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# VIDYUT ANUSANDHAN SAMACHAR

## QUARTERLY NEWSLETTER



**CENTRAL POWER RESEARCH INSTITUTE**

(Ministry of Power, Govt. of India)

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## CENTRAL POWER RESEARCH INSTITUTE

(Ministry of Power, Govt. of India)

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## ABOUT CPRI

The Central Power Research Institute (CPRI) was established by the Government of India in 1960. It became an Autonomous Society in 1978 under the aegis of the Ministry of Power, Government of India. For the past six decades, CPRI has rendered dedicated service to the power sector.

Over the years, CPRI has developed expertise in generation, transmission, and distribution systems. It has established world-class facilities for research and testing in the following areas:



Regional Testing Lab, Guwahati

- High Voltage, High Power, and Short Circuit testing
- Power Capacitors and Cables
- Solar PV, Smart Metering, and AMI
- Power System and Energy Studies
- Tower Design, Vibration Studies, and Seismic Performance
- Liquid Dielectrics, Diagnostics, and Condition Monitoring
- Cybersecurity, Smart Grid Systems, and Energy Storage
- RLA studies and the development of newer materials for the Power Sector

## Key Activities:

- Applied Research in Power Systems Engineering.
- Independent Third-Party National Laboratory for Testing & Certification.
- Consultancy & Field-Testing Services.
- Third-Party Witnessing & Specialized Training.

## DIRECTOR GENERAL'S MESSAGE

“It gives me great pleasure to present the latest issue of ‘Vidyut Anusandhan Samachar’ for the quarter of October to December 2025. This issue highlights the notable events that took place during this period.

Remarkable achievements include the signing of MoUs with **MePDCL, Shillong and PGCIL, Bengaluru**. Furthermore, the newly inaugurated Regional Testing Laboratory in Nashik successfully carried out its first test on a 3.5 MVA, 33/0.69kV transformer. CPRI also had the privilege of hosting the **Karnataka State Level Painting Competition 2025** on ‘Energy Conservation’ for school children.

I appreciate all CPRI employees for their consistent perseverance in upholding the aims and objectives of the Institute.”



Dr. J. Sreedevi  
Director General, CPRI

## IN THE NEWS

### ❖ State Level Painting Competition 2025

CPRI, under the aegis of the Bureau of Energy Efficiency (BEE) and the Ministry of Power (MoP), Government of India, organized the Karnataka State Level Painting Competition 2025 on the theme 'Energy Conservation.'

The competition saw enthusiastic participation from school children across Karnataka.

- Group A: 50 students
- Group B: 47 students



The prize distribution ceremony was held at the S.J. Auditorium, CPRI, Bengaluru, and was presided over by Dr. J. Sreedevi, Director General, CPRI. Sri Lahar Singh Siroya, Member of Parliament (Rajya Sabha), graced the event as the Chief Guest.



*Winners of Group 'A'*



*Winners of Group 'B'*

The event was coordinated by State Nodal Officer Shri. Ramadas (Engineering Officer) and Coordinating Officer Smt. Sahodar Gade (Engineering Officer). Prizes were awarded to the winners of both Group A and Group B categories.

### ❖ Parliamentary Standing Committee on the Empowerment of Women

Thiruvananthapuram | 28th December 2025

A CPRI delegation comprising Director General Dr. J. Sreedevi, Additional Director Smt. K.P.Meena, and Chief Administrative Officer Dr. S. Ganesh Kumar attended the Parliamentary Committee on the Empowerment of Women.

The meeting was chaired by Hon'ble Dr. D. Purandeswari, MP. During the session,

CPRI officials discussed the "Implementation of the POSH Act, 2013, and other welfare measures for Women.



### ❖ Commemorating RTL Nashik Inauguration

Dr. J. Sreedevi, DG CPRI, presented a memento to Shri Pankaj Agarwal, I.A.S., Secretary, Ministry of Power, GoI, at Shramshakti Bhavan, New Delhi. This gesture commemorated the inauguration of the Regional Testing Laboratory (RTL) in Nashik.



### ❖ Visit by Executive Director, REC Ltd.

Shri Prince Dhawan, I.A.S., Executive Director (RDSS), REC Ltd., visited CPRI Bengaluru. The Business Development & Capacity Building Service Division coordinated the visit.

A presentation were made by the Smart Grid Research Lab (SGRL), Metering Utility Automation Division (MUAD), and the SMITHA project. Accompanied by HoDs and Group Heads, Shri Dhawan visited the SGRL, MUAD, and ERED laboratories.



