UDC 656.7(075)

Oleksandr Kirichenko
(ICAO Training Institute, National Aviation University,
Kyiv, Ukraine)

Some aspects on the assurance of air cargo security

In the context of air cargo security and, in particular, considering the past attacks on commercial aviation committed by secretly placing improvised explosive devices in cargo shipments, it is important to remain vigilant in order to exclude the possibility of using cargo and mail for committing acts of unlawful interference with civil aviation activities.

The air cargo system is a complex, multi-faceted network that handles a vast amount of freight, packages, and mail carried aboard passenger and all-cargo aircraft. The air cargo system is vulnerable to several security threats including potential plots to place explosives aboard aircraft; illegal shipments of hazardous materials; criminal activities such as smuggling and theft; and potential hijackings and sabotage by persons with access to aircraft. Several procedural and technology initiative to enhance air cargo security and deter terrorist and criminal threats have been put in place or are under consideration. Procedural initiatives include industry-wide consolidation of the “known shipper” program; increased cargo inspections; increased physical security of air cargo facilities; increased oversight of air cargo operations; security training for cargo workers; and stricter controls over access to cargo aircraft and air cargo operations areas. Technology being considered to improve air cargo security includes tamper-resistant and tamper-evident packaging and containers; explosive detection systems (EDS) and other cargo screening technologies; blast resistant cargo containers and aircraft hardening; and biometric systems for worker identification and access control.

There are two main threats for air cargo and mail transportation, namely placing an improvised explosive device (IED) in a cargo loaded on board an aircraft; and the use of a pure cargo aircraft as a means of attacking a ground target by unlawfully capturing that aircraft. Cargo and mail can be perceived as a potential mean of attack, because the environment, in which the air cargo and mail transport industry operates, is expanding and constantly becoming more complex. The industry becomes more difficult to cope with such growth and complexity due to the multitude of parties handling air cargo and mail, at the entrance to and out of the delivery chain. State security measures for cargo and mail differ and are often based on the results of risk assessments conducted by national authorities, leading to different approaches to their implementation. This creates the possibility of vulnerabilities in the air cargo delivery chain and difficulties for aircraft operators who have to comply with different standards. Awareness of vulnerabilities in the air cargo delivery chain is enhanced by the dissemination of information by terrorists and the media.

A cargo is any item that is carried on board an aircraft on the basis of a freight invoice (or any other equivalent document), but not according to a passenger ticket. Cargo means the following:

• Consignments shipped by the cargo agent;
• Unaccompanied baggage carried as cargo;
• Courier shipments;
• Postal items;
• Diplomatic mail.

Annex 17, ICAO. Standard 4.6.1. Each Contracting State shall ensure that security controls are applied to cargo and mail prior to loading on board aircraft engaged in commercial passenger air transport.

Examination of air cargo and mail can be carried out using methods of threat detection and methods of threat activation based on the use of approved technical means or physical examination procedures.

Airborne cargo and mail include a wide range of items of various dimensions, weight and density. The inspection process must take into account the nature of the cargo or mail and should ensure that IEDs are not hidden inside the consignments.

The effectiveness or ineffectiveness of the screening method depends on the type of cargo being checked. Therefore, for inspection of cargo and mail, the appropriate method should be used, taking into account the type of cargo shipment. In some cases, inspection of cargo and mail of all kinds of one method of inspection may not be enough. Therefore, it is necessary to have several methods of inspection.

In the event that an item cannot be successfully viewed due to its characteristics (for example, when the subject is too dense for x-ray screening, or it is too overloaded with details, which makes it difficult to determine its contents), other appropriate screening methods should be used , otherwise it should not be transported by air.

Inspection can be carried out either before or after the completion of cargo shipments. Typically, if the inspection is carried out in advance, there is a greater choice of methods of inspection, since the packages are not yet placed in containers or on pallets. The process of screening at the "subject" level before consolidation or bundling makes it possible to detect IED most hidden in the cargo or mail. Inspection after cargo consolidation may prove to be impracticable, since inspection personnel may need to unload cargo lots and then reconnect them after inspection.

The most commonly used and recommended methods of air cargo and airmail screening are threat detection methods. They are designed to detect one or more IED components, such as a detonator, a power source or an explosive itself. Such screening methods may include manual inspection; conventional X-ray equipment with a static display of objects; and multidimensional display of objects; X-ray equipment based on algorithms with static display of objects; multidimensional display of objects; computed tomography with the diffraction function; neutron scanning; detection of metal; detection of traces of explosives; particles and vapors; and use of sniffer dogs.

For cargo considered to be associated with an increased risk, two or more screening methods should be used, including in the ideal case the detection of explosive traces, x-ray scanners using different cargo inspection algorithms, or the use of service dogs.

The proper way to inspect the cargo before its consolidation can be the use of threat detection methods. However, the effective use of inspection equipment to screen certain cargo shipments may be difficult due to their contents and size. Difficulties can also arise in the case of large-size packages.

Such methods of threat activation as decompression chambers, complete flight simulation systems and keeping the cargo in a safe place (for example, within 24-48 hours) are intended to bring IEDs into operation before the cargo is loaded on board the aircraft. Such methods are not methods of screening cargo and mail, and they should not be used as an alternative to screening.

Although the methods of activation of the threat do not depend on the human factor and in most cases on the problems associated with the dimensions of the cargo dispatch, this process can take a long time and do not cause the triggering of IEDs of all types. These methods make it possible to identify only VCAs triggered by pressure, vibration, etc.

The main thing is to constantly apply a suitable and effective method of screening each cargo shipment and ensure proper training and supervision of all employees conducting an inspection. The inspection equipment must be serviced, tested and operated in accordance with the manufacturer's instructions.

In order to be able to take appropriate follow-up actions, procedures should be provided for the analysis of alarm events. Inspection of cargo and mail should be carried out using the proper method or methods, given the nature of the shipment. For the inspection of certain types of goods, alternative means may be required.

References

1) Annex 17 to the Convention on International Civil Aviation. Security. Protection of international civil aviation from acts of unlawful interference. International Civil Aviation Organization, 999 University Street, Montréal, Quebec, Canada.

2) ICAO Doc 8973/9. Manual on Aviation Security. International Civil Aviation Organization, 999 University Street, Montréal, Quebec, Canada.

3) ECAC Doc 30. ECAC policy in the field of aviation security. https://www.ecac-ceac.org

4) Bart Elias, 2007. Air Cargo Security. Report for Congress. Order Code RL32022. USA. Congressional Research Service.