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Technical Publication – TP 21

# Apron Risk Management

Guidance Material

## Foreword

The guidance material in this Technical Publication is best described as ‘Accepted Good Practice’ and represents an acceptable way of doing things. It illustrates how risks might be identified and provides advice about how apron safety can be placed within the context of a systematic and structured management approach – a Safety Management System.

Technical Publication illustrates the sort of things which organisations are expected to consider in the interests of apron safety; it is not intended to be totally comprehensive in the detail provided. Nor does adherence to its content absolve those responsible for securing a safe operating and working environment from thinking for themselves. It indicates the safety organisational elements which, if provided, will help persuade regulatory bodies that the effort to discharge safety accountabilities under the law is effective, well directed and responsible.

CAA requires that all involved parties are familiar with the contents and procedures described herein.

**Dritan Gjonbalaj**  
Director General  
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## Glossary

<b>AGL</b>	Aeronautical Ground Lighting
<b>APU</b>	Auxiliary Power Unit
<b>ATC</b>	Air Traffic Control
<b>CAA</b>	Civil Aviation Authority
<b>DGR</b>	Dangerous Goods Regulations
<b>dB</b>	decibels
<b>dB(A)</b>	decibels A-weighted (to reflect the response of the human ear)
<b>EU</b>	European Union
<b>FEGP</b>	Fixed Electrical Ground Power
<b>FOD</b>	Foreign Object Debris or Foreign Object Damage
<b>GA</b>	General Aviation
<b>GPU</b>	Ground Power Unit Fixed Electrical Ground Power
<b>IATA</b>	International Air Transport Association
<b>ICAO</b>	International Civil Aviation Organization
<b>ILS</b>	Instrument Landing System
<b>JAR-OPS</b>	Joint Aviation Requirements - Operations
<b>LEP, d</b>	Personal noise exposure
<b>LVP</b>	Low Visibility Procedures
<b>MEWP</b>	Mobile Elevating Working Platform
<b>MOR</b>	Mandatory Occurrence Report
<b>POB</b>	Persons on Board
<b>PPE</b>	Personal Protective Equipment
<b>RT</b>	Radio Telephone/Radio Telephony
<b>SMS</b>	Safety Management System
<b>SOP</b>	Standard Operating Procedure
<b>VDGS</b>	Visual Docking Guidance System



## Terms and Definitions

In this manual, the terms used conform to those in Law No. 03/L-051 on Civil Aviation, Regulation No. 17/2017 on Requirements and Administrative Procedures Related to Aerodromes, and Annex 14 Volume I, to the Convention on International Civil Aviation. However some of the frequently used terms are given below for ease of reference to the user:

Term	Definition
<b>Aerodrome</b>	Aerodrome means a defined area (including any buildings, installations and equipment) on land or water or on a fixed, fixed offshore or floating structure intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;
<b>Aerodrome Facilities and Equipment</b>	Facilities and equipment, inside or outside the boundaries of an aerodrome, that are constructed or installed and maintained for the arrival, departure and surface movement of aircraft.
<b>Aerodrome Services and Operations Manual</b>	The manual that forms part of the application for an aerodrome certificate pursuant to the requirements of the Aerodrome Certification Manual including any amendments thereto accepted by the Authority.
<b>Aerodrome Operator</b>	Any person or legal entity authorized by the Authority to manage and operate an aerodrome by means of issuance of an aerodrome certificate.
<b>Aircraft</b>	Aircraft means any machine that can derive support in the atmosphere from the reactions of the air, otherwise than by the reactions of the air against the surface of the earth.
<b>Air Traffic Service</b>	Air traffic service includes <ul style="list-style-type: none"> <li>(a) aerodrome control service;</li> <li>(b) approach control service;</li> <li>(c) area control service;</li> <li>(d) flight information service;</li> <li>(e) alerting service and</li> <li>(f) any other air traffic service considered by the Authority to be necessary or desirable for the safe</li> </ul>

	and efficient operation of the civil aviation system.
<b>Apron</b>	A defined area, on a land aerodrome, intended to accommodate aircraft for the purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.
<b>Apron Management Service</b>	Means a service provided to manage the activities and the movement of aircraft and vehicles on an apron; [Reg.17-2017, Article2 (5)]
<b>Authority</b>	In this manual, the Authority means the Civil Aviation Authority of the Republic of Kosovo.
<b>Authorized Person</b>	In this manual, 'Authorized' means a person authorized by the Authority.
<b>Certified Aerodrome</b>	An aerodrome where operator has been granted an aerodrome certificate.
<b>Light Failure</b>	A light is considered to have failed when for any reason the average intensity determined using the specified angles of beam elevation, toe-in and spread, falls below 50 percent of the specified average intensity of a new light.
<b>Manoeuvring Area</b>	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.
<b>Marker</b>	An object displayed above ground level in order to indicate an obstacle or delineate a boundary,
<b>Marking</b>	A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.
<b>Movement Area</b>	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft consisting of the manoeuvring area and the apron(s).
<b>Obstacle</b>	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that: <ul style="list-style-type: none"><li>- are located on an area intended for surface movement of aircraft, or</li><li>- extend above a defined surface intended to</li></ul>

	<p>protect aircraft in flight, or</p> <ul style="list-style-type: none"><li>- stand outside those defined surfaces and that have been assessed as being a hazard to air navigation;</li></ul>
<b>Regulation on Dangerous Goods</b>	Regulation No. 08/2014 Conditions And Methods Of Transporting Dangerous Goods By Air or any act amending it.
<b>Runway</b>	A defined rectangular area on a land aerodrome prepared for landing and take-off of aircraft.
<b>Safety Management System</b>	A system for the management of safety at aerodromes including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator which provides for the control of safety at, and the safe use of the aerodrome.
<b>Taxiway</b>	<p>A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another including:</p> <ul style="list-style-type: none"><li>- aircraft standtaxi-lane,</li><li>- apron taxiway,</li><li>- rapid exit taxiway.</li></ul>
<b>Unserviceable Area</b>	A part of the movement area that is unfit and unavailable for use by aircraft.
<b>Work Area</b>	A part of an aerodrome in which maintenance or construction works are in progress.

