DEPARTMENT OF ELECTRIC MACHINES, DRIVES, ELECTRICAL LIGHTING AND ELECTROTECHNOLOGIES

MAIN RESEARCH FIELDS

- Electric machines and equipment modeling, simulation, optimal design and testing (EME)
  Keywords: electric machines, electric equipment, field calculation, optimal design, computer aided testing.
- Power electronics and motion control (PEMC)
  Keywords: electric machines and drives, power electronics, speed and position control, digital control.
- Switched reluctance motor drive (SRMD)
  Keywords: electric machines and drives, reluctance motor, power electronics, digital control.
- Power industrial electric drives (PIED)
  Keywords: electric machines and drives, power electronics, speed control.
- Electrical lighting and Electrotechnologies (ELE)
  Keywords: electromagnetic fields, applied electrostatics, welding, electrothermal processes, ultrasonics, power electronics, lighting devices.
- Logic of the creative process (LCP)
  Keywords: logicization, algorithmization, cybernettization, inventics, innovation.

Researches are organized in the centre New system of intelligent motion of the electric machines.

FIELD DESCRIPTION

Electric machines modeling including saturation and frequency effect both in the lumped parameter or distributed parameter (field distribution) forms are paramount for global optimization design and new computer - aided testing and parameter identification methods, modeling and simulation.

ACTIVITIES AND RESULTS

Since 1980 aggressive theoretical and experimental work on ever better electric machine modeling, simulation, optimal design, testing and parameter identification has been taking place with the results of two U.P.T. codes for optimal design of large power a.c. machines and a few new testing and parameter identification techniques for electric machines. Most of the work resulted in prototypes tested (or built) in cooperation in industrial partners.

Due to the long time collaboration with the Faculty of Automation and Computer Science from Timișoara, in the field of data acquisition systems and digital signal processing, the D-109 Laboratory was affiliated at the research center in automation and computer science.

RESEARCH BENEFICIARIES

Ministry of Hydro-Power plants such are Lotru-Ciunget, Slatina Aval-Drăgănești (hydro reversible generators of 14000 kVA), Iron Gates 1, Râul Mare Retezat (hydrogenerators of 175000 kVA), Turnu-Ruieni (hydrogenerators of 76500 kVA) and Nuclear Power Plant Cernavodă – Unit 2.

External cooperation – design and prototype of a low speed wind generator with HEXATRONIC Inc. – Canada.

RESEARCH TEAM

- Acad. Toma DORDEA
- Prof. dr. eng. Marius BIRIESCU
- Prof. dr. eng. Marius BABESCU
- Prof. dr. eng. Vladimir CREŢU
- Dr. eng. Gheorghe MADESCU, CS II
- Lect. dr. eng. Mihai MICEA
- Eng. Marţian MOŢ, CS III
- Assoc. prof. dr. eng. Sorin MUŞUROI
- Assoc. prof. dr. eng. Dan NICOARĂ
- Lect. Dr. eng. Ciprian Şorândaru
- Dr. eng. Ileana TORAC, CS II
- Eng. Lucian OCOLIŞAN, CS II
- Assoc. prof. dr. eng. Dan NICOARĂ
- Lect. Dr. eng. Ciprian Şorândaru
- Dr. eng. Ileana TORAC, CS II
- Eng. Lucian OCOLIŞAN, CS II

RESEARCH OFFERS

Advanced design methods of large a.c. machines including saturation and frequency effects, coupled with dynamic simulation, advanced design methods for ultrahigh torque induction motors, new design methods for capacitor induction motors, computer - aided parameters identification - software and hardware - for electric machines, consulting on large power electric machines design and testing.

Consulting regarding optimization,, efficiency improvement testing procedures and refurbishment of hydro-generators.

CONTACT PERSON

Prof. dr. eng. Marius BIRIESCU
E-mail: marius.biriescu@et.upt.ro

RESEARCH OFFERS

Advanced design methods of large a.c. machines including saturation and frequency effects, coupled with dynamic simulation, advanced design methods for ultrahigh torque induction motors, new design methods for capacitor induction motors, computer - aided parameters identification - software and hardware - for electric machines, consulting on large power electric machines design and testing.

Consulting regarding optimization,, efficiency improvement testing procedures and refurbishment of hydro-generators.

