INDEPENDENT INSULATION GROUP

CURRICULUM VITAE

PETER SIDENVALL

SHORT RESUME

Peter's specialist fields are advanced electric field calculations, electric field grading of apparatus and overhead line components, visual, IR- and UV-inspections in the field and corona-related laboratory testing. He has more than 14 years of professional experience in high voltage technology and testing. Peter has worked on electric dimensioning of bushings, cable terminations and insulators, material selection and optimization, and insulation coordination. He has held different workshops for power utility engineers and manufacturers in IR- and UV-camera practical application and 3D electric field calculations and analysis of results. He has also been involved in failure analysis, pollution performance, in-service IR- and UV-inspections and corona-related laboratory testing. He is currently active in IEC PT 63624 Fibre optical bushings, secretary in CIGRÉ WG B2.80 numerical simulation of insulator strings and member in CIGRÉ WG D1.61 optical corona measurement and detection.

MAIN FIELDS OF COMPETENCE

- Corona and IR inspections (HV laboratory and in-service)
- Electric field calculations of HV AC station and OHL components
- Material selection and optimisation
- Test development and writing of specifications

WORK EXPERIENCE

2017 – **Independent Insulation Group Sweden AB**
Senior Specialist

2012 – 2017 **STRI AB**, Ludvika, Sweden
Senior Engineer, High Voltage Technology and testing, *with focus on insulation*
Involved in several projects including electric field calculations, development of innovative test methods and criteria, pollution performance, updating specifications and creating test matrixes for complex arrangements.

2008 – 2012 **ABB Components**, Ludvika, Sweden
Development engineer, bushings
Developing new AC and DC bushings and looking into the next generation of technology, electric field calculations and developing criteria for these and responsible for material selection.

EDUCATIONAL DEGREES

2002 – 2008 **Master of Science in Material Science**
Royal Institute of Technology, Stockholm, Sweden.

	Major in polymeric materials
	2008
2021	Infrared Training Center level 2 certification
2023	ESA Fackkunnig - repetition

LANGUAGES

Swedish (native), English (fluent), German (basic)

MEMBERSHIP OF TECHNICAL COMMITTEES

IEC PT 63264 – Fibre optical bushings for a.c. voltage greater than 1000 V and d.c. voltage greater than 1500 V, test, methods and acceptance criteria (member)

CIGRÉ WG B2.80 – Numerical Simulation of electrical fields on AC and DC Overhead Line Insulator Strings (secretary)

CIGRÉ WG D1.61 – Optical Corona Measurement and Detection (member)

LIST OF PUBLICATIONS

Gutman, P. Sidenvall, J. Lundquist: “Generic pollution performance curves for different types of insulators”, 18th ISH-2013, Seoul, Korea, 25-30 August 2013, PE-03

P. Sidenvall, I. Gutman, J. Schulte-Fischedick, J. Seifert, J-F. Goffinet: “Methodology of Modern E-field Calculations – Case Study for Insulated Cross-Arm”, CEIDP-2013, 20-23 October 2013, Shenzhen China, p.p. 334-337

P. Sidenvall, N. Sundin, I. Gutman, L. Carlshem, R. Kleveborn: “Development of test method to verify composite insulators from water induced corona point of view”, 32nd Electrical Insulation Conference (EIC), Philadelphia, Pennsylvania, USA, 8 -11 June 2014, paper S11-3

P. Sidenvall, I. Gutman, J.-F. Goffinet, “Application of new test procedure for verification of water drop corona on innovative insulation cross-arms”, 19th ISH, Plsen, Czech Republic, 23-28th August 2015

I. Gutman, J. Lundengård, S. Bucan, P. Sidenvall, J.-F. Goffinet: “Trends in pollution/corona testing for compact insulation systems in the form of insulated cross-arms”, CIGRE SC D1 Colloquium 2015 in RIO, 13-18 September 2015 paper 12