## 1. Introduction

Organisations operating on aerodromes need to manage aircraft safety and occupational health and safety with a great degree of expertise and comply with legal requirements and standards. However, without adequate safety management, legal and moral obligations cannot be met.

The lessons learned from accidents to aircraft and people show that, in many cases, failures in management were a key causal factor. This document seeks to summarise the processes by which aircraft safety and occupational health and safety can be managed.

Particularly at large aerodromes the apron is a busy place of work. People and aircraft face many potential hazards, particularly from the movement and operation of aircraft and ground vehicles. Failure to eliminate or control such hazards may lead to accidents to aircraft and/or people or cases of ill health.

Safety management of the apron will apply to any aerodrome, regardless of size, only the range and magnitude of operations will vary. Managers will need to consider the degree of applicability of the detailed material presented and, indeed, the use of any suitable control measures additional to those described. The hierarchy of controls should be kept in mind when considering the most appropriate combination of control measures.

Pursuant to Article 3 of the Law No. 03/L-051 on Civil Aviation ("Official Gazette of the Republic of Kosovo" Year III/ No. 28, of 4 June 2008) and ADR.AR.A.015 of the Regulation No. 17/2017 on requirements and administrative procedures related to aerodromes ("Regulation No. 17/2017 on Certified Aerodromes"), the Republic of Kosovo has adopted the acceptable means of compliance (AMC) and guidance materials (GM) to illustrate means to establish compliance with Regulation No 03/2009, as amended, ("Basic Regulation") and its Implementing Rules.

Aerodrome operators or providers of apron management service may use the alternative means of compliance and guidance materials which shall be subject of evaluation by the CAA in accordance with ADR.OR.A.015.

## 2. Potential Hazards on the Apron

2.1 This section discusses some of the potential hazards commonly encountered on the apron. It is important that all aircraft operations, including turnround times should take full account of the need for safe working practices. Failure to do this may result in short cuts and bad practice which can lead to accidents, staff sickness and injury and damage to assets.

2.2 Common hazards at aerodromes which are discussed in the following paragraphs, include:

- Vehicles striking aircraft and/or people
- Hazards to passengers on the apron
- Moving aircraft (including aircraft on pushback or being towed)
- Live aircraft engines (including helicopters)
- Falls and falling objects
- Operation of air bridges
- Manual handling
- Noise
- Work equipment (including machinery)
- Hazardous substances and Dangerous Goods (including radioactive substances)
- Inadequate lighting, glare or confusing lights
- Adverse weather conditions (including winter operations)
- Slips and trips
- Electrical hazards
- Faults and defects

2.3 Dealing effectively with these hazards will require good management of aircraft safety and occupational health and safety, as well as co-operation and co-ordination between the aerodrome operator, ground handlers, airlines and other aerodrome users, such as maintenance contractors. Initiatives for reducing the risk to health and safety from these hazards should be an integral part of the planning of Aerodrome Operator's projects.

### 3. Vehicles Striking Aircraft and/or People

3.1 Airside vehicles constitute an ever present hazard to both people and aircraft and extreme vigilance is necessary for all those working airside. It may be possible to eliminate the risks to people in certain areas of the aerodrome by keeping vehicles and pedestrians apart where possible, by the use of passenger boarding bridges (airbridges), for example. When this is not reasonably practicable, another method of dealing with the problem is the provision of separate designated routes, such as pavements or marked walkways. Well organised traffic routes, including one-way systems, adequate lighting to roads and clear road markings can also assist.

3.2 It may not be possible to ensure complete segregation of aircraft, pedestrians and vehicles in all areas of the aerodrome. However, this does not mean that the whole idea of segregation can be abandoned. In those areas where segregation of aircraft, people and vehicles can be put in place, it should be.

3.3 Where segregation is not reasonably practicable, there are other measures which can be employed to reduce and minimise the risk. For example, it may be possible to re-organise the layout of an area, so that the interaction of pedestrians, aircraft and vehicles is minimised, or the frequency of high risk activities such as reversing are reduced. Any changes to the layout of an aerodrome which affect aircraft safety should be discussed with CAA at an early stage, as the aerodrome certification conditions may be affected.

3.4 Paragraphs 4.1 to 4.5 provide further advice on protecting passengers on the apron.

3.5 Even with such physical measures in place, a safe system of work should be developed. This provides an opportunity for partnership in planning involving all those with a direct interest in aircraft safety and occupational health and safety on the apron. Such a system should include:

- Traffic rules governing such issues as speed limits, especially on approach to aircraft and in the vicinity of people
- Correct vehicle maintenance, especially of safety critical components such as brakes and steering
  - Driver training and refresher training
  - Driving standards
  - Competence/attitude of drivers
  - Apron management
- Provision of assistance and/or audible warning devices for reversing vehicles (although such audible warning devices might not be fully effective in the

vicinity of high ambient noises, or if people are wearing hearing protection)

- Procurement of suitable vehicles, e.g. vehicles offering good driver vision
- Regular monitoring of standards
- Safe parking of vehicles in such a way as to prevent interference with aircraft manoeuvring or other aerodrome users
- Encouragement of good practice
- The provision and wearing of high visibility clothing

3.6 Where more than one company is attending an aircraft, effective co-ordination and co-operation of contractors is essential to prevent vehicles striking people, other vehicles, equipment or aircraft. Airlines and aerodrome operators have a key role in this as part of their systems for assessing, controlling and monitoring their contractors. The turnaround plan is likely to be a key document in ensuring that vehicle movements are controlled around aircraft. Paragraphs 6.3.1 to 6.3.6 give further advice on the turnaround plan.

