

LOGISTIC MODEL OF THE SECURITY SYSTEM IN THE MILITARY INDUSTRY REPAIR SECTOR

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The repair sector is a part of the military industry the establishment of the military combat readiness and thus the establishment of the state security system. This paper deals with the functional dependence of the military industry repair sector and the logistic model of a security system.

Keywords: logistics, military industry, security system, repair sector

INTRODUCTION

The military industry is considered to be one of the key factors in operation of the state security system. As such, it encompasses a great number of different commercial and industrial sectors including the repair sector. The role of the repair sector in the military industry envisages the technical maintenance and the overhaul of the equipment for the military combat equipments and the appropriate accompanying systems, units and devices by means of implementing certain machining methods, methods for thermo-chemical processing, galvanic protection, regeneration and repair [1].

The state security system is an integrating unit comprising security-commercial-economic elements whose characteristics served as the basis for designing the represented state security system concept. The security-commercial-economic element which we like to emphasise most is the military industry. The military industry is an industrial sector which produces weapons, military technology and equipment.

It consists of research, development, production and repair sectors. The biggest manufacturers in the military industry and their annual revenue are presented in Table 1 [2].

Logistics is a science of management, engineering services and technical activities related to the technical requirements, design and development, supply and provision of resources for maintaining technical material resources, aiming to provide effective support for the plans and operations. The term was first used by a Swiss general Baron de Jomini (1779 ÷ 1869).

There are two possible versions of the genesis of the word “logistics”. In both of them, it originated from

French. The first word „*logistique*“ was derived from the military rank “*Marechal de logis*” and it refers to the organization of the logistic military service. The other word „*loger*“ refers to the military formation in the field – camping. Some authors state that logistics dates back to the Late Bronze Age, from the ancient times [3].

In the basic defining of the military industry sectors, we emphasise the repair sector which, as a constituent part of the military industry, is described as a logistic sector of the army. Methodology of the services/methods in the repair sector depends on the military concept. According to the basic military concept, the repair sector is classified into the following categories:

- a) Services,
- b) Overhaul and
- c) Engineering.

By analyzing the relation between the state security system – military industry – military industry repair sector, we define a problem of protecting the services/methods of the repair sector whose primary activity is to maintain military security techniques.

Methodology used for the maintenance of military combat equipment is a military secret related to the maintenance of the combat technique.

In order to provide the protection of the methodology applied in the military combat equipment maintenance from all sorts of military-industrial-security threats (terrorism, industrial espionage, sabotage etc.), a logistic model for the security system in the military industry repair sector is being designed. The designing is carried out in phases:











I Phase – Defining the basic model of the security system,

II Phase – Indicating the methodology for the maintenance of the combat technique and

III Phase – Designing the logistic model of the security system.

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Table 1 Military industry manufacturers (excluding Chinese companies) [2]

Red. br	Company	Country	Sectors	Total sales, 2012 bil US\$	Total profit, 2012 bil US\$
1.	Lockheed Martin		Aircraft, Electronics, Missiles, Space	45 803	2 926
2.	BAE Systems		Aircraft, Artillery, Electronics, Missiles, Military vehicles, Small arms/ammunition, Ships	36 609	1 671
3.	Boeing		Aircraft, Electronics, Missiles, Space	64 306	3 307
4.	Northrop Grumman		Aircraft, Electronics, Missiles, Ships, Space	34 757	2 053
5.	General Dynamics		Artillery, Electronics, Military vehicles, Small arms/ammunition, Ships	32 466	2 624
6.	Raytheon		Electronics, Missiles	25 183	1 879
7.	EADS		Aircraft, Electronics, Missiles, Space	60 599	732
8.	Finmeccanica		Aircraft, Artillery, Electronics, Missiles, Military vehicles, Small arms/ammunition	24 762	738
9.	L-3 Communications		Electronics, Services	15 680	955
10.	United Technologies		Aircraft, Electronics, Engines	54 326	4 711

SECURITY SYSTEM MODEL

The security system is a compact unit made up of elements which were defined by their mutual interaction, the choice of concept presenting its own definition but also by analyzing macro and micro models of the military industry security systems, international

directives regarding the development of the security system, international declarations on the strategic defense tendencies as well as the frameworks of the tendencies in the military industry. According to the set parameters, we define the basic model of the security system presented in Table 2 [4].

The basic model of the security system is made up of the following elements [5, 6]:

- Contextual elements

Contextual elements represent the first level of the security system conceptually defined by the basic "framework" of the system, its problems and the problem-solving approaches.