*Laboratory Visit at CPRI, Bengaluru*

## RESEARCH HIGHLIGHTS

### Research Highlights: R&D Schemes of the Ministry of Power

- Quarterly Progress (Oct-Dec 2025): CPRI demonstrated significant momentum in executing Ministry of Power (MoP) R&D schemes, prioritizing research excellence and national scalability.
- Project Milestones: Successfully completed several high-impact projects in EV infrastructure, advanced energy storage, AI-driven load forecasting, and renewable energy materials. These outcomes bolster indigenous technology and power sector efficiency.
- National Planning & Leadership: Actively contributed technical insights to the National Electricity Plan (2027-2037).
  - The Director General of CPRI chaired the first meeting of Sub-Committee-V on “Research and Development in the Power Sector” on October 29, 2025.
- Technical Oversight: Convened multiple committee meetings to steer research across transmission, distribution, thermal, hydro, and energy conservation domains.
- Strategic Collaborations: Strengthened academic ties with premier institutions (IITs Roorkee, Madras, and Kanpur; IISc Bengaluru; and NITs) to develop Joint Research Programs and Centers of Excellence for next-gen clean energy.

### Project in Focus:

**Title: Photocatalytic Generation of Green Hydrogen and Development of Novel Low-Cost, High-Performance Hydrogen Fuel Cell Stacks.**

Central Power Research Institute Bengaluru in collaboration with Alva's Institute of

Engineering and Technology, Moodubidre has undertaken a research project titled “Photocatalytic Generation of Green Hydrogen and Development of Novel Low-Cost, High-Performance Hydrogen Fuel Cell Stacks” under RSOP scheme of the Ministry of Power (MoP), Government of India.

**Preamble:** Hydrogen Fuel Cells (HFCs) are advanced devices for the generation of green energy. They are strategically important because eventually they reduce carbon content from the atmosphere with the elimination of fossil fuels. While solar cells powered by solar energy have matured in the last 30 years with GW capacity power stations installed in many states of India. Hydrogen fuel cells are still away from the cost-effective production, although they are highly desirable.

Presently, the major issues are the high cost of membranes and catalyst. Further, there are issues in generation of green hydrogen, its transportation and storage.

The fuel cells can be used in a wide areas of applications, such as transportation, agriculture, material handling & stationery, portable, and emergency backup for power. The market for hydrogen fuel cells is anticipated to rise from US\$ 1.91 billion in 2021 to US\$ 131.06 billion by 2030, expanding at a Compound Annual Growth Rate (CAGR) of 60.1% from 2022 to 2030.

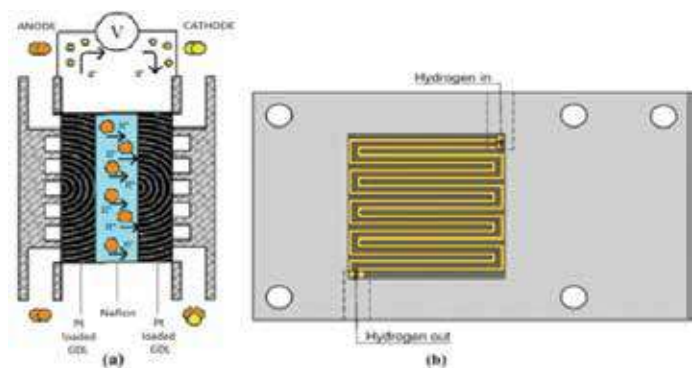


Figure 1: (a) Schematic of hydrogen fuel cells and (b) Design of dual serpentine flow channels.

## Scope of work:

The objectives of the project are to design hydrogen fuel cells (HFCs) with optimum gas flow channels, membrane electrode assembly and humidification system to realize fuel cells with high power density. This also includes fabrication of anode and cathode flow channels with appropriate gas inlet adapters. Preparation of optimally UV irradiated Nafion membrane for high proton conduction in hydrogen fuel cells/fuel cell stacks, thereby lowering of internal resistance and doubling of power density is also envisaged.

Efforts in this program are of two-fold: 1) R & D effort on reduction of the cost of Hydrogen Fuel Cells leading to a commercial production and 2) Research towards generation of Hydrogen green energy using solar power. In other words, attempt to solve two serious issues will be undertaken: 1) R & D towards low-cost production of HFCs and 2) Research on generation of solar powered photo-catalytic Green Hydrogen using UV-vis photo catalyst.

Initially, laboratory-scale development of the functionalized Nafion-based membrane and a prototype hydrogen fuel cell were carried out. Multiple performance parameters, such as ionic conductivity, mechanical stability, chemical durability, and THz-TDS-based characterisation, have been conducted on the developed prototype and has been validated. A functional prototype cell has been assembled and tested under controlled conditions, achieving a stable total output of 9.6 W.

