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SIERRA LEONE CIVIL AVIATION AUTHORITY

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Integration of Aviation Security (AVSEC) Measures into the Planning, Design and Construction of New Aerodrome Facilities and Alteration to Existing Facilities

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1 GENERAL

The Sierra Leone Civil Aviation Authority's Advisory Circulars contains information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated Regulations.

An AMC is not intended to be the only means of compliance with a Regulation, and consideration will be given to other methods of compliance that may be presented to the Authority

Information considered directive in nature is described in this AC in terms such as "shall" and "must", indicating the actions are mandatory. Guidance information is described in terms such as "should" and "may" indicating the actions are desirable or permissive, but not mandatory

1.1 Purpose

This AC has been developed to guide aerodrome operators in ensuring that aviation security measures are integrated into the planning, design and construction of new aerodrome facilities and the alteration to existing facilities at an Aerodrome, for the optimum implementation of aviation security of air transport. The protection of the airport can be achieved through a combination of physical security measures, systems and operations. The aerodrome should be designed in such a way that it accommodates all the security elements that will make up, in the response to a major incident.

In order to achieve a high degree of sustainable performance, it is necessary to apply a multi layered security system combining principles, procedures, programs, technologies and counter-measures to form an overall 'system of systems' approach to aviation security. An AMC is not intended to be the only means of compliance with a regulation, and consideration will be given to other methods of compliance that may be presented to the Authority.

1.2 Description of Changes

This AC is the first to be issued on this subject

1.3 References

- (a) SLCARs Part 14A – Aerodrome Design and Operations
- (b) SLCARs Part 14C – Certification of Aerodromes
- (c) National Civil Aviation Security Programme (NCASP)
- (d) ICAO Doc 9184 part 1- Master Planning

1.4 Cancelled Documents

Not Applicable

1.5 Background

Airport security is an integral part of airport planning, design and operations, but its details must be restricted. At each airport a basic level of security is required under normal operating conditions. In addition, extra measures and procedures are required during periods of heightened tension. These requirements will need to be determined at the earliest possible stage in the preparation of plans or designs. Consultation with airport

security authority/officials will be essential in order to assure that all security requirements are taken into account.

In order for airport security to be effective, a systems approach is required and this includes the basic design of the airport. All of the measures listed in this AC need not be implemented at every airport, but they should be considered against the level of security which it is desired to achieve. They should be implemented in such a way as will cause a minimum of interference with, or delay to, passengers, crew, baggage, cargo and mail. It should be recognized that the airport design is relatively inflexible once the structures are completed and should the security requirements become greater in future, it may be difficult, if not impossible, to modify the buildings and structures at a reasonable cost.

Concurrently with determining the level of security to be provided, there is a need to define the areas on the airport to be protected. As a minimum, this would include the airside, but at some airports, protection of the entire airport property may need to be considered. In addition, other functions vital to air navigation which may not be located on the airside, such as air traffic services, radio navigation aids, fuel storage areas, water and electrical power supplies, shall also be protected.

2 GENERAL REQUIREMENTS

2.1 Passenger Buildings - Inspection/Screening of Persons

- (a) The most important security consideration in the design of passenger buildings is that it should not be possible for unauthorized persons to pass from the landside to the airside. This requires that access from public areas of the building to operational areas including baggage and cargo areas such as hold point baggage screening point, passenger and cabin baggage screening point, flight crew screening point, baggage sorting area, security service offices and premises and central security control centre, should be strictly controlled.
- (b) In this context, adequate provisions must be made for the inspection/screening of passengers and their cabin baggage. For example, adequate space must be provided to separate X-ray devices from walk-through gate-type metal detectors by a minimum of 1m as well as to separate electromagnetic security equipment from other airport equipment that will generate electrical fields, which may adversely affect the operating efficiency of security equipment. This precaution will equally apply to ducts and cable runs provided for security equipment.
- (c) The National Civil Aviation Security Programme (NCASP) describes the basic plans for the inspection/screening of passengers at gates; hold areas and concourses, and sets out the advantages and disadvantages of each. A room or other facility should be provided in close proximity to each inspection/screening point where manual or other special search of persons may be carried out in privacy.
- (d) Passenger inspection/screening should not take place in the immediate passenger boarding area or near the aircraft door. A preferred location would be a sufficient distance from the aircraft boarding area so as to permit adequate time for security procedures to be initiated in the event of a security alert.
- (e) Regardless of the plan selected, it is essential that the design provides for:
 - (i) The physical separation of persons who have been subjected to inspection/screening from others at the airport; and

- (ii) The prevention of unauthorized access from landside or airside to passengers waiting in sterile areas prior to boarding an aircraft, after they have been inspected/screened.

