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1.0 R&D and Expert Services

1.1 R&D Projects Completed

1.1.1 Study on effect of accelerated thermal ageing on magnetic properties of CRGO steel

Thermal ageing may affect the magnetic properties of Cold Rolled Grain Oriented (CRGO) Steel.

In Product Standard for CRGO i.e. IS 3024:2015+1 Amd (2017), only one method is given i.e. at 225 °C temperature for 24 h & also this is not mandatory test in standard.

However, in Test Method Standard for CRGO i.e. IS 649:1997+4 Amd (2013) two methods for ageing are given –

- I. At 225 °C temperature for 24 h &
- II. At 100 °C temperature for 600 h

Hence, study was undertaken to find the difference in the effect of two different ageing treatment methods i.e. at 225 °C temperature for 24 h & at 100 °C temperature for 600 h on four different types of grades of CRGO. The study included one conventional Grade (27CG120), High Permeability Grade of two different thicknesses (23HP90 & 27HP100) & one Domain Refined grade (23HP85d).

For each grade, sample sets of strips (Size: 305 mm length X 30 mm width) of two different mills were selected. The sample sets were evaluated for Specific Core Loss Measurement at 1.7 Tesla & frequency of 50 Hz before ageing treatment. Subsequently, half of the samples were subjected to ageing treatment at 225 °C for 24 h and remaining half of the samples were subjected to ageing treatment at 100 °C for 600 h. The sample sets were evaluated at intermediate stages of 200, 400 & 600 h.

From the above measurements, the % change in specific core loss values were calculated before & after ageing for both the ageing treatments.

From the analysis of results, following mentioned conclusions were drawn –

- i. For conventional grade, the percentage change in specific core loss for both the ageing methods were same.
- ii. For high permeability grade & domain refine grade, there was difference in core-loss after two ageing treatment but difference was not significant.
- iii. Hence, it can be inferred that both the ageing treatments have similar effect on the ageing of CRGO steel and any one of these thermal ageing treatments can be utilized for evaluation purpose.

1.1.2 Study of High Voltage test on Lead-Acid Storage Batteries containers as per IS: 1146-1981 to establish the test voltage

While performing High Voltage test on Rubber and Plastics container for Lead-Acid Storage Batteries an AC voltage of 4000 V at power frequency is to be applied.

The value is obtained by a formula mentioned in Cl. No. 7.4.3 of IS: 1146-1981. However, the formula is ambiguous. The formula as per standard is mentioned below.

Test voltage, $V_{rms} = 4000 \times$ thickness of container

We had written to BIS for the same and also attended meeting at BIS office (ETD committee-11) for discussion. During the

meeting, it was decided that ERDA should study the case and give suggestion to ETD-11 committee along with data.

Hence, to establish formula for voltage to be applied for High voltage test a study was carried out with different thicknesses on two types of the containers.

For this study, Hard Rubber Containers with 7, 10 and 15 mm thickness were selected and Plastic containers with 3 mm thickness were selected and procured. Voltage test was carried out using three different formulas as follows:

1. $4000 \times \text{thickness of container}$
2. $4000 / \text{thickness of container}$
3. $4000 \times \text{sq. root of thickness of container}$

Outcome of study:

The results of HV test carried out:

Hard Rubber Containers - For all the thicknesses, containers withstood the applied voltage obtained by dividing the wall thickness of the container by 4000 as well as multiplied the Square root of the wall thickness by 4000. However, containers got punctured when the voltage applied is obtained by multiplying the wall thickness with 4000.

Plastic Containers- The containers withstood voltage for the voltages obtained by all the three formulas.

Considering the results obtained on containers, further study was carried out determining the Electric strength, kV/mm of whole containers as well as cut pieces of the containers.

Results of Electric strength of whole container and cut pieces

Container thickness, mm	BDV, kV of the whole container in water	Electric strength of whole container, kV/mm	BDV, kV of the sample cut from the container in air	Electric strength of cut pieces, kV/mm
Hard Rubber				
7	16.2	2.64	27.9	3.90
10	19.9	2.15	34.4	3.71
15	33.9	2.74	37.3	2.86
Plastic				
3	48.9 (Flash-over)	18.74	52.1	19.97

Conclusion: From the above study, it is proposed that following mentioned formulas should be used for Voltage to be applied

For Rubber Container –

Test Voltage, $V_{rms} = 4000 \times \text{Square root of wall thickness of the container}$

For Plastic Container –

Test Voltage, $V_{rms} = 4000 \times \text{wall thickness of the container}$

1.2 Expert Services

1.2.1 Power Quality Measurement at Wind Power Plant as per CEA Mandate

Power System section of R&D (TM4) has carried out power quality measurement for three Wind power plants in Gujarat. Measurement was carried out at 220 kV line at 220/33 kV substation point of common coupling level and point of interconnection level, where metering CTs and PTs were connected. Following power quality parameters were measured as per CEA guideline:

- Voltage & Current Harmonics
- Flicker
- DC current injection

Measurement were carried out for duration of one week. Based on measurement, power quality profile of the plant was identified.