The invention addresses critical limitations of hydrogen fuel cells by improving the performance and durability of Nafion polymer electrolyte membranes. A novel

method of enhancing mechanical stability, chemical durability, and proton conductivity through glutaraldehyde crosslinking followed by sulfonation is being attempted. This specific treatment improves key properties of Nafion membranes such as reduced swelling, increased water uptake, enhanced porosity, and higher proton conductivity. Mechanical strength and chemical durability is also envisaged to improve by the process. These enhancements directly translate to more efficient and longer-lasting hydrogen fuel cells, offering a significant advancement with clear industrial application in the growing fuel cell market.

Author:

**Dr. M.G. Anandakumar**  
Joint Director, BD&CBSD

## TECHNICAL SPOTLIGHT

### Memorandum of Understanding (MoU)

❖ **CPRI & MePDCL Collaboration:** On November 14, 2025, CPRI signed a Memorandum of Understanding (MoU) with the Meghalaya Power Distribution Corporation Limited (MePDCL), Shillong. Under this agreement, CPRI will provide technical “hand-holding” support to establish a Distribution Transformer Test Facility.



*The MoU was signed in the presence of Dr. Shakeel P. Ahammed, IAS (Chief Secretary, Government of Meghalaya), Dr. J. Sreedevi (Director General, CPRI), Shri Jitendra Srivastava, IAS (CMD, REC), and other senior officials from REC and CPRI.*

- ❖ **CPRI & PGCIL COLABARATION:** CPRI and Power Grid Corporation of India Ltd. (PGCIL) entered into an MoU on October 27, 2025. This partnership focuses on enhancing Human Resource Development (HRD) through specialized capacity-building services provided by CPRI to PGCIL.



### Special Test

- ❖ **Short Circuit Laboratory, CPRI, Bengaluru:** Successfully conducted short-circuit testing on 415V, 400A Low-Voltage Fuse Switch Disconnectors for M/s. Tenaga Prisma, Malaysia.



- ❖ **Switchgear Testing & Development Station, Bhopal** Performed a Conditional "O" shot at 100kA (per customer specifications) on 600V, 76A, and 170A Terminal Blocks with fuse



for M/s. Danfoss Industries Pvt. Ltd., Chennai, Tamil Nadu.

- ❖ **Switchgear Testing & Development Station, Bhopal** Conducted a short-circuit withstand strength test (50kA for 3 seconds) on the main and earth circuits of a 145kV, 3150A Earthing Connection GIS Module for M/s. Siemens Ltd., Chhatrapati Sambhaji Nagar, Maharashtra.



### Unique Test

- ❖ **Switchgear Testing & Development Station, Bhopal** Performed Sound Level Determination (as per IS 2026-10) on a 17.6 MVA, 33/(4x0.66) kV Inverter Duty Transformer for M/s. Kotsons Pvt. Ltd., Alwar, Rajasthan.



- ❖ **Cables & Diagnostics Division,** Successfully completed its first pre-qualification test on a 400kV, 2500 mm<sup>2</sup> cable system for M/s. LS Cables, Rewari. This rigorous, year-long evaluation utilized a 100-meter cable assembly featuring

joints and terminations across diverse environments: buried, tunneled, indoor (GIS accessories), and outdoor (oil-filled terminations). Following 180 heating-cycle voltage tests and a lightning-impulse withstand test, the system underwent a final physical examination to validate long-term insulation integrity and thermo-mechanical behavior.



- ❖ **Switchgear Testing & Development Station, Bhopal** Conducted Short-Time Withstand (50 kArms for 1.0s) and Peak Withstand Current tests as per IEC 62271-102 for a 765kV, 3150A Knee Disconnecter from M/s. Switchgear Manufacturing Company Ltd., Chittoor, Andhra Pradesh.



## First Time Test

- ❖ **Short Circuit Laboratory, CPRI Bengaluru:** Successfully performed a first-of-its-kind Short Circuit Withstand Test at 5kA rms for 30 cycles on a Solid State Decoupling Device for M/s. IOCL, Vishakhapatnam.



- ❖ **Short Circuit Laboratory, CPRI Bengaluru:** Achieved a national milestone by conducting the country's first DC MCCB Breaking Capacity Test. The test was carried out at 40kA DC and 500V DC with an 18ms time constant for M/s. Schneider Electric, Coimbatore.



❖ **Electrical Appliances Technology Division, CPRI Bengaluru:** Successfully conducted the IP 54 test as per IEC 60034-5 for the first time at CPRI. The test was performed on a 2MW, 2500kVA AC Generator (Dimensions: 3.2m x 1.8m x 2.8m; Weight: 11.85 Tons) for M/s. TDPS, Dabaspet. The procedure was witnessed by Mr. Subeeshnath K (Surveyor, M/s. IRS) alongside manufacturer representatives.



