MALDIVES CIVIL AVIATION AUTHORITY
Republic of Maldives

AIR SAFETY CIRCULAR
ASC 139-18

Aerodrome Operational Services

Issue 1.01, 1 July 2025

Foreword

The Air Safety Circular (ASC) 139-18 titled *"Aerodrome Operational Services"* is issued by the Maldives Civil Aviation Authority (CAA) to strengthen operational safety and consistency in the day-to-day management of certified aerodromes. It provides structured guidance and acceptable means of compliance for aerodrome operators in maintaining safe, orderly, and efficient aerodrome operations.

This ASC complements the MCAR-139 Aerodrome Rules, which form the regulatory framework for the certification and operation of aerodromes and supports the implementation of national aerodrome standards as defined in ASC 139-5. It also draws on applicable provisions from ICAO Annex 14, Volume I, and relevant ICAO guidance material such as Doc 9137 – Airport Services Manual.

The guidance outlined in these circular addresses a broad range of operational activities critical to aerodrome safety, including surface inspections, control of work-in-progress, management of apron activities, adverse weather operations, vehicle control, and response procedures for aircraft incidents and disabled aircraft.

This circular will be subject to regular review and updated as necessary to reflect changes in international standards, national requirements, and operational practices.

Existing requirements listed in ASC 139-18 Aerodromes Operational Services dated 15 June 2025 will be repealed as from 1 July 2025.

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Chapter 1 — General

1.1 Introduction

1.1.1 This Air Safety Circular (ASC 139-18) sets forth guidance materials related to the aerodrome operational services, encompassing a wide array of functions that directly influence aircraft operations at the aerodromes.

1.1.2 This circular serves as a key reference for establishing a proactive and standardized operational environment at certified aerodromes, contributing to the overall safety performance of civil aviation in the Maldives.

1.1.3 The circular shall be applicable from 15 June 2025 at 0000 UTC.

1.2 Definitions

1.2.1 Definitions of the terms and abbreviations used in this Circular, unless the context requires otherwise, are in MCAR-1 Definitions and Abbreviations.

1.3 Purpose

1.3.1 The purpose of ASC 139-18 is to provide aerodrome operators with a clear framework for the safe and effective management of aerodrome operational services. This guidance is intended to assist in the implementation of procedures and practices that uphold safety, efficiency, and compliance with the requirements of MCAR-139 and ASC 139-5.

1.3.2 Specifically, the circular aims to:

(a) Define acceptable practices for maintaining safe surface conditions.

(b) Establish procedures for managing operational risks during adverse weather and airside works.

(c) Promote safe apron operations and effective apron safety management.

(d) Guide aerodrome personnel in responding to accidents, incidents, and disabled aircraft scenarios.

(e) Ensure proper control of vehicles operating in the movement and manoeuvring areas.

(f) Reinforce the importance of accurate and timely provision of aerodrome data.

1.4 Applicability

1.4.1 This circular (ASC 139-18) applies to all certified aerodrome operators in the Maldives who are responsible for the planning, execution, and oversight of aerodrome operational services as required under MCAR-139 and the national standards contained in ASC 139-5.

1.4.2 Where an aerodrome operator wishes to adopt alternative methods to those described in this ASC, such proposals must demonstrate an equivalent or higher level of safety and be submitted for review and acceptance by the CAA.

1.5 Effective Date

1.5.1 This Air Safety Circular is effective from 1 July 2025.

1.6 References

a) Air Safety Circular 139 – 5 Aerodrome Standards.

Chapter 2 — Airport Surface Inspection

2.1 Frequency of inspection

2.1.1 Inspections of the movement area should be regular and as frequent as possible. In any event the minimum frequency should be:

a) **Runway:** 4 inspections daily as described below:

1. **Dawn inspection:** A detailed surface inspection covering the full width of all runways should be undertaken. This should take approximately 15 minutes of each runway (two runs).
2. **Morning inspection:** All runways, normally conducted on an ON/OFF basis concentrating on the area between the runway edge lights.
3. **Afternoon inspection:** Same as morning inspection.
4. **Dusk inspection:** This should cover all runways. It is designed to bridge the gap in runway inspections when the lighting inspection is not required until late in the evening and should cover the whole runway surface.

b) **Taxiways:** daily for those in normal regular use.

c) **Apron:** daily.

d) **Grassed areas:** those areas that may be required to sustain aircraft should be inspected as frequently as the adjacent paved areas. Other grass areas should be inspected at intervals suitable to observe any deterioration of the surface.

2.2 Method of Inspection

2.2.1 The areas and distances to be covered necessitate the use of vehicles for airport inspections. However, the higher the speed, the less effective the inspection; therefore, speeds should be kept as low as practicable. Detailed inspections of paved surfaces on foot will normally be completed by the Maintenance Department while the relevant department should inspect other areas. It will be necessary for airport operations to co-ordinate the programme to ensure that inspections are conducted at the correct frequency.

2.3 Inspection procedures

2.3.1 Before commencing any runway inspection, permission must be obtained from Air Traffic Control (ATC). Upon entering the runway, a positive entry call (e.g., "Checker entering for inspection") must be made. When vacating the runway, ATC must be informed once the inspection vehicle is clear of the runway strip.

Most inspections are conducted on an ON/OFF basis (i.e., the inspection vehicle may be required to enter or exit the runway at short notice). The aforementioned calls must be made each time the inspection vehicle enters the runway.

2.3.2 It is essential to maintain a listening watch on the appropriate R/T channel during any runway inspection.

2.3.3 If, during an ON/OFF inspection, air traffic control requests the inspection team to clear the runway, the vehicle must move outside the runway strip before advising air traffic control that they are clear. They must then remain outside the runway strip while awaiting re-entry instructions. Note: Inspectors should never clear a runway by entering an ILS critical sensitive area.

2.3.4 Clearance must be obtained before crossing any runway.

2.3.5 All runway inspections are carried out in the direction opposite to that being used for landing or taking off, primarily for safety reasons. In the case of the first- light runway inspection involving two runs in the same direction, the "back-tracking" must be done outside the runway strip and can be utilized in inspecting the runway from a distance or the taxiways adjacent to the runway in question

2.3.6 On final completion of a runway inspection the team should advise air traffic control of the fact and report the state of the runway.

2.3.7 The times of commencement and completion of the inspection must be noted and included in the Record of Inspection Log.

2.4 Paved area inspections

2.4.1 Attention should be paid to the following points:

a) general cleanliness with particular attention to material which could cause engine ingestion damage. This may include debris from runway maintenance operations or excessive grit remaining after runway gritting. Any build-up of tire rubber deposits should be noted.

b) signs of damage to the pavement surface including cracking and spelling of concrete, condition of joint sealing, cracking and looseness of aggregate in asphalt surfaces or breakup of friction courses. Damage or deterioration which could cause aircraft damage should be reported immediately for inspection by the Airport Maintenance Department and, if the damage is sufficiently serious, the area closed to aircraft pending the results of such an inspection.

c) after rain, flooded areas should be identified and marked, if possible, to facilitate later resurfacing.

d) damage of light fittings.

e) cleanliness of runway markings; and

f) the condition and fit of pit covers.

2.4.2 The extremities of the runway should be inspected for early touchdown marks; blast damage to approach lights, marker cones and threshold lights; cleanliness and obstacles in the runway end safety area.

2.5 Grassed area inspections

2.5.1 The following points should be observed:

a) the general state of ground cover vegetation ensuring in particular that excessive length is not obscuring lights, signs, markers, etc.

b) any developing depressions should be noted and plotted.

c) any unreported aircraft wheel tracks should be carefully plotted and reported.

d) the condition of signs and markers should be noted and necessary repair work ordered.

e) the general bearing strength of grass areas, particularly those close to aircraft pavement surfaces, should be noted. A reasonable assessment can be made from

the depth of vehicle wheel tracks. Any areas showing signs of persistent waterlogging should be reported. Any differences in levels between grass and paved areas should be noted and remedial action requested. Because of the hazard to aircraft engines particular note should be made of the general cleanliness of these areas. Signs of blast erosion should be noted and reported; and

f) waterlogged grass areas should be noted and reported particularly since they may be an attraction to birds.

