

Session Papers

Study Committee A2 (former SC12)

1968

- 12-01 Progress Report of Study Committee 12 (Transformers). with 3 Appendices.
- 12-02 Some Aspects of the Travelling Wave Detection Method for Locating Partial Discharges in Transformers.
- 12-03 Transformer Inrush Current.
- 12-04 Performance of Partial Discharge Tests on Power Transformers.
- 12-05 Short-Circuit Testing of Power Transformers and the Detection and Location of Damage.
- 12-06 Corona in Power Transformers.
- 12-07 Partial Discharge Measurement on Oil-Paper Insulated Transformers.
- 12-08 Transformer Ageing Diagnosis by Means of Measurements of the Degree of Polymerization. Results of New Experiments.
- 12-09 Investigations on Different Partial Discharge Location Methods on Power Transformers.
- 12-10 Measurement of Partial Discharges on Transformers and their Elements.
- 12-11 Short-Circuit Strength of Transformers. Test Methods: Calculation of Short-Circuit Strength.
- 12-12 Partial Discharge Measurements in Transformers and their Interpretation.
- 12-13 Experience in Short-Circuit Testing of Transformers.
- 12-14 The Deterioration of Insulation Consisting of Paper-Oil Layers and its Study by Gas Chromatography.
- 12-15 Partial Discharge Measurements on Power Transformer Insulation. Principles and Practice.

1970

- 12-01 Switching Impulse and Lighting Impulse Strengths of Oil-Immersed Insulation Structures and the Relevance of these Comparisons to Service and Test Voltage Requirements of Transformers.
- 12-02 The Analysis of Gases Dissolved in the Oil as a Means of Monitoring Transformers and Detecting Incipient Faults.
- 12-03 High-Voltage Shunt Reactors. Trends in Design and Testing.
- 12-04 Moisture of Insulation as a Measurement and Maintenance Problem in Oil Impregnated Power Transformers.
- 12-05 A Preliminary Discussion of the Three Preferential Subjects Concerning Shunt Reactors. Maintenance and Insulation Co-ordination (in 3 parts).
- 12-06 Problems of Co-ordination of Dielectric Strength of Extra High-Voltage Power Transformer Major Insulation.

1972

- 12-01 Dynamic Measurements in Power Transformers under Short-Circuit Conditions.
- 12-02 Hot-Spot and Top-Oil Temperatures. Proposal for a Modified Heat Specification for Oil Immersed Power Transformers.
- 12-03 Dynamic Response of Windings under Short-Circuit.
- 12-04 Design, Tests, and Service Considerations Associated with Temperature Rise and Temperature Distribution in Transformers.
- 12-05 Definition of the Use of Transformers based on the Simulation of Coolant Temperature, of Load, and of Non-Availability Conditions.
- 12-06 Design Problems of Ultra-High Voltage Power Auto-Transformers.
- 12-07 Short-Circuit Behavior of Large Power Transformers.
- 12-08 Power Transformers for Systems with a Highest Voltage between 1100 and 1500 kV.
- 12-09 Short-Circuit Behavior of Large Transformers. Transmission System Requirements, Manufacturing and Test Problems.
- 12-10 Stray Losses and Local Overheating Hazard in Transformers.
- 12-11 Dimensioning and Design of Transformers with Extra High Ratings.

1974

- 12-01 Measurements of Partial Discharges on Transformers on the Basis of the Recommendations Published in Electra N° 19 (November 1971).
- 12-02 Measuring Technique of Evaluating Partial Discharges in AC Tests on Transformers and Reactors.
- 12-02 Measuring Technique of Evaluating Partial Discharges in AC Tests on Transformers and Reactors.
- 12-03 A Critical Assessment of Methods of Measuring Partial Discharges in EHV Transformers.
- 12-04 Re-Examination of the Actual Recommendations for the High Voltage Testing of Transformers.