3.7 It is likely that a combination of measures, including segregation of people from vehicles and other hazards where reasonably practicable, will be required to control the risks. The exact combination may vary with location, activities and perhaps even the time of day. The effects of changes to the aerodrome, for example due to temporary works or the effect of new buildings will need to be considered, preferably at an early stage. Consequently, it is important that the risks from vehicles are assessed, as part of an overall system for managing aircraft safety and occupational health and safety.

3.8 Advice on aerodrome signage is given in paragraphs 6.9.1 to 6.9.7. Further advice on equipment, including vehicles is given in paragraphs 12.1.1 to 12.4.4, and guidance on lighting is given in paragraphs 14.1 to 14.14.

## 4 Hazards to passengers on the apron

4.1 At aerodromes passengers may have to walk across the apron between the terminal building and the aircraft. This may expose passengers to hazards such as vehicles moving across the apron. The risks of injury are increased as passengers are vulnerable and generally unaware of the dangers around them. Furthermore, passengers may inadvertently (or even deliberately) damage aircraft. The aerodrome operator, the airline operator and ground handlers all have responsibility for ensuring that the movement of passengers is strictly supervised and controlled.

4.2 The aerodrome operator has a responsibility to provide an aerodrome that is safe for its users. In designing the aerodrome layout and facilities, the aerodrome operator is able to make a significant contribution to the safety of passengers. For example, when the aerodrome operator provides airbridges, passengers are not exposed to any of the hazards on the apron. Where the provision of airbridges is not reasonably practicable, the aerodrome operator should ensure that the layout and marking of airside areas enables the safe movement of passengers to and from the terminal areas.

4.3 The steps that can be taken to ensure passenger health and safety on the apron will vary from aerodrome to aerodrome and from stand to stand, but will include the following measures:

- a) Passengers should not be permitted to move free;
- b) Where possible, the aerodrome operator should ensure that permanent traffic routes, e.g. aerodrome roads or taxiways, do not dissect the path between the terminal and the aircraft;
- c) Where this is not possible the aerodrome operator should provide safe routes marked on the apron surface (including safe crossing points for the apron roads) and clear, unambiguous signs to indicate the route to be followed. Positive control of vehicular traffic may be required from the airline or handling agent; co-ordination and co-operation with the aerodrome operator may be necessary to achieve this;
- d) Safe routes can also be indicated by the use of moveable barriers and chains to create a temporary safe route across the apron for passengers to follow. When not in use, it is important that such equipment is properly stowed to ensure that it does not become a source of FOD;
- e) Routes to the aircraft should not pass below aircraft wings or beneath fuel vents, or close to propellers or rotors of the aircraft they are boarding/disembarking or those of aircraft on adjacent stands. Routes should also be clear of vehicular traffic around the aircraft, electrical cables, fuel hoses and other ramp equipment;



- f) Restrictions should be placed on the running of aircraft engines in the vicinity of passengers and positive measures should be taken to protect them from excessive engine noise and jet blast;
- g) Staff should be positioned on the apron to ensure that passengers follow a safe path to the terminal/aircraft. If necessary, passengers should be led from the aircraft or terminal;
- h) Passengers should be informed of the safe route they should follow into the terminal/aircraft, e.g. by public announcement before they leave the aircraft/terminal;
- i) For remote stands or stands in a different location to the terminal lounge, passengers should be transported to the aircraft by bus; and
- j) Information on embarking and disembarking passengers could form part of the turnround plan (see paragraphs 6.3.1 to 6.3.6 for further guidance on the turnround plan).

4.4 Relying solely on informing passengers of safe routes and marking them out is unlikely to be adequate for commercial passenger operations. Whenever passengers are to walk across the apron there should be sufficient staff to ensure that passengers do not wander away from safe routes.

4.5 Responsibility for ensuring that passengers are safeguarded between the aircraft and the terminal building is shared between the airline, aerodrome operator and any ground handlers involved. It is vital that it is clear who is responsible for providing staff to supervise and/or escort passengers across the apron, and that sufficient numbers of staff are provided. Clearly, any contracts will need to take this into account. Failure to supervise passengers properly may lead to accidents with serious consequences for all involved.

4.6 Consideration should be given to unusual circumstances, such as evacuation of terminal buildings or aircraft, in which passengers and other members of the public may be required to enter airside areas. Procedures should ensure that responsible persons who are familiar with the hazards that exist in airside areas are present to supervise passengers and members of the public as soon as practicable wherever there is emergency egress. Consideration should also be given to methods by which aircraft movement and other sources of hazard may be stopped in areas in which passengers and members of the public may congregate with limited supervision.

## 5 Aircraft Ground Movement

5.1 The movement of aircraft on the ground, either under their own power or towed, creates a number of hazards that are unique to the aviation industry. In particular operating jet or propeller engines can cause fatal or serious injuries and extensive damage to equipment or other aircraft.

5.2 The appendices of this publication consist of a series of model safety instructions which are constructed to include relevant points or issues of the described operation. The models are offered for consideration as a strong basis for the drafting of suitable instructions for each individual aerodrome's own operation.

## 6 Aircraft Parking Safety Practices

### 6.1 Operation of the stand

6.1.1 The following paragraphs describe typical responsibilities and accountabilities for the operation of aircraft on and off stand. Relationships might vary from aerodrome to aerodrome due to differing contractual arrangements or other owner/operator agreements. Each aerodrome must establish its own hierarchy of responsibilities and then work to establish agreed safe working practices within that framework.