As per CEA mandate, renewable energy developers have to submit the detailed report to utility / LDCs. ERDA conducted detailed study based on CEA guidelines and measurement report for the same was given to customer for further submission to utility/LDCs.

1.2.2 Power Quality & Switching Surge Measurement

As a part of root cause analysis of 33 kV Potential Transformer installed at one of the Metro stations, ERDA carried out harmonic measurement at three numbers of ASS and switching surge measurement on secondary side of 33 kV transformer. Harmonic measurement was carried out for 24 hrs. duration and for switching surge measurement, individual 11 nos. of ASS were charged one by one and waveform captured for surge if any, in system during that condition.

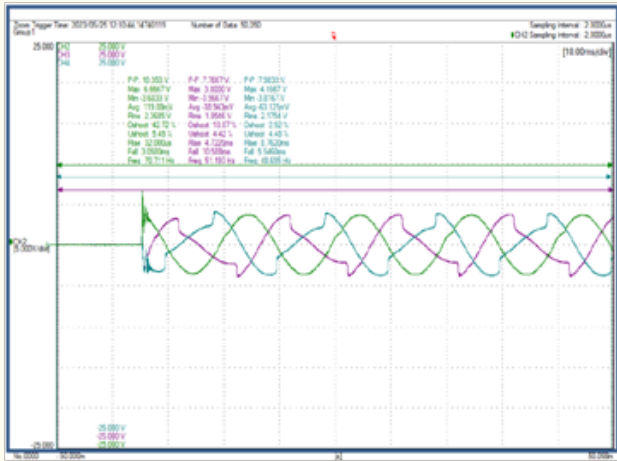


Figure 1.2.2(a): Overall voltage distribution surrounding insulator

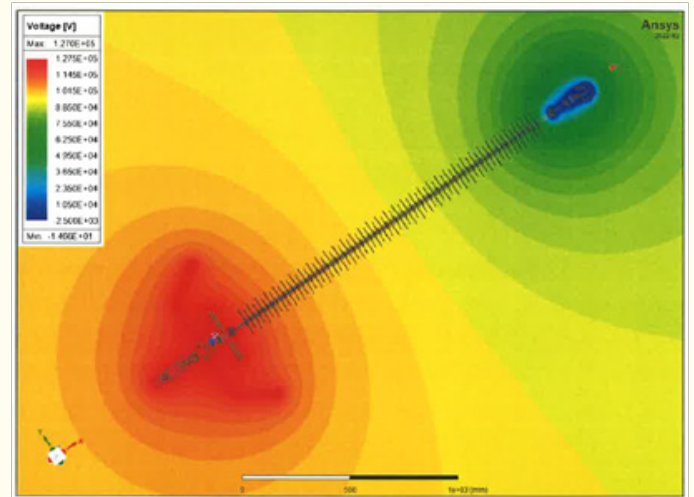


Figure 1.2.3(b): Overall voltage distribution surrounding insulator

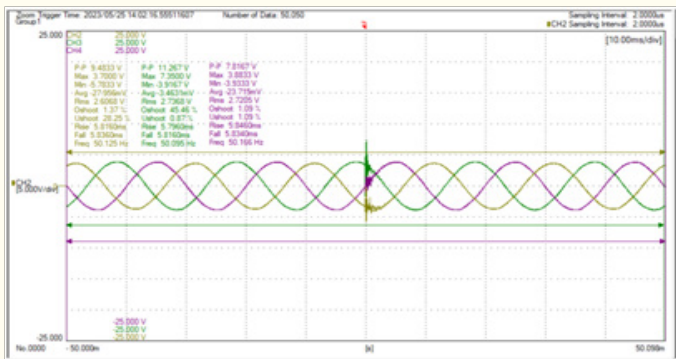


Figure 1.2.2(b): Waveform of one of the ASS Charging

1.2.3 Electrical Field Analysis of 220 kV - 90 kN, 120 kN Polymeric Insulator

Polymeric insulator design analysis study was undertaken for client. Specifically, the work involved detailed Electrostatic Field Mapping (Electric field and voltage) at RMS voltage level on 220kV -90kN and 120kN insulator. ERDA performed this study using 3D Ansys Maxwell software and provided the results of Electric Field Strength at various locations across the insulator profile.