- 12-05 Dielectric Tests of EHV and UHV Transformers.
- 12-06 Problems of Current Interest in the Design, Testing, Transport and Service of Very Large Transformers.
- 12-07 Some Characteristic Design Problems of Large Power Transformers.
- 12-08 Importance of Different Statistical Methods for the Judgment of the Reliability of Transformers.

1976

- 12-01 Proposals on standardization of the site installation to secure the reliability of transformer insulation.
- 12-02 The transfer of fault gases in transformers and its effect upon the interpretation of gas analysis data.
- 12-03 Condition of transformer insulation in service; Methods of its assessment and required criteria for satisfactory operation.
- 12-04 Insulation problems in power transformers for HVDC transmissions.
- 12-05 The oxygen-free transformer reduced ageing by continuous degassing.
- 12-06 Analysis of gases dissolved in oil and maintenance of transformers.
- 12-07 Present state and trends in developing tap changers of the high speed transition resistor type with special regard to operating reliability.
- 12-08 On load tap changers. Important new developments for improved reliability. Increased ratings and important application problems.
- 12-09 Criteria for checking the insulation conditions of large power transformers in ENEL's 420 kV and 245 kV systems.

1978

- 12-01 The loading of transformer units in power plants and networks with regard to ambient temperature.
- 12-02 Reliability improvement of 500 kV large capacity power transformer.
- 12-03 Duties of large transformers associated with load current, applied voltage, frequency and cooling medium temperature, their consequences on specifications, design, testing and operation.
- 12-04 Some aspects of design associated with the operation reliability of large and EHV transformers.
- 12-05 Reactor transformer for controllable static compensators.
- 12-06 Selected optimization and reliability problems in large transformers.
- 12-07 Review of power transformer insulation systems, operational and constructional features as affected by solid and liquid material characteristics.
- 12-08 Reliability and selection of characteristics for EHV transformers.
- 12-09 The loading of the magnetic circuit.
- 12-10 Influence of raw material and manufacturing process on the behavior of solid transformer insulation.
- 12-11 Choice of the characteristics of power transformers for UHV systems.

1980

- 12-01 Short-circuit testing of transformers.
- 12-02 The short-circuit performance of transformers - A contribution to the alternative to direct testing.
- 12-03 Short-circuit stresses in three-limb transformers with delta connected inner winding during single-phase faults.
- 12-04 Prospects for developing insulation tests on HVAC power transformers and shunt reactors.
- 12-05 Selected short-circuit strength problems in power transformers.
- 12-06 System conditions and dielectric test procedures for transformers.
- 12-07 Assurance of transformer short-circuit withstand capability. - A review of existing knowledge experience and opinion.
- 12-08 Short-circuit withstand capability of large transformers. Influence on transformer design and construction resulting from experience acquired during tests.
- 12-09 Review of transformer insulation test procedures.
- 12-10 Rumanian experience in the domain of switching impulse tests of power transformers.
- 12-11 Short-circuit tests at full size on a 160 MVA three-phase transformer and one phase of a 1070 MVA autotransformer.
- 12-12 The short-circuit withstand of large power transformers. Contribution to design improvement and test criteria.

1982

- 12-01 Fault detection and location in transformers.
- 12-02 The measurement of transformer winding temperature.
- 12-03 Development of UHV transformers in Japan.
- 12-04 UHV shunt reactors. Technical problems and test facilities.
- 12-05 Testing of paraffinic oils in transformer models.

- 12-06 Transformer and reactor insulation diagnosis based on pre-evaluated oscillograms.
- 12-07 Response of transformers to various types of overvoltages and related problems of dielectric testing.
- 12-08 Location of partial discharges and electrical failures in power transformers by means of automatic ultrasonic method.
- 12-09 Studies on partial discharge measurement in transformer windings.
- 12-10 Present and future trends in the development design and operation of large power transformers and shunt reactors.
- 12-11 Diagnostic technique and proceedings of preventive maintenance of large transformers.
- 12-12 Diagnostic testing in maintenance practice of HV transformers.
- 12-13 Diagnostic techniques and preventive maintenance procedures for large transformers.
- 12-14 Determination of transformer condition and preventive maintenance procedures in service.