I. Gutman, P. Sidenvall: “Optimal Dimensioning of Grading Rings for Composite Insulators”, INMR Q3 2015 p.p. 78-89

I. Gutman, P. Sidenvall: “Optimal Dimensioning of Corona/Grading Rings for Composite Insulators: Calculations & Verification by Testing”, World Congress & Exhibition on Insulators, Arresters & Bushings, Munich, Germany, 18-21 October 2015

P. Sidenvall, I. Gutman, L. Carlshem, J. Bartsch, R. Kleveborn: “Development of the Water Drop Induced Corona WDIC Test method for Composite Insulators”, IEEE Electrical Insulation Magazine, November/December 2015, Vol. 31, No. 6, p.p. 43-51

P. Sidenvall, I. Gutman, L. Carlshem, J. Bartsch: “A Round Robin Test of the Water Induced Corona Test”, ICOLIM-2017, Strasbourg, France, 26-28 April 2017, paper 0017

I. Gutman, P. Sidenvall, J-F. Goffinet: “Innovative insulated cross-arm – requirements, testing and construction”, ICOLIM, Strasbourg, France, 26 - 28 April 2017, paper 0078

I. Gutman, P. Sidenvall, T. Condon, P. Flynn and P. Shiel: “Evaluation of composite insulators with internal deterioration: lessons learned from service and after-service testing”, CIGRE SC A3, B4 & D1 Colloquium in Winnipeg, Canada, September 30 – October 6, 2017, paper 142

M. Radosavljevic, I. Gutman, C. Ahlholm, P. Sidenvall: “Ageing and deterioration of composite post insulators exposed to high electric field in 220 kV and 400 kV switchyards in Swedish network”, CIGRE SC B3 Colloquium in Recife, Brazil, 18-20 September 2017

M. Ghaffarian Niasar, P. Sidenvall, L. Carlshem, M. Jalonen, M. Pálsson, B. Adum: “Motion magnification techniques for aeolian vibration measurements”, ISDAC 2017, Porto, Portugal, 30 – 31 October 2017

I. Gutman, A. Dernfalk, P. Sidenvall: “Testing Level of Adhesion Between Fiberglass Rod & Housing in Composite Insulators (Part 1 of 2)”, INMR (e-version), December 8, 2018

I. Gutman, A. Dernfalk, P. Sidenvall: “Testing Level of Adhesion Between Fiberglass Rod & Housing in Composite Insulators (Part 2 of 2)”, INMR (e-version), December 15, 2018

I. Gutman, A. Dernfalk, P. Sidenvall: “Testing Adhesion Between Fiberglass Rod & Housing in Composite Insulators”, INMR 2019/20 Power Engineers Handbook, Zimmar Holdings Ltd., p.p. 7-6-7-12, 2019

A. Dernfalk, P. Sidenvall, I. Gutman: “Development of the test capable to reveal level of adhesion between fibreglass rod and housing of composite insulators”, CIGRE-IEC 2019 Conference on EHV and UHV (AC & DC), April 23-26, 2019, Hakodate, Hokkaido, Japan, paper P1-10

I. Gutman, A. Dernfalk, P. Sidenvall, J. Lundengård: “New Test to Reveal Level of Rod/Housing Adhesion for Composite Insulators”, 21st ISH-2019, Budapest, Hungary, August 26-30, 2019, paper 749

I. Gutman, A. Dernfalk, P. Sidenvall, J. Lundengård, C. Ahlrot, P. Aparicio, A. Berlin, T. Condon, J.-F. Goffinet, K. Halsan, R. Radosavljevic, K. Varli, K. Välimaa: "Rod to Housing Adhesion in Composite Insulators: Practical Evaluation in Collaboration with Utilities", 2019 World Congress, Tucson, USA, 20-23 October 2019

I. Gutman, C. Ahlrot, P. Aparicio, A. Berlin, T. Condon, A. Dernfalk, J.-F. Goffinet, K. Halsan, K. Kleinekorte, J. Lundengård, M. Radosavljevic, P. Sidenvall, S. Steevens, K. Varli, K. Välimaa: “Development of Innovative Test Procedure for Evaluation of Adhesion of Core-Housing of Composite Insulators: from Root Cause of Failures in Service to Reproducible Test Procedure”, Cigré Science & Engineering, N. 20, February 2021, p.p. 171-182