6.1.2 The aerodrome operator is responsible for the rules and procedures that safeguard the arrival and departure movements of aircraft on stands and for the dissemination of information to airline/company operators.

### 6.2 Visual Docking Guidance System (VDGS)

6.2.1 Where a VDGS is provided, the aerodrome operator should arrange for the stopping guidance element to be calibrated and indicated, for all selected user aircraft, in a clear and unambiguous fashion. The azimuth guidance should be regularly checked for accuracy. Such systems should be subject to daily serviceability checks, the results of which should be recorded. Details of the VDGS available at the aerodrome should be promulgated in the Aeronautical Information Publication - AIP.

### 6.3 Ownership' of Stand/Parking Bay

6.3.1 In general the aerodrome operator has the responsibility to ensure that aircraft stands remain serviceable, clean and free from obstruction. However, in the busy operation of the apron, with minute to minute changes of status and vehicle/equipment movements, there will also be specific responsibilities for handling staff.

6.3.2 When a stand is allocated for use to an aircraft operator and the arrival of their aircraft on stand is imminent, it is usually the responsibility of the handling staff to ensure that the stand and clearways are free from obstruction by vehicles or equipment. These staff should also ensure that the airbridge(s) is (are) fully retracted or correctly parked with the drive wheels in the parking box provided (see paragraphs 9.7 to 9.10) before the arrival of the aircraft. These actions must be completed by the handler before the VDGS is switched on. Switching on the VDGS will normally signify to the aircraft commander that these actions have been completed and it is safe for the aircraft to enter the stand. Once the VDGS is switched on, the stand must remain under supervision until the aircraft arrives on stand in order to ensure that it remains safe for use by the aircraft. If for any

reason the stand becomes 'unsafe' or unattended before the aircraft has arrived on stand the VDGS should be switched off or 'STOP' indicated using the Emergency Stop System if necessary.

6.3.3 A supervisor should be nominated to control and manage the various states of the operation and should be clearly identified to all staff working on the stand. The supervisor should be working to an agreed plan for the turnround and should have sufficient authority to control the activities around the aircraft. The supervisor should be present throughout the arrival, handling and departure procedures.

6.3.4 The plan for the turnround should describe how the turnround will be carried out. It should enable every person involved to carry out their work safely and without endangering others or the aircraft. All the companies involved should have a copy of the plan and have accepted their roles and responsibilities. Points to consider in the plan include:

- a) how the supervisor for the turnround or handling agent will carry out their work;
- b) common arrangements, such as what to do in an emergency and minimum personal protective equipment needs;
- c) the signal that it is safe for vehicles, equipment and people to approach the aircraft;
- d) the order in which they should approach;
- e) the positions they should take up, to make sure everyone can get to and from the aircraft safely and without damaging the aircraft;
- f) any differences between aircraft and stands which affect how the turnround should be carried out; and
- g) ensuring clear and rapid exit for aircraft refuelling vehicles.

6.3.5 When turnround operations have been completed and the aircraft is ready to depart airline staff should ensure that the stand is free from obstruction by vehicles and equipment before push-back commences. (Airbridge positioning is covered in paragraph 6.3.2).

6.3.6 Before leaving the stand handling staff must ensure that the VDGS is switched off.

## **6.4 Aircraft Parking Safety Considerations**

6.4.1 In general, some of the greatest threats to the safety of an arriving aircraft are carelessly driven vehicles, chaotically parked or stowed ground equipment and misleading markings or signals. Ground equipment should be parked in the

equipment areas provided, service vehicles and baggage trolleys should hold clear and equipment such as ground power units, or any other gear with trailing cables or hoses should be fully retracted and stowed. The stand must be clear of all obstructions when an aircraft is in motion. Other considerations for the safe docking and parking of an aircraft are described in the following paragraphs. 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 minimise the possibility of this information being misinterpreted by a pilot by ensuring that information that is not relevant for a particular aircraft is suppressed if possible, and that all staff 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.

### **Control of the Operation**

6.4.2 Handling staff are responsible for many aspects of the control of the parking/docking operation once the aircraft has entered the stand, although where a marshaller is responsible for guiding the aircraft on to the stand local instructions should clearly indicate the point at which responsibility is transferred from the marshaller to the handling staff. The nominated supervisor should control the progress of the operation and the actions of the handling team.

### **Brakes/Chocks**

6.4.3 On arrival, when the aircraft is positioned to the pilot's satisfaction and finally stopped, the appropriate aircraft wheel brakes should be engaged by the pilot until the aircraft has been safely and properly chocked (emergency situations such as dangerously hot or failed brakes will need to be dealt with under airline procedures). Wheel chocks should not be inserted until the pilot has indicated that the aircraft has finally stopped, and any propellers have stopped turning. In addition to hand signals, the pilot of a jet-engine aircraft will commonly indicate that it is safe to insert chocks by shutting down the engines. To avoid the possibility of the aircraft climbing its chocks, or chocks being ejected, ground stopmarks should not be used as a positive indication to insert chocks or that the aircraft has reached its final position. When not in use chocks should be safely stowed and not left on the apron surface.

6.4.4 A model Instruction that may be suitable for issue by an Aerodrome Authority dealing with Aircraft Chocking is included at Appendix A.

### **Flap and Control Surface Movement**

6.4.5 Staff should be aware of the dangers of the movement of aircraft flaps and other underwing devices when an aircraft is on stand. These areas should be avoided by staff and vehicles and equipment should not be driven or parked in such

a way that damage would be caused by flap and other control surface movements.