1984

- 12-01 Associated problems, inspection and maintenance of two types of interface between EHV transformers and metalclad electric link insulated with SF₆.
- 12-02 Hot-spot measurements in power transformers.
- 12-03 Oscillatory switching voltages and relevant responses of HV power transformers.
- 12-04 Numerical prediction of the temperature distribution in the coils of a transformer winding.
- 12-05 Evaluation of thermal conditions of large transformers.
- 12-06 Seismic analysis and test on transformers bushings.
- 12-07 Resonant overvoltages in power station transformers initiated by switching transients in the connected cable network.
- 12-08 Transformer loading capability information derived from winding hot-spot measurements.
- 12-09 Recent developments by CEGB to improve the prediction and monitoring of transformers performance.
- 12-10 Practical investigation into repeated failures of 400/220 kV auto-transformers in the ESCOM network - Results and solutions.
- 12-11 Contribution to studies on an unusual overvoltage phenomenon in the tapchanger on the HV side of a 400 kV station transformer.
- 12-12 Hot-spot identification and overheating hazard preventing when designing a large transformer.
- 12-13 Thermal aspects of large transformers. Test procedures, hot-spot identification, permissible limits, their assessment in factory tests and service. Overload limitation, Effects of cooling system.
- 12-14 Resonance behavior of high voltage transformers.
- 12-15 Bushings and connections for large power transformers.
- 12-16 Methods of temperature rise calculations of power transformer windings.

1986

- 12-01 Insulation diagnostic system for HV power transformers in service.
- 12-02 Experience with the 750 kV transformers on the Hungarian electric system, acquired during on site testing.
- 12-03 Special features of transformers for HVDC transmission with particular reference to the converter transformers for the CEGB Sellindge terminal.
- 12-04 Space-charge and field distribution in transformers under DC stress.
- 12-05 Analysing gases dissolved in oil and its application to maintenance of transformers.
- 12-06 Diagnostic methods for transformers in service.
- 12-07 Experience obtained with the routine testing of the insulating oils of power transformers on the Belgian system.
- 12-08 Switching, protection and damping of arc furnace transformer windings.
- 12-09 Application of new materials for power transformers.
- 12-10 The shell form transformer used as furnace transformer.
- 12-11 Influence of asymmetrical circuit conditions on the operation and design of furnace transformers.
- 12-12 Application of cellulosic and non cellulosic materials in power transformers.
- 12-13 Converter transformers for +/- 750 kV HVDC system.
- 12-14 International standardisation of magnetic steels for power transformer cores - (IEC).
- 12-15 Conventional and actual load losses in HVDC transformers.

1988

- 12-01 Measurement of iron loss in large power transformers.
- 12-02 Prevention of tank rupture due to internal fault of oil-filled transformer.
- 12-03 Loss evaluation and the use of magnetic and electromagnetic shields in transformers.
- 12-04 Transformer loss reductions.
- 12-05 Some topics on designing transformers with low load losses.

- 12-06 Losses in rectifier transformers Factory test losses in comparison with actual operating losses.
- 12-07 Losses in tanks of large power transformers caused by magnetic field and methods of their reduction.
- 12-08 Study of noise emitted by power transformers based on today's viewpoint.
- 12-09 Criteria for a better evaluation of real losses in power transformers.
- 12-10 Losses in transformers and reactors.
- 12-11 Environmental considerations of transformers and reactors.