2.2 Passenger Terminal Building

- (a) The planning and design of the passenger terminal building should make provisions for the following security measures:
 - (i) Hold baggage screening points
 - (ii) Passenger and cabin baggage screening points
 - (iii) Flight crew screening points (crew gate)
 - (iv) Baggage sorting area
 - (v) The security services offices and premises
 - (vi) Central security control centre
- (b) To attain the general objective of security planning as well as overall airport planning, the following principles should be complied with:
 - (i) Passenger and baggage flow routes should be simple and self-evident.
 - (ii) Transit and transfer passenger and cargo flows should be physically separated.
 - (iii) The number of security checkpoints should be minimized as best as possible (this can be achieved by centralizing the screening points for passenger and baggage).
 - (iv) The number of points where pedestrians can have access to the airside area should be minimized. (This can be done after a rigorous analysis of ground personnel flow routes and by applying the basic principle of developing the overall plan for the access permit system)
 - (v) All passenger departure areas between the screening checkpoint and the aircraft are to be considered a security-restricted area where access must be controlled.

2.3 The Landside / Public Areas

The landside / public areas that overlook aircraft parked on the apron or passenger handling operations must comply with the following requirements:

- (i) Access must be controlled or guards must supervise the area.
- (ii) The areas should be enclosed or contain barriers to prevent unauthorized access or the throwing of objects at parked aircraft or into security restricted areas.
- (iii) Access control features should enable them to be secured and closed to the public when required.

2.4 VIP Lounges

VIP lounges should be so designed that they do not permit unauthorized land side/air side access. Persons boarding an aircraft from a VIP lounge shall be subjected to the passenger and cabin baggage inspection / screening process.

2.5 Visitors' Observation Areas

Consideration may need to be given to the desirability of providing observation areas for the public to overlook aprons. If observation areas are to be provided, consideration

should be given to enclosing them with glass or providing for surveillance by security guards. In cases where persons in the observation area would be able to pass material to departing passengers, the observation area should be made sterile by subjecting everyone to inspection/screening prior to being permitted access.

2.6 Airport Emergency Operation Centre

The airport design must provide for an Airport Emergency Operations Centre for coordinating, monitoring and directing emergency response activities during an emergency.

2.7 Baggage Handling Facilities

(a) Adequate space will be required to enable the airline operator to establish procedures to ensure that only checked baggage for which a passenger is on board will be allowed to be transported on the aircraft. The exception to this would be if the airline operator has authority for some other form of security control for unaccompanied baggage, such as X-rays.

(b) Another feature, which should be considered in terminal design in relation to baggage handling, is the ability to control access from landside to airside through the baggage conveyor system. If direct access is possible, a method of locking or otherwise controlling the access areas should be provided.

2.8 Storage of Mishandled / Misrouted Baggage

Each baggage storage facility should be constructed in a manner to minimise the effects of an explosion occurring from items being handled, stored or contained in the baggage. Consideration should be given to providing a secured storage area in the passenger terminal building where mishandled baggage may be stored until forwarded, claimed or disposed of. Provision should also be made for screening by trained staff of all items by X-ray or hand search before they are accepted for storage.

Airside and security restricted areas should be designed and constructed to prevent passage of articles from non-sterile areas. For example, links or connections among plumbing, air vents, drain, utility tunnels, or other fixtures in restricted security area restrooms and restrooms in non-sterile areas should be avoided to limit the possibility of articles being passed from one area to the other. When planning the construction of non-restricted or public access suspended walkways or balconies over or adjacent to restricted security areas, it is critical to ensure that they do not facilitate the passing of items into those areas.

2.9 Physical Separation of Arriving / Departing Passengers

The design of the passenger terminal building should provide for the physical separation of arriving passengers from departing passengers in the area after the inspection/screening point. There must be no possibility of mixing or contact between passengers who have been inspected/screened and other persons who have not been subjected to that process.

2.10 Cargo and Mail Handling Facilities

(a) Special security facilities may be required for cargo. In certain situations it may be necessary to provide security controls for cargo, such as planned delays or physical or electronic searching. Airport planning should consider special requirements for cargo.