### **New Test Facility:**

The Regional Testing Laboratory, Nashik, marks its first operational milestone post-inauguration (10.11.2025) with the successful testing of a 3.5 MVA, 33/0.69kV transformer for M/s Inox Renewable Solutions Limited, Jaipur, Rajasthan.

### **Testing Scope:**

1. **Lightning Impulse (Chopped Wave):** Verified per standard protocols.
2. **Short-Circuit (Dynamic Effects):** Ability to withstand mechanical and thermal stress confirmed.



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## OVERSEAS CUSTOMERS

### Testing for overseas customers

CPRI is rendering testing services to many overseas customers. Few of the services rendered are listed below:

- ❖ **Switchgear Testing & Development Station (STDS), Bhopal**, successfully conducted a Short-Circuit Withstand Capability test as per IEC 60076-5 on a 500kVA, 24/0.416kV Distribution Transformer for M/s. CC Transformer Co. Ltd., Thailand.



- ❖ **Switchgear Testing & Development Station, Bhopal**, carried out a 50kA Short-Time Current test on a 600V, 1600A Busway for M/s. Underwriters Laboratories Ltd., UAE, in accordance with specific customer requirements.



- ❖ **Short Circuit Laboratory, CPRI, Bengaluru**, completed Sequence-I testing on a 415V, 400A Fuse Switch Disconnecter for M/s. Tenaga Prisma, Malaysia. The tests were witnessed by

Mr. Wan Mohd Syahmi Bin Wan Othman and Mr. Mohd Khir Bin Hamzah from Tenaga Prisma.



- ❖ **Switchgear Testing & Development Station, Bhopal**, performed Test Sequence-III (O-CO) as per IEC 60947-2 on a 690V, 1A, 100kA MPCB for M/s. Schneider (Thailand) Limited, Thailand.



- ❖ **Switchgear Testing & Development Station, Bhopal**, conducted an Ability to Withstand Dynamic Effects of Short Circuit test as per IEC 60076-5 for a 3.15MVA, 33/0.433kV Dry-Type Transformer manufactured by M/s. Emirates Transformers & Switchgears, Dubai, UAE.



❖ **Electrical Appliances Technology Division, CPRI Bengaluru**, conducted “second check” testing on Samsung Refrigerator Model No. RR20C11C2GS/HL for the Bureau of Energy Efficiency (BEE) under the Star Labeling Program. The test was witnessed by Mr. Seyoung Choi, Samsung Korea, Indian representatives, and the Project Engineer from KREDL.



❖ **Mechanical Engineering Division, CPRI Bengaluru**, completed tower testing on a 110kV D/C Angle Tower (Type HAT, 30-60°) with a +8M Line Extension of M/s. Salasar Techno Engg. Ltd, Noida for the customer M/s. Energy Development Corporation Ltd, Rwanda, Africa.



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## LEGACY DESK:

### REMAINING LIFE ASSESSMENT OF POWER TRANSFORMERS

#### Introduction

The end of life of a transformer originally based on reduction of tensile strength of the paper to half the original value, suffered from practical shortcomings - obtaining suitable paper samples & interrupting electrical service. Next the degree of polymerization (DP) test was developed. New paper has DP of about 1200, and worn out paper has been defined as DP of 200. IEEE C57.91 loading guide mentions that one should be able to operate a transformer well-dried, oxygen-free, and with a 110°C hot spot for 135,000 hours until 25% of retained tensile strength (75% loss), or 150,000 hours until a DP of 200 is reached (80% loss of tensile strength). The DP test too has practical shortcomings - requirement of actual paper samples, high cost, slow and labor intensive.

The furan test method for paper is promising as a non-invasive technique, because only the oil needs to be sampled, and the transformer can remain on line. The furan test looks for breakdown products of paper dissolved in the insulating oil. The cost of furan testing is reasonable compared to DP testing. The unknown is furan interpretation.