## **Wheels**

6.4.6 When an aircraft is in motion staff should keep well clear of all wheels to avoid becoming trapped. When an aircraft arrives on stand, tyres and particularly brake assemblies can remain very hot for some time. Ramp staff should exercise care when required to work in the vicinity of aircraft wheels. Where there is some free movement of aircraft wheels, care must be exercised to ensure that clothing and hands or feet do not become trapped.

## **Control of passengers**

6.4.7 See paragraph 3.1 to 3.5

## **Marshalling of aircraft**

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

- a) The aerodrome operator as part of its safety management system should provide for the training, testing and authorisation of aircraft marshallers, standard marshalling signals, as laid down in the Regulation No. 6/2013 On Rules of the Air, should be employed. Only trained, experienced marshallers in regular marshalling practice should be permitted to marshal aircraft unsupervised;
- b) Except where full self-manoeuvring is permitted, a marshalling service should be provided automatically on stands not equipped with VDGS, or where the VDGS or other stand facilities have known unserviceabilities. A marshalling service should also be available on request;
- c) In certain circumstances, such as a non-standard taxiway routing or on request from a visiting pilot, unfamiliar with the aerodrome, and/or in poor visibility, a 'Follow me' vehicle should lead the pilot to a marshaller or his parking place directly.

## **Fixed Electrical Ground Power (FEGP)/Auxiliary Power Units (APU)/Ground Power Units (GPU)**

6.4.9 To reduce noise and contamination from oil and exhaust emissions, the running of all types of engines on the apron should be kept to the minimum necessary to maintain operational needs. Where FEGP units are provided on stands they should be used in preference to other forms of auxiliary power. The running of aircraft Auxiliary Power Units (APUs) and engine driven Ground Power Units

(GPUs) should be strictly controlled to the minimum operational requirement. Airlines should be encouraged to use GPUs with the quietest engines available. At large aerodromes consideration can be given to the provision, on stand, of preconditioned air units to reduce the running of APUs for cabin conditioning.

6.4.10 Further advice is given in the sections on Noise (paragraphs 11.1 to 11.7), Slips and Trips (paragraphs 16.1 to 16.5) and Electrical hazards (paragraphs 17.1 to 17.8).

## **6.5 Aircraft Arrival**

### **Safety of the Stand**

6.5.1 Fundamental to the safe, smooth and professional management of an aircraft movement is the timely attendance of the dispatcher/airbridge operator to initiate those actions necessary to promote a safe arrival sequence. A full functional check of the airbridge should be completed in good time before the aircraft arrives. To maintain aircraft and personnel safety and to ensure that the prescribed safe clearances between aircraft and bridge are maintained the following precautions should be observed:

- a) Before the aircraft enters the stand, ensure by personal visual inspection that there are no potential hazards to a safe parking operation;
- b) Before the aircraft enters the stand, the drive wheels of an apron-drive bridge must be positioned in the marked parking box provided or, in the case of a rail-drive airbridge, must be fully retracted;
- c) Before the aircraft enters the stand, confirm that the stand is set up for the approaching aircraft type;
- d) A careful check should be made to ensure that no vehicles or equipment are obstructing the horizontal or vertical movement of the bridge while ensuring that the airbridge remains in the appropriate position;
- e) The airbridge cab should be adjusted vertically and in azimuth to suit the incoming aircraft type;
- f) Only when the aircraft has stopped; the wheel chocks are in place; the engines have run down and the aircraft anti-collision beacon has been extinguished, the airbridge can be driven from its parking position and docked to the aircraft;
- g) The aircraft passenger door should remain closed until the airbridge had been docked, the canopy has been lowered on to the fuselage and the autoleveller device has been set;
- h) The airbridge operator should remain in attendance in the cab until passenger disembarkation is completed.



6.5.2 Further advice on airbridges is given in 9.1 to 9.19.

### **Emergency Stop System**

6.5.3 In order to deal with no-notice contingencies, failures and emergency situations on nose-in stands, consideration should be given to an indicator system to warn the pilot to make an emergency stop. Where signs are provided they should be easily and immediately visible to pilots. The sign should be conspicuous and may take the form of a red flashing electronic warning sign indicating EMERGENCY STOP or STOP. The emergency stop warning device should be readily accessible and be capable of being activated quickly both from the airbridge cab and from apron level.

### **Stop Short System**

6.5.4 On stands equipped with VDGS, an indicator system should be provided to advise the pilot to Stop Short; this is normally because the airbridge is unserviceable and passenger steps must be used. Other unserviceabilities or works at the head of stand may also give rise to Stop Short conditions. The Stop Short indication may be an electronic sign associated with the VDGS display, or conspicuous painted signs may be used, normally fixed to the airbridge. In Stop Short conditions a marshalling service should be provided.

### **Location of Controls**

6.5.5 The determination of the best positions for VDGS, Stop Short and Emergency Stop switches may vary from aerodrome to aerodrome, or even from stand to stand. However, it should be an objective of the safety system to standardise the location of switches on all stands at a particular aerodrome. The following locations offer the best control positions:

- a) Emergency Stop switches: One gated switch located in the airbridge cab and clearly marked. A second gated switch, working in parallel with the first, located in a prominent and easily reached position at the head of stand and conspicuously marked. A responsible person should be positioned adjacent to each switch provided until the aircraft has successfully parked.
- b) Stop Short and VDGS Switches: These switches can be grouped together. One set of switches should be located in the airbridge cab and clearly marked. A second set of switches working in parallel with the first should be located at a prominent easily reached position at stand level and conspicuously marked. Which of these positions is the primary VDGS switching position will depend on which position gives the operator the best view of the stand area.

**NOTE:** It is important the VDGS controls are located in a position such that the operator has an unimpeded view of the specific apron parking position whilst the



controls are being used.

