Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC140-02

General Requirements for Security Screening Equipment

Initial Issue

28 April 2025

GENERAL

Civil Aviation Safety Authority of Papua New Guinea Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

PURPOSE

This Advisory Circular (AC) provides comprehensive technical and operational guidance for the use of security screening equipment at civil aviation facilities in Papua New Guinea. It supports compliance with PNG Civil Aviation Rule (CAR) Part 140 and national security objectives.

RELATED CAR

This AC is specifically related to Rule 140.55, Appendices A.4 and A.26 of the PNG Civil Aviation Rules Part 140, which outlines the requirement for security screening equipment at civil aviation facilities in Papua New Guinea. The AC provides supporting guidance to help applicants understand and fulfil this requirement, including the processes and documentation needed for certification.

CHANGE NOTICE

This Advisory Circular (AC140-02) is the initial issue. It introduces the first version of guidance for the use of security screening equipment at civil aviation facilities in Papua New Guinea.

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1. EQUIPMENT CATEGORIES AND FUNCTIONS

This section outlines the categories of security screening equipment deployed at civil aviation facilities in PNG, along with their specific functions and minimum performance standards.

1.1. Walk-Through Metal Detectors (WTMD)

1.1.1 Walk-through metal detectors are used to detect metallic threat items concealed on a person's body.

1.1.2 These detectors must feature adjustable sensitivity settings to accommodate varying operational environments and security risk levels.

1.1.3 The performance of WTMDs must be verified using standardised test pieces approved by the Director.

1.1.4 Calibration and configuration must be based on the results of risk assessments and current threat intelligence.

1.2. Hand-Held Metal Detectors (HHMD)

1.1.1 HHMDs provide secondary screening following WTMD alarms or for targeted searches. the aerodrome exposition.

1.1.2 They must offer high sensitivity to small metallic threats and both audible and visual alarm features.

1.3. X-ray Imaging Systems (Single and Dual View)

1.3.1 These systems are used for screening cabin baggage, hold baggage, cargo, and supplies.

1.3.2 They must meet international standards for image quality, resolution, and penetration and incorporate Threat Image Projection (TIP) functionality for operator training.

1.4. Explosives Detection Systems (EDS and EDSCB)

1.4.1 EDS are primarily used for the screening of hold baggage, cargo, and mail.

1.4.2 They must meet ECAC C2–C4 certification levels and be capable of detecting a wide range of explosives such as PETN, RDX, TNT, and TATP.

1.5. Explosives Trace Detection (ETD) Systems

1.5.1 ETD systems are deployed for surface sampling and trace analysis of explosives.

1.5.2 They must detect nanogram-level traces reliably and maintain low false alarm rates.

1.6. Millimetre-Wave Body Scanners

1.6.1 Body scanners detect non-metallic threats hidden under clothing.

1.6.2 They must feature Automatic Threat Recognition (ATR) software to preserve passenger privacy and ensure alarm resolution through generic, non-anatomical displays.

1.7. Cargo, Mail, Airport Supplies and Vehicle Screening Equipment

1.7.1 This category includes X-ray systems, ETDs, EDS, and vehicle scanners.

1.7.2 Equipment selection must be risk-based and screening integrity must be maintained until

items are loaded onto aircraft.

1.7.3 All equipment must be approved, maintained, calibrated, and operated by trained personnel according to CASA PNG requirements.

2. TECHNICAL SPECIFICATIONS AND OPERATIONAL REQUIREMENTS

This chapter sets out the detailed minimum specifications, operational conditions, and compliance expectations for all security screening equipment deployed at security-designated aerodromes and navigation facilities in Papua New Guinea. These requirements are based on international standards, PNG Civil Aviation Rule Part 140, and CASA PNG's Aviation Security Risk Assessment Methodology (ASRAM).

2.1 Certification and Standards

2.1.1 International Certification

2.1.1.1 All security screening equipment must be certified by internationally recognized bodies such as ECAC (meeting C1 to C4 standards for EDS), TSA (ACSTL certification for screening technologies), or equivalent standards accepted by the Director.

2.1.2 Performance Requirements

2.1.2.1 Certification must cover, at a minimum:

(a) Threat detection performance (types and mass/size of weapons/explosives);

(b) Image quality and resolution standards for X-ray and EDS equipment;

(c) Penetration capability for dense objects;

(d) Alarm rates for detection systems (false alarm rates must not exceed acceptable international thresholds);

(e) Resistance to known methods of concealment and countermeasures.

2.1.3 Suitability for Environment

2.1.3.1 Equipment selected must be suited to the security threat profile of the location, determined through a site-specific risk assessment, and documented within the operator's Aviation Security Programme.

2.2 Procurement and Deployment

2.2.1 Security Risk Assessment (SRA)

2.2.1.1 Prior to procurement, applicants must conduct a formal SRA in accordance with CASA PNG's ASRAM Policy to determine the operational needs and threat environment.

