

ABSTRACT

The habilitation thesis presents the research and didactic activities carried out after obtaining the scientific title of doctor (November 2000). They have developed gradually, being focused on two elements: the courses delivered at the North University from Baia Mare and then at the Technical University from Cluj Napoca and the wish to carry out research in the directions in which the personal skills, competences and abilities acquired by means of education and professional experience proved to be valuable.

As it is natural, the two central elements are related, therefore the didactic and research activities have focused especially on industrial logistic and the reliability, maintenance and availability of the machines and equipment, but there have also been preoccupations in other domains specific for industrial engineering and management. An analysis of the didactic and research activities shows the directions in which results have been obtained. These research directions can be grouped as follows:

- Scientific research and didactic activities in the field of equipment, machines and tools;
- Scientific research and didactic activities in the field of reliability, maintenance and availability of equipment, machines and tools;
- Scientific research and didactic activities in the field of industrial logistic, focusing on the logistic of maintenance activities;
- Preoccupations in the domain of innovation and technologic transfer.

The habilitation thesis contains, in section I, SCIENTIFIC, PROFESSIONAL AND ACADEMIC ACHIEVEMENTS, four sub-chapters dedicated to the presentation of the most relevant achievements in the above mentioned directions.

Therefore sub-chapter 1.1 presents the achievements carried out in two domains, the domain of equipment, machines and tools for transport and, respectively, research and contributions for setting up the tribo-system for drilling the rock massif.

The first part of the sub-chapter presents the main didactic activities carried out in the domain of transport equipment, with emphasis on our own contributions. Here is also presented the scientific research in the domain of transport equipment, namely the analyses carried out for the study of important parameters for the operation of the

continuous-belt conveyer, as well as the program conceived for the calculation for the continuous-belt conveyer, a program that was a premiere in our country.

The second part of sub-chapter 1.1. presents the results of the scientific research regarding the tribo-system for drilling the rock massif, research that developed a series of aspects approached within the doctorate thesis.

Chapter 1.2. „Scientific research and didactic activities in the field of reliability, maintainability and availability of equipment, machines and tools” presents initially the didactic activities in the field of reliability, maintainability and availability of the equipment, machines and tools and the scientific research in this field is presented, developing the aspects below:

- Scientific research in the field of qualitative and quantitative assessment of the behavior of the equipment, machines and tools;
- Scientific research in the field of the study and the physical analysis of the damages occurred (ways of manifestation, causes of occurrence, remedy methods, etc.);
- Scientific research in the field of establishing the methodologies for determining and, respectively, the confirmation of the reliability;
- Scientific research referring to the management of reliability allocation as well as the management of the equipment, machines and tools management.

Concrete examples of the scientific contributions made, supported by demonstrations, flowcharts or „cause-effect diagrams” are presented for each aspect mentioned above.

Sub-chapter 1.3. „Scientific research and didactic activities in the domain of industrial logistic focusing on the logistic of maintenance activities” presents a series of aspects specific to logistics, customizations imposed firstly by the industrial environment and, secondly, by the specific of the maintenance actions.

Thus, starting from the general notions of logistics, customizations for the maintenance of some very important activities have been made: providing raw materials, materials and spare parts for the maintenance activities, calculation of the rate of consumption in maintenance, calculation and optimization the maintenance stocks, providing spare parts, storage of the spare parts, recovery, refurbishing and reuse of the worn-out parts.

Sub-chapter 1.4. ”Preoccupations in the domain of innovation and technologic transfer” presents the scientific research related to the way in which innovation and technologic transfer affect the maintenance activities, starting from the idea that in maintenance the innovation and the technologic transfer must be manifested stronger than in other domains due to a basic desideratum: to transform maintenance from an activity generating losses into an activity leading to increasing the competitiveness of

the company. In this sub-chapter, maintenance is seen as a product, having a lot of particularities. An analysis is done for this product in terms of innovation and technologic transfer, in order to identify where innovation is needed, the size of the innovation process, the managers of the innovation process, the way in which the innovation process is assessed, etc.

The second section PLANS FOR THE EVOLUTION AND THE DEVELOPMENT OF THE PROFESSIONAL, SCIENTIFIC AND ACADEMIC CAREER presents: the synthesis of the scientific and didactic achievements, a set of principles underlying the activity, the directions of the professional development as well as the concrete elements which contribute to their being carried out in future.

The future development directions are detailed on concrete scientific domains, also presenting the expected results. Future plans related to international collaboration and the programs with national and international funding are also highlighted.

An important direction, specified in the second section, is that of coordinating the doctoral studies, direct or joint-coordination.

Section III. ASSOCIATED BIBLIOGRAPHICAL REFERENCES includes the list of references used in the habilitation thesis.

Annex 1 contains the calculation program for the continuous-belt conveyer and examples of data bases.

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