## **6.6 Precautions before aircraft departure**

6.6.1 To avoid damage and to maintain the prescribed safe clearance from the airbridge the following precautions must be observed before aircraft push back is initiated:

- a) The aircraft passenger door must be closed;
- b) The airbridge canopy and autoleveller must be retracted;
- c) The airbridge safety barrier should be erected or the doors should be closed;
- d) An apron drive bridge should be withdrawn and the drive wheels placed in the parking box provided;
- e) A rail drive bridge should be fully retracted; and
- f) A check should be made that there are no vehicles, equipment or personnel obstructing the movement of the airbridge before it is moved. A check should also be made to confirm that the ground equipment is configured to meet any specific settings for the aircraft type.

6.6.2 Model operating procedures that may be suitable for issue by an Aerodrome Authority dealing with the use of a Visual Docking Guidance System are included at Appendix B.

## **6.7 Self-manoeuving of aircraft on the apron**

### **Stand Configurations**

6.7.1 Self-manoeuving is a procedure whereby an aircraft enters an apron, parks and subsequently departs, at all times under its own power. The principal methods of stand configuration are angled nose-in, angled nose-out and parallel-parking; each method involves the adjacent apron area in being subjected to high levels of engine blast, noise and fumes at some stage of an aircraft movement. Taxi-through stands can also be used for self-manoeuving and the blast effects are relatively less, but opportunities for this layout are generally few.

6.7.2 Self-manoeuving operations offer a saving on aircraft tugs and ground crews but the layout of stands requires approximately double the apron area of conventional nose- in push-back operations. Due to the relatively high levels of engine power likely to be used for self-manoeuving, there is an increased potential safety threat to buildings, installations, vehicles, equipment and personnel and passengers which must be controlled and managed.

6.7.3 Before deciding to adopt self-maneuvring operations aerodromes should consider other methods of aircraft handling. Self-maneuvring on open, unmarked aprons should be subject to special procedures and a marshalling service should be available at all times on aircraft arrival. The aerodrome operator should determine which combination of aircraft stands and conditions require a marshalling service on departure.

### **Safety Considerations**

6.7.4 Where self-maneuvring is employed aerodrome operators should ensure that the following arrangements and requirements are met:

- a) Stand entry routes, parking positions and departure routes should be marked with standard paint markings, in accordance with the appropriate standards;
- b) Buildings and installations adjacent to self-maneuvring 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; equipment parking areas should be protected by blast screens or located remote from the stands;
- d) Passenger areas and apron staff 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 the prescribed safe clearances are maintained. Pilots should also be required to exercise caution and use the minimum engine power settings needed to complete a satisfactory manoeuvre;
- f) Self-maneuvring stands should be inspected regularly and kept clear of any FOD in order to minimise the risk of ingestion.

## **6.8 Aircraft departure**

6.8.1 Aircraft departure is a critical phase of any flight, with loaded aircraft operating at heavy all-up-weights. Notwithstanding the pressures that often call for expeditious movement to meet schedules, clearances and 'slot' allocations, the safe management of departure procedures is paramount. Aircraft that use the aerodrome only infrequently may require special attention from handling agents because procedures may not exist for the specific aircraft type or variant. For example, written instructions should be requested by ground crews loading cargo or baggage onto aircraft with which they are not familiar. For the purposes of this section the departure phase is considered to be from the time the aircraft starts an engine, or push-back movement starts if earlier, to the point where taxi clearance is issued by

ATC. Guidance covering the various methods of aircraft departure is given in the following paragraphs.

### **Push-back Procedures**

6.8.2 Aircraft push-back operations have the potential for accidents involving personal injury/fatalities for ground crews and damage to aircraft, vehicles and equipment. As part of their safety management system, aerodrome operators should establish and promulgate general rules and requirements for the safe conduct of push-back operations. When considering rules for push-backs the following should be taken into account:

- a) Detailed, written operating procedures should be produced. These procedures should ensure the safety of the aircraft and the personnel involved;
- b) Unless required to ensure the safety of the aircraft, all personnel involved should stay within the aircraft tug. Any personnel working outside the aircraft tug, such as those 'walking the nose wheel', are particularly vulnerable to injury;
- c) All tug drivers should be qualified to drive aircraft tugs in all weather conditions.
- d) They should be trained and certified in these procedures. Push-back crews should be trained and thoroughly familiar with push-back procedures;
- e) Push-back supervisors should be nominated, trained and certificated as competent, as in c) above;
- f) The supervisor should, ideally, be in speech contact with the flight deck crew throughout the push-back. Where there is a possibility that speech communication will not be available for any reason, the supervisor should be trained to use internationally agreed hand signals;
- g) Where risk 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;
- h) All push-back crew members should wear high visibility clothing in compliance with current standards;
- i) In the case of a departing aircraft being pushed back from its stand, the pilot of the aircraft will obtain approval to push back from ATC and pass this information to the tug driver.