CONTACT PERSON

Prof. dr. eng. Marius BIRIESCU
E-mail: marius.biriescu@et.upt.ro
ACTIVITIES AND RESULTS
Research activities on linear and rotary motors & drives since 1975 with numerous prototypes built and tested. Integration of intelligent motion systems in Romanian industries up to 2000 kW units since 1994. Various applications of power electronics in energy conversion and digital control concerned with: wind and hydraulic energy conversion systems into electric energy by means of variable speed operation, starter-alternators with digital control designed for hybrid and electric vehicles, and PM machines-based digital control systems up to 150 rpm

RESEARCH BENEFICIARIES
Various Romanian industrial companies such as: Beespeed Automatizări Timişoara, UCM Reşiţa, Azomures Tg. Mureş, Aquatim Timisoara, SE Iernut, Electrocentrale Deva, CNCSIS, ANSTI etc. External co-operations: Aalborg University Denmark, EBM Papst Germany, Casino University Italy

RESEARCH TEAM
- Prof. dr. eng. Ion BOLDEA
- Assoc. Prof. dr. eng. Nicolae MUNTEAN
- Assoc. Prof. dr. eng. Lucian TUTELEA
- Lect. dr. eng. Cristian LASCU
- Lect. dr. eng. Lucian Miheş - POPA
- Ph.D. Student Răzvan ANCUŢI
- Ph.D. Student Marius FĂTU
- Ph.D. Student Sorin AGARLIŢĂ
- Ph.D. Student Lucian CIBU
- Ph.D. Student Codruţa PAICU
- Ph.D. Student Vlad GRĂDINARU
- Ph.D. Student Robert ANTAL
- Ph.D. Student Alin ŞTIRBAN
- Ph.D. Student Liviu IEPURE

RESEARCH OFFERS
HARDWARE: Integration of intelligent motion control systems in various industries (automotive electric actuators and renewable electric energy converters are key subjects of interest) from process identification to commissioning and service. Prototyping of new systems for given specifications.

SOFTWARE: Electric motor - linear and rotary - design software aids in the form as software licensed products by request.

Intelligent motion control system.

FIELD DESCRIPTION
Switched reluctance motor (SRM) is a position-controlled power stepper motor with a very rugged topology and low costs but requires a specific static power converter and digital controller. Numerous potential applications in harsh environments look adequate for this kind of drive which drew worldwide attention in the last 10 years.

ACTIVITIES AND RESULTS
The actual activity aims at introducing the modeling, simulation and validation of the permanent and dynamic performances of the SR Drives

RESEARCH TEAM
- Prof. dr. eng. Gheorghe ATANASIU
- Prof. dr. eng. Dorin POPOVICI
- Lect. dr. eng. Alin ARGEŞEANU
- Lect. dr. eng. Ciprian ŞORĂNDARU
- Assist. eng. Octavian CORNEA
- Assist. eng. Valeriu OLĂRESCU
- Ph.D. Student Marcus SVOBODA

RESEARCH OFFERS
New drives with SRMs - from research to prototyping for various applications at variable speed, digital control of industrial drives with static power converters, medium power variable frequency motor drives (research and consulting)

CONTACT PERSON:
Prof. dr. eng. Dorin POPOVICI
E-mail: dorin.popovici@et.upt.ro

Researches in **POWER INDUSTRIAL ELECTRIC DRIVES**

**FIELD DESCRIPTION**
Power electric drives with variable speed are useful to increase productivity and quality in various processes and require means for speed control invariably. The load requirements are very specific and the best solution depends notably on the application.

**ACTIVITIES AND RESULTS**
Since 1980, with emphasis on overhead cranes using various static power converters, research efforts have been developed to define, design, built and test power drives with variable speed. New design methods and converter realizations have been obtained both with rotary or linear motors.

**RESEARCH BENEFICIARIES**
Mechanical works Timişoara, Ministry of Education, PROMPT Research Institute.

**RESEARCH TEAM**
- Prof. dr. eng. Eugen SERACIN
- Prof. dr. eng. Dorin POPOVICI
- Assoc. prof. dr. eng. Sorin MUŞUROI
- Assoc. prof. dr. eng. Ioan GHIUR
- Lect. Dr. eng. Ciprian ŞORÂNDARU
- Lect. Dr. Eng. Cristian LASCU
- Ph.D. Student Marcus SVOBODA

**RESEARCH OFFERS**
Optimal design methods for power industrial drives, current inverter power drives, linear motors conveyors.