2.5.2 The main object of grass cutting is to ensure that lights and markers are not obscured by tall vegetation. It should also be managed in such a fashion as to limit the attraction of the airport to birds and other wildlife. It will be necessary to ensure that mounds of grass cuttings are not left on areas where engine ingestion is possible.

2.6 Obstacles

2.6.1 A check should be made of all authorized obstacles for proper lighting and marking.

2.6.2 Any unauthorized obstacles must be reported to the designated persons or organizations immediately. Where possible, prompt removal of the obstacle should be carried out. If this is not possible immediate consideration must be given to whether aircraft operations should be restricted in any form and appropriate marking and lighting of the obstacle carried out.

2.7 Reporting

2.7.1 If a dangerous un-serviceability is discovered during a runway inspection (e.g. damaged pit covers or broken lights), the fact should be immediately reported by R/T in order that appropriate ATC action can be taken. In addition, airport operations should be informed. If the runway is closed as a result of such damage the inspection team should continue their inspection whilst awaiting the arrival of airport maintenance support.

2.7.2 If runway un-serviceability of a type that will not affect its use is discovered the matter must be reported to the Airport Maintenance Department on the appropriate form stating the degree of urgency, date and time, etc.

2.7.3 Should aircraft parts or tire pieces be found during a runway inspection, then airport operations and air traffic control must be informed immediately so that tracing and notification action can be taken.

2.7.4 To assist in identifying the location of faults on a runway, reference plates should be installed outside the runway edge lights on one side of the runway.

Chapter 3 — Adverse Weather Conditions

3.1 Introduction

3.1.1 Adverse weather conditions requiring special action by the aerodrome operator are snow, fog, strong winds, frost, ice, and rain.

3.1.2 It is essential that a communications net be established so that messages from the Meteorological Office giving adequate warning of all the above meteorological phenomena are passed to operations, air traffic control and the airlines.

3.1.3 During adverse weather, airport operations will advise air traffic control of relevant surface conditions and should conduct such various checks that the weather may dictate.

3.2 Strong winds

3.2.1 A method of disseminating strong wind warnings to airlines, airport operations and handling agents should be implemented.

3.2.2 Airport operations should arrange for checks to be made of work in progress to ensure markers and equipment are secure.

3.2.3 Airport operations should arrange for airside patrols to be conducted to collect blowing objects and warn air traffic control and operations regarding objects that cannot be retrieved and are blown onto operational areas.

3.2.4 The safeguarding of light aircraft should be the responsibility of the owner. Operational staff should be aware of the effect of high winds on such aircraft and take positive steps to tum aircraft into the wind and to assist in tying them down.

3.2.5 The safeguarding of aircraft ground equipment should be the responsibility of the owner, but a careful watch should be maintained by airport operations and adequate warnings passed to all airline and handling agencies.

3.2.6 When wind speeds exceed forty (40) knots, aerobridges should be retracted, full lowered, and their shutters closed. Where possible, they should also be positioned to face away from the prevailing wind direction to minimize the risks and avoid structural damage.

3.3 Rain

3.3.1 There is an operational need for information on runways which may become slippery when wet. To this end there is a need to measure periodically the friction characteristics of a wet runway surface to ensure that they do not fall below an agreed level. Details of methods for measuring and expressing friction characteristics of a wet runway can be found in ASC 139-14.

3.3.2 Standing water checks should be conducted on request from air traffic control or airport operations. A verbal assessment for the centre half of the width of the runway is required. On completion of the check the results should be passed to air traffic control and recorded for reference purposes.

3.4 Fog or low visibility

3.4.1 During conditions of low visibility, normally caused by fog, special procedures will be required to ensure that vehicles or workers on foot do not inadvertently lose their way and enter active runways or taxiways. In such conditions the time available for aircraft and possibly vehicles to take evasive action will be too short to avoid an accident.

3.4.2 The visibility at which special procedures will become necessary may vary from airport to airport. (Category III operations will require special procedures but so may Category II operations.) Regardless of the visibility at which an airport decides low visibility procedures are required, a slightly higher visibility should be selected at which, during a time of failing visibility, the call to implement low visibility procedures would be given. Once low visibility procedures have been implemented, they should remain in force until there is a clear trend of improving visibility. Again, a slightly higher visibility should be selected at which to terminate low visibility procedures.

3.4.3 Low visibility procedures:

3.4.3.1 When low visibility operations are likely and at a pre-agreed visibility condition, air traffic control should notify airport operations and Category II/III airport surface security checks should commence. Aircraft operators should be notified immediately prior to low visibility procedures actually beginning.

3.4.3.2 Airport operations should respond to the initial call from air traffic control by arranging for the tasks detailed below, as appropriate, to be carried out:

a) advise airport security so that airside access for vehicles and personnel is restricted.

b) prohibited areas are closed off by lighting, portable or switched.

c) ensure that all contractors working in manoeuvring area evacuate the area, and leave the site marked and secure.

d) check that any lights provided to indicate the ILS sensitive area are switched on and working.

e) notify the following, advising them the "Category .... operations on the appropriate runway are being conducted":

i. Airport rescue and firefighting service

ii. Security control staff

iii. Apron management staff

iv. Senior operations management; and

f) advise ATC when the checks are completed and safeguarding complete.

3.4.3.3 Once all controlled accesses have been closed by airside security, operations may have to arrange leader vehicles to supervise taxiway crossings to remote stands, fuel farms, etc., for any essential vehicles.

3.4.3.4 Perimeter security should notify operations of any unauthorized vehicle or persons seen entering the manoeuvring area, and a team should be dispatched to investigate and keep air traffic control and senior operations management informed.

3.4.3.5 When advised by the air traffic control that Category II/III conditions are cancelled, operations should ensure that the actions detailed in previous paragraphs are positively restored and previously notified personnel are re-advised.

Chapter 4 — Control of work in progress on the movement area and precautions to be taken

4.1 Control

4.1.1 The Aerodrome Operator is responsible for coordinating work on the movement area and for dictating the safety requirements. Further guidance is contained in the ASC 139-7 Notification of Changes to Aerodromes, and ASC 139-9 Aerodrome Safeguarding.

4.2 Routine Maintenance

4.2.1 Persons, or sections specially authorized in writing by airport operations, may enter active parts of the movement area subject to clearance from air traffic control or by the separate unit in charge of apron management services as appropriate by R/T or telephone for routine tasks such as light maintenance, grass cutting, etc. Individuals carrying out such duties must comply with local rules concerning the control of vehicles on the manoeuvring area.

4.3 Minor Construction / Maintenance work

4.3.1 For minor work on active parts of the movement area a system of work permits should be established. The actual system employed at each airport should be jointly agreed between airport management and air traffic control. The objectives of the work permit are to ensure that:

a) no work takes place on the active movement area without the knowledge of airport operations staff and air traffic control.

b) permitted times of work are strictly followed; and

c) all individuals taking part in the work are briefed in detail on the following:

1. precise areas in which work may be done.
2. the routes to be followed to and from the working area.
3. the R/T procedures to be used.
4. the safety precautions to be observed, the maintenance of a listening watch and the use of lookouts; and

5. the reporting procedure to be followed on completion of work.

4.3.2 At the conclusion of work, airport operations staff, or other appropriate staff, should inspect the working area to ensure that it has been left in a satisfactory condition.

4.4 Major Construction / Maintenance work

4.4.1 **Liaison machinery.** Before the commencement of any substantial work on the movement area, liaison machinery comprising representatives from the Airport Operations Department, Air Traffic Control, Airport Maintenance Department, and contractors' agents should be established.

4.4.2 The group should meet as often as considered necessary to review progress and consider the need for any change in working practices to meet operational requirements.

4.4.3 **Isolation of work area.** As far as a practicable working areas should be blocked off from the active parts of the movement area by the erection of physical barriers. This is to both warn pilots and preclude work vehicles inadvertently straying onto the movement area. Any barriers must be marked for day use and adequately lit by night. The lights of taxiways leading into working areas must be permanently "off ". Guidance on the marking of unserviceable areas is contained in ASC 139-15 Aerodrome Physical Characteristics.

