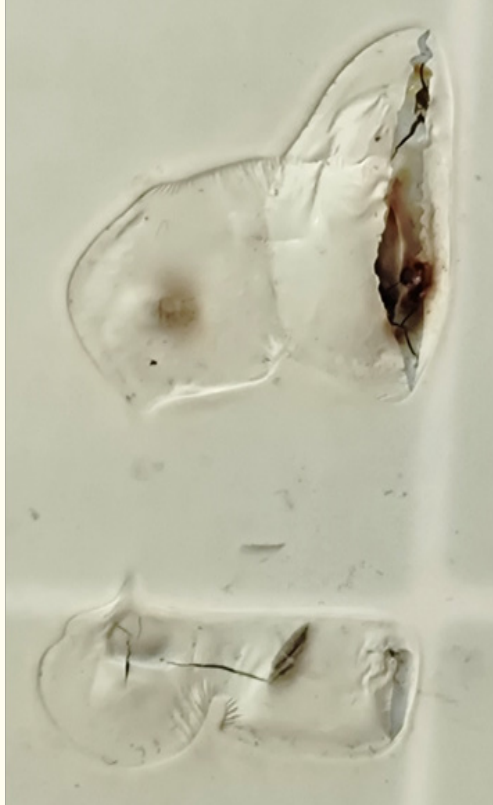


Figure 2.2.1(b) Damage of back sheet due to overheating

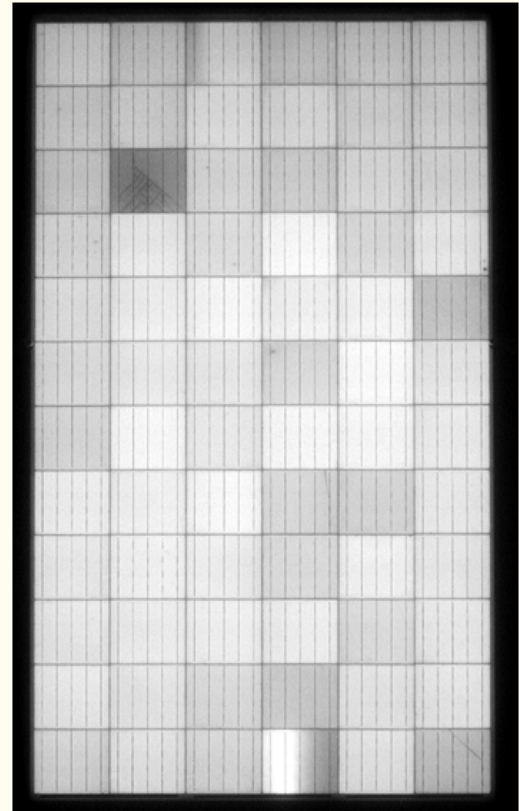


Figure 2.2.1(c) Electroluminescence photograph of solar panel indicating cracks in cell

2.3 Papers Presented

Below is the details of the paper presented by ERDA officials at a conference organised in the quarter of November – December 2023.

Sr No	Title	Author(s)	Conference /Seminar/ Journal	Organized by	Date of conference
1	Charging techniques of Electrical Vehicle and it's impact on Distribution Grid	Mr. Arpit Sheth, Mrs. Shefali Talati, Mr. Siddharth Singh, Mr. Shivam Shrivastava, Mr. Zankhit Vora	IEEE R10 HTC 2023	IEEE Gujarat Section	16 – 18 October 2023
2	Effect of Harmonics on Transformer losses	Mrs. Bhoomi Patel, Mr. Anil Khopkar, Mr. Hemang Tailor	TRAFOTECH Global 2023	IEEMA	23 – 25 November 2023
3	Stray gassing tendency of Mineral oil and Natural ester oil based insulation in transformer	Mrs. Manjusha Nambiar, Dr. Nitin Shingne	TRAFOTECH Global 2023	IEEMA	23 – 25 November 2023
4	Transformer Tap Changer Failure Study & Its Impact On Overall Condition Of Power Transformer	Mr. Manas Patra, Mr. Umesh Soni, Mr. Anil Khopkar	18 th INDIA DOBLE POWER FORUM	DOBLE	12 – 13 December 2023

3.0 Knowledge Dissemination

3.1 ERDA Workshops

During this quarter, ERDA organized workshops consisting of one and two days duration. These workshops consisted of presentations covering a range of topics, along with practical demonstrations and visits to laboratories. Participants from DISCOMs, TRANSCOs, Government Utilities, and private organizations attended the workshops. The details of the workshops conducted are as below.