Security measures are required for cargo and airmail items prior to transport by air, either through the application of a regulated agent system of cargo security or through the application of other security controls. Therefore, the activities of consignors and freight forwarders may be as significant as those of airports and/or air carriers.

- (b) Cargo and mail handling facilities should be subject to security controls with access to secure cargo being controlled at all times. On-airport cargo facilities may be divided into two sectors:
 - (i) **The landside sector**, which may be entered by cargo or mail service personnel, characters, and members of the general public coming to send or pick up goods, as well as by service vehicles, and cargo/mail or goods delivery or collection vehicles. This sector should include the portion of the terminal (spaces, loading bays, and rooms) where cargo, mail, and goods are delivered and picked up.
 - (ii) **The security restricted area sector**, which includes that portion of the terminal facilities where cargo, mail, and goods are processed for air transport at departure and for land transport upon arrival and the loading bay and manoeuvring and parking areas for airport service vehicles and equipment used for loading and unloading. The airside sector should be isolated from the landside portion of the terminal by metal grills or solid walls but allow goods passage to facilitate movement.

2.11 General Aviation (GA)

General aviation operations at commercial service airports should be evaluated, designed and located independently from commercial operations areas as much as is practicable, so as to minimize potential security conflicts, flight delays and unnecessary inconveniences to both GA and commercial service operators. The following general aviation operations should be segregated from the main terminal area so as to minimize the movement of vehicles and persons. These include:

- (i) Private hangars
- (ii) Private jet /Helicopter operators
- (iii)Cooperate jet operators
- (iv)Agricultural aviation
- (v) Light aircraft operators

2.12 GA Security Requirement

- (a) GA terminal operators should consider the design of secure or monitored access doors and gates for each portal leading to the aircraft ramp.
- (b) Provide security signages that clearly restricts access to the aircraft operations area to authorized persons only.
- (c) The use of signage provides a deterrent by warning of facility boundaries as well notifying individuals of the consequences of a violation.
- (d) Signs should be constructed of durable materials, contrasting colors, and reflective material where appropriate.
- (e) Use of concise and consistent language is recommended.

- (f) Wording may include, but is not limited to, warnings against trespassing, unauthorized use of aircraft and tampering with aircraft, and reporting of suspicious activity.

2.13 Aviation Blast Protection

The terminal building should be built to minimize the effects of an explosion. The following should be taken into consideration:

- (a) Ensuring that roofing, ceilings are fire retardant and are made of incombustible materials.
- (b) Designing the terminal areas accessible to passengers and the public to facilitate patrols and surveillance and to reduce or eliminate places where explosive or incendiary devices may be concealed.
- (c) Using the appropriate glazing securely fixed into robust frames or mullions and transoms with sufficient rebate depth. The frames or glazing support systems are to be securely fixed to the structure.
- (d) Ensuring that roofing, cladding, false ceilings, etc., are securely fixed as large panels or items that become detached can cause considerable injury and damage.
- (e) Employing materials used in the internal fitting out of the public areas of the terminal and retail outlets, etc., that will minimize casualties and damage following an explosion or fail in such a way that will minimize the formation of secondary fragments.
- (f) Ensuring that materials used within terminal buildings, for example, as upholstery on seating and for false ceilings, are fire resistant and do not give off toxic fumes or smoke.

2.14 Airside Security

- (a) Security of operational areas, where aircraft may be present, such as runways, taxiways and aprons shall be physically separated from public areas. separation should be ensured between public and operational areas, although the extensive area required for the latter and the need for public access to passenger terminal buildings makes this difficult to achieve. No precise distances can be given but the greater the separation, the higher the level of security. A particular problem may be runways and taxiways, which overpass public roads. Where such overpasses are planned, special measures may be needed to restrict access to runways or taxiways at this point and to counteract the possibility of sabotage to the structure of the bridge. Other potential danger areas are the approach and departure paths to runways where aircraft fly at low altitude. If it is considered necessary to protect these areas, it will be expedient to extend the airport boundaries during the initial design of the airport to include them in the land acquired as airport property.
- (b) To adequately protect air operation areas from unauthorized access, it is important to consider physical security measures including fencing or other barriers, lighting, locks, alarms, guards and guard houses in the planning process of air side facilities.
- (c) Buildings may be used as a part of the physical barrier and incorporated in the fence line provided measures are taken to restrict unauthorized passage through the buildings. Care should also be taken to ensure that the roofs of the buildings do not provide a possible route for unauthorized access to the airside. For additional

security, floodlighting of the perimeter fencing and/or the installation of an alarm system may be considered.

