

## Evgenii Ermakov

Evgenii Ermakov holds a Ph.D. in high voltage technology, is a Senior IEEE member and member of IEC National Committee of Sweden TC14. Evgenii began his professional career in 2006 at Russian Federal Grid and joined Hitachi Energy (formerly ABB) in 2011. His main field of work has been focused on transformer condition, life and risk assessments as well as on leading research and development projects in the field of transformer condition assessment and monitoring. In 2006 – 2025 Dr. Ermakov evaluated condition of more than 1000 transformers, shunt reactors and bushings installed on all continents except Antarctica. Dozens of failures of transformers have been prevented, as a result of these inspections. Evgenii also actively participates in relevant IEEE, CIGRE and IEC working groups and task forces. He is the author of more than 40 technical publications.



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### MAIN FIELDS OF COMPETENCE

- Condition, life and risk assessments of high-voltage power transformers of different applications (transmission, distribution, traction, furnace, HVDC, GSU, etc.), shunt reactors and capacitance graded bushings
- Advanced diagnostic methods for power transformers and bushings: Frequency Response Analysis (FRA), Dielectric Frequency Response Analysis (DFR) and others
- Algorithms for online monitoring systems and risk assessment tools
- Development of global and corporate standards for power transformers and bushings condition assessment
- Training courses and tutorials for condition assessment of transformers and bushings

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### EMPLOYMENT

2026 –	Independent Insulation Group, Sweden, Expert
2016 – 2026	Hitachi Energy, Transformer Service Department (former ABB), Ludvika, Sweden: Diagnostic Service Engineer (2016 -2020), Technical Consultant (2020 – 2022), R&D Principal Engineer (2022 – 2025), R&D Principal Engineer with focus on HVDC transformer service (2025 – 2026).
2011 – 2016	ABB, Transformer Service Department, Saint-Petersburg, Russia, Consultant: <ul style="list-style-type: none"><li>• Transformer Service Sales Specialist (2011 - 2012),</li><li>• Transformer Service Sales Manager with duties of Head of diagnostic lab. (2012 - 2014),</li><li>• Head of Transformer Service Sales with duties of Head of diagnostic lab. (2014 - 2016).</li></ul>
2009 – 2011	Saint-Petersburg Power Engineering Institute of Professional Development, Russia, External Lecturer
2008 – 2011	Energobalance, Saint-Petersburg, Russia, Senior Specialist
2006 – 2008	Elektrosetsservice, branch of Russian Federal Grid Company, Saint-Petersburg, Russia, First Category Engineer

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### EDUCATIONAL DEGREES

2010	PhD degree in High Voltage Engineering from State Polytechnic University, Saint-Petersburg
2007	Master of science in Electric Power Engineering and Technology
2004	Bachelor of science in Electric Power Engineering and Technology

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**LANGUAGES**

Russian (native), Swedish, English (professional level)

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**AWARDS**

- 2022 Senior Member of the IEEE
- 2022 Certificate of Appreciation from IEEE for outstanding contribution to the development of IEEE Standard C57.12.200™ – 2022 “IEEE Guide for the Dielectric Frequency Response Measurement of Bushings”
- 2009 Laureate of the competition «The Best Innovation Idea», Saint-Petersburg Russia
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**MEMBERSHIP IN TECHNICAL COMMITTEES**

Swedish IEC TC 14 “Transformers”

IEC MT 60076-18: Revision of IEC 60076-18 (Power transformers – Part 18: Measurement of frequency response)

IEEE PES Transformers Committee, Bushing Subcommittee, Dielectric Test Subcommittee, Transformers and Reactors for HVDC Applications Subcommittee, Power Transformers Subcommittee, Insulation Life Subcommittee, Performance Characteristics Subcommittee, Standards Subcommittee

IEEE C57.161: **Chair** of the WG for revision of the “IEEE Guide for Dielectric Frequency Response Test for liquid-immersed transformers and reactors”

IEEE C57.140: Revision of the “IEEE Guide for Evaluation and Reconditioning of Liquid Immersed Power Transformers”

CIGRE JWG D1/A2.77: “Liquid tests for electrical equipment”

CIGRE WG A2.78: “Bushing Diagnostics: Off-Line Testing and On-Line Monitoring Systems”

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**LIST OF LATEST PUBLICATIONS (since 2019)**