1. Two days Workshop on "Evaluation of Insulators and Lightning arrestors"



Group photo of workshop participants with ERDA officials

2. One days workshop on "Evaluation techniques for Instrument Transformers (CT/PT, CTPT Units)".



Group photo of workshop participants with ERDA officials

3. One day Workshop on "Energy Conservation Techniques in Industries and Power Plants".



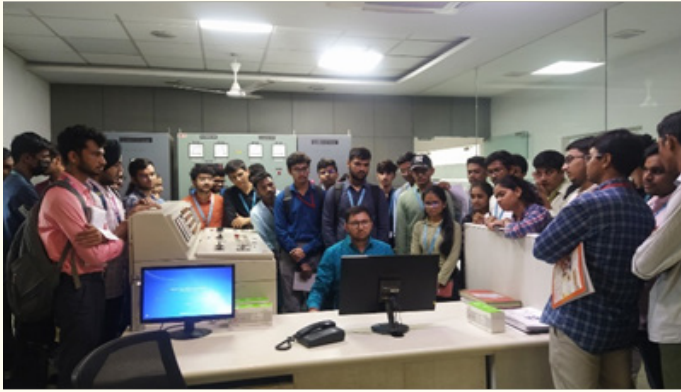
3.2 Students Visit at ERDA

At ERDA, our passion for knowledge-sharing knows no bounds. We constantly strive to disseminate knowledge in every way imaginable. As part of this, we arrange industrial visits for engineering students, enabling them to explore a world of practical knowledge. These visits offer a remarkable opportunity for students to embark on a captivating journey through diverse laboratories, where they can acquire invaluable hands-on experience.

During this quarter, we welcomed students from the following engineering colleges.

1. BVM Engineering College, Vallabh Vidyanagar
2. Chandubhai S. Patel Institute of Technology, CHARUSAT University, Changa





Glimpse of student's visit at ERDA

4.0 Visit of Customers

On 06th December, 2023, Mr. A. K. Mishra from India Air force visited ERDA, for discussion on Measurement of different parameters for project on aircraft for Indian Air Force.



ERDA experts with officials from Indian Air Force at Calibration Lab, ERDA, Vadodara

5.0 Letters of Appreciation

Positive feedback and letters of appreciation inspire us to continue striving for customer satisfaction. Here are excerpts from some of the appreciation letters received during this quarter.

5.1 Amod Stamping Pvt. Ltd., Vadodara, Gujarat

"...We are glad that your laboratory is providing us testing service. Prompt and timely service is appreciated..."

5.2 Transformers & Rectifiers (India) Ltd, Ahmedabad, Gujarat

"..."Thanks" For your prompt reply and test results with report provided in 03 days time..."

5.3 GE T&D India Limited (formerly Alstom T&D India Ltd), Vadodara, Gujarat

".....Thank you for your tremendous help for achieving CRGO results before the time...."

6.0 Customer Outreach Programme – "Sampark"

6.1 Customer Outreach Program – "Sampark" at Bhilwara

Customer Outreach Program – "Sampark" was organised at Bhilwara on 28th October, 2023 under the theme "Enhancing Reliability of Electrical System" More than 45 participants from member companies and customers in nearby areas attended the event. The program included presentations on Asset Management of Electrical Equipment, Non Destructive Techniques, Energy Audit, Due Diligence of Solar Power Plants & Expert Services of Power System for Industries, Third Party Inspection of Raw Material, Onsite Calibration of Electrical Equipment. The event was very well appreciated by participants present.



Team ERDA with customers at "Sampark" – Bhilwara

6.2 Customer Outreach Program – "Sampark" at Nashik

On 22nd November 2023, a Customer Outreach Program "Sampark" took place in Nashik under the theme "Empowering Electrical Reliability". The event was attended by over 60 participants

from member companies and customers in the nearby area. The main focus of the program was to highlight the expert services provided by ERDA, and it included informative presentations on various topics such as Evaluation of Instrument Transformers, Due Diligence of Solar Power Plants, Evaluation of Switchgear Products, Asset Management of Electrical Products, Power System Studies and Power Quality Measurement and services at Regional Lab – Rabale. All the attendees, including both members and customers, expressed a highly positive response and deep appreciation for the event.