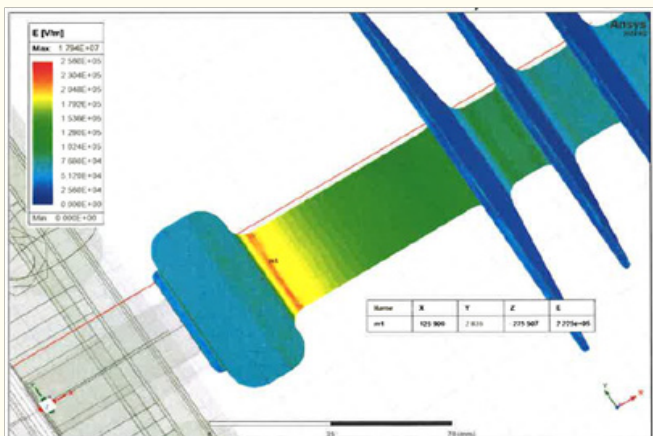


Figure 1.2.3(a): Surface E-field magnitudes on weather-shed material

1.2.4 Diagnostic testing of switchyard equipment:

During the period of April to June, 2023 diagnostic testing of total 30 LA's, 06 nos. of transformers, 42 nos. of CT/CVT, 21 nos. of motors, 42 nos. HT cables (11 kV) have been carried out. Total eight nos. of cables showed high tan delta value & recommended to keep close watch on the same. One cable showed very abnormal tan delta & increase in capacitance with voltage & same has been replaced.

1.2.5 Root Cause Analysis of 220 kV Failed Silicone Rubber Insulator

Root cause analysis (RCA) was conducted on a failed 220 kV silicone rubber insulator (SRI) as shown in photographs. The failed insulator was located in industrial area and it failed after service life of 14 years. ERDA analysed the failed insulators as well as two nearby working insulators to investigate the failure mechanism.

The failed insulator was broken approximately 37 cm from the line end tri-junction. The failed insulator was covered with thick layer of dust on silicone rubber sheath as shown in Figure 1.2.5(a). Testing of samples from failed and two working insulators did not reveal any abnormality in composite rod and silicone rubber. However, analysis of glass fibre fracture surface using Scanning Electron Microscope (SEM) showed typical surface structure of brittle fracture as shown in Figure 1.2.5(b) Brittle fracture typically results from stress corrosion cracking (SCC) in presence of acid and mechanical load (e.g. tensile).

Several cracks in the silicone rubber sheath were observed near the breaking point and close to the line end of insulator. Once water has entered inside the insulator through the cracks, acid could be generated in presence of electric field and air. This acid may lead to brittle fracture of the insulator. The thick pollution layer on the sheath surface leads to change in hydrophobic properties of silicone rubber and making it more hydrophilic. This leads to lowering the contact angle of water drop on sheath surface resulting and thereby reducing the inception voltage for corona discharges. These corona discharges lead to degradation of silicone rubber resulting in cracks which allow water ingress. Once the silicone sheath is cracked and water is entered in the insulator the degradation of composite rod is accelerated. Periodic visual inspection as well as monitoring using IR camera along with cleaning of insulators was recommended as the insulator sheath is covered with dust.



Figure 1.2.5(a): Failed polymer insulator (left) and section of insulator showing silicone sheath with degradation and cracks (right)

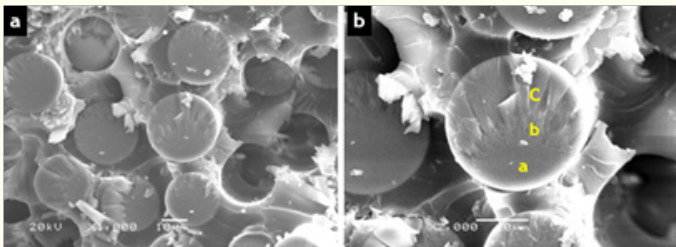


Figure 1.2.5(b): SEM images of brittle fracture surface with magnification: a) 1000x and b) 2000x

1.2.6 Root Cause Analysis of Failed Aluminium Flange of Transformer Bushing

Aluminium flange of transformer bushing was found cracked during service at installation site after a service of 1 year. The investigation of failed flange was carried out using various analysis techniques such as visual examination, NDT methods such as X-ray radiography and Ultrasonic testing (UT), optical emission spectroscopy for chemical analysis, metallography and mechanical property evaluations (Hardness and Tensile test).

