

POLICIES AND STANDARDS FOR SECURITY SCREENING EQUIPMENT

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Pursuant to EO No. 277 as amended by EO 311; Annex 17 to the Convention on International Civil Aviation (Chicago Convention), Chapter 11-2 of the SOLAS Convention otherwise known as International Ship and Port Facility Security (ISPS) Code; Aviation Security Manual (ICAO Document 8973); the National Civil Aviation Security Program (NCASP), Transportation Security Regulation (TSR) No. 002-2006 “Daily Operational Testing of Screening Equipment” the Office for Transportation Security (OTS) adopts the following policies and standards:

I. PURPOSE

To prescribe policies and standards for procurement, calibration, operation and maintenance of security screening equipment.

II. COVERAGE

This covers all airport operators, aircraft operators, cargo operators and other transportation entities charged with procurement, calibration, operation and maintenance of security screening equipment.

III. POLICIES/GUIDELINES

A. Procurement

1. All procurement of security screening equipment shall conform and be guided by standards established under this circular.
2. The following are the standard security screening equipment and technologies recognized for aviation security:
 - a. Hand-held metal detectors - detectors employ an electromagnetic field that interacts with any metal nearby, triggering an alarm.
 - b. Walk-through metal detectors - detectors that employ a pulsed magnetic field, which induces eddy currents in any metallic conductor.
 - c. Security scanners - scanners that detect both metallic and non-metallic items concealed on the body of a person. Body scanners use a range of different technologies, which may include the following:
 - (1) Active Millimeter (MM) Waves - Objects (threats, both metallic and non-metallic) concealed on the body can be detected as anomalies by analyzing the reflected MM wave radiation;
 - (2) Passive Millimeter (MM) Waves; (3) Terahertz Imaging System;
 - (4) X-ray-Based - Backscatter - Objects (threats, both metallic and non-metallic) concealed on the body under

clothing can be detected as anomalies by viewing the backscatter radiation from a backscatter X-ray system; and,

(5) X-ray-Based - Transmission.

d. Explosives Trace Detectors - The detection of explosive residues can be conducted by explosives trace detection systems when screening passengers, baggage and cargo to indicate the presence of explosives having three (3) different approaches to the detection of explosive traces:

(1) Explosive particulate; (2) Explosive vapors; and
(3) Canine olfaction or Explosive Detection Dogs (EDD).

e. Conventional X-rays - Explosives and weapons can be detected in cabin baggage through the recognition of their image by a screener on a transmission X-ray system.

f. Liquid Explosives Detection Systems (LEDS) - Liquid Explosives Detection systems are able to analyze liquids, aerosols and gels (LAGs) carried in cabin baggage to detect the presence of liquid explosives or precursors, while at the same time clearing benign items. Several technologies are employed to screen LAGs for the presence of liquid explosives and precursors. Examples are:

(1) Raman laser;
(2) Algorithm-based X-ray;
(3) FTIR (Fourier Transform Infra-Red) laser;
(4) Di-electric;
(5) Chemical test strips;
(6) Chemiluminescence;
(7) Ion Mobility Spectrometry;
(8) Gas chromatography; and
(9) Mass spectroscopy.

g. Algorithm-Based X-rays - For algorithm-based x-ray systems (also known as Explosives Detection Systems - EDS), dual-energy, dual-axis and X-ray backscatter technologies are used in varying degrees to allow the determination of a material's mass absorption coefficient and effective Z number through the interaction of X-ray energy with the material.

h. Computed Tomography Systems - CT images are acquired by one or more linear arrays of X-ray detectors on a rotating gantry illuminated by one X-ray source (typically about 160 kV) that is also on the gantry that rotates around the baggage to be screened.

i. Explosives Detection Dogs - Explosives detection dogs associated with proficient handlers are another efficient method to detect explosives. They shall be trained to detect explosives only, not narcotics nor shall they be used as a protection dog.

j. Threat Image Projection (TIP) - TIP consists of the virtual insertion of threat images from a database into the stream of images of scanned baggage and provides:

(1) Continual refresher training free of downtime;
(2) Objective performance assessment; and,
(3) Maintenance of operator vigilance.