## **'Dead' aircraft handling**

6.8.3 In addition to the above considerations, the handling staff pushing back a 'dead' aircraft for towing will need to consider the following:

- A trained staff member will normally be required to occupy the flight deck to control the brakes, monitor radio contact between tug/aircraft and ATC and control the aircraft's anti-collision and, if appropriate, navigation lights;
- As soon as a tug is assigned a task associated with the movement of an aircraft on any part of the manoeuvring area the tug driver must normally establish RT contact with ATC and obtain a specific ATC clearance before entering the manoeuvring area. The tug driver will normally be instructed to advise ATC when the manoeuvre is complete;
- Whilst an aircraft is under tow, the tug driver is responsible for the safety of the aircraft, just as the aircraft commander is when it is taxiing. It should be remembered that, irrespective of any instructions issued by ATC, the tug driver is responsible at all times for ensuring that the aircraft does not collide with vehicles, aircraft, buildings or other obstructions;
- When towing an aircraft, it is particularly important to be aware of the extent of the extremities, such as wingtips, of the aircraft and their proximity to obstructions. In the event that a tug driver is unsure whether there is sufficient space for an aircraft under tow to be moved safely, he or she should safely bring the aircraft to a stop and request assistance. If the aircraft stops on the manoeuvring area for this reason, the driver should advise ATC;
- For safety reasons it is important that the number of persons on board (POB) the aircraft is known for local ground movements. Companies involved with ground movements should ensure that tug drivers ascertain the POB. In the event of an incident or other unusual circumstances involving the towed aircraft, the tug driver should be able to advise Operations Control Center or the Fire Section staff of the POB;
- When an aircraft is being towed during the hours of darkness or low visibility, it must display those lights which would be required when flying, i.e. navigation lights. Logo lights will usually be of assistance to ATC;
- During Low Visibility Procedures (LVPs) it is essential that all vehicles operating on the airfield operate in accordance with the safety requirements set out in LVPs and exercise extreme caution particularly when operating on the manoeuvring area.

## **Power-back procedures (Reversing under Power)**

6.8.4 Powering back an aircraft is inherently less directionally accurate than push-back or powering forward: there may also be an increase in noise and blast effect.

Accordingly, the use of this technique should be limited to those aircraft types authorised in the aircraft's flight manual to reverse under power and for which procedures can be agreed which do not adversely affect apron safety in respect of engine noise, vibration and blast effects.

6.8.5 Before approving power-backs the aerodrome operator should take into consideration aircraft characteristics, apron layout/stand density, the stand clearances available and any gradients involved on stands or taxiways.

6.8.6 Before approval is issued to an airline, for a particular aircraft type, the aerodrome operator should satisfy itself that the intended operation will be safe and will not give rise to unacceptable levels of noise, vibration, blast or fumes on the adjacent apron areas. The following minimum requirements are recommended.

- a) The procedures are authorised in the aircraft manufacturer's manual;
- b) The procedures to be used are incorporated in the airline's operations manual;
- c) Pilots are trained and experienced in power-back operations;
- d) The aircraft is directed by a trained handling agent/marshaller using standard power-back marshalling signals;
- e) Wing walkers are employed to safeguard the rearward movement of the aircraft, particularly wing tip clearances, to prevent collisions with other aircraft or vehicles or personnel. Procedures, training and personal protective equipment should be employed which ensure the safety of these personnel during powerback operations;
- f) A trial is observed of a live powerback using the engine settings, aircraft weight and procedure intended for operational use in which the safety of the operation is demonstrated.

6.8.7 The aerodrome operator should assess the effects of noise, vibration, blast and fumes, observed during the trial, in order to decide the suitability of the procedure demonstrated. It is not possible to state the finite limits of noise, blast and fumes to suit all locations and all aircraft types; aerodrome operators should decide the local limitations to be met.

6.8.8 Power-back operations should not be permitted when passengers are being boarded or disembarked on adjacent stands unless it is necessary for operational reasons. In such circumstances, the aerodrome operator should specifically consider and assess the associated risks and put in place control measures to reduce these risks to as low a level as reasonably practicable.

### **Multiple push-back procedures**

6.8.9 Multiple aircraft push-backs from a run of stands, or in a cul-de-sac, are an

accepted method of achieving a faster push-back and departure rate, but they must be conducted with due regard to the additional health and safety requirements that arise for ground crews and for overall aircraft safety.

6.8.10 Approval for start of 'push-back' normally rests with ATC and if there are apron areas of an aerodrome where the ground movement controller does not have a full view of the aircraft, then any procedures must take this into account.

6.8.11 The principal safety threats in push-back operations where aircraft end up positioned nose to tail are:

- a) Aircraft positioned too close to each other when the push-back phase is completed.
- b) Excessive levels of engine blast and fumes for push-back crews positioned behind another aircraft that has started or is starting its engines.

6.8.12 In order to avoid excessive blast and fumes, the safe separation distance behind an aircraft will vary according to aircraft type and engine fit. It is impractical for push-back crews or operational staff to measure exact distance each time, therefore, a practical rule of thumb should be established to permit multiple push-back operations to be managed and sequenced safely. Experience gained from other aerodromes may be useful in deciding what practical separation distances can be used with safety, but in any event safe separation distances should be established through a risk assessment. Aircraft maintenance manuals will also include guidance on this topic.

6.8.13 The acceptance of a clearance from ATC to push-back into an area in which other aircraft are being manoeuvred will normally assume that the prescribed safety distance criteria will be achieved. The decision to accept a clearance for a 'multiple push-back' remains with an aircraft commander as does the responsibility to ensure that the push-back crew are fully aware of any limitation or conditions to be adhered to. Clearly there is a need for prior planning, co-ordination and information exchange between the aerodrome operator, the operators and ATC before such manoeuvres are adopted as standard practice at any aerodrome.

6.8.14 Model operating procedures that may be suitable for issue by an Aerodrome Authority dealing with Aircraft Push-Back Procedures are included at Appendix C.

6.8.15 Model operating procedures that may be suitable for issue by an Aerodrome Authority dealing with the operation of Towbarless Tug Vehicles are included at Appendix D.

6.8.16 Model operating procedures that may be suitable for issue by an Aerodrome Authority dealing with Aircraft Power-Back Procedures are included at Appendix E.



## 6.9 Other safety considerations

### Signs, Markings and Guidance

6.9.1 An increase of signs and surface paint markings on aprons and airside roads can lead to confusion and, possibly, disregard of the important information and guidance being given. The multitude of signs often found in airside areas can lead to the condition of 'sign blindness' where important sign messages are missed, particularly if they do not conform to recognised standards.