Team ERDA with customers at "Sampark" - Nashik

6.3 Customer Outreach Program – "Sampark" at Lucknow

Customer Outreach Program 'Sampark' was held in Lucknow on December 21st 2023 Under the theme 'Enhancing the Reliability of Electrical Systems'. The event witnessed a strong turnout, with more than 90 participants from member companies and customers in the nearby area. The program's primary objective was to showcase ERDA's expert services, featuring informative presentations on a range of topics, Field Inspection of Electrical Network Third Party Inspection of Raw Material, Energy Meter Evaluation, Power System Study & Protection Audit & Services of Regional Laboratory : ERDA North

The event was met with enthusiasm and appreciation from all the attendees, comprising both members and customers.



Team ERDA with customers at "Sampark" - Lucknow

7.0 Major Contracts from Overseas Market

ERDA received major orders for onsite calibration work from overseas market. This included orders from leading transformer manufacturing companies in Dubai, Sharjah and Abu Dhabi region for their complete calibration requirement. ERDA Team executed the job within scheduled time frame of one week which was highly appreciated by customers.

8.0 HR Initiatives

8.1. Learning and Development

ERDA believes that the continuous improvement comes through constant learning and by sharpening knowledge, skills and competences of the most important asset - the employees.

8.1.1 Outbound Training:

In the 50th glorious year of ERDA, Outbound location was decided as theme of training. Outbound training is one of the most effective methods of enhancing individual and team performance and behaviour through experiential learning. This will make the individuals help in coming out of their comfort zone and start challenging their own goals for their own and organizational growth.

The topic of the training is '**Productivity Enhancement**'. The outbound training organized in pleasant weather of December 2023 - February 2024 in nearby Riparian Resort which is 35 kms from Vadodara.





Glimpse of Out bound training program

9.0 ERDA Celebration

9.1 Navaratri (Garba)

ERDA organised a Garba during Navratri in ERDA premises which was enthusiastically and with devotion enjoyed by ERDA employees. The employees played garba and after the same all employees did aarti of goddess Saraswati with little Diyas in their palms. At the end the programme was followed by the High Tea take away.



Glimpse of Navratri (Garba) Celebration



9.2 Dusshera

The Dusshera Puja was held on 24th October 2023 at Energy Meter Lab, ERDA Makarpura. The ERDA employees performed Dusshera puja with great enthusiasm and devotion. The puja material and High Tea was arranged by P&A section.



Glimpse of Dusshera Pooja

9.3 Deepawali

This year ERDA decided to celebrate Deepawali in unique way as every building was given a task of preparing the ERDA 50 Year logo with little Diyas (lamps) given to them.





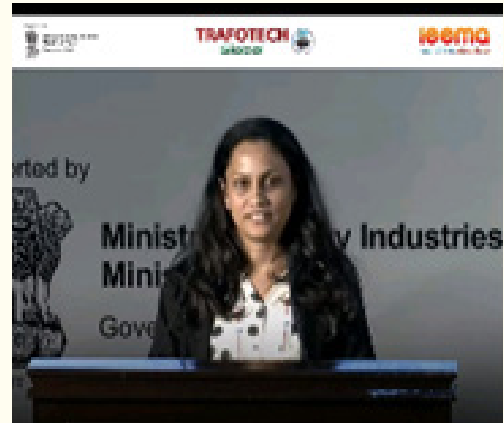
Glimpse of Deepawali Celebration with Diyas

10.0 Employee's Appreciation



Mrs. Bhoomi Patel, Deputy Manager from Metallurgy Section presented a Research Paper on "EFFECT OF HARMONICS ON TRANSFORMER LOSSES" at Trafotech Global 2023 held in New Delhi from 23-25-November 2023.

Mrs. Manjusha Nambiar, Assistant Manager from TM1 Advanced Materials Section presented a Research Paper on "Stray gassing tendency of mineral oil and natural ester oil based insulation in transformer" at Trafotech Global 2023 held in New Delhi from 23-25-November 2023.



11.0 Award & Recognition

ERDA won the Mahatma Award on 1st October 2023 at New Delhi for contributing to the society and communities in regards to electrical testing and R&D in the category of **Mahatma Award for Social Good and Impact** [NGOs | Nonprofits | Charities | Foundations | Social Workers | Volunteers | Hospitals | Social Entrepreneurs (Nonprofit)]



The Mahatma Award celebrates social impact leaders and change-makers across the globe. These organizations work towards making an impact and leading the way to a sustainable future. This award is applicable to the organizations who have made significant contributions to the society/Mankind at large.

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

(Accrediated by the National Accreditation Board for Testing and Calibration Laboratories Govt. of India)

ERDA Road, GIDC, Makarpura, Vadodara - 390 010



Contributing to Build an Atmanirbhar Bharat

NEWSLETTER

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