Dear colleagues,

The development and intellectualization of the logical level of processing, the adoption of the Radio Frequency Identification (RFID) technologies, the establishment of the Internet and origination of its varieties – The Internet of (Medical) Things and Expanded Internet, the massed advance to the assimilation of the physical level of processing started by them as well as stipulated their deep system transformation with an entry to the nano-level of processing is a complex and internally contradictive process.

On the one hand it leads to deep qualitative reorganization of economic and social relations and on the other hand, – to the increase and drastic aggravation of security threats.

The problems for provisioning security acquire the increasing, especially important role, which is caused by the following factors:

- Unprecedented increase in the production and distribution of adulterated products, the increase in the sales of poor-quality and uncertified products, increase in the number of thefts, burglaries and car theft,
- The continuing globalization of the information space and transfer of key functions of control and management to automatic and robotic systems,
- The ongoing attempts to attain one-sided advantages by means of the technological pressure, real and latent cybernetic threats, introduction of latent beetles, active promotion and sharp propaganda of defective solutions,
- The anticipatory growth of technological availability of criminals,
- The expansion of the scales and possible directions for performing destructive attacks.

It has become possible to solve cost-effectively and efficiently the key problems in the field of security provisions at a qualitatively new and efficient level due to the pioneering works of Auto-ID Labs, the development of the EPCglobal concept, the achievements in radio engineering and microelectronics (Hitachi, NXP Semiconductors), in system analysis and a breakthrough based on the discoveries in the field of algebra (I. A. Kulakov, 2005), the development of a new innovative direction – ***stochastic technologies***.

With the introduction of private keys, **stochastic technologies, as well as products (hardware, software) being made on their basis pass into cryptographic ones**. Stochastic technologies cover all topics of the modern symmetric cryptography; they are aimed at the perspective and open up new possibilities in the field of theory of systems, statistical modeling and security provisions. *They have an overwhelming superiority in all the characteristics over the existing analogues*.

The efficient, cost-effective and power saving protection of system elements from cloning and counterfeit based on stochastic technologies (RFID/EPC tags and microsensors, silicon and organic, in fact not leading to the increase in their cost and power consumption) will make it possible to solve sequentially the following applied problems within a short time by using the existing technological basis:

1. Protection of goods and products from adulteration and counterfeit, distribution of solutions to the tasks of money payments, remote payment of services, access regulation and access control, protection of certifying documents and currency, marking of the post, archival documents, exhibits and the library stocks, identification of domestic animals, etc.
2. Implementation of highly cost-effective protection of composite and complex objects (from simple packages and their elements to assemblies and their units and parts) by integrating electronic protection with cheap production and technological means from simple numbered labels to laser engraving, distribution of the technologies to the economy sector (pharmaceutics, transport, etc.).
3. Transition of the control system for the goods quality and monitoring of the environmental state as well as systems providing ecological, biological, physical and engineering and technical security to a qualitatively new level by equipping tags and microsensors with multifunctional sensitive mini-transducers, which are based on smart materials produced by the modern bio- and nano-industries.
4. Production upon mastering of noise-immune multichannel wideband and acoustical radio-frequency technologies of protection systems of vitally important objects, dwellings and buildings, protection of distributed engineering and technical infrastructures from unauthorized actions under conditions of industrial and intentional electromagnetic noises.

5. System integration with advanced high-level solutions of such business organization as SAP and HP, the mastering of new generation technologies developing together with adaptive technologies of integration of system elements such as smart buildings, community facilities and complexes, smart dwellings (smart houses), landings and housing cooperatives.

One of the key moments of solutions is the introduction of a high-efficient (the performance being tens of billions of keys per second), centralized system of key management, as well as the provision of all categories of customers with authorized and individual devices for authentication of products and goods and their quality check, namely

- cheap pocket and mobile autonomous devices of direct control as well as local and high-level network plug-in units and add-in devices, in particular, for computers and telephones.

Setting up large-scale production of the above-mentioned devices, it becomes possible *to attract different groups of population to organization of the total protection of segments of national and world goods market and economy from illegal and poor-quality products*. In this respect, the example of the rushing development, assimilation and return of mobile NFC (Near Field Communication, Nokia) technologies is illustrative.

As one can see in the perspective, upon development and thorough approbation of stochastic technologies, i*t will become possible to create a highly efficient parallel cryptographic co-processor*. The introduction of a co-processor will allow one, without a visible decrease in the performance of computer, telecommunication and TV systems, communication facilities, positioning and navigation, to solve on a qualitatively new level the problems:

- information security, prevention of massaged cybernetic attacks, real and latent cybernetic threats, unauthorized access and unregulated action, protection of copyrights, in particular of audio and video products, programs and literature.

The above-mentioned problems can be solved based on the Concept of Security Provisions, worked out by the leading Russian scientists and engineers, strengthened by the newest fundamental and applied scientific and technical developments.

In order to apply in practice the scientific and technical achievements mentioned in the Concept and to eliminate the drawbacks, which result in a considerable slowdown of distribution and development of electronic systems, **it is proposed to combine the efforts** for modernizing the EPC global system and integration with high-level applications of business organization, to transfer RFID technologies (EPC, Mifare and µ-Chip radio-frequency tags), as well as microsensor technologies and technologies for security provisions on the whole, as is predicted by the experts, to the level compared to the revolutionary one.

In this extended substantiation, **the presented technologies, with respect to scales, returns and significance, become comparable with a highly-developed economic segment** and with respect to importance, they pass to the national and interstate level, thus making it possible *to take the leading part in the world* in the field of security provisions and the development of electronic systems.

Looking into the future, inevitably with the development of the element base endowed with intellectual functions and of the technologies of their adaptive network integration, **microsensor technologies and cyber-networks are gradually replacing the RFID technologies**.

Cyber-networks will cover and naturally conquer the world - from homes, purses and currency to technological systems, production complexes, medical institutions and land - and will penetrate to deeper material levels. Under conditions of potentially dangerous and real cybernetic threats, introduced by them, non-eliminated great-power ambitions in the interconnected world, the growth of terrorism and high technological availability of criminals **solutions laying the foundations of the Concept after all will also become a reliable guarantor for providing the State security of countries and their citizens**.

I am ready to answer questions which may arise. The review of the performed works and the **Concept of Security Provisions** are forwarded on demand.

Sincerely yours,
Coordinator and the responsible executor of the research

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