

PHD THESIS ABSTRACT

„CONTRIBUTIONS ON SUSTAINABLE DEVELOPMENT OF BORDER SECURITY SYSTEMS”

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This paper covers an important topic in border security systems domain, as the sustainable development of integrated border security systems is of high interest both for decision makers and responsible staff to implement such systems. Therefore, the main goal of this thesis is to define a development model of this type of systems through a systemic approach, so that satisfactory evolution plans can be obtained for a sustainable development. Personal involvement within research and development projects at European Commission level in the field of border security, both as partner within projects' consortiums and as independent reviewer for call of proposals phase, and monitoring under implementation phase, allowed me to validate the results obtained within this research activity.

Chapter I includes details about complex systems' aspects and on development of integrated border security systems, while the subsystems of Integrated Border Security System in Romania are presented together with challenges and solutions identified at national level. The requirements and modern technologies at European borders represent the starting point to identify the model for the sustainable development of an integrated border security.

In the second chapter the thesis is addressing a new way of thinking, systemic approach, a methodology used for „systems of systems” or „family of systems”. The results obtained while applying the principles of systemic approach for the activities specific to the roll-out of an integrated border security system, including for the selection process of bids, are detailed in this chapter. In the same time, chapter II presents the reliability concept while considering the systemic approach within EFFISEC project.

The multi-objective optimization aspects related to border security systems are presented in chapter III, aiming to develop a mathematical model for such systems. The results obtained while applying such methodology for choosing the optimal border surveillance solution are included in this chapter. In addition, this chapter presents the results obtained for the technical-economical aspects simulations when choosing the optimal solution to develop the next generation of broadband communication networks that could be used by responsible authorities within the border security domain.

Chapter IV presents the results obtained within the research activities in relation with key components and definition for the sustainable development of the integrated border security systems that could be used to develop new optimisation proposals both at national and European level. Key performance indicators and measures of effectiveness metrics are developed on this topic.

The conclusions and perspective ideas are presented in last chapter, as the sustainable development of integrated border security systems represent a topic which should be under permanent assessment to improve the approach for performance factors and multi-criteria optimisation models.