4.4.4 **General working rules.** Before work commences agreement should be established on:

a) the hours of work.

b) the authorized routes, preferably these should be marked with contractor's signs. At critical points controls should be established. Where there is real risk of conflict between aircraft and vehicles, control points should be manned. At less critical points controls may be effected by lights or warning signs.

c) the communications facilities to be used. Where direct control of vehicles is required, each vehicle should either have R/T or be escorted by a suitably equipped vehicle. In some circumstances it may be sufficient to have direct

communications with control points by R/T or by direct telephone lines to air traffic control.

d) the permitted heights of vehicles and equipment and the limitations to be placed on operating heights of crane jibs; and

e) any limitation to be placed on use of electrical equipment which might cause interference with navigational facilities or aircraft communications.

4.4.5 Safety Contractors should be warned in writing of possible hazards to personnel working on airports, in particular the jet blast problem and noise. Where necessary, contractors should be briefed to provide look- out men. A distinctive jacket must be worn at all times. This can be of the waistcoat variety coloured day-glow red, reflective orange, or reflective yellow.

4.4.6 **Paved area cleanliness.** Where contractors work on or traverse aircraft pavement areas, these areas should be thoroughly inspected before they are opened again for aircraft use, with particular attention to the presence of debris and the general cleanliness of the surface. Where aircraft are constantly using areas open in contractors, inspection should be carried out at frequent intervals to ensure that the contractor has carried out any necessary cleaning.

4.4.7 **Marking and lighting.** Adequate marking arrangements should be insisted on for crane jibs when extra conspicuity is considered desirable. If work is of prolonged duration a constant watch should be maintained to ensure that the marking and lighting of obstacles and unserviceable areas does not degrade below acceptable limits. This is particularly important with marking and lighting arrangements to indicate a displaced threshold.

4.4.8 **Effect on operations limits.** The effect of tall cranes on ILS and radar will need to be considered in conjunction with those responsible for electronic landing aids and steps taken to reduce limitations to the minimum. Construction equipment may have adverse effects on obstacle clearance limits and dominant obstacle allowances, and these should be considered and the appropriate authorities consulted when working arrangements are being planned.

Chapter 5 — Apron Management

5.1 Introduction

5.1.1 The Air Traffic Control Service at an aerodrome extends throughout the manoeuvring area, but no specific instructions relating to such a service cover the apron. Therefore, an apron management service is required to regulate the activities and the movement of aircraft and vehicles on the apron.

5.1.2 There are a variety of different approaches to apron management service which have been developed and which can, depending on the particular condition, accommodate the requirements of the aerodrome.

5.1.3 Apron management services may be provided by the aerodrome traffic service unit, by a unit set up by the aerodrome authority, by the operator in the case of a company, or by coordinated control between ATS and the aerodrome authority or operating company.

5.2 Co-ordinated Management

5.2.1 Whichever method of operating an apron management service is provided, the need for close liaison between the Aerodrome Operator, aircraft operator and A TS is paramount. Stand allocation, aircraft arrival or departure time, start-up clearances, dissemination of information to operators, notification of work in progress and non-availability of facilities, security arrangements and the availability of safety services, are all items of vital importance to both ATS and the Aerodrome Operator. The operational efficiency and safety of whichever system is adopted, depends very largely upon this close co-operation.

5.2.2 One form of the coordinated apron management service is where radio control of aircraft requiring start-up or push-back clearance on the apron is vested in the Air Traffic Control Service Unit, and the control of vehicles is the responsibility of the Aerodrome Operator. At these airports instructions to aircraft are given on the understanding that safe separation between the aircraft and vehicles not under radio control is not included in the instruction.

5.2.3 The Apron Management unit provided by the Aerodrome Operator maintains close communication with the Air Traffic Control Service Unit, and is responsible for aircraft stand allocation, dissemination of movement information to aircraft operators by monitoring ATC frequency, and by updating basic information continuously on aircraft arrival times, landings, and take-offs. The apron management unit may also provide a marshalling service and a leader van service.

5.2.4 The unit staff will be responsible for the maintenance of discipline and compliance with regulations relating to the control of vehicles, as laid down by the CAA or operating company.

5.3 Management by aerodrome operating company

5.3.1 Some aerodromes have found that a preferred system of operating aprons has been to set up a traffic management control procedure in which a single unit takes over the responsibility for aircraft and vehicles at a pre-determined hand-over point between the apron and the manoeuvring area.

5.3.2 This unit will then assume responsibilities for monitoring and coordinating all aircraft traffic on the apron, issuing verbal advisory information on an agreed radio frequency, and monitoring all apron vehicle traffic, and other apron activities, in order to advise aircraft of potential hazards within the apron area. By arrangement with the airport ATS unit, start-up and taxi clearances will be given to departing aircraft to the hand-over point where the A TS unit assumes responsibility.

5.4 Aircraft stand Allocation

5.4.1 Overall responsibility for aircraft stand allocation should be retained by the aerodrome operator although for operational convenience and efficiency a system of preferred user stands may be established. Instructions should clearly state which stands may be used by which aircraft or groups of aircraft. Where considered desirable, a preferred order of use of stands should be laid down. Apron control staff should be given clear guidance on the stand occupancy times to be permitted and the steps to be taken to achieve compliance with the rules.

5.4.2 The apron is a complex area of often intense activity as many different organizations attempt to turn an aircraft around in a limited space. Good apron management will contribute towards reducing the hazards. This involves allocating aircraft to stands to ensure there is sufficient clearance between the aircraft, vehicles, or buildings therefor the use of acceptable aircraft for each parking stand formally identified.

5.4.3 To achieve this and meet requirements it is common for aerodromes to have an agreed process for allocating stands and a procedure to ensure coordination with ATS. The safety aspects of this involve ensuring that aircraft can only be allocated to stands that are large enough to accommodate them with the required margins.

5.4.4 Procedures and communications with interested parties will be needed to close and reopen stands for planned maintenance work (aerobridge repairs, apron slab replacement, and line painting) or due to accidents, incidents, or spillages.

5.4.5 Apron layouts should be determined with consideration for the impact of jet blast, particularly in relation to ramp staff work areas, vehicles and ground service equipment movement and storage.

5.4.6 Safety clearances to the sides of the stand, and to the rear (in this case the nose of the aircraft) are the same as for safety. Clearances around self-manoeuvring stands will need to be increased from those used for nose-in/push-back stands to take account of jet blast. There may also be requirements for jet blast protection, which may include blast diffuser screens and/or an area clear of equipment, roadways, buildings, and activity.

5.4.7 Adequate aircraft stand clearances and apron safety lines must be provided in accordance with applicable standards. Apron safety lines include wing tip clearance lines and service road boundary lines.

5.4.8 In areas or stands that can accommodate a number of variations of aircraft parking arrangements, there are often complex signs or markings, only some of which are appropriate for specific aircraft. It is important to ensure personnel who may be involved in activities in the area are fully trained in the appropriate configuration for all aircraft types that may use the stand and the appropriate marking and signage.

5.5 Engine Management on Aircraft Arrival/Departure

5.5.1 When entering a stand, it is desirable that flight crews use the minimum power needed to conduct a normal arrival manoeuvre. Where possible the aircraft should be kept moving to avoid the need to apply 'break away' power to continue the approach to the stand. This may be particularly important in locations where there are stands on the opposite side of the taxiway or taxilane. A trained member of airline or handling personnel should ensure that the area behind the aircraft and the zone immediately in front of the engine intakes are clear of personnel, vehicles, FOD and equipment before engine start.

5.5.2 The aircraft anti-collision beacon must be switched on before an engine is started.

5.5.3 The number of engines started before pushback commences should be the minimum to meet technical and passenger service needs.

5.5.4 During start up and pushback, engine power settings should not normally exceed ground idle.

5.5.5 Aircraft Pushback:

5.5.5.1 Aerodrome operators shall establish procedures or ensure that procedures are in place to ensure aircraft pushbacks are conducted safely.

5.5.5.2 Aircraft pushback operations have the potential for accidents involving personal injury/fatalities for ground crews and damage to aircraft, vehicles, and equipment. It is recommended that all stakeholders (aerodrome operators, airlines, and ground handlers) conduct and coordinate safety assessments to establish and promulgate general rules and requirements for the safe conduct of pushback operations.

5.5.5.3 The development of detailed procedures, within the general rules and requirements issued, may remain the responsibility of airline operators/handling agents.

5.5.5.4 When considering rules to ensure aircraft pushbacks are done as safely as possible. The following should be considered prior to or during the operation:

a) Detailed written operating procedures should be produced by the aerodrome operator and airline operators/handling agents for use by their personnel.