- Conceptual elements

Conceptual elements represent the second level of the security system conceptually defined by a comprehensive systematic strategy.

- Logic elements

Logic elements represent the third level of the security system conceptually defined by a form of a system and its effects.

- Physical elements

Physical elements represent the fourth level of the security system conceptually defined by a form of applied resources and system carriers.

- Component elements

Component elements represent the fifth level of the security system conceptually defined by consistency in the original form of resources and system carriers.

- Operational elements

Operational elements represent the sixth level of the security system conceptually defined by the effects of the system management.

SERVICES/METHODS OF THE MILITARY INDUSTRY REPAIR SECTOR

Services/methods of the repair sector include a wide variety of different methodologies used for maintaining the military combat equipment as one of the main activities of the repair sector. Grinding is mentioned as one of the possible methodologies for maintaining military combat equipments.

Processing by grinding represents one of the most significant operations of the final processing because it provides high accuracy of measurement and high quality of the machined surface of the military combat equipment.

It is performed after the thermal processing, therefore removing anomalies occurred due to thermal deformations which were the result of thermal processing. The schedules of main and secondary motion depend on the type of manufacturing operation and the tools. Basic manufacturing operations are the following:

- Circular grinding,
 - Flat grinding,
 - Grinding without spikes and
 - Complex surfaces grinding.
- Grinding machines are classified according to:
- External and internal circular grinding,
 - Flat grinding,
 - Grinding without spikes and
 - Special grinding (sharpening of the tools and other) [7].

As an example, we give a model of a grinder used for external circular grinding shown in Figure 1.

Grindstone (2) is located on the main spindle carrier. It performs the main rotating movement and radially approaches the work piece (a part of the military combat equipment) (1). Work piece (a part of the military combat equipment) is squeezed between the grinder spikes. The left spike carrier has a gear installed for changing rotation speed of the work piece. Spike carriers are located on the longitudinal desk slider (3), which

Table 2 Basic model of the security system [4]

Matrix	Property (What?)	Motivation (Why?)	Processes (How?)	People (Who?)	Location (Where?)	Time (When?)
Contextual elements	activity	risk model	process model	organization	system positioning	time positioning
Conceptual elements	characteristics	aim	strategy	model of an entity	domain model	deadline
Logic elements	information model	policy	services	entity scheme	domain scheme	process cycle
Physical elements	information system	procedures	mechanisms	entity interface	domain platform	time structurednes
Component elements	information structure	standards	tools	identity	position	time
Operational elements	management	risk management	strategic management	human resources management	operational management	time management

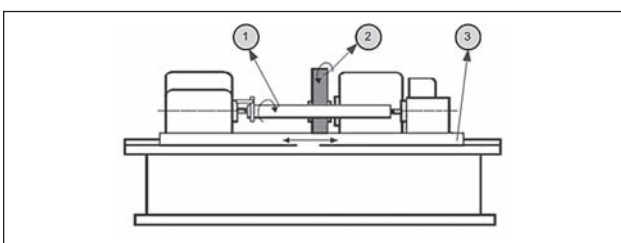


Figure 1 Elements: 1 – Work piece, 2 – Grindstone and 3 – Desk slider [7]

performs secondary axial motion. The longitudinal slider can rotate on the flat horizontal surface, which enables the grinding of conical surfaces as well. Grinders of this type enable external circular grinding with axial and radial movement (steps).

The complete approach to the maintenance of the military combat equipment depends on the characteristics of the military combat equipment apart from the characteristics of the repair sector methodology (grinding).

We give you Howtzer 122 mm D30 as an example, shown in Figure 2.

Howtzer D30 is intended for the destruction and neutralisation of the living force without cover or in the natural shelters, enemy fire resources, demolition of the points of resistance, wire fences and other obstacles, making safe paths in the minefields and destruction and neutralisation of the artillery and motor-technical weapon systems and the hostile military equipment [8].

The main features of Howtzer 122 mm D30 are:

- Crew: seven members,



Figure 2 Howtzer 122 mm D30

- Field of fire in azimuth:
Ranging from -5 to 70 degrees,
- Maximum range of a projectile:
OF - 462: 15 300 m,
- Maximum range with a projectile:
M76: 17 133 m,
- The highest rate of fire:
6 ÷ 8 grenades per minute.