- E. Ermakov, L. Jonsson, L. Melzer, “Approach to DFR analysis for condition assessment of 400 kV transformer and shunt reactor OIP bushings” (CIGRE Colloquium, Study Committees A2, B2 & D1, New Delhi, 2019)
- E. Ermakov, T. Lindstedt, L. Melzer, L. Pettersson, M. Pettersson “Fleet screening of HVDC transformers” (CIGRE Session 2020, Paris, France, paper no. A2-313)
- E. Ermakov, L. Jonsson, M. Kornek, T. Lindstedt, L. Melzer, “Condition assessment of bushings in the field” (GCC POWER 2021 - GCC POWER 2021 e-conference & exhibition, GCC CIGRE - Doha, Qatar, 2021)
- E. Ermakov, L. Melzer, T. Lindstedt, N. Schönborg, G.-O. Persson “Condition assessment of HVDC converter transformers at limited time of outage applied to the Fenno–Skan 1 transmission system” (CIGRE Session 2022, Paris, France, paper no. A2-10100)
- E. Ermakov, D. Robalino, P. Werelius “Case study: What is melting here? Time for an SFRA test” (Megger, 2022, < [https://megger.widen.net/content/2qcanqitbg/original/Case-study-6\\_SC\\_SFRA\\_What-is-melting-here.pdf](https://megger.widen.net/content/2qcanqitbg/original/Case-study-6_SC_SFRA_What-is-melting-here.pdf)>)
- L. Jonsson, E. Ermakov, L. Melzer, J. Redander, N. Schönborg, G-O. Persson, “Condition Assessment of Bushings to Prevent Unplanned Outages of 400 kV Transformers and Shunt Reactors in the Swedish National Grid” (Cigre SC A2 & 6th International Colloquium "Transformer Research and Asset Management", November 29 - December 2, 2023, Split, Croatia)
- L. A. Eriksson, E. Ermakov, L. Jonsson, E. Nicolaisen “Detecting degraded bushings with DFR – A case study” (CIGRE Session 2024, Paris, France, paper no. A2-10888)
- E. Ermakov, T. Lindstedt “Requirement for reliable transformer diagnostics using Frequency Response Analysis (FRA)” (CIGRE Session 2024, Paris, France, paper no. A2-11585)

R. Alvarez, E. Ermakov, D. Robalino "Critical factors to ensure robustness in frequency response analysis", XX ERIAC, VIGÉSIMO ENCUESTRO, REGIONAL IBERO-AMERICANO DE CIGRE, Ciudad del Este, Paraguay, 25 a 29 de mayo de 2025

P. Werelius, E. Ermakov, L. Jonsson, H. Rudegard "Condition Assessment of Bushings Using DFR" - 2025 IEEE Electrical Insulation Conference (EIC), South Padre Island, TX, US, June 8-12, 2025

E. Ermakov "New Experience of Using Dielectric Frequency Response Analysis for Assessing the Condition of Transformers and Reactors", CIGRE SC A2 & D1 Joint Colloquium Seoul 2025, Seoul, Korea, paper no. 3-0208, 2025

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## REFERENCE PROJECTS

- 2006/2026 Projects for condition assessment of transformers of different voltage level (up to 800 kV) and different applications (transmission, distribution, traction, furnace, HVDC, GSU, etc.), shunt reactors and bushings. Condition assessments took place all around the globe except Antarctica (Sweden, Denmark, Canada, USA, UK, China, Russia, Ukraine, Kazakhstan, Finland, South Africa, Australia, New Zealand, India, Philippines, Norway, Germany, Chile and other countries. **More than 1000 units in total. Dozens of failures of transformers have been prevented.** This involves:
- Planning the project, suggesting standard and advanced diagnostic methods according to technical needs and customer expectations.
  - Performing measurements on site – leading a team of field technicians making sure that highest standards of quality are observed.
  - Interpreting measurement results, calculating paper aging rate and risk of failure. This involves complex computer modelling using various software.
  - Writing and presenting a transformer condition assessment report for the customer.
  - Reporting and discussing observed issues. Proposing improvements.
- 2016/2026 Development of algorithms for online monitoring systems and risk assessment tools
- 2011/2026 Improving the application of new diagnostic methods for transformers and bushings, developing guides and standards.
- 2019/2025 Condition assessment of "mature" transformers of HVDC converter stations in Sweden, Finland, Germany, New Zealand and China.
- 2018/2025 Tutorials on transformer diagnostics for Hitachi / ABB engineers and management as well as for flagship Hitachi / ABB customer summits, including deep-dive technical sessions at the High Voltage Academy in Ludvika and In-booth speaking theatre presentations at CIGRE Paris
- 2023 Tutorial on DFR measurements on bushings for IEEE in Kansas City, MO, USA. The tutorial attracted over 500 transformer experts from all over the world and was a great success.
- 2022 Tutorial on condition assessment of HVDC transformers for IEEE in Denver, Colorado, USA
- 2019/2022 Major contribution to the development of the IEEE Guide C57.12.200 TM – the first international standard for Dielectric Frequency Response (DFR) measurement of bushings.
- 2018/2021 Condition assessment program for 400 kV bushings installed on transmission type transformers and shunt reactors at Swedish National Grid. Consultations for similar projects in Norway and other countries.
- 2016/2017 Development of the world's first asset management tool for risk assessment of HVDC transformers.
- 2011/2016 Managing Transformer Service Sales in ABB Russia and leading transformer diagnostic lab.
- 2006/2010 Development of diagnostic criteria for power transformers based on PD characteristics.
- 2006/2010 Optimal methodology for condition assessment for power transformers.
- 2006/2008 Diagnostic Projects for Electrical Equipment (up to 750 kV) in Russian Federal Grid
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