These procedures should ensure the safety of the aircraft, and the personnel involved.

b) A check of the aircraft to ensure that there are no missing panels or damage has occurred and all doors/holds and service panels are closed.

c) Ground crews are to ensure areas behind the aircraft are clear of obstacles, and that the aircraft is positioned in such a way as to avoid concentrating break-away blast at buildings, parked or taxiing aircraft or persons on the apron.

d) Do not commence a pushback if it will conflict with another pushback already in progress or with an aircraft that is ready to taxi as well as with other traffic on the apron, are avoided.

e) Vehicle operators should be aware of dangers associated with passing behind an aircraft being pushed back.

f) Unless required to ensure the safety of the aircraft, personnel involved in the pushback should stay within the aircraft tug. Personnel working outside the aircraft tug, such as the headset operator, are particularly vulnerable to injury and employers may have safety assessments and safe working practices in place to address the hazards. Where safety assessment has shown it to be advisable, 'tail look-out' and/or 'wing-walkers' should be used to safeguard the rearward movement of the aircraft and prevent collisions with other aircraft, vehicles or personnel. Procedures for these personnel should be written down and should ensure the safety of the aircraft and the people involved. Personnel should be trained to ensure they are familiar with the procedures.

g) All tug drivers should be trained and competent in aircraft push and tow operations in all weather conditions.

h) Pushback crews, and those conducting supervisory roles should be nominated for the respective tasks, trained and competent.

i) For those aerodromes providing apron management services, aerodrome operators should ensure good cooperation and exchange of information between apron management services, ATC, and ground service providers.

5.5.5.5 Normally, the head-set operator should be in verbal contact with the flight deck crew throughout the pushback, except for exceptional circumstances. Where there is a possibility that verbal, communication will not be available for any reason, the head-set operator and other members of the ground crew should be trained to use internationally agreed hand signals.

5.5.5.6 Before the Aircraft Commander calls for pushback, he/she must ensure that the tug driver is in the tug, ready to push. If the tug driver has not received the pushback instruction, he must not push the aircraft, and the tug driver must confirm with the Apron control for pushback instructions.

5.5.5.7 Procedures must reflect the measures taken to reduce the possibility of an unauthorised pushback and consequent risk of collision etc.

5.5.6 Self-manoeuvring:

5.5.6.1 Self-manoeuvring is a procedure whereby an aircraft enters an apron or stand, parks and subsequently departs under its own power. The principal stand configurations are angled nose-in, angled nose-out and parallel-parking; each involves the adjacent apron area in being subjected to high levels of jet blast, noise, and emissions at some stage of an aircraft movement. Taxi-through stands can also be used for self-manoeuvring and the blast effects are smaller.

5.5.6.2 Self-manoeuvring operations do not require aircraft tugs or 'ground crews' but the layout of stands requires approximately double the apron area of nose-in pushback operations. Due to the relatively high levels of engine power likely to be used for self-manoeuvring, and dependent upon location, there is an increased potential safety hazard to buildings, installations, vehicles, equipment, personnel, and passengers which must be controlled and managed.

5.5.6.3 Prior to deciding to adopt self-manoeuvring operations aerodromes should conduct a joint safety assessment with the aerodrome users. Self-manoeuvring on open, unmarked aprons should be subject to special procedures and a marshalling service

should be available for all aircraft arrivals. The aerodrome operator should determine which combination of aircraft stands and conditions require a marshalling service on departure.

5.5.6.4 Safety assessments should ensure that the following are considered:

a) Stand entry routes, parking positions and departure routes should be marked with standard paint markings, in accordance with the requirements noted in the applicable Aerodrome regulations and guidance.

b) Buildings and installations adjacent to self-manoeuvring stands should be constructed to withstand the engine blast or be protected by blast screening.

c) Vehicles and equipment should not be placed in a position where they can be affected by blast, and where appropriate, equipment parking areas should be protected by blast screens or located remote from the stands.

d) Where appropriate, and as deemed necessary due to health and safety considerations, passenger areas and apron personnel working areas should be protected by blast screens. Passengers should not be subjected to blast, excessive noise, or fumes.

e) Safety instructions should be issued, specifying the maximum aircraft sizes to be permitted on individual stands so as to ensure that any prescribed safe clearances (such as aircraft to stand) are maintained. Pilots should also be required to exercise caution and use the minimum engine power settings needed to complete a satisfactory manoeuvre.

5.6 Dissemination of information to operators

5.6.1 Foreknowledge of arrival and departure times scheduled, estimated and actual is required by ATS, apron management, terminal management, and the operators. A system should be established to ensure that this information is passed between all interested parties as quickly and efficiently as possible.

5.7 Aircraft Marshalling Service

5.7.1 A marshalling service should be available to aircraft on request and provided where guidance systems do not exist or are unserviceable. Marshalling guidance may also be required to avoid a temporary safety hazard.

5.7.2 The marshalling service is normally, but not necessarily exclusively, provided by the aerodrome operator. The principal considerations are as follows:

a) Appropriate training and competency checks should be given to ensure that staff remains current. Note that different signals are required for helicopter marshalling.

b) Except where full self-manoeuvring is permitted, a marshalling service should be provided automatically on unmarked stands not equipped with VDGS or where the VDGS or other stand facilities have known unserviceable. A marshalling service should also be available on request.

c) A distinctive high-visibility jacket or vest should be worn by the marshaller to easily distinguish them from other apron personnel.

d) Marshalling signals should be performed at a steady pace and should not become stylized with local variations from the standard. Illuminated marshalling wands are available for marshalling in darkness or low visibility. If sight lines from the approaching aircraft become obstructed during a manoeuvre, then two-man marshalling should be used to ensure continuity of safe guidance.

5.7.3 The marshaller shall:

a) Ensure that the stand-to-be used is clear of fixed and mobile obstructions, and take action in the event of an aircraft incident occurring during marshalling.

b) Take action in the event of an aircraft incident occurring during marshalling.

5.8 Aircraft Visual Docking Guidance System

5.8.1 The apron guidance system provided will depend upon the accuracy of parking required and the type of aircraft operating. The simplest form of stand guidance where precise accuracy is not required will comprise stand identification and centre line paint markings with an arrow to indicate the position in which the aircraft should be brought to rest. This system will be suitable for nose-in parking where the aircraft does not have to mate

with a loading bridge and hydrant refuelling is not in use. Paint markings must be maintained in a clean condition to ensure maximum visibility.

5.8.2 Where frequent night movements take place centre line paint markings will be supplemented by centre line lighting. These will comprise omni-directional fittings with a yellow filter. Switching for stand centre line lighting will either be locally controlled or at the centralized apron control room. Stand centre line lighting should be inspected weekly to ensure replacement of lamp failures where necessary.

5.8.3 Where a nose-in stand is equipped with a loading bridge, precision parking is required to mate aircraft with the loading bridge. In such cases, a visual docking guidance system will be used.

5.8.4 Should these systems be unserviceable it will be necessary either to marshal aircraft onto stands where loading bridges are provided, or to park aircraft short of the loading bridge to ensure safety clearances are maintained.

5.9 Operation of Aerobridge

5.9.1 Movement of Passenger Boarding Bridge (Aerobridge)

5.9.1.1 Where provided by the aerodrome operator, aerobridges should be installed, inspected, and adequately maintained in accordance with the manufacturer's guidelines or better. Aerobridges should be installed with adequate safety equipment in order effect safe movement of the bridge, to prevent unintentional or excessive pressure on the airframe of an aircraft or contact with a pedestrian or a vehicle.

5.9.1.2 The area used for the movement of the aerobridge should be kept free of vehicles and/or equipment to ensure its safe operation. Operators should do a visual check (camera, mirrors or looking out the window) before moving the aerobridge in order to ensure that there are no obstructions.

5.9.1.3 Aerodrome operators should provide ground markings indicating where the aerobridge must be parked, with its wheelbase positioned in the designated area when not in use. These markings should also define the prohibited area where vehicles and equipment are not permitted to park.

5.9.1.4 Aerodrome operators should consider installing height restriction signage, markings to indicate difference in level, instructing users not to leave any garbage in the rotunda or on the top landing of the outside stairs and ensuring emergency exits remain unobstructed at all times.