The furan test is being increasingly accepted by utilities to know the condition of the power transformer, as a part of ‘remaining life assessment’ study. John R. Sans et al have reported that if furans are high in a young transformer, then some type of incipient fault is likely. Furans migrate back & forth between the oil and paper in response to changes in the conditions in a transformer. For interpretation of furan behaviour, it may be necessary to measure the temperature of the oil sample & moisture, at the time of collecting oils. Reclamation of oil lowers furans. But reclamation does not remove

furans from the transformer, because most of the furans reside on the paper. The furans leach back into the oil from the paper over a period of months, & return to equilibrium. Such transformers have to be monitored. If minor furans are present, there is an incipient fault, or the paper is degrading abnormally fast due to some operating problem. H. Lutke et al have reported that the rate of production of furan may provide a valuable information for the effect of sudden or continuous overheating (e.g. cooling system failure) as well as monitoring the transformer in service. A.J.Kachler et al have reported that in order to identify a failure (or a condition change) it is important to evaluate the increase in the rate of furan concentration. I. Hohlein et al have reported that wet transformers usually have higher levels of furans, inferior oil properties, and lower DP values of paper than dry ones under similar service conditions. The development of furan concentration and moisture content are very important ageing indicators for the evaluation and life assessment of transformers in service.

The CPRI project team attempted to assess the remaining life of transformers based on a massive survey of furans from operating transformers in the country.

Mineral insulating oil samples were drawn from eight hundred and sixteen numbers of different ratings & designs of power and distribution transformers operating under a vast array of climates, operating temperatures and types of oil & paper in the country, and evaluated for furan as per IEC 61198. Furans were extracted from a known volume of oil by means of liquid / liquid extraction. A portion of the extract was introduced into a High-Performance Liquid Chromatograph (HPLC) equipped with a C18 reverse phase column and

a diode-array detector. Furans were identified and quantified by comparison to standards of known concentration. The five furans that were measured are reported in Table I. 2FOL was quantified at 220nm, and the other four furans at 276 nm. The concentration of furans was measured in ppb.

**Table I: Furans from mineral insulating oils measured with HPLC using a diode-array detector**

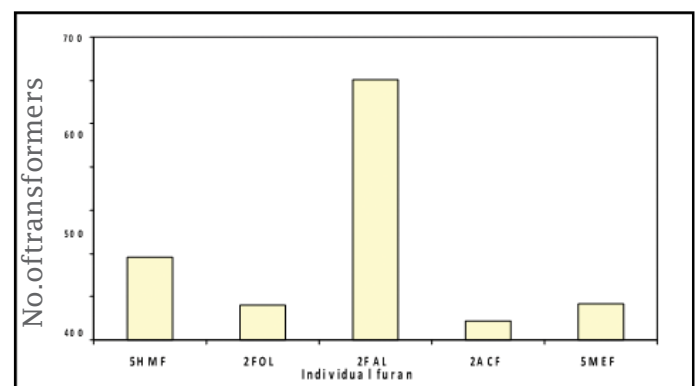
Sl.No.	Furan	Abbreviation
1.	5-hydroxymethyl-2-furaldehyde	5HMF
2.	2-furfuryl alcohol	2FOL
3.	2-furaldehyde	2FAL
4.	2-acetylfuran	2ACF
5.	5-methyl-2-furaldehyde	5MEF

### Findings:

Frequency distribution of the individual furans is reported in Table II and Fig I.

**Table II: Frequency distribution of individual furans**

Furan	No. of transformers	Percentage of transformers
5HMF	192	23.5
2FOL	80	9.8
2FAL	602	73.8
2ACF	43	5.3
5MEF	83	10.2

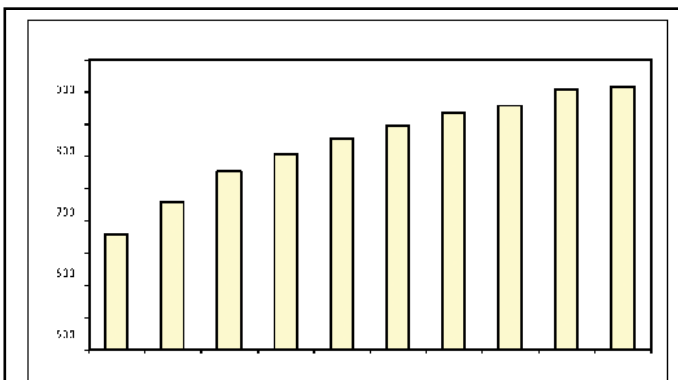


2FAL is present in about 75% of the oil samples. 5HMF, 2FOL, 2ACF and 5MEF are present in less than 25% of the oil samples. Hence they are called 'minor furans'.

The sum of the five furans was used as an indicator of the overall condition of the cellulosic insulation. Precision of furan analysis is within 5%. Frequency distribution of furan is reported in Table III and Fig II.