The analysis of failed flange showed that the fracture of flange occurred on bottom portion of flange which was fastened with transformer. Fracture of flange occurred with radial crack formation on the flange which passed through the mountings and linked to the inner surface of flange. The crack formation was also observed on the inner surface of flange. The melting of flange at few locations observed near inner surface of flange towards transformer side.

Chemical composition, hardness, tensile strength of material met the required specifications of aluminium alloy. Percentage elongation of flange was observed slightly lower than specification. However, it may not cause the failure. Both UT and radiography test did not show presence of any defects inside the flange material. Microstructure of both failed and unused flange showed dendrites of aluminium (Al) and eutectic mixture of Al and silicon (Si) indicating properly treated structure. No abnormality observed in flange material.

The detailed fractographic examination was carried out to identify the failure mechanism using optical stereo microscope and Scanning Electron Microscope (SEM). It indicated that the fracture surface has fibrous/rough appearance throughout the failed flange. SEM microstructures clearly showed cleavage facets in fibrous/rough zone indicating brittle fracture whereas melted portion was smooth and with voids formed due to melting.

It was inferred from the detailed analysis that the failure of transformer bushing flange might have occurred due to hoop stresses on the inner surface of the flange. The probable reason for hoop stresses might be gas pressure developed due to oil burning. The melting of flange on bottom surface of flange towards transformer side indicate the possibility of arcing during failure. The detailed analysis of material did not show abnormality in flange material.

Therefore, as the failure of flange occurred due to hoop stresses on the flange, it was recommended to study electrical parameters from the point of view of operation.



Figure 1.2.6 (a): Photograph of failed aluminium flange of transformer bushing

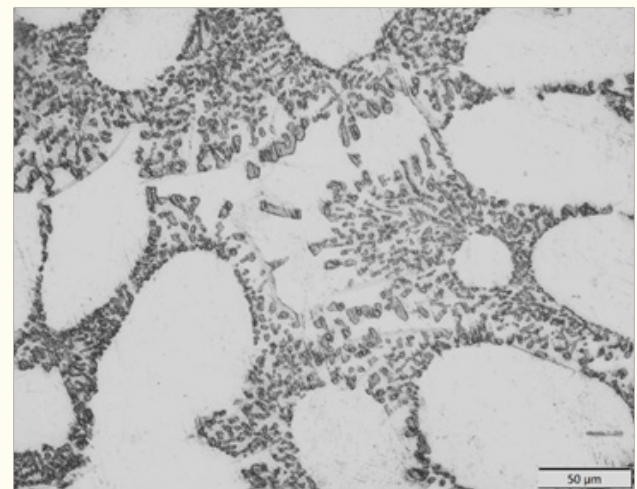
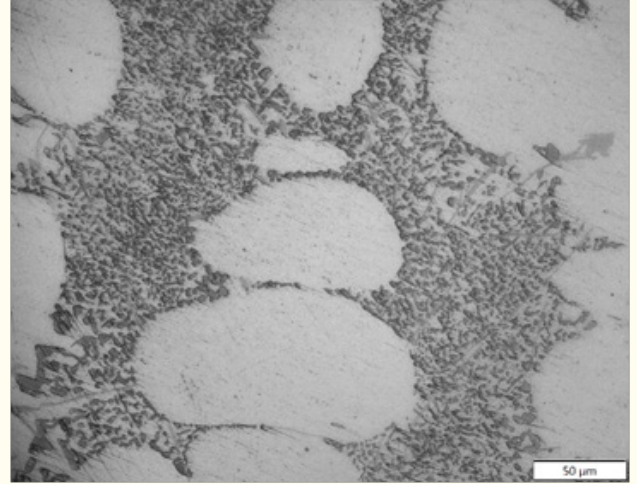


Figure 1.2.6 (c): Optical micrograph of failed and unused aluminium flange. Microstructure shows dendrites of aluminum (Al) and eutectic mixture of Al and silicon (Si) indicating properly treated structure

