

## EXPERIMENTAL MODEL FOR AN AUTOMATIC CAPACITIVE COMPENSATOR DESIGNED FOR IMPROVING THE POWER FACTOR AND FOR LOAD BALANCING IN LOW-VOLTAGE ELECTRICITY DISTRIBUTION NETWORKS - CAEREDJT

### Goal of the project

The project is intended to finance industrial research activities, needed to put in practice under the form of an experimental model of research findings of a group of academics from UPT, concerning the network load balancing electric phase through cross unbalanced capacitive compensation. In electrical networks, capacitive load variation implies variation of the capacity compensation, thus the need for building an unbalanced capacitive automatic compensator, to record load variation.

### Short description of the project

The automatically unbalanced capacitive compensator proposed by this project is an innovative product, so achieving a functional experimental model involves overcoming a number of scientific and technical challenges, the most important being: control and single-phase switching of the capacitor batteries steps, the construction algorithm and implementation of a programming language for PLC process control, process optimization for automatic compensation.

### Project implemented by

- Politehnica University of Timisoara – Lead partner
- S.C. ICPE S.A. Bucharest – Project partner

### Implementation period

01.07.2014 – 30.06.2016

### Main activities

1. Conducting studies and analysis on the alternative constructive solutions and developing the technical documentation for the construction of the experimental model.
2. Manufacturing of the experimental model and the analysis, control and monitoring systems.
3. Testing the model and proving its functionality and its utility
4. Dissemination of results and protect the intellectual property rights.

### Financed through/by

UEFISCDI

### Applicability and transferability of the results

The results of the project are useful for unbalanced electrical loads supplied at low voltage level, and also for the Distribution system operator (DSO).

### Results

- The main outcome of the project will be a functional experimental model and its documentation of implementation for a capacitive compensator designed to improve power factor and load balancing in networks of low voltage power distribution.
- It will underpin the design and construction in a later stage, of a prototype of a capacitive automatically balance high power compensator (tens of kVA) for increasing network performance of low-voltage power distribution and utilization facilities connected to it, by reducing reactive power flow and load balancing.
- The results of the research will be disseminated in scientific papers in professional journals or communication conferences.
- New technical solutions brought by this automatic capacitive compensator, as regard to the structure, order, sizing, automatic control algorithm, will be the subject of intellectual property protection activities.

### Research team

Assoc.Prof. Adrian PANĂ, PhD  
Prof. Radu – Emil PRECUP, PhD  
Prof. Ștefan PREITL, PhD  
As. Florin MOLNAR-MATEI, PhD  
As. Alexandru BĂLOI, PhD  
Lecturer Ilie Mihai TĂUCEAN, PhD  
Lecturer Mircea-Bogdan RĂDAC, PhD  
As.Claudia-Adina BOJAN-DRAGOȘ, PhD  
Alexandra Iulia STÎNEAN, PhD  
Eng. Andrei PLETTINGER

### Contact information

Assoc. Prof. Adrian PANĂ, PhD  
Department of Power Engineering  
Address: Bv. Vasile Pârvan, No. 2, RO300223, Timisoara  
Phone: (+40) 256 403420  
E-mail: adrian.pana@upt.ro  
Web: <https://sites.google.com/site/caeredjt/>