5.9.2 Operating Procedure

5.9.2.1 Aerodrome operators should ensure that they develop and promulgate SOP for aerobridges. These should include emergency back-off and wind-off procedures. Instructions for emergency back-off action should be displayed in the aerobridge cab and in the case of manual wind-off, at the point of operation. Depending on each aerobridge, the stowed position should withstand winds of up to 150 km/h and the extended position up to 90 km/h.

5.9.2.2 Aerobridge should not be left unattended during passenger embarkation or disembarkation. In practice, either a member of the cabin crew, ground crew or other nominated person would be in attendance. When bridges are not being used for passenger loading or unloading, or required for servicing the aircraft, they should be retracted into their parking box and closed down.

5.9.2.3 The aerodrome operator should have procedures to ensure the airbridges are parked in fully retracted position prior to aircraft arrival and prior to aircraft departure movement.

5.9.2.4 The aerodrome operator should have procedures to ensure, during the positioning of the airbridges only the bridge operator is in the bridgehead. If vision is restricted, a guide person must be used and is in a position to accurately judge clearances and communicate signals to the driver/operator, or operation is assisted by a video monitoring system.

5.9.2.5 Aircraft operators are reminded that they are responsible for the security of their aircraft and docked aerobridges make aircraft vulnerable. To prevent unauthorised access via aerobridges, aerodrome operator should either deploy personnel to control access to their aircraft or remove the aerobridge from it.

5.9.2.6 The aerodrome operator should have procedures to ensure the aerobridge is moved slowly to the aircraft cabin access doorsill until the bridge safety bar just touches the

aircraft in a manner that prevents damage to aircraft components protruding from the fuselage.

5.9.2.7 The aircraft passenger door must remain closed until the aerobridge has been correctly docked and must be closed before the bridge is retracted.

5.9.2.8 If the aerobridge is fitted with devices that prevent operations by unauthorized persons when an operator is not at the controls, the provider should have procedures to ensure such controls are secured.

5.9.2.9 In the event of an emergency whilst the aircraft is on stand, the aerobridge should remain attached or be re-attached to the aircraft until all passengers and crew have evacuated the aircraft.

5.9.2.10 Where equipped, the aerobridge operator must ensure that the auto-leveller is engaged before loading or unloading the aircraft. Whenever the aerobridge is docked to the aircraft the auto leveller must remain engaged. When not equipped with the auto-leveller, the aerodrome operator must maintain a gap in accordance with No-Touch policy or airline requirement (if applicable).

Note: Aerobridges are fitted with a safety canopy and an auto-leveller device. The canopy provides fire and weather protection for bridge users, and the auto-leveller compensates for trim changes experienced during aircraft refuelling and the loading and unloading of passengers.

5.9.3 Ground markings

5.9.3.1 Apron-drive aerobridges are vulnerable to obstructions. Significant damage has occurred when items of equipment have been parked in the operating area of aerobridges. For stands equipped with an apron-drive aerobridge, ground marking in the form of a hatched area should be provided to delineate the area within which the parking of vehicles and equipment must be prohibited. The aerodrome operator should enforce this parking restriction and aerobridge operators should bring improperly parked vehicles to the aerodrome operators' attention.

5.9.3.2 For stands equipped with an apron-drive aerobridge, a ground marking in the form of a parking box should be provided to show the position of the aerobridge wheels

when it is fully retracted so that the prescribed safe clearance as defined by the manufacture or in any other approved document, can be maintained between any aircraft and the bridge structure.

5.9.3.3 To assist marshallers and towing crews, painted stop marks should be provided across the stand centreline and designed for each aircraft type permitted to use the stand. These stop marks should be harmonised with the Visual Docking Guidance System (VDGS) stopping positions for the particular aircraft.

5.9.4 Airbridge Maintenance and Serviceability

5.9.4.1 Aerodrome operator should establish procedures to ensure the walking surfaces of aerobridge are free from conditions that could cause injury to passengers of personnel.

5.9.4.2 Aerodrome operators should establish a schedule of preventative maintenance including inspection by competent people in accordance with the manufacturer's guidelines or better. Clear records should be kept of any preventative maintenance or repair. Such inspection and maintenance regimes should be based on risk and with reference to the manufacturer's requirements.

5.9.4.3 Aerodrome operators should establish and promulgate a formal reporting system for aerobridge faults. The procedure should include response activities by engineering and aerodrome operations personnel, where necessary withdrawing the aerobridge from service until remedial action is taken, to maintain safe aircraft and passenger handling.

5.9.5 Operator Training

5.9.5.1 A system should be established for the training, testing, and licensing of aerobridge operators. An Aerobridge Operator's Licence (or permit), endorsed for the appropriate type of aerobridge, should be issued by the aerodrome operator when a satisfactory level of competence has been demonstrated. The demonstration of competence should include a practical test.

5.9.5.2 Procedures should be established to ensure that aerobridge operators attempt to operate only those types of aerobridges on which they have been assessed as

competent. Aerobridges with different operating characteristics or control/warning systems should be considered to be different types of aerobridges.

5.9.5.3 The safe operation of an aerobridge should require specific training. It is recommended that operators receive theoretical training followed by a practical test and successful demonstration in order to receive a permit for a specific air bridge type. Training should include:

a) Manoeuvring, steering, and speed of operation.
b) Adverse weather conditions.
c) Approach to the aircraft.
d) Setting the auto leveller.
e) Security and safety procedures concerning any doors.
f) Backing off the aircraft.
g) Correct parking.
h) Use of cameras, mirrors, and visual checks for any obstructions (including parked mobile equipment and vehicles).
i) Emergency procedures.

5.9.5.4 Training can be provided by the aerodrome directly or given by third party companies including handling agents. If other organizations deliver training, audits should be carried out by the aerodrome operator to ensure that defined standards are being met.

5.9.5.5 If responsibility for training and/or testing of aerobridge operators has been delegated to a handling agent or a third party, the airport operator should conduct regular audits of the performance and actions of these employers in order to ensure that adequate levels of safety are achieved. Following an accident or incident, aerobridge operators should be subject to revalidation on request of the aerodrome operator, and it should be possible to suspend an operator's licence pending re-training.

5.9.5.6 Periodical retraining is required, to confirm that they remain competent to operate the equipment, as well after every accident incident and occurrence involving an aerobridge.

5.10 Leader Van / Follow-me Services

5.10.1 In certain circumstances, such as at night or a non-standard taxiway routing or on request from a visiting pilot unfamiliar with the aerodrome, and/or in poor visibility, Aerodrome operators should provide a follow-me (leader vehicle) service to lead aircraft to a marshaller or the designated parking place.

5.10.2 At airports where ground guidance (follow-me) vehicles are in use, local orders should ensure that drivers are suitably trained in RTF procedures, visual signals, taxiing speeds, and the correct aircraft vehicle spacings.

5.10.3 The use of any such vehicles during normal operations will be decided by the aerodrome operator, based on operational safety requirements. The following elements should be considered:

a) Vehicle with flashing or rotating lights and /or the words 'FOLLOW ME', clearly identified, and equipped to operate in the movement area.

b) Importance of radio communications, more particularly clearances and read-back.

c) Enhanced situational awareness.

d) Both vehicle operator and the pilot should know where marshalling begins following landing or ends prior to take-off.

e) ATC taxi routing instructions should be given to, acknowledged and read- back by the vehicle operator and monitored by the pilot.

5.10.4 Follow-me vehicles should be easily identified either by a distinct marking or colour and be adequately equipped.

5.11 Security Arrangements

5.11.1 In addition to normal security arrangements there are security requirements which are of interest to many parties who operate on the apron. These would include contingency plans for such eventualities as baggage identification on the stand, bomb warnings and hijack threats.

5.12 Training

5.12.1 The functions of the apron management service require that its staff be appropriately trained and authorized to carry out their respective responsibilities. This applies

particularly to those responsible for the operation of an apron management centre or tower, to marshallers and to leader van (follow-me vehicle) operators.

5.12.2 Staff operating an apron management centre or tower have the responsibility for managing and, at some aerodromes, controlling aircraft movement within their area of responsibility.

5.12.3 issues addressed by a training programme will be:

a) ATS unit/apron management co-ordination

b) start-up procedures

c) push-back procedures.

d) gate holding procedures.

e) taxi clearances; and

f) En-route clearances.