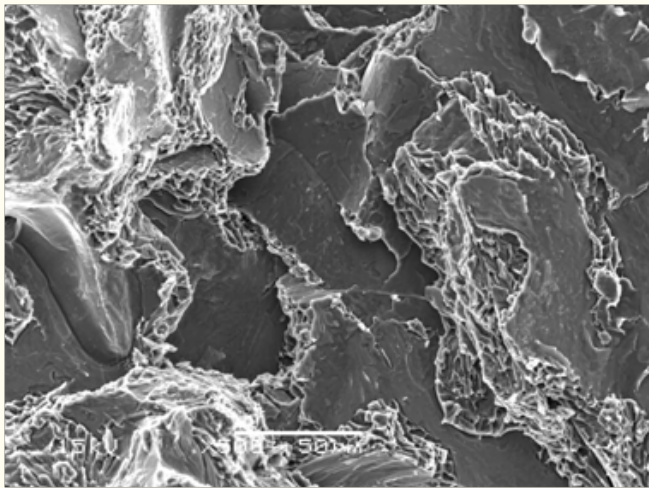


Figure 1.2.6 (b): SEM micrograph of failed flange; It shows brittle fracture feature with cleavage facets

1.3 Papers published

The list of papers that ERDA representatives presented at conferences hosted by various organisations is provided below.

Sr. No.	Title	Author(S)	Conference /Seminar/ Journal	Organized by
1	Condition Assessment and Performance Monitoring of Solar PV Module through Thermal Imaging and I-V Characteristics	Mr. Robert Macwan, Mr. Bhavesh Vasiyani, Dr. U. N. Puntambekar	International conference on Recent Advances in Applied Sciences and Engineering (RAISE 2023), 12 th – 13 th April, 2023	Maharaja Sayajirao University of Baroda
2	Implementation of ANFIS-based MPPT of a Solar PV System for Varying Atmospheric Conditions	Ms. Maitri Shah, Mr. Pramod Modi, Mr. Asheesh Dhaneria, Mr. Hardik Khambhadiya	International conference on Recent Advances in Applied Sciences and Engineering (RAISE 2023), 12 th – 13 th April, 2023	Maharaja Sayajirao University of Baroda

Sr. No.	Title	Author(S)	Conference /Seminar/ Journal	Organized by
3	ESP32 based Wi-Fi enabled Solar MPP tracker using Synchronous Buck Converter	Mr. Ashish Singh, Mr. Hardik Khambhadiya, Mr. Asheesh Dhaneria, Mr. Hiren Shah	International conference on Recent Advances in Applied Sciences and Engineering (RAISE 2023), 12 th – 13 th April, 2023	Maharaja Sayajirao University of Baroda
4	Shunt Active Power Filter Using 5 level CHB MLI For Medium-High voltage Application	Ms. Vrunda Shah, Mr. Pramod Modi, Mr. Asheesh Dhaneria, Mr. Hardik Khambhadiya	International conference on Recent Advances in Applied Sciences and Engineering (RAISE 2023), 12 th – 13 th April, 2023	Maharaja Sayajirao University of Baroda
5	Water Balance Study of Power Plants – A Case Study	Mr. Bhavesh Vasiyani, Mr. Arunesh Dwivedi, Dr. Uday Puntambekar	International conference on Recent Advances in Applied Sciences and Engineering (RAISE 2023), 12 th – 13 th April, 2023	Maharaja Sayajirao University of Baroda
6	Transformer Health Monitoring using Dissolved Gas Analysis	Mrs. Manjusha S. Nambiar, Dr. Nitin Shingne	One Day International Conference on Emerging Technologies on Electrical Systems (ETES 2023), 22 nd June, 2023	Electrical Mirror

1.4 Internal R&D Projects

ERDA undertook ten numbers of internal R&D projects on various topics of current importance to industries. Projects undertaken are as below:

Sr. No	Title
1	Evaluation of Insulator composite core rod and silicone rubber using DMA and dielectric spectroscopy
2	Development of the axial flux air core traction motor
3	Development of 3 phase AC Induction motor controller for Electric vehicle application
4	Method validation and Excel software preparation of Energy Audit of Thermal Power Plants, Process Industries, Manufacturing Industries, DISCOMs and Commercial Buildings
5	Comparative study of THRC and Partial discharge in Lightning Arrester

Sr. No	Title
6	Techniques to limit ROCOF in Renewable Power Generation Regime
7	Advance techniques for online condition monitoring of metal oxide surge arresters
8	Design and development of Islanding system for Grid tied solar inverter
9	Effect of harmonics on transformer losses
10	Design and development of controller based voltage and current module as per IEC 61000-4-19

2.0 Accreditations

- BSI surveillance assessment for Information Security Management System (ISMS) as per ISO/IEC 27001:2013 was successfully completed on 10-11 April 2023. Continuation of accreditation has been granted. Certificate is valid till 10th May, 2024.
- NABCB surveillance assessment for Third Party Inspection services was carried out on 18-19 April 2023 as per ISO/IEC 17020:2012. Continuation of accreditation has been granted. Certificate is valid till 8th March, 2025.

