

UNIVERSITY POLITEHNICA OF BUCHAREST
FACULTY OF ELECTRICAL ENGINEERING

HABILITATION THESIS

**Contributions regarding the degradation and
aging of electrical insulating materials**

-Summary-

Field: Electrical engineering

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This habilitation thesis synthesizes a series of information on the technical-scientific activity undertaken by Assoc. Prof. Dr. ing. Cristina STANCU in the period after defending the doctoral thesis and obtaining the PhD title in Electrical Engineering in 2008. The thesis aims to demonstrate the originality and relevance of Assoc. Prof. Dr. Eng. Cristina STANCU professional activity and to receive the habilitation certificate.

The habilitation thesis, written in Romanian, consists of four parts. The first part contains a short presentation (Curriculum Vitae). The second part presents the didactic achievements of the author, in which are presented the disciplines taught, the contributions brought within the disciplines, the license / dissertation projects in which she was supervisor, the development of the didactic laboratories, as well as the Erasmus agreements with the purpose of facilitating the students of the Faculty of Electrical Engineering to study in abroad universities. There is also a list of doctoral theses in which the author was a member of the doctoral student guidance committee, respectively a member of the doctoral thesis defence.

The third part presents the scientific, professional and academic achievements of the author, structured on disciplinary or interdisciplinary thematic directions, as follows:

- 1: Study of the degradation of electrical insulating materials, through water trees, space charge and partial discharges
- 2: Development of a method for determining the aging state and for calculating the lifetime of polypropylene film capacitor insulation
- 3: Calculation of the lifetime of transformer insulation in the presence of solar radiation

It should be noted that each of the three research directions is supported by a portfolio of scientific papers that practically attests to the quality of the scientific activity undertaken by the author so far. Thus, Conf. Dr. ing. Cristina STANCU is the author of 16 scientific publications in journals listed WSO Thomson Reuters (of which 8 as principal author) and 22 other papers in journals and volumes of scientific events indexed in other databases (BDI) (of which 13 as principa author). The results presented in this thesis are obtained following the activity carried out in the Laboratory of Electrotechnical Materials within the Department of Electrical Machines, Materials and Drives, Faculty of Electrical Engineering, as well as in the Laboratory of Electrotechnical Materials within the Department of Electrotechnologies, Faculty of electrotechnics, Technical University of Prague.

The scientific activity was carried out mainly in partnership with researchers from the country and abroad and private companies (University of Montpellier, Technical University of Prague, Pccl, Icechim, Icpe Saerp, Icpe CA, Cablel, Prysmian, Iproeb) within research and development projects in partnership. Another confirmation of the author's professional activity is the national projects she has led as project director and / or partner manager (3 grants).

The last part of the habilitation thesis is dedicated to the perspectives of academic and didactic professional development of the author in relation to the current state of knowledge and her professional experience being proposed a series of clear actions to achieve them. The objectives I will pursue in the development of the university career in didactic plan are:

- updating the content of the didactic material
- improving the teaching base with new equipment and materials
- increasing the number of collaborations with other universities and other companies in order to ensure students' teaching and internships

The habilitation thesis concludes with the presentation of the bibliographic references used by the author to demonstrate the originality of the topic and to frame the field of research in the scientific trends of the international academic society. With the completion of this paper, the author would like to thank all those who have been with her in recent years, namely: Prof. Dr. ing. Petru V. Notingher and Prof. Dr. ing. Virgiliu Fireteanu (Department of Machines, Materials and Drives - UPB), Prof. Dr. ing. Petru Notingher jr (University of Montpellier), Prof. Dr. ing. Pavel Mach and Assoc. Prof. Dr. ing. Karel Dusek (Technical University of Prague), as well as collaborators within the research projects (Drd.ing. Lucian Taranu, Dr. ing. Mihai Plopeanu, Dr. Ing. Stefan Busoi, Ing. Adelina Cernat, Ing. Alexandra Constantin, Dr. Chim. Antonel Plesa, Dr. Chim. Denis Panaitescu, Ing. Catalin Goia, Prof. dr. Chim. Radu Setnescu, Dr. Chim. Marius Lungulescu).