5.12.4 Aircraft marshallers require training to ensure that they are properly qualified to direct aircraft movements. Their training should focus on:

a) Signalling.

b) aircraft characteristics, both physical and operating, that relate to manoeuvring of aircraft within the confines of the apron; and

c) personal safety around aircraft and particularly engines.

5.12.5 At aerodromes where leader vans ("follow me" vehicles) are in use, local regulations should ensure that drivers are suitably qualified in RTF procedures, know visual signals and have a suitable knowledge of taxiing speeds and correct aircraft! vehicle spacings.

Chapter 6 — Apron Safety

6.1 Blast Precautions

6.1.1 All apron users should be made aware of the hazards arising from jet effluxes and propeller slipstreams. Where necessary apron design will have incorporated blast fences and the best use must be made of these to protect equipment.

6.1.2 All vehicles and wheeled equipment must be left properly braked and, where appropriate, on jacks to minimize the risk of movement when subjected to jet blast or propeller slipstream. Particular care must be exercised with apron equipment having a large flat side surface area. Litter or rubbish can constitute a risk when acted on by blast and it is thus necessary to ensure that aprons are kept clean.

6.1.3 Foreign object debris (FOD) may be moved by jet blast, creating additional hazards and it is thus necessary to ensure that aprons are kept clean.

6.1.4 Responsibility for escorting of passengers across aprons rests with the aerodrome operator. All staff operating on the apron shall be aware of the risk to passengers on aprons from jet blast, propeller slipstream and rotor wash and should be prepared to take appropriate action when necessary.

6.1.5 When designing or making changes to apron layouts, consideration should be given to jet blast and, if necessary, the installation of blast protection fences.

6.2 Engine Test Running

6.2.1 Engine ground runs and check starts should be controlled and where required, only conducted with prior approval from air traffic control and the aerodrome operators. which should specify the conditions to be applied, for example:

a) Where possible, engine ground runs should be conducted on agreed, selected, and prepared remote areas, preferably equipped with engine baffles/de-tuners.

b) Engine ground runs at above idle power should not be permitted in cul-de-sacs or, for example, in areas where the jet blast would impinge on stands, equipment areas or works areas.

c) Engine ground runs on stands in regular use in apron areas should be limited to check starts and idle power only.

d) Where engine running is permitted on the apron, a remote area should be chosen where the jet-blast will not affect other apron areas and busy taxiways.

e) Where necessary, engine ground runs should be safeguarded by Aerodrome Operations personnel who should arrange for any rear-of-stand roads and, if needed, sections of taxiway to be closed.

f) The area around the engine intakes, behind and adjacent to the cone of the blast should be clear of equipment and the ground must be firm and without loose tarmac, stones, or other material.

g) The engineer in charge of the ground run must ensure that the aircraft wheels are safely chocked and that the aircraft cannot move forward under any circumstances.

h) Ground running must not take place when passengers are being embarked/ disembarked on any adjacent or opposite stands, except when such passengers are using an airbridge.

i) A trained member of airline or handling personnel is to be positioned on the stand and should be in verbal contact with the flight deck. He/she will communicate by radiotelephony or interphone with the flight deck to ensure that the engine(s) are shut down if persons or vehicles move into the danger area in front of, behind or in the vicinity of a live engine. For this purpose and if the radiotelephony or interphone link is unserviceable, internationally agreed standard hand signals by day and light signals by night must be used.

6.3 Rotor Precautions

6.3.1 Helicopter operations, particularly those of large helicopters, should be segregated from fixed-wing apron operations where possible. In addition to the provision of standard clearances for rotors in the apron layout. Dependent on aircraft type characteristics, procedures should include arrangements whereby:

a) Helicopter arrivals are marshalled unless the helicopter apron is remote and configured for self-manoeuvring. Marshalling assistance/safeguarding may also be required for departure.

b) Ideally passengers should not be allowed to walk on the apron when rotors are turning. Where it is operationally essential to keep rotors running passengers must be effectively controlled.

c) Personnel, vehicles, and ground equipment should remain well clear of the rotor disk until it has come to rest. If as above, running the rotors is essential, handling personnel must be trained accordingly.

d) Suitable signs should be provided to warn drivers and apron personnel that they are approaching an area where helicopter operations are handled. All airside drivers and handling personnel should be briefed to maintain a good look-out and should be trained to look upwards as well as horizontally to detect and give-way to helicopter movements.

6.4 Safety Precautions during Aircraft Refuelling Operations

6.4.1 Aircraft fuelling is a significant hazard on aprons and the cause of many accidents and incidents. Aerodrome operators should ensure personnel operating on the apron are familiar with the general safety precautions related to fuelling activities.

6.4.2 A fuelling safe zone should be established (a minimum radius of 3 m is recommended) around the aircraft fuelling receptacles, fuel vents and fuelling equipment. Within this zone, the use of portable electronic devices (e.g. mobile telephones, handheld radios, pagers, photographic flash bulbs or electronic flash equipment) and other sources of ignition or fire are prohibited.

6.4.3 Fuelling activities should be included in apron safety awareness training for all personnel, especially in driver training, so as to make staff aware of the safety risks associated with high-pressure hoses delivering fuel to the aircraft from fuel hydrants and the presence of the electrical bonding wire.

6.4.4 Where refuelling with passengers on board is permitted, the aerodrome operator in conjunction with the air operators, will define requirements and ensure the Ground Handling Service Providers (GHSPs) are aware of them.

6.4.5 The key points to be considered for safe fuelling procedures include:

a) A single person should be in charge of the fuelling process.

b) Fuelling zones should be established around all filling and venting points in use on the aircraft and vehicle.

c) The aircraft should be chocked.

d) All hoses used in fuelling should be electrically bonded.

e) Personnel should not be able to generate sources of ignition accidentally.

f) Equipment used should be intrinsically safe.

g) Escape routes for staff, passengers and vehicles should be free of obstructions.

h) Aircraft APUs should not be started during fuelling.

i) Emergency fuel cut-off switches should be provided and clearly signed at the head of stand and remain unobstructed at all times.

j) All staff in the vicinity of the fuelling operation should be trained in the operation of any hydrant emergency shut-off system and appropriate firefighting equipment should be readily available.

k) Fuel spillage should be immediately brought to the attention of the fuelling overseer. Detailed instructions should be laid down for dealing with fuel spillage.

l) No smoking or naked lights within the fuelling zone.

6.5 Fuelling with passenger On-board, Embarking or Disembarking

6.5.1 Where refuelling with passengers on board is permitted, the aerodrome operator in conjunction with the air operators, will define requirements and ensure the handling personnel are aware of them. These precautions may include:

a) Flight crew and ground staff should be made aware.

b) Aircraft emergency chute deployment areas should be clear of obstructions and cabin aisles and emergency exits must be kept clear.

c) If attached to an air bridge, main door must remain open.

d) The aircraft internal 'NO SMOKING' and 'EXIT' signs must be illuminated.

e) Seat belts should not be fastened.

f) Passengers should be advised that fuelling is taking place.

g) Adequate numbers of cabin staff must be present to assist with a possible evacuation.

h) Communication should exist between the flight deck and the staff member in charge of fuelling.

i) Aerodrome firefighting staff may need to be informed and if required, Rescue and Firefighting Service vehicles may be parked on scene in a stand-by mode.

j) When refuelling is conducted with passengers onboard and the aircraft is connected to the aerobridge, aerodrome operators must ensure an additional evacuation means (such as serviceable passenger stairs or equivalent) is available through an exit used for passenger boarding/disembarkation, to enable expeditious evacuation of passengers and crew in the event of an emergency.

6.6 Pedestrian movements on the Apron

6.6.1 The Aerodrome Operator shall develop procedures to protect the user of apron against jet blast hazards. The procedures developed shall as a minimum, encompass measures to:

a) Ensure vehicles and wheeled equipment are left properly braked to minimize the risk of movement when subjected to jet blast.

b) Ensure prior to engine start up, all obstacles that are likely to be struck by jet blast are cleared.

c) Ensure apron employees and passengers are restricted from passing behind or near an aircraft with running engines.

d) Ensure passengers from the aircraft to the Terminal Building and vice versa are guided safely by taking the following precautions:

i. Passengers are taken into or out of the aircraft only when its engines are powered off and, if applicable, propellers have stopped spinning.

ii. When there is another aircraft with engines on, passengers must be led at a sufficient distance from the aircraft so as not to be exposed to jet blast or air intake area of the engines.

iii. Passengers are not led to cut across the route of a moving aircraft.

iv. Special case passengers are preferably not to be led on foot across the apron.

e) Ensure pedestrians use crossings, markings or walk paths and look out for traffic at all times, and that the designated passenger routes are kept free of any equipment and surface conditions kept clean and passengers are kept clear of protrusions on the aircraft, propellers and ground support equipment as well as jet blast from other aircraft.