1990

- 12-101 How to eliminate some systematic errors in transformer temperature-rise measurements.
- 12-102 Measurement of winding temperature of power transformers and diagnosis of ageing deterioration by detection of CO₂ and CO.
- 12-103 Determination of hot-spot temperature rise at rated load and at overload.
- 12-104 Determination of reliable transformer capacity through direct hot-spot temperature measurement and safe thermal loading limits.
- 12-105 Thermal assessment of transformers.
- 12-106 Direct fibre-optic hot-spot temperature measurement in an operating transformer.
- 12-107 Thermal aspects of transformers.
- 12-201 Some designing, testing and reliability problems related to large generator transformers.
- 12-202 Rationale and implementation of a new 765kV generator step-up transformer specification.
- 12-203 Dielectric stress in 735 kV generator transformers under operating and test conditions.
- 12-204 Large space saving generator transformer for seismic regions.
- 12-205 Reliability availability and maintenance of generator transformers.
- 12-206 Aspects of design, tests and operation of an 850 MVA standardized generator transformer.
- 12-207 Electromagnetic transients in large power step-up transformers: some design and testing problems.
- 12-208 Large generator transformers.

1992

- 12-101 Transformer insulation condition monitoring life assessment and life extension techniques in Australia.
- 12-102 Experiences of on- and off-line condition monitoring of power transformers in service.
- 12-103 Essential requirements to maintain transformers in service.
- 12-104 How the products from insulating oil degradation can affect the life of transformers.
- 12-105 Transformer condition monitoring - Realizing an integrated adaptive analysis system.
- 12-106 Condition diagnosis and monitoring of transformers - Possibility of estimating transformer lifetime.
- 12-201 Five years of monitoring the impulse test of power transformers with digital recorders and the transfer function method.
- 12-202 Service experience and requirements for insulation high-voltage tests of EHV power transformers and shunt reactors.
- 12-203 Critical estimation of standardized lightning surge test procedures on neutral of a power transformer.
- 12-204 Distribution of very fast transient overvoltages in transformer windings.
- 12-301 Transient loss analysis of power transformers using magnetic and electric equivalent circuits.
- 12-302 Transformer model, based on the magnetic circuit.
- 12-303 Travelling waves as causes of internal resonance phenomena in coils and windings.
- 12-304 Modeling power transformer for transient voltage calculations.
- 12-305 Dynamic analysis of thermal behaviour of transformers using optical fibre measurements.

1994

- 12-101 On-site conditioning of transformers: its control and impact on dielectric strength.
- 12-102 Improved measures to solve the transportation problems of large power transformers.
- 12-103 Installation of power transformers on site.
- 12-104 Transportation problems of large power transformers in conjunction with design characteristics and activities related to on site installation and setting in service.
- 12-105 Installation of power transformers in underground substations of the Central London area.
- 12-201 Experience of fault detecting, repairing and testing of EHV transformers and shunt reactors on site.
- 12-202 Repair on-site of EHV transformers in the Polish grid.
- 12-203 Repair and refurbishing of power transformers - A Finnish view on the approaches and experiences.
- 12-204 AEP experience with repair and refurbishment of transformers and reactors.

- 12-205 On site determination of the condition of on-load tap changer contacts if a hot spot has been indicated by gas-in-oil analysis in power transformers.
- 12-206 A DC expert system (RVM) for checking the refurbishment efficiency of high voltage oil-paper insulating system using polarization spectrum analysis in range of long-time-constants.
- 12-207 Repair of large power transformers: experiences developed in Italy.