**CONTACT PERSON**
Assoc. prof. dr. eng. Sorin MUŞUROI
E-mail: sorin.musuroi@et.upt.ro

Researches in **ELECTRIC LIGHTING AND EQUIPMENT FOR ELECTROTECHNOLOGIES**

**FIELD DESCRIPTION**
Modern lighting sources and lighting devices, optimal lighting design, power electronics for electric lighting, electrotechnologies - based on electromagnetic or electrostatic fields are widely used in the fabrications manufacturing systems and include electrothermal processes, welding power sources, power ultrasonics, electrostatic etching etc.

**ACTIVITIES AND RESULTS**
Since 1980 notable research efforts have been devoted to investigate induction - the welding process and the power sources, new electric welding and ultrasonic power electronics sources. A few prototypes have been built and tested. New researches have been oriented to ultrasonic enhancement of liquid magnetic processing and sonosinthesys of nano-materials.

**RESEARCH BENEFICIARIES**
Ministry of Research, ISIM Timişoara

**RESEARCH TEAM**
- Prof. dr. eng. Ioan ȘORA
- Assoc. prof. dr. eng. Dan NICOARĂ
- Assoc. prof. dr. eng. Alexandru HEDEȘ

**RESEARCH OFFERS**
Power electronics, for electrotechnologies, including high-frequency power transformers, arc welding power sources, advanced power electronics ultrasonics sources (from research to prototyping), ultrasonic processing of materials, consulting in electrotechnologies and electric lighting devices.

**CONTACT PERSON**
Prof. dr. eng. Ioan ȘORA
E-mail: ion.sora@et.utp.ro

**MAIN PUBLICATIONS**

**PUBLISHED PAPERS**


33. Şorândaru, C., Muşuroi, S., Svoboda, M. Matlab simulation of an auto-adaptive control system of a switched reluctance motor drive, Buletinul Institutului Politehnic Iasi, pp.. 735-740, ISSN 1223-8139


38. Coroban, V., Boldea, I., Andreescu, G.D., Active flux based observer for motion sensorless control biaxial excitation generator-motor for automobiles (Bega), Scientific Bulletin of the Politehnica University of Timişoara, Transaction on Power Engineering, Tom 53(67), pp. 81-87, ISSN 1582 – 7194
of Timişoara, Transaction on Power Engineering, Tom 53(67), pp. 177-180, ISSN 1582-7194


63. Svoobra, M., Şorândaru, C., Olărescu, V., Muşuroi, S. Modeling and simulation of a version of neuronal control of the permanent magnet synchronous machine, 5th International Conference of Electric and Power Engineering, Buletinul Institutului Politehnic Iasi, pp. 11-17, ISSN 1223-8139


70. Dordea, T., Torac, I., Madescu, Gh., Moţ, M., Ocolişan, I. Efficiency improvement of high power generators trough computer aided optimun design of the Roebel bars, International Scientific Conference eRA-3, Aegina Island, T 4, ISSN 1083-08998


PhD THESIS DEFENDED

1. Bobocea, M. Studiul poluării sistemelor electroenergetice de către maşinile electrice saturate de medie şi mică putere, PhD supervisor: Ioan Novac

2. Stoian, O. Stabilitatea dinamică a sistemelor electroenergetice alimentate de la generatoare asincrone și synchron, PhD supervisor: Ioan Novac

3. Fătu, M. High performance control of PM synchronous generator (PMSG) for wind
energy Conversion, PhD supervisor: Ion Boldea

4. Moț, M. Determinarea parametrilor și caracteristicilor mașinilor electrice de inducție prin măsurarea valorilor momentane, PhD supervisor: Toma Dordea

5. Ancuți, R. Răspunsul dinamic rapid al controlului fără senzori mecanici al acționărilor cu motoare sincrone cu magneti permanenti supercili, de mare vitează, PhD supervisor: Ion Boldea


ORGANIZED CONFERENCE

1. 11th International Conference on Optimization of Electrical and Electronic Equipment, May, 22-23, organized by: The Faculty of Electrical Engineering of the Transilvania University of Braşov, The Faculty of Electrical Engineering of the Politehnica University of Timişoara and The Faculty of Electrical Engineering of the Politehnica University of Timişoara in cooperation with The Institute of Electrical and Electronics Engineers IEEE and The Institution of Electrical Engineers IEE