6.7 Personnel safety when working on the Apron

6.7.1 The apron is an area of high probability of accidents. Therefore, the Aerodrome Operator shall have procedures that ensure occupational Health Safety of personnel working on the apron. The procedures developed, shall as a minimum, encompass measures to:

a) Ensure personnel are conversant with safety rules applicable to the job; first aid, location, and use of firefighting equipment.

b) Ensure personnel wear safety protective gears (for example: Hi-Viz jackets, gloves, ear protection) as appropriate and necessary for the job being performed.

6.8 Apron Sweeping

6.8.1 The cleanliness of paved areas is vital to prevent foreign object damage (FOD) to the engines of taxiing aircraft. A regular programme should be instituted for the mechanical sweeping of aprons and taxiways so that in a given period of time all the operational paved areas where aircraft taxi or park will have been swept.

6.8.2 In addition, sweeping should be available "on request" to deal with those areas on which loose material has accumulated since the last regular sweeping and which represent a hazard to aircraft. It is unlikely that there will be any requirement to sweep the runway on a regular basis unless the airfield is located in a dusty or sandy area.

6.9 Apron Cleaning

6.9.1 At regular intervals, aircraft stands should be withdrawn from service and scrubbed with a chemical solvent to remove oil, grease, and rubber marks. This is also required prior to repainting stand markings. The solvent may be applied from a bowser using spray booms and the stand is then scrubbed using a mechanical rotary brush. It is important that the stand being scrubbed should not be used by aircraft during the scrubbing operation.

6.10 Foreign Object Debris (FOD)

6.10.1 The presence of foreign object debris (FOD) on the movement area may pose a significant hazard to the safety of aircraft operations. FOD has the potential to damage aircraft during critical phases of flight, which can lead to catastrophic loss of life and airframe, and increased maintenance and operating costs. FOD hazards can be reduced through the implementation of an FOD control programme, which would normally include FOD prevention, detection, removal, and evaluation.

6.10.2 Operational procedures and, where applicable, equipment, shall be provided for the removal, containment, and disposal of FOD from the movement area. FOD bins equipped with an attached lid can be an effective part of this process, but they then need emptying periodically.

6.10.3 Aircraft stands should be inspected before the arrival of aircraft. In addition to these procedures, it may be necessary to sweep / clean the stands, airside roads and equipment areas to ensure the removal of all debris. Magnetic pick-up devices can be used to remove most metal objects.

6.10.4 Data and information about FOD shall be collected and analysed regularly to identify sources and trends.

Note: Further information may be found in Doc 9981 Procedures for Air Navigation Services – Aerodromes, Chapter 5 Foreign Object Debris (FOD) control.

6.11 Ground Support Equipment

6.11.1 Aerodrome Operator shall develop procedures to guide equipment providing ground services to aircraft. The procedures developed, shall as a minimum ensure that:

a) Only adequately trained, qualified and authorized personnel are permitted to operate equipment.

b) Equipment shall be used only for the intended purpose.

c) Equipment are not permitted to move across the path of taxiing aircraft or embarking and disembarking passengers, and pedestrians always have the right-of-way.

d) Apron equipment are positioned behind the equipment restraint line with the parking brakes applied prior to the arrival of the aircraft at the parking position.

e) Equipment, including passenger boarding bridges shall not be moved towards the aircraft until it has come to a complete stop, parking brakes on, chocks positioned, engines shut down, anti-collision beacons switched off, and ground/flight deck contact established.

f) Ground support equipment are in good mechanical condition. Equipment, when approaching or leaving an aircraft, are driven at the established low safe speed.

g) Baggage/cargo must be transported on equipment specifically designed for that purpose.

h) Loaded transporters and dollies have the load secured from movement by the use of locks, stops, rails or straps at ALL times, except when the load is being transferred onto or off the equipment.

i) All locks, stops, rails and straps should be checked every time before use. Unserviceable equipment are clearly tagged “Out of Service” and shall immediately be sent to the repair/maintenance department.

j) Motorized equipment make a full stop as a brake check before entering the equipment restraint area and again before reaching the aircraft side.

k) Protective rubber bumpers on equipment, e.g. passenger steps, boarding bridges, conveyor belts, catering trucks, are not compressed against the aircraft fuselage, in order to prevent damage and to allow for aircraft settling during servicing.

l) Before removing ground support equipment from any aircraft cabin access door, the operators are advised by cabin crew. Ground support equipment is not removed unless a safety device has been put across the door opening or the door is being closed.

m) When opening the gate area, equipment are positioned so as to allow the clear movement of the aircraft.

Chapter 7 — Aircraft accidents / incidents

7.1 Introduction

7.1.1 An accident is an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

1. A person is fatally or seriously injured.
2. the aircraft sustains damage or structural failure; or
3. the aircraft is missing or is completely inaccessible.

7.1.2 An incident is an occurrence other than an accident associated with the operation of an aircraft which affects or could affect the safety of operation. Further details on the explanation of the terms "accident" and "incident" are included in MCAR-1 Definitions and Abbreviations.

7.2 Airport emergency planning

7.2.1 In the event of an aircraft accident the primary consideration is to save lives. In order that this may be accomplished expeditiously it is necessary to plan the action to be taken in advance and publish orders which clearly denote the responsibility of the various emergency services involved in the rescue.

7.2.2 Each airport should draw up an emergency plan containing a comprehensive set of procedures detailing the action to be taken for all degrees of aircraft emergencies. These procedures should be approved by the airport, off airport and other appropriate authorities as necessary.

7.2.3 Guidance on the preparation and content of the emergency plan is given in ASC 139-5.

7.3 Reporting procedures

7.3.1 **Notifiable accidents.** Responsibility for official reporting of notifiable accidents to the Accident Investigation Coordinating Committee (AICC) is usually vested in air traffic control, but airport staff should co-operate as much as possible in the process.

7.3.2 **Other incidents.** In addition to the official reporting procedure described above, airport operations staff should report any other incidents which are considered to be of operational significance.

7.4 Post-emergency procedures

7.4.1 NOTAM Action

7.4.1.1 Where an accident or incident is likely to result in any interference with aircraft operation, immediate NOTAM action should be taken. If the runway strip, stopway or clearway is obstructed, operations on the runway affected should be notified as suspended pending examination of the situation.

7.4.1.2 The location and effective height of any crashed or disabled aircraft should be determined as quickly and accurately as possible. Where this establishes that none of the safeguarded surfaces or areas are infringed, the runway may be notified as available for operation with any cautionary advice considered necessary.

7.4.1.3 Where safeguarded surfaces and areas are infringed by a crashed or disabled aircraft, consideration must be given to the possibility of operating the runway with reduced distances. The distances to be offered will be determined in practice by the need to achieve satisfactorily marked and lighted thresholds and runway ends. It may be necessary to restrict a runway to take-offs or landings only.

7.4.1.4 Close liaison must be maintained with air traffic control in the preparation and dispatch of NOTAM.

7.4.1.5 A list should be prepared and constantly updated of all persons in airlines and other agencies with whom contact may need to be made.

7.4.2 Marking and lighting for temporary revised distances

7.4.2.1 The arbiter of what is acceptable in the form of temporary runway marking and lighting is the CAA. Airports should discuss contingency arrangements with their local national office and seek provisional approval for them.

7.4.2.2 *Thresholds.* Temporary threshold lighting may be provided by temporary wing bars. The normal threshold lights must be extinguished. For temporary displacements of thresholds of less than 24 or 48 hours, the standard runway markings may not be a

practical proposition. It may be acceptable to mark the temporarily closed lengths of runway with portable "cross" markings.

7.4.2.3 *Runway ends*. Runway ends may be indicated by portable battery powered lights with red filters or by prefabricated "plug in" light sets. Closed marking, i.e. a white cross should be displayed on the section of runway not available beyond the temporary runway end.