1996

- 12-101 Acoustic diagnosis of tap changers.
- 12-102 Study on inappropriate transformer trippings by Buchholz relays.
- 12-103 Reliability of on-load tap changers with special consideration of experience with delta connected transformer windings and tropical environmental conditions.
- 12-104 Transformer accessories.
- 12-105 Service experience and reasons of bushing failures of EHV transformers and shunt reactors.
- 12-106 Bushing insulation monitoring in the course of operation.
- 12-108 Monitoring methods for on-load tap changers. An overview and future perspectives.
- 12-109 Loss of life optimisation and noise reduction by means of intelligent controlling of AF cooled power transformers.
- 12-110 On-line transformer load and fault gas analyzer for determination of reliable overload capacity.
- 12-111 New developments of traditional transformer accessories and components installed on large units (step-p transformers and station autotransformers) operated by ENEL.
- 12-201 Converter transformers for 500 kV HVDC links.
- 12-202 HVDC converter transformers.
- 12-208 Route selection and design of 765 kV transmission line considering environmental constraints and public hearing.
- 12-301 Discharge propagation in large oil volumes. Influence of particles.
- 12-302 Accelerated degradation of transformer insulation by impact of polar particles and methods of retardation of this process.

1998

- 12-101 Monitoring and operational behaviour of HV and EHV instrument transformers.
- 12-102 On-line dissipation factor monitoring of high voltage current transformers and bushings.
- 12-103 Instrument transformers. Field and HV laboratory study and test program to prevent failures.
- 12-104 Experiences with optical instrument transformer.
- 12-105 The problem of internal arc in SF6 insulated current transformers.
- 12-106 Combined sensors for current and voltage are ready for application in GIS.
- 12-107 Development of diagnostic system of 330- 750 kV current transformers based on service experiences and endurance tests.
- 12-108 Evaluation of 30 years experience with HV Instrument transformers - derived requirements for installation, design and testing.
- 12-201 Pros and contras of on-site tests on power transformers and reactors.
- 12-202 The application of interfacial polarisation spectra for assessing insulation condition in aged power transformers.
- 12-203 Selected elements of life management of large power transformers. A Polish experience.
- 12-204 Life assessment: ranking of power transformers using condition based evaluation. A new approach.
- 12-205 Application of in-service monitoring systems during tests at Consolidated Edison's Ramapo station.
- 12-206 New mechanism of moderate hydrogen gas generation in oil-filled transformers.
- 12-207 Development and application of new condition assessment methods for power transformers.
- 12-208 Diagnostics of paper-oil current transformer insulation.
- 12-209 Monitoring tap changer operations.
- 12-212 Mechanical seismic behaviour of power transformers.
- 12-213 Control, diagnostic and monitoring of power transformers.
- 12-301 Use of active noise control (ANC) technology to quiet power transformers.
- 12-302 High temperature 630 KVA superconducting transformer.
- 12-303 Development and field test of 1000 kV - 3000 MVA transformer.
- 12-304 Development of a 500 kV gas insulated transformer using CGPA method for underground substations.
- 12-305 Static electronic tap-changer for fast phasewise voltage control.
- 12-306 Phase shifting transformers. Discussion of specific characteristics.
- 12-307 High temperature superconducting current limiting series reactor.

12-308 Design and application criteria of variable Mvar output shunt reactors with on-load tap-changer. Operation experience in Africa.

2000

12-101 A major breakthrough in transformer technology.

12-102 The short-circuit resistance of transformers: the feedback in France based on tests - service and calculation approaches.

12-103 Performance of transformers with split winding under non standard operation conditions.

12-104 Investigation of inrush currents during a short-circuit test on a 440 MVA 400 kV GSU transformer.

12-105 Short-circuit testing experience with large power transformers.

12-106 Problems of autotransformers operation in systems with fault currents upgrowth.

12-107 Power transmission reliability. Technical and economic issues relating to the short-circuit performance of power transformers.

12-108 Design verification criteria for evaluating the short-circuit withstand capability of transformer inner windings.

12-201 Recent achievements in performing shortcircuit withstand tests on large power transformers in Canada.

12-202 Economical aspects and practical experiences of power transformer on-line monitoring.

12-203 The design - construction and operation of high temperature superconducting transformers. Practical considerations.

12-204 Enhanced diagnosis of power transformers using on and off-line methods: results - examples and future trends.

12-205 Current limitation in high temperature superconducting transformers and impact on the grid.