3.0 Knowledge Dissemination

3.1 ERDA Workshops

During this quarter, ERDA organized workshops 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 workshops conducted are as below.

1. Techniques for calculations of Measurement of uncertainty in testing and calibration



Group photo of workshop participants with ERDA officials

2. One Day Online workshop on Cable Testing organised for Intertek
3. Two day Workshop on High Voltage and Partial Discharge Measurement Techniques organised for Bharat Bijlee



Workshop participants of Intertek with ERDA officials

4. One Day Workshop on EMI/EMC Evaluation Techniques for Electrical and Electronics Equipment & Machinery

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 which, 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 last quarter, we welcomed students from the following engineering colleges.

1. Navrachna University, Vadodara
2. Maharaja Sayajirao University of Baroda
3. Government Polytechnic College, Halol
4. SAL Institute of Engineering and Research, Ahmedabad
5. Shroff S.R. Rotary Institute of Chemical Technology(SRICT), UPL University, Surat
6. Government Engineering College, Bharuch



Glimpse of students visits at ERDA



3.3 Faculty Visit at ERDA

ERDA had the privilege of hosting the Faculty Development Programme for four faculty members from Parul University, Vadodara as part of their curriculum requirement. The theme of programme was "Recent Advancement in Renewable Energy Systems and Smart Grid Technologies." These faculty members also visited ERDA's Power Electronics Laboratory and Switchgear Laboratory, where they had the opportunity to interact with our team of experts. This interaction proved to be a valuable exchange of knowledge and ideas

in the field of renewable energy systems and smart grid technologies.

3.4 BIS Meet at Rabale

“BIS MEET” was organized at ERDA, Rabale on 22nd May, 2023. More than 15 representative of Industries from Rabale, Thane, Pune and Nashik attended the meet. It was one day Training and Exposure visit for the licensees of IS 1180 from Transformers. The objective of the exposure visit was to create awareness among the industries for testing infrastructure for assessing the quality of transformer manufactured.

The program undergone with introduction, presentation, Lab visits and questionnaire round at end.



Attendees of BIS Meet at Rabale

4.0 Visit of Customers

4.1 DEWA Witness from Dubai

ERDA achieved a significant milestone by conducting first-ever short circuit test on the LV Distribution Board of M/s. HS Switchgear FZCO, Dubai. This noteworthy event took place in the presence of Mr. Ahmed Fayed, from the Dubai Electricity & Water Authority (DEWA). The test involved subjecting the 1600 A LT Distribution Board to rigorous short circuit withstand and conditional assessments.

ERDA had the privilege of hosting esteemed guests on this occasion, including Mr. Ahmed Fayed from DEWA, Mr. Nilesh Shah (Director) and Mr. Adi Sivaraman from M/s. HS Switchgear FZCO, Dubai. This collaboration allowed for an enriching exchange of knowledge and expertise.



ERDA experts with DEWA officials from Dubai at Short Circuit Lab, Savli

4.2 Witness from Vietstar Meiden Corporation – Vietnam

On 12th June, 2023, officials from M/s Vietstar Meiden Corporation, Vietnam visited ERDA, Savli for witnessing testing of 4000 A LT Panel. ERDA had privilege of hosting Mr. N. Guyen Chi Cwong, Mr. Do Van Khang and Mr. Mai Cong Bac from M/s Vietstar Meiden Corporation, Vietnam.



ERDA experts with officials from M/s Vietstar Meidan Corporation, Vietnam at Short Circuit Lab, Savli

4.3 Visit of Officials from GUVNL

On the 2nd May, 2023, a delegation from GUVNL and MGVL, led by Shri H.P. Kothari, the Director – Technical of GUVNL, along with Mr. M.T. Sangada, Chief Engineer – Procurement at MGVL, Mr. R.G. Nagariya, Additional Chief Engineer – Procurement at MGVL, Mr. D.S. Olakiya, Electrical Engineer at GUVNL, and Mr. N.N. Mansuri, Deputy Engineer at GUVNL, visited ERDA. The purpose of their visit was

to address their various testing requirements. During their visit, officials from GUVNL and MGVCL engaged in discussions with the Director and officers from ERDA.



ERDA officials with visitors from GUVNL & MGVCL

4.4 Customer Visit

Mr. Markus Vestner, the Managing Director and CEO of Pfiffner Instrument Transformers Pvt. Ltd., had an insightful visit to ERDA in Vadodara on the 23rd May, 2023. During this visit, valuable discussions took place between ERDA officials and Mr. Markus Vestner, focusing on ERDA's wide range of services and offerings.