B. Considerations for Procurement

a. The identification and scientific analysis of the characteristics and properties of a threat shall be the basis for the selection of the appropriate technology to efficiently detect threat items. This shall also consider technology detection capabilities and limitations to determine the minimum detection requirement.

b. An assessment of the existing technology detection capabilities shall be performed based on the minimum detection requirement. This consists of selecting key performance parameters and conducting an evaluation of associated detection capabilities thereafter. The key performance parameters considered for security screening equipment shall include:

(1) Probability of detection (Pd): refers to the probability that a detection system will detect a certain threat item under a given set of conditions;

(2) False alarm rate (FAR): there are two types of false alarm:

(1) False negative: occurs when a device fails to alarm in the presence of a threat item. This type of false alarm has an impact on security; and

(2) False positive: occurs when a device generates an alarm even though no threat item is present. This type of false alarm has a mostly operational impact;

(3) Throughput: a system's throughput rate is expressed in units such as persons per minute, bags per hour, etc. The ability to screen people or items quickly is very important; and

(4) Other key parameters, such as automated detection, multi-view, and image quality.

2. With the concept of operations and function provided by the manufacturer, equipment performance shall be assessed based on the minimum detection requirements. Testing shall be conducted so that as many variables as possible can be eliminated, providing for repeatable test scenarios and consistency in the results.

3. All testing scenarios shall be documented and applied to all pieces of equipment tested during the assessment, thus giving comparable benchmark data.

4. Technology assessments shall develop testing tools that can be used for the "proof of performance" and routine testing of security screening equipment for procurement. Testing tools developed and referenced by detection requirement during laboratory assessments shall also be used to measure the ongoing performance of equipment in the field.

5. The standard minimum detection requirement reference is reflected in (Appendix 1 - Security Screening Equipment Minimum Detection Standards Checklist).

6. Operational requirements shall be part of security screening equipment procurement cycles. Before a piece of equipment is deployed operationally, the following shall be considered:

a. Size of items to be screened;

b. Size and mass of the equipment;

c. Screening capacity (throughput and hourly screening capacity);

d. Reliability and maintainability;

e. Integrity (possible sources of interference);

f. Licensing, such as of frequency bands used by the equipment;

g. Safety requirements;

h. Automation;

i. Operator interface;

j. Power requirements;

k. Data recording;

l. Threat image projection capability;

m. Training requirements;

n. Ease of use;

o. Environmental constraints (e.g. temperature and humidity); and, p. Networking.

7. Consideration of the following costs when establishing a budget for the procurement of security screening equipment are as follows:

a. Equipment capital:

- (1) Costs related to equipment integration, which may in some instances represent a greater cost than the equipment capital cost and shall therefore be examined closely;
- (2) Costs related to the modification of the equipment to meet a specific or non-standard requirement; and
- (3) Costs related to environment modifications (where the equipment will be used), including changes in dedicated spaces and electrical power requirements;

b. Training: development and delivery of training material on a regular basis;

c. Maintenance:

- (1) Equipment life cycle factors;
- (2) Maintenance provider's competency and response time; and
- (3) Parts availability; and

d. Consumables: electricity consumption costs.

8. Equipment availability requirements, such as regular maintenance and mean-time between failures, shall be considered. If the operational requirement is to have the equipment available for 20 hours per day, airports and/or aircraft operators shall not select a single piece of equipment that can be available for only 18 hours per day. The following questions shall also be addressed:

a. Where will the equipment be used:

- (1) Mobile or fixed-base operations;
- (2) Integrated or stand-alone use;
- (3) Unique physical requirements (e.g. size of X-ray tunnel or metal detector archway);
- (4) Unique environmental requirements (e.g. temperature, dust, vibration and susceptibility to interference from/with other equipment); and,
- (5) Space and maximum weight requirements;

b. Who will use it and what training/skills will be required:

- (1) A pre-qualified skill set may be required for operators due to system complexity (e.g. complexity of the operator interface);
- (2) A training program shall be provided by the equipment supplier or specifically developed by the end-user (i.e. State, airport and/or aircraft operator); and
- (3) Equipment-specific standard operating procedures, including alarm resolution protocols, shall be considered during the selection process; and

c. How will it be used:

- (1) Throughput and automation levels;
- (2) Ease of use;
- (3) Networking; possible need for the prevention of data-recording; and,
- (4) Consumables and service: a clear understanding of supplies and service that will keep the equipment functioning shall be included.

d. Legal and financial considerations

9. The handling and protection of personal data shall be addressed, along with the following:

- a. Health and safety: equipment shall comply with local regulations, including radiation, electrical and operator safety standards;
- b. Licensing issues (e.g. frequency bands used by equipment); and, Privacy issues.