2. 14th National Conference on Electrical Drives, September, 25-26, organized by the Electrical Engineering Department of the Faculty of Electrical and Power Engineering of the Politehnica University of Timişoara

RESEARCH GRANTS


2. Biriescu, M., Moț, M., Irimia, D., Mușuroi, S., Greconici, M. Optimizarea înfasurărilor hidrogeneratoarelor electrice în vederea creșterii eficienței energetice, nr. 21028, PNCDI2, value (2008): 2.000 RON


4. Hedeș, A. Sistem intergat de comanda si control pentru CA1...3, 100t/h si turboagregat TA ER 19, 7MW-1, 4/0, 3 la CT Sud Timisoara, nr. 7/2008, 7000 RON

CONTACT

Prof. dr. eng. Dorin POPOVICI, Head of Department
2, Vasile Pârvan Blv.
300223, Timișoara, Romania

Tel/Fax: +40-256-403451
Tel: +40-256-403452
Email: dorin.popovici@et.upt.ro
Web: http://www.et.upt.ro
DEPARTMENT OF POWER ENGINEERING

MAIN RESEARCH FIELDS

- Electromagnetic Compatibility in Power Systems
  *Keywords*: electromagnetic field, environment, disturbance source, electromagnetic interference
- High Voltage Laboratory Tests and Quality Checking
  *Keywords*: high voltage technique, overvoltages, testing record
- Modeling and Simulation of Electromagnetic Transients in Power Systems
  *Keywords*: switching and lightning, overvoltages, transient response, simulation
- Power System Reliability
  *Keywords*: loss of load probability, power system reliability, probability density function
- Power Apparatus and Equipment
  *Keywords*: power apparatus, electrical equipment, switching devices, protection devices
- Power Quality
  *Keywords*: harmonic analysis, data acquisition, computer aided statistical research
- Load forecasting
  *Keywords*: energy forecasting, expert system
- Power System Restructuring
  *Keywords*: power system, energy pool, transmission open access, ancillary services, independent system operator
- Power System Transient Stability and Voltage Stability
  *Keywords*: power systems, power systems stability, transient stability, voltage stability
- Electrical Materials
  *Keywords*: ferromagnetic materials, hysteresis loop, transformer iron core, non-linear analyses methods
- Electrical substations and Power plants
  *Keywords*: electrical energy production, power transformer, switching devices, protection devices, secondary circuits
- Energy management
  *Keywords*: energy efficiency, energy management systems, project feasibility

Activities and Results

Over-voltage protection equipments, using ZnO varistors
Mathematics modeling and measurements of induced voltages in two-line circuit and adjacent circuits

Research Beneficiaries

RN Transelectrica S.A., Timișoara

Research Team

- Prof. dr. eng. Flavius Dan ŞURIANU
- Prof. dr. eng. Viorel TITIHZĂN
- Lect dr. eng. Ilona BUCATARIU

Researches in ELECTROMAGNETIC COMPATIBILITY IN POWER SYSTEMS

Field Description

Electromagnetically disturbances analysis produced by high and low perturbation sources; coupling mode between sources and victims and against perturbation action to protect the energetically field receptors analyses.

Activities and Results

The purpose of high voltage tests consists of certifying the quality of insulation systems and emitting testing bulletins, optimal computation and experimental testing of insulation disturbance location and characteristic parameters measuring.

Research Beneficiaries

SC Electroconstrucția ELCO Oradea S.A., S.C. Electrica Banat Timişoara, ISIM Timişoara

Research Team

- Prof. dr. eng. Flavius Dan ŞURIANU
- Assoc. prof. dr. eng. Viorel TITIHZĂN
- Assoc. prof. dr. eng. Adrian PANĂ
- Lect dr. eng. Marianna TITIHZĂN

Researches in ELECTROMAGNETIC COMPATIBILITY IN POWER SYSTEMS

Field Description

Electromagnetically disturbances analysis produced by high and low perturbation sources; coupling mode between sources and victims and against

Activities and Results

Tests on sparkover voltages (high voltages resistance variable arresters).
Tests on insulators of glass and composite insulators for a.c. overhead lines (Un > 1000 V).
Tests on medium voltage 20 kV steel-aluminum conductor insulated with XLPE.
Tests on insulation of welding equipment.