2.15 Airport Roads

Roads located on the airside should be for the exclusive use of airport personnel. Separate means of access to public buildings not involving travel on the airside will need to be provided for non-airport personnel. Perimeter roads around the airside area, normally just inside the airport fencing, shall be provided for the use of both maintenance personnel and security patrols.

2.16 Fencing

- (a) Physical barriers shall be provided to deter the access of unauthorized persons into non-public areas. These should be permanent barriers and, normally, fencing is the most suitable means. Care must be taken to ensure that the provision of fencing does not conflict with the operational requirements of the airport. Access points shall be made in the fence to allow the passage of vehicles and persons; the number of access points should be kept to a minimum and equipped so that they can be securely closed whenever required. If a gate is used frequently, a security guard will be required, together with a shelter for protection against the elements. The shelter should be designed in such a way so as to permit maximum visibility over the immediate area of the gate and to provide easy access for the guard to carry out the duties of inspecting vehicles and their contents. When night use is anticipated, the area surrounding the gate should be illuminated. Discreet communications should be provided between the security post and the airport security services office as well as a discreet and audible alarm by which assistance may be summoned in the event of emergency. Security of an airport will require that underground service ducts, sewers and other structures which provide access to the air side or other restricted area be barred. If access to these facilities is required for maintenance purposes, locked doors or gates should be provided.
- (b) Airport perimeter fence may be any of the following types, based on safety and security risk assessment:
- (i) **Chain link fencing**- steel wire woven together in a grid like pattern and should be weatherproof coating to slow down deterioration and rusting of the wire.
 - (ii) **Palisade fencing**- made of materials such as expanded metal or welded mesh closely spaced vertical steel poles.
 - (iii) **Concrete slab/block**- Concrete slab of minimum height of 8 feet or 2.44 meters.
- (c) The feature of the perimeter fence shall include but not limited to the following:
- (i) Height - minimum height of 8 feet or 2.44 meters above ground level;
 - (ii) Orientation - construct in a straight lines for ease of surveillance;
 - (iii) Visibility - the whole of the fence should be visible for patrolling;
 - (iv) Clear Zone - establishes a clear zone of 5 meters on both sides of the fence;
 - (v) Anti-Climb - barbed wire or concertina should be used at the top of the fence;
 - (vi) Gates - Constructed to a comparable standard to the fence;
 - (vii) Lighting - illumination for deterrence and effective surveillance; and
 - (viii) CCTV- installed in conjunction with the intruder detection system.

- (ix) Perimeter road is required for ease of patrolling and security signage to deter intruder

Note: – See Appendix K of the NCASP for further details on the features of aerodrome perimeter fence.

2.17 Access Control

- (a) Consideration should be given to reducing a minimum number of access control points to airside/landside boundaries and restricted security areas. Effective security relies on the integrated application of identification and access control systems and detection equipment. It should be ensured that all cabling, piping, ducting and other panels are covered in such a way it does not provide unauthorized access.
- (b) Whenever possible, maintenance, service and miscellaneous activities areas and building or controlled areas should be located at the landside with controlled access to airside.
- (c) To prevent unauthorized access, doors or gates leading from landside to airside to security restricted and to controlled areas not under surveillance should be equipped with locks or alarms system.
- (d) Every tenant/lessee at airports, whose premises are wholly or partly within a designated restricted area, shall take all reasonably practical steps to prevent access to the restricted area by persons not authorized by the airport operator to have such access through the area under their control. Consideration shall be given to location, configuration and layout of the premises, the restricted area and the nature of the activities carried out on the premises.

2.18 Access Gate Requirement

The minimum requirements for Access Gates should include:

- (a) standard security gate;
- (b) drop arm barrier/speed breakers;
- (c) adequate shelter to withstand weather conditions;
- (d) guard house with necessary conveniences;
- (e) adequate communication and surveillance gadgets;
- (f) sufficient illumination to accomplish the following, Reveal, Deter intruders and Conceal defenders;
- (g) screening equipment such as Search Mirrors, Hand Held Metal Detectors, etc.;
- (h) Aviation Security office
- (i) Supporting law enforcement office.