**Table III : Frequency distribution of furan**

Furan, ppb			No. of transformers	Percentile population
0	-	100	356	43.5
0	-	250	458	55.9
0	-	500	554	67.8
0	-	700	609	74.6
0	-	1000	654	80.1
0	-	1500	698	85.6
0	-	2000	734	89.9
0	-	2500	757	92.8
0	-	5000	806	98.7
0	-	5840	816	100



The observed range of furan extends over four orders of magnitude. The concentration of furan increased with the age of a transformer. The lowest concentration was 0 ppb, and the highest was 5840 ppb. 74.6% of the population of operating transformers is below 700 ppb, 80.1 % below 1000 ppb, 92.8 % below 2500ppb, and 98.7 % below 5000 ppb. Only 1.3 % of the population is above 5000 ppb.

## Interpretation

Statistical approach has been adopted to interpret furan. But care is to be exercised because furan concentration depends on the following factors

- Design of transformer
- Type of transformer
- Operating conditions
- Type of paper
- Type of oil

In a perfect world, one would have many years of furan data beginning with the time the transformer was energized to the time of failure. In a real world, remaining life of a transformer can be approximated from its percentile in the furan population. The furan data for the population of transformers is analogous to the life cycle of a single transformer, because each transformer is at a different stage in its life cycle. For example, if a certain transformer was furan tested and has a furan concentration of 2001 ppb. From the data base, only 10 % of operating transformers have a higher furan concentration. And 90 % of transformers have a lower furan concentration in the oil. This can be interpreted to mean that the transformer with 2001 ppb has consumed 90% of its useful life. Only 10% of its life remains. If the actual age of the transformer is known, then the furan percentile can be converted to actual time units. If it is known from nameplate information that the transformer is 25 years old, then

t, life remaining in years is given by:

$$r_{\text{remaining}} = 25 \text{ years} \times (10 \% / 90 \%)$$

$$r_{\text{remaining}} = 2.8 \text{ years}$$

The calculation yields a statistical half-life. In a large population of 25-year-old transformers with 2001 ppb, half may fail within 2.8 years.

## Conclusions

The following benchmarks for furan in in-service insulating oils suiting to Indian conditions have been devised for implementation by CPRI :

- Upto 700 ppb furan (to 74.6<sup>th</sup> percentile), the transformer is healthy. The DP range is from 1200 to 454. The retest interval is 1 year.
- From 701 to 1000 ppb furan (to 80.1<sup>th</sup> percentile), the condition of transformer is questionable. The DP range is from 453 to 399. The retest interval is 6 months.
- From 1001 to 2500 ppb furan (to 92.8<sup>th</sup> percentile), the transformer has deteriorated. The DP range is from 398 to 272. The retest interval is 3 months.
- From 2501 to 5000 ppb furan (to 98.7<sup>th</sup> percentile), the transformer has low reliability. The DP range is from 271 to 213. The retest interval is 1 month.
- Above 5000 ppb furan (above 98.7<sup>th</sup> percentile), reliability of the transformer is poor indicating rewinding or replacement. The DP value would fall below 213. Damage to the paper is irreversible.

Life assessment of transformers can be successful if utilities make a systematic condition assessment by trend analysis of furan along with other diagnostic procedures, e.g., dissolved gas analysis, acid number & electrical tests.

## Project Team:

CPRI team consisting of Mrs. S. Vijaya Kumari, Mr. G.R. Viswanath, Ms. Dheepalakshmi & Dr. K. Dwarakanath carried out these studies and the findings were published in CIGRE Conference 2008, D1-2008 at Paris during August 2008.

## REFERENCES

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- [3] Transformer ageing research on furanic compounds dissolved in insulating oil, H. Lutke et al, (15-302, Session 2002, CIGRE).
- [4] Aging of cellulose at transformer service temperatures. Part 1: Influence of type of oil and air on the degree of polymerization of pressboard, dissolved gases, and furanic compounds in oil, A.J.Kachler et al (IEEE Electrical Insulation Magazine, March/April 2005).
- [5] Aging of cellulose at transformer service temperatures. Part 2. Influence of moisture and temperature on degree of polymerization and formation of furanic compounds in free-breathing systems, I.Hohlein et al (IEEE Electrical Insulation Magazine, Sept/Oct.2005).
- [6] IEC 61198 - 1993 : Mineral insulating oils - Methods for the determination of 2-furfural and related compounds.

Author :  
**G.R. Viswanath,**  
Former Additional Director



## EXHIBITION PARTICIPATION:

### India Manufacturing Show- 2025, Bengaluru

CPRI participated in the **IMS 2025 Exhibition**, organized by M/s India Exposition Mart Ltd. in association with the IMS Foundation, held at BIEC, Bengaluru. The event was inaugurated on November 6, 2025, by Union Minister **Shri Pralhad Joshi** and Minister of State **Ms. Shobha Karandlaje**, alongside other key dignitaries.