Research Beneficiaries

SC Electroconstrucția ELCO Oradea S.A., S.C. Electrica Banat Timişoara, ISIM Timişoara

Research Team

- Prof. dr. eng. Flavius Dan ŞURIANU
- Assoc. prof. dr. eng. Viorel TITIHZĂN
- Assoc. prof. dr. eng. Adrian PANĂ
- Lect dr. eng. Marianna TITIHZĂN

Researches in MODELING AND SIMULATION OF ELECTROMAGNETIC TRANSIENTS IN POWER SYSTEMS

Field Description

Studies present the statistical results of a switching or a lightning overvoltage performed on electromagnetic transients. The probability of shielding failures and backflashover have been evaluated and compared to the characteristics of transmission lines in service. Overvoltages caused by line energization, single and
three phase reclosing have been investigated by statistical approach using ATP – EMTP.

***ACTIVITIES AND RESULTS***

In scientific research programs several models have been developed for calculation of switching or lightning overvoltages.

**RESEARCH TEAM**
- Prof. dr. eng. Corneliu VELICESCU
- Assoc. prof. dr. eng. Gheorghe VUC
- PhD Student Daniel DONDERA
- PhD Student Răzvan POPA

**RESEARCH OFFERS**
Power systems transients - modeling and simulation
Power systems reliability studies
Transformer iron core, non-linear analyses methods.

**Researches in POWER SYSTEMS RELIABILITY**

**FIELD DESCRIPTION**
The research presents for different power systems configuration the probable energy value, which cannot be supplied and the loss of load probability. To obtain the probability density function the different probabilistic models are used like Gram-Charlier expansion or Monte Carlo simulation.

**ACTIVITIES AND RESULTS**
The scientific papers are published in power system reliability area.

**RESEARCH TEAM**
- Prof. dr. eng. Corneliu VELICESCU
- Prof. dr. eng. Mircea NEMEŞ
- PhD Student Daniel DONDERA
- PhD Student Răzvan POPA
- PhD Student Felicia COROIU

**RESEARCH OFFERS**
Reliability evaluation of power system extension

**Researches in POWER APPARATUS AND EQUIPMENT**

**FIELD DESCRIPTION**
There are a very large category of electrical systems, which include all type of switching devices (from Low to High Voltage), all the equipment existing in power stations, protection systems (surge arresters, current protections), automatic equipment (relays, contactors), power electronic devices and digital command equipment (such as PLC-s).

**ACTIVITIES AND RESULTS**
Design of new electrical switching devices, equipment and installations
PCL’s implementation for different applications
Software for digital command equipment
On-line systems for monitoring and diagnosis of electrical equipment

**RESEARCH BENEFICIARIES**

**RESEARCH TEAM**
- Prof. dr. eng. Alexandru VASILIEVICI
- Prof. dr. eng. Iuliu DELESEGA
- Prof. dr. eng. Petru ANDEA
- Assoc. prof. dr. eng. Doru VĂTĂU
- Lect. dr. eng. Flaviu FRIGURĂ

**Researches in POWER QUALITY**

**FIELD DESCRIPTION**
Analysis of harmonics, unsymmetrical operations; equivalent parameter measurements for harmonic frequencies; evaluation of static reactive power compensation; control of passive power filter in electrical distribution systems.

**ACTIVITIES AND RESULTS**
Measurements were made in substations for Romanian National Electricity Company. A complex digital data acquisition system was used for the statistical estimation of harmonic distortion and unsymmetrical operation. New solutions were developed for the improvement of power quality in distribution systems.

**RESEARCH BENEFICIARIES**
National Agency of Scientific Research
Electrical Power Distribution Company – Electrica
National Power Transmission Company – Transselectrica

**RESEARCH TEAM**
- Prof. dr. eng. Vasile DUŞA
- Prof. dr. eng. Petru GHEJU
- Assoc. prof. dr. eng. Adrian PANĂ
- Lect. dr. eng. Ilona BUCATARIU

**RESEARCH OFFERS**
Measurement and characterization of harmonic distortion for large industrial loads, location of harmonics in power systems, estimation effects for harmonics and unbalanced load on power system’s equipment, analysis of power quality.

**Researches in LOAD FORECASTING**

**FIELD DESCRIPTION**
Analysis of electrical energy and power need for short and mid-term load forecasting; algorithm and program development for monthly energy consumption and daily load curves.