2.19 Security Lighting

- (a) Security lighting can offer a high degree of deterrence to a potential intruder in addition to providing the illumination necessary for effective surveillance either directly by guards or indirectly through CCTV system. It further helps
 - (i) To allow guard to see intruders before they reach their objectives
 - (ii) Conceal the guards from intruders

- (iii) Deter intruders or hinder them in their purpose.
- (b) The various types of security lighting shall be as described such as:
 - (i) **Perimeter lighting** is designed to cast a strong light on the perimeter. This may be provided by overhead lamps or by low-mounted lamps that will create a glare effect to dazzle and deter intruders. If the latter are used, care should be taken to ensure that they do not create a nuisance or hazard to aircraft;
 - (ii) **Area lighting** is intended to illuminate areas inside the perimeter through which intruders may cross in order to reach their objectives. This increases the guards' ability to detect intruders and acts as a powerful deterrent. Ideally, the illumination shall be even and without shadows. Every part of each area to be illuminated shall be lit by at least two lights to guard against lamp failure;
 - (iii) **Local lighting** shall illuminate those areas inadequately covered by area lighting and which might conceal an intruder. Small bulkhead lights, tough and resistant to interference, shall be used. Fluorescent or tungsten-halogen lamps can be used as miniature floodlights. All dark spots shall be eliminated. Roofs, fire escapes and emergency exits shall be illuminated by such local lighting; and
 - (iv) **Floodlighting** shall be used to illuminate surfaces (e.g., buildings and fences), which intruders may pass in front of to reach their objectives. At the low illumination levels typical of security lighting, the eyes rely mainly on the ability to recognize outline shapes. A moving silhouette can readily be seen against an illuminated wall (preferably painted white or some other light color).

2.20 Physical Protection Afforded To Lighting Installations

- (a) This should be assessed and designed according to its location and the risk of sabotage.
- (b) Minimum requirements for security control points within the terminal building;
 - (i) Adequate communication and surveillance gadgets;
 - (ii) Screening equipment such as Walk Through Metal Detector, Hand Held Metal Detectors, etc.;
 - (iii) Aviation Security office
 - (iv) Supporting law enforcement office.

2.21 Vulnerable Points

- (a) A vulnerable point is any facility on or connected with an airport, which, if damaged, destroyed, sabotaged would seriously impair the functioning of the airport. Control towers, communication facilities, radio navigation aids, power transformers, primary and secondary power supplies, and fuel installations both on and off an airport, are designated vulnerable points.
- (b) Communication and radio navigation aids that, if tampered with, could give false signals for the guidance of aircraft and, therefore, must be afforded a higher level of security.
- (c) The following security measures shall be complied with:
 - (i) Physical security measures and intrusion detection systems should be provided
 - (ii) Vulnerable points should be manned with strict control of access measures

- (iii) Admission to the installation should include the requirement to produce valid identification cards.

2.22 Isolated Parking Position

- (a) An isolated parking position will need to be designated to which aircraft suspected of carrying explosive or incendiary devices may be taken. It should be located at the maximum distance possible and at least 100m from other aircraft parking positions, buildings or public areas and the airport fence. If taxiways and runways pass within this limit, they may have to be closed for normal operations when a "suspect" aircraft is in the area. The isolated parking position may also be used to handle unlawfully seized aircraft, which land at an airport and require servicing and attention. Care should be taken to ensure that the position is not located over underground utilities such as gasoline, aviation fuel, water mains, or electrical or communications cables.
- (b) Facilities for the examination of baggage, cargo, mail and stores removed from an aircraft subjected to an act of unlawful interference should be provided as part of the isolated parking position and consideration given to the provision of shelter in the case of inclement weather.

2.23 Security Parking Area

In addition to the isolated parking position, consideration may need to be given to the provision of an aircraft stand where an aircraft likely to be the object of an act of unlawful interference may be parked until it is required, or for the loading and unloading of passengers. The objective in the selection and design of this area is to eliminate the possibility of persons physically reaching or being able to launch an attack against the aircraft.

2.24 General Aviation Parking Areas

It is advisable to designate a parking area for general aviation aircraft separate from that used by commercial air transport aircraft. This practice safeguards against the possible use of a general aviation aircraft as a means of circumventing security control at the airport. Taxiways to such general aviation parking areas should be identified and should, where possible, be planned so as to avoid aprons used by commercial air transport aircraft.

2.25 Explosive Holding Area

A holding area should be provided for any suspicious articles found on the airport or on an aircraft. It should be located in a remote area, and in order to allow bomb disposal experts to deal with any devices, the provision of a shelter, bunker or building is recommended. This should be constructed in such a way that vehicles used to transport explosive devices can be driven inside for unloading.

Further guidance on subject, can be found in the National Civil Aviation Security Programme (NCASP).