Occupying a 9-square-meter stall, CPRI showcased its specialized test facilities and R&D capabilities. The exhibition drew a significant number of visitors from manufacturing, utilities, and academia, many of whom sought detailed information regarding CPRI's laboratory services. The stall was managed by a dedicated team of officers from the **Business Development Division, HPL, QAD, and SGRL**.



*Visitor at CPRI stall*

### Conference/Seminar/Workshop/ Training

❖ Training Programme organized for **WBSEDCL, West Bengal (Batch-55)** at CCAR, CPRI, Bengaluru during 10<sup>th</sup> - 28<sup>th</sup> November 2025. The Training Programme focused mainly on the important aspects of Electricity Distribution such as Protection System, Relays, Cables & Capacitors, Energy

Metering, Electricity Act, Maintenance of Substation, Billing, Reduction of Technical Losses and Commercial Losses, Loss Precaution, Power System Management, SCADA System, Distribution Network, Reactive Power Compensation, Voltage Improvement, Faults, Earthling System, etc., The training programme is devised to comprehensively address various aspects of Electrical Distribution for the newly inducted Engineers.



*Group photo of*

*M/s. WBSEDCL (Batch-55) Engineers*

❖ Training Programme organized for **WBSEDCL, West Bengal (Batch-56)** at CCAR, CPRI, Bengaluru during 1<sup>st</sup> December to 19<sup>th</sup> December 2025. The Training Programme mainly discussed about the important aspects of Electricity Distribution such as Protection System, Relays, Cables &



*Group photo of*

*M/s. WBSEDCL (Batch-56) Engineers.*

Capacitors, Energy Metering, Electricity Act, Maintenance of Substation, Billing, Reduction of Technical Losses and Commercial Losses, Loss Precaution, Power System Management, SCADA System, Distribution Network, Reactive Power Compensation, Voltage Improvement, Faults, Earthling System, etc., The training programme is devised to comprehensively address various aspects of Electrical Distribution for the newly inducted Engineers.

- ❖ Power Systems Division, CPRI Bengaluru has conducted an On-Site Training Program on **“Substation protection system check points as per IEGC-2023 Guidelines and Numerical relays settings configurations”** for the officials of 132/33kV Ampati GSS, Meghalaya Power Transmission Corporation Limited (MePTCL), has been successfully conducted on 12.11.2025. The program was Conducted by Mr.K.Marimuthu, Engineering Officer and Mr. Tanmay Roy, Engineering Assistant.



- ❖ Shri Shivakumar.V, JD & HoD, SGRL participated in the IEC TC 57 WG15 (Data and communication security) meeting held during 7th to 9th October 2025 at Concordia University, Montreal, Canada also visited IREQ, Hydro Quebec Research Centre, Montreal on 10.10.2025



- ❖ Dr. Kaliappan Perumal, AD & GH (MUAD), participated virtually in the IEC TC57 WG15 meeting held in Montreal, Canada, from October 7-10, 2025. The sessions focused on the evolution of cybersecurity standards within the IEC **62351 series** to meet emerging global requirements.

Key technical areas discussed included:

- **Advanced Security:** Homomorphic Cryptography and Machine Learning (IEC 62351-90-2) and Zero Trust Architecture.
- **Standard Updates:** IEC 62351-8 Edition 2 and IEC 62351-90-4.
- **Future-Proofing:** Post-Quantum Cybersecurity and key usage in X.509 certificates.
- **Interoperability:** Integration of IEC 62351-4 with IEC 62351-15, as well as updates to IEC 62351-10, IEC 62351-14, and IEC 27019.

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## EVENTS

### Hindi Maah and Hindi Divas Celebration at CPRI, Bengaluru

The **Hindi Maah** (Hindi Month) celebrations commenced on September 1, 2025, featuring a variety of competitions, including Hindi Translation, Essay Writing, News Reading, Crosswords, Hindi Song, Quiz, Antakshari, and a Hindi Skit. These events were conducted in two categories: one for employees with a working knowledge of Hindi and another for those proficient in the language.

In addition to awarding cash prizes and certificates to winners, 13 employees were recognized under the **Incentive Scheme** for their original noting and drafting in Hindi. Maintaining its long-standing tradition, the

Institute also organized the **Annual Technical Article Competition** under TOLIC-IV, Bengaluru, where the three best authors were honored during the Hindi Divas ceremony.

**Hindi Divas** was celebrated on November 7, 2025, at the S.J. Auditorium, presided over by the Director General. The event began with a collective rendition of **"Vande Mataram"** in honor of its 150th Anniversary. During the ceremony, prizes were distributed to competition winners, and 20 employees were awarded cash prizes for excelling in the **Parangat** and **Prabodh** examinations. The celebrations concluded with vibrant cultural performances by employees and children from the staff colony, making the event both successful and memorable.



