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IMPLEMENTATION OF MOST PROGRESSIVE METHODS OF USING DOGS FOR CARGO SCREENING

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Introduction

Key issues:
- Efficiency of patrol dogs’ application fully depends on environment conditions;
- Time limits of non-stop activity of patrol dogs;
- Lack of objective (instrumental) control of dogs’ activity;
- Lack of full-value standard and methodical base regulating application of dog-detectors for the purposes of transport security.
Detecting of target substances by means of Sulimov dog and hardware-software complex for objectification.

Principle: technique – animal (bio-system) – human is provided.

Olfactory biotechnical system

subject of inquiry

Info concentrator

Device for the Accumulation of Gas Components of Explosives (DAGCE)

Sensor

Dogs’ olfactory receptors

switchboard - amplifier

Brain of Dog

Computer interface

Documentation of information

Information transmission system

GSM channel

Decoder

Hardware – software complex

Decision - maker

Documentation of information

INNOVATIVE SOLUTIONS of Russian Federation
Sulimov Dog advantages

- Inherited from jackal - high order sensitivity, endurance, search activity, lack of personal attachment to Instructor
- Inherited from Siberian Laika (similar to Husky) - mobility, optimum size, loyalty to people, resistance to environment (temperature range from -30°C to +42°C)
- Hybrids contain 75% of Laika (dog) genes and 25% of jackal genes
Sulimov Dogs within aviation security department of Aeroflot

- aircraft control
- cargo control
- patrols in the airport facilities
- detecting of target substances at suspicious objects
- olfactory monitoring technology
Remote Explosive Scent Tracing (REST)

REST is optional olfactory research with specially trained dogs acting as a sensor, and filters with air pumped through them from target object subjected to inspection.

Application of REST allows to organize systematic and continuous inspection of probable places of production, storage and transportation of subversive and terrorist means. It complies with the concept of "monitoring" and provides control over transported cargo and detection of explosive objects and other forbidden substances.
Sampling is carried out by means of specially developed Device of accumulation of gaseous components of explosives (DAGCE) equipped with electrical activator of air consumption.

Application of REST to high risk transport vehicles and containers inspection allows to define/exclude presence of objects and substances with specific olfactory signs without opening of locking devices of containers.
Objectification of dogs’ search activity

**Dog–detectors’ choice objectification role.**
- Reliability of research results is a priority for decision-making.
- Reliability of olfactory research results in target substances detecting is provided by odororogical dogs’ choice objectification.
- Upon results of search activity protocol is automatically formed – it is based on objective data of psychophysiological characteristics.
Objectification of dogs’ search activity

TRUE REACTION (FOUND)  FALSE REACTION (NOT FOUND)

False

True
Objectification of dogs’ search activity

INDIVIDUAL RESULTS OF EEG ANALYSIS:
FREQUENCY AND AMPLITUDE CHANGES OF THE MAIN EEG RHYTHM RANGE 1-30 HZ
Developing of hardware – software complex

Physiology Data (EEG, cardiogram, respiration)

Software-Hardware Complex

Database: the ability of the individual analysis of the dog

Alarm: Yes / No

Formal protocol of the search results (printout on 1 page)

Psychophysiological data for passports for selection, for scientific work, etc.

Information for security officer

Information for the report and «for prosecutor»
As a result of consideration and discussion of Aeroflot report the following conclusions and recommendations have been made:

- deploying explosives detection dogs (EDDs) has potential benefits;
- it’s necessary to continue exploring practical application of EDDs;
- it’s reasonable to organize development of the advanced methods of best practice of EDDs through the WGIAS;
- for distribution of EDDs methods among the States it is recommended to include them into ICAO’s technical assistance program to Member States.
Legal Framework

1. Framework of Standards to Secure and Facilitate Global Trade, WCO, 2005, Brussels, Belgium

2. International standards of anti-mine activity (IMAS 09.43, 2005), UN, New York, USA

3. Aviation Security Manual (Doc. 8973-9, 2014), ICAO, Montreal, Canada

Framework of Standards to Secure and Facilitate Global Trade, WCO, 2005, Brussels, Belgium

Standard 2. Cargo Inspection Authority

Standard 3. Application of modern technologies for inspection activity

Standard 5. High-risk Cargo or Container

Standard 11. Outbound Security Inspections
Recommendations on EDDs application for Air Cargo Screening. EDDs use for cargo screening takes place after application of technical means in initial handling and make up zone. EDDs search activity is planned in the period when moving and make up of pallets is low active - that provides safety of EDD –instructor team and does not influence the efficiency of Cargo Facility.
Conclusion

1 Biotechnical system “Olfactory Monitoring” allows:
- to carry out systematic and regular cynological inspection of controlled objects to provide their security from explosions of a criminal or terrorist orientation;
- to carry out olfactory investigation in crowded places during mass actions;
- to control transport vehicles and transported freights in order to exclude the delivery of explosives;
- to increase efficiency of dogs’ search activity;
- to provide objectification of dogs’ search activity and its’ documentation.

2 Advantages of utilization:
- No need to open the locking devices on the containers.
- Efficiency of EDDs does not depend on climate and weather conditions.
- EDDs experience less fatigue fulfilling their tasks in laboratory conditions, that increases the duration of effective work compared to traditional detection method.
- Reliability of olfactory information is provided by application of results’ objectification system of EDDs search activity by means of registration and analysing of dogs’ physiological characteristics.
Thanks for your attention!!!

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