DESIGNING THE SECURITY SYSTEM IN THE MILITARY INDUSTRY REPAIR SECTOR

By classifying the methodology for maintaining the military combat equipment as a military secret, the con-

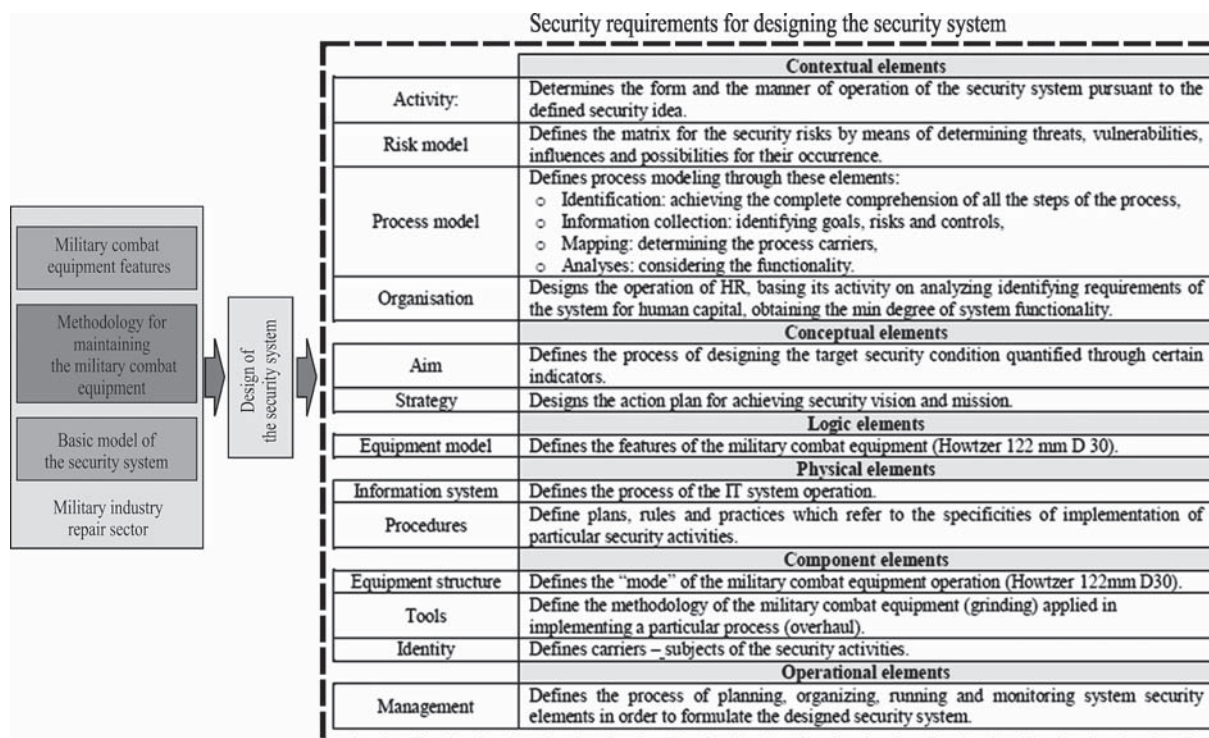


Figure 3 Logistic model of the security system in the military industry repair sector [9]

dition for designing the security system in the military industry repair sector is identified.

The concept used for the implementation of the protection of the military secret regarding the maintenance of the combat equipment is based on the integration of the military combat equipment features, methodology for the maintenance of the military combat equipment and the basic model of the security system and it is shown in Figure 3.

CONCLUSION

Designing the security system in the military industry sector is defined as one of the most complex security concepts [10].

By defining the relation between the state security system – military industry – military industry repair sector- combat equipment- methodology for maintaining military combat equipment-logistic model of security system, we managed to identify the problem of protecting the methodology for maintaining military combat equipment as a military secret regarding the maintenance of combat equipment. It was illustrated by the example of maintaining Howtzer 122 mm D30 by means of grinding.

Having the abovementioned in mind, the concept for integrating the features of the military combat equipment, methodologies for maintaining military combat equipment and the basic model of the security system was designed which consequently enabled the definition of the logistic model of the security system in the military industry repair sector.

The design of the logistic model of the security system in the military industry repair sector gave way to a unique and new logistic concept of the security system as a solution for the problem of protecting the methodology for maintaining the military combat equipment.

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Note: The responsible translator for the English language is a translator and a proof-reader Gorana Kukobat, the Government of the Autonomous Province of Vojvodina, Novi Sad, Serbia.