## ❖ Inter-Organizational Hindi Competition

As part of the **Inter-Organizational Competitions** under **TOLIC-IV**, the Official Language Section organized a **Translation Competition** on November 10, 2025, at the P.S. Seminar Hall. The event saw active participation from various Central Government Offices, providing an effective platform to promote the use of Hindi in administrative functions.

To ensure equitable competition and encourage wider engagement, cash prizes were awarded in two distinct categories:

- **Hindi-speaking employees**
- **Non-Hindi-speaking employees**

## Workshop on Progressive Use of Hindi

A specialized **Hindi Workshop** was conducted on December 16, 2025 (10:00 a.m. to 11:30 a.m.), at the CRTL Committee Room to further the progressive use of the official language in day-to-day operations.

The workshop was attended by staff from **Administration**

**Sections 1 & 2, Accounts Sections 1 & 2**, and Assistants from various Divisions and Laboratories. The session focused on enhancing practical awareness and encouraging the seamless integration of Hindi into official correspondence.

The program was attended by senior leadership, including the **Director, Chief Administrative Officer, Senior Administrative Officer, and Accounts Officer**, reflecting the Institute's commitment to official language implementation.



### ❖ TOLIC Meeting at CPRI, Bhopal

The second half-yearly meeting for the year 2025-26 of the **Town Official Language Implementation Committee (TOLIC), Bhopal (No. 2)**, was convened on **December 11, 2025**, at the National Institute of Design (NID) Auditorium, Bhopal.

The meeting was chaired by Mrs. Sumbul Munshi, Additional Director and Chairperson of TOLIC, CPRI Bhopal. Shri Narendra Singh Mehra, from the Regional Implementation Office, Department of Official Language (Ministry of Home Affairs), attended as the Chief Guest.

The meeting saw excellent engagement from the member organizations; out of 34 member offices, 32 were represented, including participation from 20 Heads of Offices. The discussions focused on reviewing the progress of official language implementation and setting goals for the upcoming period.



### ❖ Observance of Vigilance Awareness Week:

In accordance with the directives of the Central Vigilance Commission (CVC), CPRI observed Vigilance Awareness Week across its headquarters in Bengaluru and all regional units. The observance commenced with employees collectively taking the Integrity Pledge, centred on the national theme: "Culture of Integrity for Nation's Prosperity" > (सत्यनिष्ठा की संस्कृति से राष्ट्र की समृद्धि)



*Integrity pledge @ CPRI Bengaluru*



*Integrity pledge @ CPRI Hyderabad*

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## ACOLADS

### Awards and Achievements

#### Best Paper Award at TRAFOTECH 2025

Shri Nunnagoppula Maheswara Rao, Engineering Officer at the Short Circuit Laboratory, CPRI Bengaluru, was honored with the First Best Paper Award at the TRAFOTECH Global Conference (13th Edition 2025).

- **Paper Title:** “An Insight into Mechanical Stresses in the Core and Windings of Power Transformers.”
- **Event Details:** Organized by IEEMA and supported by the Ministry of Heavy Industries, the Ministry of Power, and the DPIIT, Government of India.
- **Venue:** Manekshaw Centre, New Delhi (December 4-6, 2025).



#### ❖ Doctoral Degree Conferred

Dr. Sathish K.H., Senior Assistant, has been awarded a Ph.D. in Management Studies by Visvesvaraya Technological University (VTU).

His doctoral thesis, titled “Employee Attitude Towards e-Office Implementation in R&D Organisations of the Power Sector in India,” provides a critical analysis of the digital transformation process. The research specifically:



- **Identifies Challenges:** Examines the personal and environmental hurdles faced by personnel during the transition to e-Office systems.
- **Demographic Analysis:** Evaluates how these challenges vary across different demographic groups within the power sector.
- **Organizational Impact:** Offers insights into improving digital adoption within specialized R&D environments.



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Power Research - A Journal of CPRI is a biannual publication by the Central Power Research Institute, Bangalore, India. The journal focuses on research and innovative applications in the generation, transmission, distribution, utilization, and conservation of electric power within the power and energy sectors. It serves as a platform for technical and managerial professionals across utilities, R&D institutions, planners, industries, and academia.

The journal invites authors to contribute original, high-quality research papers addressing current or futuristic topics of relevance to the power and energy sector, spanning concepts to practical field applications.

All submissions undergo a rigorous peer review process by subject experts. Detailed instructions for authors are available on the journal's official website.

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