**ACTIVITIES AND RESULTS**
Electrical load data acquisition from “Electrica Banat” substations and data files processing.
Development of PRENPS and PELTMRNA programs for short-term daily load curve forecasting, respectively for mid-term monthly load forecasting. Result analysis and forecast validation.

**RESEARCH TEAM**
- Prof. dr. eng. Bucur LUSTEREA
- Assoc. prof. dr. eng. Adrian PANĂ
- Lect. dr. eng Ioan BORLEA
- Lect. dr. eng. Ilona BUCATARIU
- PhD Student Constantin BĂRBULESCU
- PhD Student Dan JIGORIA-OPREA

**RESEARCH OFFERS**
Short-term energy and load curve forecasting. Expert systems for the checking of used database at forecasting.

**FIELD DESCRIPTION**
The unprecedented world-wide restructuring of the power industry move away from the traditional monopolies and toward greater competition, in the form an increased members of independent power producers and an unbundling of the main services that were until now provided by the utilities, has been building up for over a decade.

**ACTIVITIES AND RESULTS**
Managing risk on new market power and price stability
Pricing of network access

**RESEARCH TEAM**
- Prof. dr. eng. Mircea NEMEȘ
- Prof. dr. eng. Corneliu VELICESCU
- Assoc. prof. dr. eng. Gheorghe VUC
- Assoc. prof. dr. mat. Doru PĂUNESCU (Department of Mathematics)
- Eng. Oana POP

**RESEARCH OFFERS**
Digital model of power system
Optimal Power Price Simulator (OPP)

**Researches in POWER SYSTEM TRANSIENT STABILITY AND VOLTAGE STABILITY**

**FIELD DESCRIPTION**
Computer aided analysis and improvement of the stability of the electric power system (transient stability, dynamic stability and voltage stability). New control technique for stability improvement. Developing of the master studies in these fields.

**ACTIVITIES AND RESULTS**
Advanced software for stability analysis
New control techniques for the improvement of the dynamic behavior of synchronous generators
PHARE postgraduate and PhD program

**RESEARCH BENEFICIARIES**
Ministry of Education and Research
Electrical Power Distribution Company – Electrica
National Power Transmission Company – Transelectrica

**RESEARCH TEAM**
- Prof. dr. eng. Stefan KILYENI
- Prof. dr. eng. Mircea NEMEȘ
- Prof. dr. eng. Ștefan PREITL
- Prof. dr. eng. Bucur LUSTEREA
- Prof. dr. eng. Mihai MOGA
- Prof. dr. eng. Radu Emil PRECUP
- Lect. dr. eng. Ioan BORLEA
- Phd. Student Constantin BĂRBULESCU
- Phd. Student Dan JIGORIA-OPREA

**RESEARCH OFFERS**
Software for stability analysis and improvement
Studies concerning dynamic behavior of power systems
Advanced control techniques for transient and voltage stability improvement
Researches in Applied Non-linear Modeling of Ferromagnetic Materials

FIELD DESCRIPTION
The modeling of non-linear transformer iron core considered the hysteresis loop. Modeling methods for establishment and validation. Estimation of the transformer behavior under symmetrical (sinusoidal and non-sinusoidal) and asymmetrical supply conditions. Analyses the main quantities. Iron core losses harmonic analyses.

ACTIVITIES AND RESULTS
Measurements were performed in the “National Research Center for Welding and Material Trials-ISIM” and the “Power Energy Department” laboratories. A complex digital system was used for data acquisition and harmonics analyze of the transformer currents and tension for different supply conditions. The proposed transformer model was implemented into a welding machine and validated (comparison between the simulated and the measured results showed a very good agreement). Simulations were performed over in order to estimate the welding performances over a wide range of condition defined through: different firing pulse angle, materials, forms and thickness of welding pieces.

RESEARCH BENEFICIARIES
National Research Center for Welding and Material Trials-ISIM, Timisoara
Power Energy Department of the “Politehnica” University of Timisoara
ICPE Bucharest - manufacturer of the welding transformer under test

RESEARCH TEAM
- Assoc. prof. dr. eng. Doru VĂTĂU
- Lect. Dr. Eng. Flaviu FRIGURĂ

RESEARCH OFFER
Modeling single-phase transformers and equipments with ferromagnetic core.
Estimation of electromagnetic quantities: time variation shape, r.m.s., peak values, harmonic analyze over a wide range of conditions.
Time and frequency analysis of electromagnetic quantities.
Behavioral analysis of a complex system containing a transformer or an apparatus.
Iron core power losses detailed analysis.