The visit provided an ideal platform for ERDA officials to showcase their expertise and share insights with Mr. Vestner. The discussions and interactions held during the visit are expected to foster collaboration and further strengthen the partnership between Pfiffner Instrument Transformers Pvt. Ltd. and ERDA.



Mr. Markus Vestner – MD & CEO of Pfiffner Instrument Transformers Pvt. Ltd., with ERDA officials during their visit

5.0 Letters of Appreciation

Positive feedback and appreciation letters encourage us to keep working for our customers' satisfaction. Excerpts from some of the appreciation letters received are as below.

5.1 ABB India Limited, Bangalore

"...We convey our sincere thanks for providing excellent support by ERDA team for our team in conducting their test assignments, carried out at ERDA Lab. ERDA has been our preferred test lab due to its customer friendly, efficient work environment.

We expect the same excellent support for our future validation and certification requirements and wishes to continue and grow our journey with ERDA..."

5.2 Transformers and Rectifiers (India) Limited, Ahmedabad

"...I extend my sincerest gratitude and appreciation for your outstanding contributions. Your exceptional skills, unwavering commitment, and positive attitude are truly commendable. You and your team contributions have not only benefited our team and organization but have also positively impacted our clients and partners.

Your team's exceptional customer service and commitment to exceeding expectations have played a significant role in our client satisfaction and loyalty.

Thank you once again for everything you & your team do..."

6.0 Golden Jubilee Celebration by Customer Outreach Programme – "Sampark"

Electrical Research and Development Association (ERDA), India's leading professional institution in Applied Research has entered into its 50th year of service.

As a part of Golden Jubilee Celebration of ERDA, a series of Customer Outreach Programme – "Sampark" has been planned across various cities of India. The programme seeks to stimulate interaction and inspire knowledge sharing by obtaining insightful feedback from existing and potential customers regarding their requirements in various services provided by ERDA since last 50 years.

6.1 Customer Outreach Program – "Sampark" at Silvassa

Customer Outreach Program – "Sampark" was organised at Silvassa on 26th April, 2023 under the theme "Creating Connections for Energy

Transition through New Generation tools of Energy and Asset Management.” More than 35 participants from member companies and customers in nearby area attended the event. The program included presentations on Asset Management of Electrical Equipment, Energy Management, Power System Studies and Power Quality Measurement and Root Cause Analysis of Failed Components. Event was very well appreciated by participants present in the event.



Team ERDA with customers at “Sampark” - Silvassa

6.2 Customer Outreach Program – “Sampark” at Gurugram

On May 24th, 2023, a Customer Outreach Program “Sampark” took place in Gurugram under the theme “Adapting to the needs of Distribution Sector through Regional Laboratory Infrastructure.” The event was attended by over 80 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 Smart Meters, Liquid Insulating Materials (Mineral & Ester Oil), CRGO Steel, Instrument Transformers (CT/PT), Calibration of Equipment, and Onsite Power Transformer evaluation. 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” - Gurugram

6.3 Customer Outreach Program – “Sampark” at Hyderabad

Under the theme ‘Enhancing the Reliability of Transmission & Distribution Components,’ a Customer Outreach Program ‘Sampark’ was held in Hyderabad on June 23rd, 2023. 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, including Field Services for Power Transformers, evaluation of Distribution Transformers, Transmission & Distribution conductor and Hardware evaluation, Smart Meters, Diagnostics of Switchyard Equipment, Third-Party Inspection, Power System Studies and EMI/EMC evaluation Facility. The event was met with enthusiasm and appreciation from all the attendees, comprising both members and customers.



Team ERDA with customers at “Sampark” - Hyderabad

7.0 HR Initiatives

7.1 Sessions on ‘Financial and Tax Planning’

ERDA organised awareness program on ‘Financial and Tax Planning’ in May 2023 in four sessions. Out of four session, one session was made online to cover the outstation ERDA employees. The sessions were taken by Chartered Accountant Dr. Alok Shah, Senior Partner at CNK & Associates LLP. This training was organised as a part of ERDA’s 50th year of service (Golden Jubilee Celebration) to the Electrical Industries and Utilities.

The employees were enlightened on topics such as selecting the right tax regime, the importance of filing income tax returns, important provisions of the Income Tax Act 1961, the right investment opportunities. The queries related to the topics were thoroughly addressed and resolved.