2.2.2 Procurement Specifications

2.2.2.1 Technical specifications must be aligned to the threats identified in the SRA and must include throughput rates, environmental operating conditions (e.g., temperature, humidity), and scalability requirements.

2.2.3 Site Acceptance Testing (SAT)

2.2.3.1 Before deployment, equipment must undergo SAT to verify compliance with procurement specifications, including

(a) Verification of detection capabilities against standard threat materials;

(b) Validation of image quality, penetration, and material discrimination (X-ray/EDS);

(c) Sensitivity setting validation for WTMD, HHMD, and ETDs;

(d) Confirming alarm presentation functionality (visual/audible/ATR bounding boxes);

(e) Compliance with operational performance under actual site conditions.

2.2.4 Documentation

2.2.4.1 SAT results must be recorded, submitted to the Director for approval, and retained for a minimum period of three years.

2.3 Maintenance and Calibration

2.3.1 Maintenance Program

2.3.1.1 Operators must establish and implement a preventive maintenance and corrective maintenance program:

(a) Compliant with manufacturer guidelines;

(b) Supplemented by national and international best practices.

2.3.2 Calibration Requirements

2.3.2.1 All detection equipment must be calibrated:

(a) Initially upon installation;

(b) Monthly thereafter;

(c) Immediately after any major maintenance or service event.

2.3.2.2 Calibration must utilize Director-approved standard test pieces.

2.3.3 Maintenance and Calibration Records

2.3.3.1 Maintenance and calibration logs must detail:

(a) The date, nature of maintenance or calibration;

(b) Identification of personnel conducting the task;

(c) Any anomalies detected and actions taken to restore serviceability.

2.4 Performance Testing

2.4.1 Daily Testing

2.4.1.1 Prior to commencing operations each day, equipment must pass functionality tests using standard threat test pieces.

2.4.1.2 For X-ray machines, Threat Image Projection (TIP) systems must be used where installed, to automatically and randomly display threat images during live screening operations as a means to assess operator performance. In the absence of a TIP system, manual test bag insertion containing Director-approved threat simulation objects must be conducted at regular intervals to validate the alertness and detection capabilities of screeners. All TIP activities and manual test bag insertions must be logged and reviewed as part of the operator's quality assurance

programme.

2.4.2 Weekly and Monthly Testing

2.4.2.1 In-depth operational checks to verify alarm threshold settings, detection capability consistency, image quality (for imaging devices), and chemical trace sensitivity (for ETDs).

2.4.3 Failure Response

2.4.3.1 Any failure during daily or periodic testing must result in immediate removal of the equipment from service until repairs are completed and retested successfully.

2.4.4 Testing Documentation

2.4.4.1 Test results must be logged daily, reviewed weekly, and submitted to the Director quarterly or upon request.

2.5 Training and Competency

2.5.1 Initial Training

2.5.1.1 Personnel operating security screening equipment must successfully complete training that covers:

(a) Theory of detection principles;

(b) Hands-on operational skills;

(c) Threat recognition (including emerging threats);

(d) Emergency response actions.

2.5.2 Recurrent Training.

2.5.2.1 Operators must provide annual refresher training, aligned with changes to threat profiles and technology updates.

2.5.2.2 Practical proficiency must be assessed at least once every 12 months.

2.5.3 Certification

2.5.3.1 Personnel must hold a valid certificate of competency, issued by a CASA PNG-approved training organization or an entity recognized under the NCASTP.

2.5.4 Recordkeeping

2.5.4.1 Training and competency assessment records must be maintained for at least 24 months and be available for CASA PNG audits.

2.6 Contingency Planning

2.6.1 Equipment Failure Protocol

2.6.1.1 In accordance with Appendix A.29 of PNG CAR Part 140, operators must have in place immediate and effective contingency measures for any unserviceability of primary security screening equipment. The following actions must be implemented:

(a) Immediate Withdrawal of Defective Equipment

Any screening equipment identified as defective or failing to meet operational standards must be immediately withdrawn from service to prevent compromised security screening.

(b) Activation of Alternate Screening Methods

Alternate Director-approved screening methods must be activated without delay. These may include, but are not limited to:

(i) Full manual hand search of persons, baggage, or goods;

(ii) Use of Explosive Trace Detection (ETD) systems as the primary screening method;

(iii) Deployment of portable or backup screening devices where available.

2.6.2 Notification Requirements

2.6.2.1 The Director must be notified immediately if a primary item of security screening equipment remains unserviceable for a continuous period exceeding four (4) hours, or as otherwise directed.

2.6.3 Contingency Plan Testing

2.6.3.1 Contingency procedures must be periodically tested through drills at least once every six (6) months to ensure effectiveness, in accordance with the operator's Security Programme and Quality Assurance system.

2.6.4 Documentation

2.6.4.1 All equipment failures, activation of contingency screening methods, testing drills, and recovery actions must be fully documented, logged, and retained for audit by CASA PNG for a minimum of three (3) years.