10. All procurement of security screening equipment used in transportation security shall be submitted to OTS for

approval.

C. Calibration

1. Certain items of equipment can be adjusted to detect different levels of threat objects, in particular, metal detection equipment. Manufacturers specify the detection levels for aviation security and may also specify the minimum and recommended sensitivity settings.
2. If spurious alarms are generated at the minimum recommended setting, due to environmental interference, then a lower sensitivity setting may be tested but, in any event, shall not be below the minimum level or standard recommended by the manufacturer.
3. The manufacturer's standard sensitivity setting for equipment in normal operations, to correspond to what is required to be detected, with an enhanced sensitivity setting for a higher level of threat shall be followed.

D. Operations and Maintenance

1. Security systems and devices shall be designed, installed and maintained in such a way as to ensure maximum efficiency. A schedule of preventive maintenance shall be established and carried out in the interest of maintaining a high degree of operational effectiveness with minimum cost.
2. All security screening equipment in use shall be operated in conjunction with the manufacturers' recommendations and individual standard operating procedures as contained in airport, aircraft operator or tenant security program.
3. All authorities and entities operating security screening equipment shall ensure that preventive and fault maintenance schedules are instituted to guarantee that such equipment is operating at optimum efficiency.
4. All authorities operating security screening equipment shall ensure that suitably qualified technicians are available to carry out the necessary maintenance of equipment.
5. All security screening equipment shall be tested by the airport operator every time it is switched on and brought into service using Manufacturer's Test Piece (MTP) to ensure that it is operating within the minimum standard prescribed by the manufacturer. (Appendix 2 - Standard Operating Procedure for Testing Security Screening Equipment).
6. Depending on the type of equipment, recognized test pieces shall be obtained from manufacturers which can be utilized to determine that the equipment is operating according to design specifications and will function as expected. There are two types of maintenance that need to be done:
 - a. Preventive maintenance; and,
 - b. Fault, or corrective, maintenance.
7. Comprehensive equipment maintenance schedules at airports require accurate recordkeeping and document maintenance. This shall include the following:
 - a. Lists of all the items of equipment installed at an airport and their locations;
 - b. Technical records for each type of equipment, detailing in particular the equipment's technical characteristics, including natures, types, serial numbers and manufacturers; and,
 - c. Information related to installation of the equipment, including the date and the names of the installer, person responsible for installation, and site acceptance test conducted prior to initial operation.
8. Equipment maintenance schedules shall include:
 - a. Identification of a technical team leader for each item of equipment and response procedures, including the scheduled dates for periodic preventive inspections and the actual dates of any corrective maintenance that has been carried out;
 - b. Periodic inspection program records, including dates of performance, measurement reports, nature of actions

taken and to be taken, component and parts, replacement schedules, dates of actions and names of the technicians who performed them; and

c. Corrective maintenance records, including the date, nature and description of corrective actions and the identification of defective, repaired or replaced components.

9. Airport operators, aircraft operators, cargo operators and their authorized agents shall provide OTS with details of the type, number, location of equipment and comprehensive maintenance schedule used in aviation security preventive measures, including monthly report of the test results.

IV. MISCELLANEOUS PROVISIONS

A. Construction. The provisions herein shall be liberally construed in order to promote its civil aviation security objectives.

B. Reservation. Nothing herein shall be construed as precluding OTS, through its Administrator, from implementing/enforcing the provisions enunciated herein; and from prescribing other requirements to meet the constantly evolving challenges in civil aviation security.

C. Amendments - Nothing in this circular shall restrict the authority of OTS, through its Administrator, to modify, amend or repeal any provision of this circular by subsequent issuances.

D. Repeal - All OTS orders, rules, regulations and issuances, or parts hereof, which are inconsistent with this circular, are hereby accordingly repealed or modified.

E. Separability - If any provision or section of this circular is declared null and void by competent authority, the remaining provisions thereof shall not be affected and shall remain in full force and effect.

F. Effectivity - This circular shall take effect immediately. A copy of this circular shall be deposited with the University of the Philippines Law Center, in compliance with the Revised Administrative Code.

(SGD) USEC. ARTURO M. EVANGELISTA
Administrator

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