Dr. Alok Shah conducting the session

Both groups had the opportunity to present their learnings, observations, and share knowledge with their fellow employees. This knowledge sharing session was arranged on International Yoga Day, 21st June, 2023.

8.0 ERDA Celebrations

8.1 National Technology Day

On May 11, 2023, ERDA commemorated National Technology Day with the theme "Leading to a Better World with Technological Advancements" at Vadodara to highlight its diverse array of R&D facilities which includes innovative technologies developed by ERDA. Shri Jatin Upadhyay, Incharge Head, Gujarat Power Research and Development Cell (GPRD), Gandhinagar graced the occasion as chief guest of the event. Director ERDA, Dr. Satish Chetwani along with Chief Guest Shri Jatin Upadhyay and ERDA HODs inaugurated the function through lighting the Lamp ceremony.



ERDA Employees' attending the Session

7.2 Knowledge Sharing Session on 'Inner Engineering' and 'HINAR'

ERDA arranged for its employees to participate in training programs organized by the Isha Foundation, Coimbatore. The employees were divided into two groups and attended the 'Inner Engineering' and 'HINAR' (Human Is Not a Resource) programs.

From the 'Inner Engineering' program, the employees gained insights into the importance of perceptions towards individuals, work approaches, emotions, and feelings in how individuals are treated.

In the 'HINAR' program, the employees learned how to maximize an individual's potential by refraining from categorizing them merely as a resource.



Lamp lighting by ERDA officials and Chief Guest Shri Jatin Upadhyay



Dr. Satish Chetwani, Director - ERDA along with Chief Guest Shri Jatin Upadhyay

On the occasion of National Technology Day technical papers presentation were given by officers of R&D and Expert Services division. These included subjects such as "Overview of Energy Storage Technologies", "DC Charger for Electrical Vehicle" and "Condition Assessment and Performance Monitoring of Solar PV Module through Thermal Imaging and I-V Characteristics".



ERDA R&D officers presenting on National Technology Day

Shri Jatin Upadhyay delivered a technical lecture on the occasion and emphasised insights on core areas of research and status of research projects conducted by GPRD cell.



Chief Guest Shri Jatin Upadhyay addressing the gathering

Annual Award distribution ceremony was also held during the Technology Day with distribution of more than 50 awards in different categories such as ERDA Awards, P. R. Deshpande Awards, Mylavaram Ramamoorthy Award, R&D – Reward and Recognition Awards, Long Service Awards.



Chief Guest Shri Jatin Upadhyay giving away the Annual Awards





Awardees of Foundation Day Awards in different categories for the year 2022-23 receiving the awards from the Chief Guest, Director and HODs.



8.2 World Environment Day

ERDA marked World Environment Day on 5th June, 2023 with great enthusiasm and spirit. The occasion was celebrated by organizing tree-planting activities in the surroundings of various laboratories. As a symbolic gesture to commemorate ERDA's 50 years of service, small plants in pots were distributed among the employees throughout the organization. These plants were specially designed with the ERDA logo as well as ERDA's 50 Years completion logo imprint, serving as a meaningful reminder of this significant milestone. By engaging in these green initiatives, ERDA demonstrated its commitment to environmental conservation and celebrated its rich history.





Employees Celebrating World Environment Day 2023



A vase with plant distributed to all employees

Plants distribution to employees on World Environment Day

9.0 Participation in Conferences

9.1 Participation in ETES - 2023 Conference / Invited talk

Mr. Anil Khopkar, Head R&D delivered expert lecture on "Recent Technologies on transformer – A methodology to monitor Hot spot temperature" at One Day International Conference, Exhibition & Award on EMERGING TECHNOLOGIES ON ELECTRICAL SYSTEM - 2023 (ETES - 2023) at SCOPE Convention Centre, New Delhi organized by "Electrical Mirror." The theme of the conference was TTNN (Transformer Technologies Now and Next). The expert lecture was delivered about ERDA developed technology to monitor the hotspot temperature in transformer remotely and remaining life assessment of transformer.



Mr. Anil Khopkar along with other experts at One Day International Conference, Exhibition & Award on EMERGING TECHNOLOGIES ON ELECTRICAL SYSTEM - 2023 (ETES - 2023)

A technical paper was also presented by Ms. Manjusha Nambiar on "Transformer Health Monitoring using Dissolved Gas Analysis" where a brief overview was done on different DGA interpretation methods, along with case study of fault in transformer captured by DGA analysis.



Ms. Manjusha Nambiar receiving memento for presenting paper at ETES-2023

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

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

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