B. Adum, K. Halsan, P. Sidenvall, C. Ahlholm, L. Carlshem, M. Jalonen, M. Pálsson: “Measuring aeolian vibrations by video analysis”, ISDAC 2021, Stavanger, Norway, 16-17 September 2021

P. Sidenvall, et al.: ” Limits of electric field for composite insulators: state-of-the-art and recent investigations of overhead line insulators purchased by power utilities”, CIGRE Science & Engineering, N. 24, February 2022

K. Varli, S. Steevens, J. Unterfinger, A. Dernfalk, I. Gutman, J. Lundengård, P. Sidenvall: “Benchmarking of sealing systems of composite insulators: ideas for innovative test methods”, CIGRE Science & Engineering, N. 25, June 2022, p.p. 108-131

I. Gutman, A. Dernfalk, J. Lundengård, P. Sidenvall, A. Deckwerth, L. Diaz, K. Halsan, M. Leonhardsberger, M. Radosavljevic, P. Trenz, K. Varli, K. Välimaa: "Test methods and criteria for validation of functional properties of composite insulators related to materials and interfaces", CIGRE-2022, D1-10828

V. Dubickas, E. Thunberg, J. Hansson, A. Dernfalk, P. Sidenvall: "Lightning strike to ground – a case study about observed cable damages, risk estimation and protection method", CIGRE-2022, B1-10511

M. Radosavljevic, I. Gutman, P. Sidenvall, C. Ahlholm: "Application of Composite Apparatus Insulators at Substations: Policy, Driving Forces & Service Experience", 2022 INMR World Congress, Berlin, Germany, 16-19 October 2022

P. Sidenvall, I. Gutman, F. Lehretz, K. Varli: "Service experience compared to with electric field criteria for composite insulators", CIGRE Colloquium Sendai 3-7 October 2023, Japan, Paper 5303877

LIST OF PROJECTS

2023-	**Maintenance of composite insulators** Development of diagnostics criteria for composite insulators in service for several utilities
2022-	**Inspections of composite station post and composite apparatus insulators** Inspections and status assessment of composite insulators in approximately 20 substations per year
2020-2022	**Benchmarking of composite insulators** Analysis of composite insulators status from storage and service of several utilities
2020-	**Inspections of composite insulators in overhead line** IR-, UV- and visual inspection of composite insulators
2021-	**Studies on protection of buried HVDC cables from nearby lightning strikes (3 projects)** Simulations to achieve required protection from lightnings strikes
2018-	**Development of motion detection technique** Development of software to analyse vibrations on conductors and structures from recorded videos
2017-	**Inspections of overhead line conductor joints** IR and visual inspections of overhead line conductor joints (annual basis)
2018-	**Inspection of optical fibre termination (several projects)** IR-, UV- and visual inspection of optical fibre terminations in-service (annual basis)
2017-	**Failure analysis of optical fibre termination (phase-to-ground)** Analysis of failure mode of a PtG and improvement suggestions
2017-	**Independent analysis of IR inspections** Review of technical performance of an overhead line IR inspection
2013-	**UV and IR inspections in substations (several projects)** Performing UV-, IR- and visual inspections in substations (annual basis)
2012-	**Specification for composite insulators (several projects)** Developing full specification for composite insulators used in overhead lines
2012-	**Design of grading rings for composite insulators (several projects)** Design of grading rings for composite insulators which shall fulfill certain electric field criteria

