

Physical-chemical diagnostics of high-voltage devices

PHYSICAL-CHEMICAL TRANSFORMER DIAGNOSTICS DEPARTMENT

Empowering High-Voltage Solutions: Our fundamental and applied studies, and comprehensive physical-chemical research on high voltage devices, ensure the reliable operation and longevity of power transformers and other liquid filled high-voltage technology.



Research and diagnostics on the condition of transformers and high-voltage equipment.



Physical-chemical diagnostics are carried out in our own accredited laboratory.



Verification of the lifespan and reliability of transformers.

Our services include analysing transformer liquid and paper insulation, and developing comprehensive physical-chemical diagnostic assessments to ensure the operational reliability of both new and aging transformers. We also assess the remaining service life of transformers and other high-voltage equipment, and provide detailed reports that outline strategic investment, maintenance and refurbishment plans for high-voltage transformers to ensure their optimal performance.

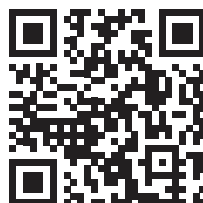
We rely on international standards recognised procedures and continuously develop state-of-the-art non-destructive diagnostic methods, enabling us to excel in early fault detection and preventive maintenance. This ensures the longest possible service life and reliable operation of transformers.

COMPREHENSIVE LABORATORY SERVICES AND RESEARCH ACTIVITIES

- We provide IEC 17025-accredited physical and chemical transformer liquid and paper insulation tests in accordance with IEC, DIN, ISO and ASTM standards.
- We perform expert diagnostic evaluation of the operational reliability and the remaining lifespan of new and aging HV transformers.
- We provide consultation on maintenance measures for prolonging transformer service life.
- We actively develop and apply dynamic thermal models, dynamic thermal loading and transformer aging models.
- We conduct research and development on physical and chemical diagnostic methods for HV transformers.
- We prepare applied studies focusing on investments, maintenance and operational refurbishment for HV transformers.
- We offer consultation on limit values of DGA and humidity monitoring sensor alarms.
- We organise and implement inter-laboratory efficiency tests (known as Round Robin tests).



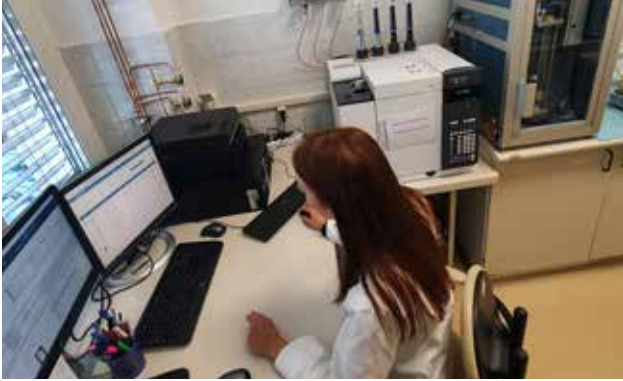
**SLOVENSKA
AKREDITACIJA**
SIST EN ISO/IEC 17025
LP-102



INTERNATIONAL COOPERATION AND PROJECTS

We continuously advance our expertise and research work, including through the organisation of international conferences and working group meetings (CIGRE, IEC, ICDL, ISH).

We also actively participate in various international working groups, such as IEC TC 10 - insulation electro-technical liquids and TC 14 - transformers, CIGRE A2 - transformers and D 1.01 - new insulation materials and testing techniques.



Detecting anomalies with gas chromatography in transformers during their operation

THE IMPORTANCE OF PHYSICAL AND CHEMICAL TRANSFORMER DIAGNOSTICS

Physical and chemical diagnostics are a fundamental tool for monitoring the condition, operational reliability and aging of a transformer, enabling timely and cost-effective maintenance, planning, refurbishment, or replacement of a transformer.

Transformer insulating liquid contains important information about the condition of the transformer, as thermal and electrical faults produce by-products in the insulating liquid. These can be detected using various diagnostic methods on insulating liquid samples taken from the transformer during regular operation, without the need to disconnect the transformer from the grid. Dissolved gas analysis (DGA) can detect abnormal electrical and thermal disturbances in transformer operation.

Furanic analysis of the thermal by-products of cellulose (2FAL analysis) enables accurate and reliable assessment of the paper insulation aging process, which is the main indicator of transformer reliability and expected remaining transformer technical lifetime.

Physical and chemical diagnostics provide reliable information on the operational reliability and ageing of the transformer and enable timely, cost-effective maintenance, planning, refurbishment or replacement of the transformer.

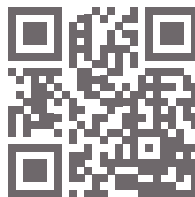
WE RELIABLY EXAMINE THE CONDITION OF YOUR TRANSFORMER

Do you want to learn about the condition of your transformer and its operational reliability? Maybe it's time for a spare unit or maintenance action.

Our analyses will help you determine whether periodic preventive physical and chemical diagnostics are economically justified and whether you can extend the life span of your transformer in an appropriate way.

Contact us if you've had an outage due to a Buchholz alarm, if you're unsure about whether you can switch the transformer back on or if you need to determine the limiting thermal capabilities of the transformer. Or you may simply want to know how long the transformer will continue to operate reliably.

Preventive physical and chemical diagnostics provide the answers you need. For more information call +386 1 474 36 60 or visit our website: www.eimv.si/chem.



Laboratory for physical-chemical analysis of transformer oils



Verification and calibration of constant transformer supervision sensors



Milan Vidmar Electric Power Research Institute
Hajdrihova 2 | SI-1000 LJUBLJANA | SLOVENIA

T +386 1 474 36 01 E info@eimv.si W www.eimv.si