PhD THESIS ABSTRACT
„RESEARCH ON METHODS AND PROCEDURES FOR IDENTIFYING AND ASSESSING RISKS ASSOCIATED WITH SHOOTING WEAPONS IN FIRING RANGES”

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The doctoral thesisentitled **„Research on methods and procedures for identifying and assessing risks associated with shooting weapons in firing ranges”**, structured inseven chapters, was conducted by the author to determine the main risks posed by the use of weapons in firing ranges.

Small caliber weapons systems equipping Romanian armed forces were considered for determinations.

The topic of the thesis was approached by the authorthrough bibliographic research. The initial research was focused on the firing ranges for small caliber arms. The classification and structural organisation of ranges are described in accordance with national and international legislation.

Small caliber arms considered for determinations are detailed, their constructive, performance and safety characteristics are given in order to achieve the correlation between them and the risk-generating factors when used in firing ranges.

Another aspect of this paper was to determine the influence of ballistic parameters as risk-generating factors. In order to achieve this, the phenomena of fragmentation (penetration capacity) and ricochet were evaluated,considering the gravity of the risk associated.

The following main objectives to be achieved were considered for the research activity:

1. The study of national and international achievements regarding the configuration of firing ranges for small caliber arms;
2. The study of small caliber arms, firing sessions conducted for these arms in firing ranges and the risks considered by the literature when operated in the firing ranges;
3. The current state of ballistics of modern weapons systems, detailing the main risk-generating ballistic parameters used for risk assessments models;
4. Experimental assessments of risks arising in the vicinity of the shooter, on the trajectory and in the vicinity of the impact area when conducting firings with small caliber arms;
5. Development and validation of MATLAB programs for the numerical simulation of bullet trajectories, bullet-obstacle impact and bullet ricochet occuring when shooting small caliber weapons in firing ranges.

The objectives were met through theoretical and experimental research. The experimentally obtained results were validated by numerical simulations performed in the MATLAB program.

I believe that the importance of this work lies in addressing the issue of risk determinations for military actions. The thesis offers two calculation solutions (MATLAB programs) for firing range shootings with small arms risk determinations.

This paper opens further research opportunities, new directions can be pursued adapting the computation programto the firing session type and desired weapon caliber.