2002

12-101 Ageing and moisture analysis of power transformer insulation systems.

12-102 Condition assessment and lifetime extension of power transformers.

12-103 Experiences from on-site transformer oil reclaiming.

12-104 Technical and economic assessment of power transformers - the Polish practice.

12-105 Estimation and minimization techniques of eddy current losses in transformer windings.

12-106 Life assessment of power transformers to prepare a rehabilitation based on a technical-economical analysis.

12-107 Improvement in maintenance and inspection and pursuit of economical effectiveness of transformers in Japan.

12-108 Condition based evaluation of net transformers - experience from a new ranking procedure.

12-109 Design process for reliable and cost effective transformers.

12-110 Experience based evaluation of economic benefits of on-line monitoring systems for power transformers.

12-111 French experience with decision making for damaged transformers.

12-112 A probabilistic approach to transformer overloading.

12-113 Extension of the lifetime and increase of the transformer operation safety on the grid.

12-114 On site repair of HV power transformers.

12-115 The impact of economic and reliability considerations on decisions regarding the life management of power transformers.

12-116 Analysis - simulation and testing of transformer insulation failures related to switching transients overvoltages.

2004

A2-101 Thermal analysis of oil cooled transformer

A2-102 Requirements for operation of transformers beyond nameplate rating - Australian and New Zealand experience

A2-103 Power transformer refurbishment : the benefits of hybrid insulation

A2-104 Estimation and minimization techniques of transformer tank losses

A2-105 Thermal performance of power transformers : thermal calculation tools focused on new operating requirements /
Comportement thermique des transformateurs : des outils de calcul thermique adaptés aux nouvelles exigences d'exploitation

A2-106 Temperature measurement of primary windings transformers in the hydro-electric power plant ' Djerdap 1 '
rated 380 MVA, 2 x 15,75 kV/420 kV, d5/d5/YN, OFWF, under load after 30 years operation

A2-107 New developments in transformer cooling calculations

A2-201 Integrated programme of diagnostics, decontamination and detoxification of fleets of transformers immersed in oil

A2-202 Transformer condition assessment experiences using automated on-line dissolved gas analysis

A2-203 On-site repair, refurbishment and high voltage tests of large power transformers in the transmission grid

A2-204 New concepts for prevention of ageing by means of on-line degassing and drying and hermetically sealing of power transformers

- A2-205 Practical experience with the drying of power transformers in the field, applying the LFH (Low Frequency Heating) technology
- A2-206 Experiences in managing transformers through maintenance operations and monitoring systems
- A2-207 Application of modern techniques for the condition assessment of power transformers
- A2-208 On-site processing of insulation system of large power transformers and hot-spot computer determination
- A2-209 Site maintenance operations on oil-immersed transformers and the state of renewal for low-cost operations in Japan
- A2-210 On site repair of a HVDC transformer
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2006