2012-	**E-field calculations of composite line insulator arrangements (several projects)** Verifying if insulator design fulfills all acceptance criteria regarding electric field on insulator and hardware. Giving recommendations for improvements if needed
2021	**Status check of 330 and 500 kV composite insulators** After service laboratory tests and simulations on composite insulators
2021	**Composite insulator workshop** Workshop regarding composite insulators
2020	**Study on protection of buried HVDC cables from nearby lightning strikes** Simulations to achieve required protection from lightnings strikes
2020	**Comparison of composite insulator sealing techniques** Comparison of several different composite insulators sealing techniques and development of testing to verify the integrity of the sealing techniques
2020	**Optimal positioning of grading rings** Parametric study to find optimal size and positioning of grading rings for several types of composite insulators
2019	**Optimal positioning of ADSS** Electric field analysis for best positioning of ADSS in tower structure
2018-2022	**Development of motion detection technique** Development of software to analyse vibrations on conductors and structures from recorded videos
2018	**Required minimum clearance from HVAC and HVDC cables** Study on minimum clearance of structures to HVAC and HVDC cables to protect them from lightning strikes
2017, 2018, 2021	**Composite insulator workshop** Workshops regarding composite insulators
2018	**Voltage upgrade verification** Electric field analysis of exterior of PtG for voltage upgrade
2017-2019	**Quality of composite insulators** Analysis of damage insulators and development of new test methods (and update of existing) to increase the quality of composite insulators
2017	**Workshop in electric field calculations** A one-day workshop in how to use and analyse results with 3D electric field calculations on overhead line insulators
2017	**UV inspection workshop** A one-day workshop in how to use and analyse results with a daylight UV-camera
2017	**Third party review of coating** Analysis of technical and market performance of coating for insulators
2016	**Round-robin test of water induced corona test method** Performing a Round-robin test of the Water drop induced corona test method around the world to verify that it fulfils all IEC requirements for a test method
2016	**Review of GIL** State-of-the-art review of GIL for comparison with other alternatives
2014-2017	**Failure analysis of insulators (several projects)** Testing, dissection and analysis of insulator design to find root cause of failure

2015	**Analysis of failed PTG** Testing, dissection and analysis of PTG design to find root cause of failure
2015	**Water induced corona testing on complex insulated cross-arms** Specifying and performing the Water drop induced corona test method on complex insulated cross-arms
2014	**Test matrix for complex insulator arrangement** Development of a test matrix for a complex composite insulator arrangement
2014	**Grounding options for steel foundations** Investigating different types of grounding options for steel foundations to avoid corrosion
2014	**UV and IR analysis of damaged composite insulators** Investigating root cause to failed composite insulators
2014-2015	**Consulting to optimize design of insulating cross-arms 380 kV** Review of design of insulated cross-arm at 380 kV. Optimizing it to fulfill all criteria and specifying missing tests
2013-2015	**E-field calculations of substations (several projects)** Investigating E-fields in substations using 3D calculations and giving recommendations to lower the E-fields to accepted levels
2013-2014	**UV and AN measurement on insulator string** Performing an UV and AN measurement on a suspected insulator string and giving recommendations to avoid corona activity
2013-2016	**Development of water induced corona test method for composite insulators** Development of the Water Drop Induced Corona test method to be included as a type test into the composite insulator specification
2013	**Countermeasures against outages on composite apparatus insulators** Investigated outages due to pollution and giving recommendations for countermeasure
2013	**E-field calculations and analysis of fitting design for manufacturer** Performing an E-field analysis of end fitting design and giving recommendations for improvements
2013-2016	**Inspections of composite insulators (several projects)** Close-up inspections of composite insulators in substations
2013	**Worldwide survey of client's composite insulators in polluted environments** Visual inspections and collection of pollution data at several different substations around the world
2013	**Examination of insulator sets** Examination of glass cap and pin insulator sets with suspected failure
2013	**Calculation of electric fields in line corridor** Investigating the electric field in line corridor using 3D calculations
2012	**Consulting to optimize design of insulating cross-arms 110 kV** Review of design of insulated cross-arm at 110 kV. Optimizing it to fulfill all criteria and specifying missing tests
2012	**EMF calculations of AC yard and DC hall** An EMF study to evaluate if the personnel can work safely at a AC yard and DC hall