

## RESEARCH ON THE ANALYSIS AND OPTIMIZATION OF OPERATING REGIMES OF POWER TRANSMISSION AND DISTRIBUTION NETWORKS

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### Abstract

Both the didactic component of the candidate and its research activities took place in two closely related areas, namely the electrical transport and distribution networks and the power quality, fields of major importance belonging to an integrating domain - electrical power engineering. The most important results of the candidate's research work, obtained on the research topics defined as representative, were grouped into four thematic areas of major importance, as follows:

1. Transfiguration of electrical distribution networks.
2. Balancing the loads of electrical distribution networks by unbalanced reactive shunt compensation.
3. Evaluation of impedance unbalance in three-phase electrical networks and their effects.
4. Evaluation of harmonic impedances in harmonic polluted electrical networks and their effects.

The study of the harmonic impedance has an important weight in the research activity, being oriented towards:

- Using the harmonic impedance of the network in the study of capacitive shunt compensation in the presence of non-sinusoidal regime.
- Analytical and numerical determination of the harmonic impedance seen in the buses of an electrical distribution network.
- Analytical and numerical determination of harmonic impedance seen in the sections of a three-phase line.
- Experimental determination of the harmonic impedance seen in the buses of an electrical network.

Another component of the author's research activity is the participation in solving over 20 research grants won in national competitions, research contracts or consultancy with energy companies or training grants, out of which six he was the project director:

- 7 research/ consultancy contracts with a value of at least 2000 € - out of which 3 was the project director;
- 6 national grants/projects won by competition - out of which 2 was project director.



The results of the candidate's research activity have been brought to the attention of national and international academic and scientific community, through articles published in journals or conferences proceedings. For the period covered by the habilitation thesis, the candidate has published 81 articles, out of which 36 articles he is the first author or main author. The most important are:

- 4 in journals ISI indexed;
- 2 in journals indexed in other international data bases (IDB);
- 19 to ISI international conferences;
- 5 to IDB international conferences.

The full thesis at:

[http://www.upt.ro/img/files/2018-2019/doctorat/abilitare/Pana-Adrian/Adrian\\_Pana\\_Rezumat\\_abilitare\\_en.pdf](http://www.upt.ro/img/files/2018-2019/doctorat/abilitare/Pana-Adrian/Adrian_Pana_Rezumat_abilitare_en.pdf)

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