- A2-101 An analysis of the increase on transformer failures rate phenomena and measures taken to improve transformers reliability
- A2-102 OLTC reliability and maintenance strategy
- A2-103 2FAL, ageing of paper insulation and life management of power transformers
- A2-104 Condition assessment of aged transformer bushing insulations
- A2-105 Effect of mercaptan sulphur on insulation performance of HVDC converter transformers
- A2-106 A new technique for diagnosing internal abnormalities in oil – filled transformers
- A2-107 Development of gas insulated transformers
- A2-108 Drying of power transformers in the field, applying the LFH-technology in combination with oil reclamation
- A2-109 Combined assessment of transformer winding mechanical condition – important step to enhancement of transformer reliability
- A2-110 Electronic transformer control with monitoring and diagnostics
- A2-111 Oil corrosion and conducting Cu₂S deposition in power transformer windings
- A2-112 Data collection and analysis of transformer insulations in EGAT : toward to ageing
- A2-113 Engineered reliability: UK experience of 400kV 800MVA GSU transformers
- A2-114 Transformer reliability surveys
- A2-201 In service failure of 230 kV transformer due to steep-front lightning over voltages at Mexican West Coast
- A2-202 Grid implementation of a 400MVA 220/150kV $-15^{\circ}/+3^{\circ}$ phase shifting transformer for power flow control in the Belgian network : specification and operational considerations
- A2-203 Innovative applications of phase-shifting transformers supplemented with series reactive elements
- A2-204 French experience in phase-shifting transformers
- A2-205 Special considerations on the selection of on-load tap-changers for phase-shifting transformer
- A2-206 Power flow control on the Italian network by means of phase-shifting transformers
- A2-207 The specification and application of large quadrature boosters to restrict post-fault power flows
- A2-208 A 100 MW variable frequency transformer (VFT) on the HYDROQUÉBEC network – a new technology for connecting asynchronous networks
- A2-301 Assessment of an EHV shunt reactor insulation and mechanical performance by switching surge analyses
- A2-302 Experience with HF modeling for electrical transients and its application to FRA modelling
- A2-303 Long time experiences of ZnO-varistor application in power transformers and OLTC'S
- A2-304 Investigation and site repair of HVDC converter transformers – POWERGRID INDIA experience
- A2-305 Transformer internal over-voltages caused by remote energisation
- A2-306 Sympathetic interaction between GSU transformers up 13.2/400 kV of MACAGUA HYDROELECTRIC complex from CVG EDELCA

2008

- A2-101 Advanced application of a natural ester vegetable oil in a HV power transformer
- A2-102 Application of vegetable oil-based insulating fluids to hermetically sealed power transformers
- A2-103 Compact power transformers for substation in urban areas using hybrid insulation system
- A2-104 Development of gas insulated transformer and low-viscosity silicone immersed transformer with the fire safety considered environment aspect
- A2-105 Analysis on dielectric strength of SF₆ gas for gas insulated transformer
- A2-201 Strategies to replace, refurbish, repair and upgrade power transformers: The Spanish experience
- A2-202 Type moisture assessment in transformers including overloading limits
- A2-203 A simple and reliable algorithm for discrimination between inrush state and faulty conditions in transformers

- A2-204 Transformer refurbishment policy at RTE conditioned by the residual lifetime assessment
- A2-205 Post mortem investigation of insulation material of power transformers and comparison with diagnostic measurements
- A2-206 Failure modes of oil-immersed transformers due to static electrification and copper sulfide generation and suppressive effect of BTA
- A2-207 EHV bushing failure due to very fast transient overvoltages (VFTO)
- A2-208 Experiences and comparatives in tests of field and laboratory of sweep in the frequency of transformers using methods of sweep in the frequency and impulse
- A2-209 Condition assessment of medium-power transformers using diagnostic methods: PDC, FDS, FRA to support decision to modernize or replace service-aged units
- A2-210 Experience in assessment and on-site refurbishment of power transformers in service
- A2-211 Mineral oil with corrosive sulfur – method evaluation to identify false negatives and its performance with blends of natural ester
- A2-212 Autotransformer and reactor models development for core and shell type windings for frequency analysis studies
- A2-213 Asset management of transformers using accredited physical-chemical diagnostics and on-line monitoring in Slovenia
- A2-214 Understanding and management of sulfur corrosion from insulating oil
- A2-215 The effect of passivator additive used in transformers and reactor's mineral oil to neutralize the sulphur corrosion, and its influence on low thermal defects
- A2-216 Refining of corrosive insulating oils by selective liquid-liquid extraction process
- A2-217 Field experience with on-line bushing diagnostic to improve transformer reliability
- A2-218 Specification of new power transformers - basic maintenance issues.
- A2-219 Comparison of sealed conservator systems in power transformers vs desiccant breather protected systems
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- A2-302 Experience of specifying and using reactors in a transmission network
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- A2-305 Design and testing of 300 MVAR shunt reactors
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