Researches in Electrical Substations and Power Plants

FIELD DESCRIPTION
Constructive solutions optimization used for electrical equipments and installations in electrical substations, operating principles and general characteristic optimization for the reliability and system management improvement.
Specific problems of planning for the electrical network operating control and command.

ACTIVITIES AND RESULTS
Solutions for the electrical substation auxiliaries supplying from the 220/110 kV autotransformer tertiary. Development of an expert system which offer informational support for substation operating recovery, which following a failure, that monitor continually all functions needed by protection and control and which come in to support for operating personnel.

RESEARCH TEAM
- Prof. dr. eng. Petru GHEJU
- Prof. dr. eng. Vasile DUŞA
- Prof. dr. eng. Bucur LUSTREA
- Lect. dr. eng Ioan BORLEA
- Lect. dr. eng Ilona BUCATARIU
- Phd. Student Florin MOLNAR-MATEI
- Phd. Student Alexandru BĂLOI

RESEARCH OFFERS
The opportunity analysis of the implementation intelligent systems needed for filtering, cataloguing and store of the information provided from the protection and control systems in the electrical substations for substation remote control.

Researches in Energy Management

FIELD DESCRIPTION
Energy audit, energy management are the only means for sustainable energy use and best economical performance in entire society.

ACTIVITIES AND RESULTS
Measurements audit were made in substations for “Transelectrica” National Transmission Company. Were realized feasibilities studies for new solutions in auxiliary services supplying and for public lightning systems energy efficiency improvement.

RESEARCH BENEFICIARIES
National Agency of Scientific Research
Timisoara, Satu Mare City Councils
National Power Transmission Company – Transelectrica
Politehnica University from Timisoara

RESEARCH TEAM
- Prof. dr. eng. Flavius Dan ŞURIANU
- Assoc. prof. dr. eng. Gheorghe VUC
- Assoc. prof. dr. eng. Dan NICOARA
- Assoc. prof. dr. eng. Alexandru HEDES

RESEARCH OFFERS
Feasibility studies for energy efficiency projects, energy audits, energy policies advising.
BOOKS


18. Bărbulescu, C., Kilyeni, Şt., Vuc, Gh., Chiosoa, N., Pop, D., Ardelean, I. Aspects regarding congestion management in a competitive power market environment, Energetica, Romania, An 56, nr. 2, pp. 52-57, ISSN 1453-2360


20. Kilyeni, Şt., Bărbulescu, C., Vuc, Gh. Modern power system analysis using stochastic power flow, Buletinul Institutului Politehnic din Iasi, Romania, Tom LIV (LVIII), Fasc. 4, pp. 1099-1106, ISSN 1099-1106


27. Deleșega, I. Varistors-Operating and Choice to Protect Telecommunication Equipment, Analecte Universității din Craiova, An 32, nr 32, pp.48-51, ISSN1842-4805


45. Vuc, Gh., Kilyeni, Şt., Ardelean, I., Bărbulescu, C. Congestion evaluation in complex power systems using probabilistic power flow, WORLD ENERGY SYSTEM CONFERENCE, 2008 – Iaşi 2008, (CD) B 068, ISSN 1198-0729


RESEARCH GRANTS


2. Frigură, F., Măţiu-Iovan, L. Îmbunătăţirea performanţelor funcţionale ale echipamentelor de protecţie împotriva supratensiunilor cu varistoare pe bază de ZnO pentru aplicaţii la joasă tensiune, CEEX ET 33, contract 5908, value (2008): 23760 RON.


4. Şurianu, F.D., Nicoară, D., Vuc, Gh., Ştef, V. Studiu de oportunitate privind concesionarea iluminatului stradal în oraşul Sânnicolau Mare, contract 99 / 2008, value (2008): 5.000+950 TVA RON.


10. Tăhăzan, V., Tăhăzan, M. Verificarea tensiunii înalte și verificarea rigidității dielectriche la echipamente de încercare, contract BC 123/29.07.2008, value 714 RON.

CONTACT
Prof. dr. eng. Flavius Dan ȘURIANU
Head of Department
2, Vasile Pârvan Blv.
300223, Timișoara, Romania
Tel/Fax: +40-256-403411
Email: catee@et.upt.ro
Web: http://www.et.upt.ro