7.4.2.4 *Approach lighting.* Where thresholds are temporarily displaced the continued use of approach lighting systems is open to considerable doubt. Where the displacement is small (less than 150 m) continued use may be acceptable if free standing approach lights of appropriate intensity can be provided to extend the centre line up to the temporary threshold.

7.4.2.5 *Runway edge and centre line lights*. Runway centre line and edge lights in closed sections should be extinguished.

7.4.2.6 *Touchdown zone lighting.* Where thresholds are displaced, the appropriate touchdown zone lighting should be extinguished.

7.4.2.7 *Visual approach slope indicators (VASI / APAPI / PAPI).* These should be extinguished when thresholds are temporarily displaced.

7.4.2.8 *Radio navigation aids.* Before any displaced threshold is implemented, a confirmatory check should be made that the ILS glide path for the runway concerned has been taken out of service.

Chapter 8 — Removal of Disabled Aircraft

8.1 Legal considerations

8.1.1 **Accident investigation.** The Accident Investigation Authority (AICC) must be notified of any accident. Responsibility for notification is normally delegated to ATC. No crashed aircraft or wreckage shall be moved until clearance has been received from the Accident Investigation Authority unless it constitutes an obstruction to the public or to air navigation or to other transport. These exceptions must be considered conservatively and the general rule about not moving wreckage should apply unless a definite hazard exists. The alternative of diverting aircraft is acceptable. Operations can often be continued with reduced distances.

8.1.2 **Insurance aspects.** The aircraft is the property of the aircraft operator and his insurers. A claim for damages could follow an attempt to move a crashed aircraft if it can be proven the act of moving has exacerbated the damage. Therefore, the invariable rule is that only the aircraft owner, operator or his appointed representatives should control the aircraft removal operation.

8.1.3 **Customs and immigration requirements.** Both customs and immigration clearance may be required before aircraft removal operations are commenced.

8.2 Capability for aircraft removal

8.2.1 Information concerning the capability to remove an aircraft on or adjacent to the movement area should be made available. This information may be expressed in terms of the largest type of aircraft which the airport is equipped to remove.

8.3 Division of Responsibilities

8.3.1 Aerodrome Operator should co-ordinate the aircraft removal operation and an officer should be designated for this purpose. His/her telephone/telex number should be made available on request to aircraft operators.

8.3.2 The task of moving the aircraft is the responsibility of the aircraft owner or operator.

8.3.3 Each operator using the airport should nominate a person or organization authorized to act on his behalf in this respect prior to the commencement of flight operations into the airport.

8.4 Record of Operation

8.4.1 A detailed log of the aircraft removal operation should be maintained supplemented by photographs if possible.

8.5 Disable Aircraft Removal Plan

8.5.1 Each airport should draw up a comprehensive plan for the removal of a disabled aircraft. In addition to covering and amplifying the points above, the plan should deal with the following:

a) a list of equipment available on or in the vicinity of the airport.

b) a list of additional equipment available from other airports on request.

c) a list of nominated agents acting on behalf of each operator at the airport.

d) a statement of the airline arrangements for the use of pooled specialist equipment; and

e) a list of local contractors (with names and telephone numbers) able to supply heavy removal equipment on hire.

8.6 Communications

8.6.1 A mobile office should be available for the aircraft removal operation. Adequate communication system linking this office with the Air Traffic Services Unit should be provided, particularly if the removal operation interferes in any way with flight operations.

Chapter 9 — Vehicle Control

9.1 On-manoeuvring Area

9.1.1 **Air traffic control responsibility.** Air traffic control is responsible for the control of the movement of vehicles on the manoeuvring area. To maintain such control, vehicles operating on the manoeuvring area should be fitted with R/T on the appropriate channel or closely escorted by an R/T equipped vehicle.

9.1.2 **Airport responsibility.** The aerodrome operator is responsible for ensuring that all possible steps are taken to co-operate with air traffic control in discharging its responsibility for control of vehicles on the manoeuvring area. In particular, action should be taken to see that:

a) A system of vehicle passes is established and only authorized vehicles permitted on the canoeing area.

b) R/T equipment is provided on vehicles and is maintained in a fully serviceable condition.

c) Drivers are fully conversant with:

1. proper R/T procedures.
2. the terms and phrases used in air traffic control, including the ICAO spelling alphabet.
3. the meaning of visual signals on the airport, with particular emphasis on those intended to prevent inadvertent infringement of active runways.
4. the geography of the airport.
5. the "rules of the road" relating to vehicles and aircraft; and
6. the need to avoid infringement of the restricted areas associated with radio navigation facilities.

d) an airport plan is displayed in the cab of all vehicles indicating the boundaries of the manoeuvring area and the runway crossing points.

e) unless specifically exempted, vehicles are fitted with appropriate obstacle marking and lighting.

9.1.3 The aerodrome operator is responsible for the supply, fitting and maintenance of signs, lights and markings needed for the control of traffic on the manoeuvring area.

9.2 On Apron Areas

9.2.1 **Air traffic control responsibility.** Air traffic control normally has no responsibility for control of vehicles on apron areas.

9.2.2 **Airport responsibility.** The aerodrome operator is responsible for regulating vehicular traffic movement on the apron in order to reduce to a minimum the risk of aircraft/vehicle and vehicle/vehicle conflict and to promote the safety of pedestrians and to achieve efficient traffic flows. Control can be exercised by regulating the vehicles that can enter the apron and by instruction of driven.

9.2.3 All vehicle used on the apron areas shall display an airside or apron pass and the person responsible for a given vehicle shall ensure that all drivers are properly briefed. An air side or apron pass should not be issued unless the vehicle operator can produce a certificate showing that the vehicle is in good working condition.

9.2.4 The person responsible for a vehicle shall bring the following points to the attention of the driver:

a) speed limits in specific or general terms.

b) authorized routes.

c) rules relating to rights of way of aircraft and vehicles; and

d) authorized parking areas.

9.2.5 **Physical controls.** Adequate controls should be established to ensure that drivers have no difficulty in complying with safety measures. In some cases, it may be necessary to set up manned crossing points. In other cases, control by traffic lights, warning signs or pavement markings may be sufficient. A careful check should be made to ensure that all lights, signs and markings conform with standards laid down by the airport licensing authority and/or the aerodrome operator.

Chapter 10 — Aerodrome Mapping Data

10.1 Introduction

10.1.1 ASC 139-5, Chapter 2, 2.1.2 and 2.1.3, relate to the provision of aerodrome mapping data. The aerodrome mapping data features are collected and made available to the Aeronautical Information Services with consideration of the intended applications. These applications are closely tied to an identified need and operational use where the application of the data would provide a safety benefit or could be used as mitigation of a safety concern.

10.2 Application

10.2.1 Aerodrome mapping data include aerodrome geographic information that supports applications which improve the user's situational awareness or supplement surface navigation, thereby increasing safety margins and operational efficiency. With appropriate data element accuracy, these data sets support collaborative decision-making, common situational awareness, and aerodrome guidance applications. The data sets are intended to be used in the following air navigation applications:

a) on-board positioning and route awareness including moving maps with own aircraft position, surface guidance and navigation.

b) traffic awareness including surveillance and runway incursion detection and alerting (such as, respectively, in A-SMGCS levels 1 and 2).

c) ground positioning and route awareness including situational displays with aircraft and vehicles position and taxi route, surface guidance and navigation (such as A-SMGCS levels 3 and 4).

d) facilitation of aerodrome-related aeronautical information, including NOTAMs.

e) resource and aerodrome facility management; and

f) aeronautical chart production.

10.2.2 The data may also be used in other applications such as training/flight simulators and on-board or ground enhanced vision systems (EVS), synthetic vision systems (SVS) and combined vision systems (CVS).

10.3 Determining of Aerodromes Data for collecting mapping data features

10.3.1 In order to determine which aerodromes may make use of applications requiring the collection of aerodrome mapping data features, the following aerodrome characteristics may be considered:

a) safety risks at the aerodrome.

b) visibility conditions.

c) aerodrome layout; and

d) traffic density.

Note. — Further guidance on aerodrome mapping data can be found in the Airport Services Manual, Part 8 — Airport Operational Service (Doc 9137).

For the Civil Aviation Authority

Hussain Jaleel

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