6.9.2 Aerodrome operators should arrange through airfield or operations safety responsible staff, to establish standards and to co-ordinate and control airside signs and ground markings. Regular audits should be undertaken to remove redundant markings and signs and to ensure compliance with the promulgated standards.

6.9.3 Signs should be clear in format, clear in the message they convey, in clean condition and positioned to give the clearest indication of the intended information. Experience shows that airside users become familiar with a recognised standard of signs and markings and tend to react correctly to their information.

6.9.4 A standard for airside signs should be established and promulgated for aerodrome- wide information. The design of sign will, of course, depend on the need for that sign.

It should comply with the following standards and it is likely it would be selected in the following order of precedence:

- a) Where applicable signs should conform to the standards described in ICAO Annex 14 (Chapter 5);
- b) Where Regulation ICAO Annex 14 does not offer a suitable sign, the standard signs should be published according to the industry best practice;
- c) The use of purpose designed special signs should only be considered when the standard possibilities have proved unsuitable.

6.9.5 Signs should be clearly readable at night, particularly warning signs such as vehicle height restrictions and those marking the approaches to the Aircraft Manoeuvring Area. In remote locations where area lighting is not provided, point lighting or retroflective signs should be used although care must be taken to avoid any creating any lighting effects that may cause confusion to pilots or drivers.

6.9.6 Ground markings on the movement area should conform to standards contained in ICAO Annex 14 (Chapter 5.2), in general, should adhere to the following principles:

- a) Yellow markings for the guidance of aircraft;
- b) White markings for the guidance of vehicles, equipment and staff;
- c) Where possible, airside road markings should conform with, or be based upon, the standard markings published in association with the Road Traffic applicable legislation;
- d) Fixed obstacles that represent an obstruction to aircraft or vehicles, such as corners of buildings, air bridges and airside furniture, including lighting pylons, should be painted in a colour(s) that make them prominent by day, by night and in reduced visibility. The obstacles marking shall be in compliance with Regulation on marking of the obstacles.

6.9.7 Where the applicable regulation and standards does not give suitable guidance, signs and markings should adhere to an alternative standard, such as those described in the IATA Apron Markings and Signs Handbook and ACI Markings and Signs Handbook , wherever possible.

### **High-visibility clothing**

6.9.8 Irrespective of other measures that are taken to provide a safe environment for personnel working in airside areas, all personnel who will be working outside (i.e. on foot) on the movement area should wear high-visibility clothing.



## 7 Engine Hazards

7.1 There is a clear operational need for the running of aircraft engines on apron areas. The associated safety hazards caused by exhaust blast, vibration, fumes, turning propellers and rotors and the intake suction of jet engines are well recognised. As part of the safety management system, aerodrome operators should ensure that rules and procedures for safe engine running on the aerodrome are promulgated and understood by flight crews and handling staff.

### **Blast, Vibration, Noise and Fumes**

7.2 Even at idle power the blast effects, vibration and fumes from all sizes of aircraft engines can be significant. As engine size and power settings are increased, the potential for personal injury and damage increases. The amount of fumes produced is directly related to the engine running time and the power settings used. Engine running on the apron and adjacent taxiway areas should be limited to the minimum necessary to meet aircraft operating needs. In formulating safety rules the issues detailed in the following paragraphs should be considered.

### **General**

7.3 Vehicles and personnel should not pass behind running engines. Staff must not approach running engines unless it is part of their job function and is necessary for the task at hand, in which case a risk assessment of the operation leading to control measures which will protect aircraft safety and staff health and safety is required.

7.4 Drivers and pedestrians should be vigilant at all times on the apron. A common indication to handling staff that aircraft engines are running, or are about to be started, is the illumination of the aircraft's anti-collision beacon(s). However, the absence of such illumination should not be regarded as proof that the engine is safe to approach and the presence of blast and engine noise may not be immediately obvious to a driver in a vehicle or a person wearing ear defenders.

7.5 Where possible, blast screens should be provided to protect buildings, installations and vehicle and staff areas that are vulnerable to blast.

7.6 When contractors' sites using temporary buildings are placed on the apron, due regard should be given to building design and protection to minimise the effects of blast, vibration, noise and fumes for the occupants.

### **Engine Management on Aircraft Arrival**

7.7 When turning on to a stand, it is desirable that flight crews use the minimum

power needed to carry out 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 is particularly important in cul-de-sac<sup>1</sup> locations.

7.8 Flight crews should be reminded of the need to avoid the use of high power settings on live engines when others are shut down.

7.9 Thrust levers should not be exercised for any purposes when the arriving aircraft is on stand, unless specifically approved by the aerodrome operator.

7.10 The aircraft anti-collision beacon(s) must remain on until engines have run down or propellers/rotors have stopped rotating.

### **Engine Management on Aircraft Departure**

7.11 A trained member of airline or handling staff should ensure that the area behind the aircraft and the zone immediately in front of the engine intakes are clear of personnel, vehicles and equipment before engine start.

7.12 The aircraft anti-collision beacon(s) must be switched on before an engine is started.

7.13 The number of engines started before push-back commences should be the minimum to meet technical and passenger-service needs.

7.14 During start up and push-back, engine power settings should not normally exceed ground idle.

7.15 Wide body aircraft should not normally be permitted to start more than one engine until the aircraft is aligned with the centreline of the taxiway/taxilane and ground personnel are clear of the aircraft.

7.16 Aircraft leaving the inner stands of a cul-de-sac should be towed forward to a safe distance from the blast screen before the tug and towbar are disconnected. This position should be marked on the taxiway centreline for guidance of tug-crew.

7.17 Three-engine aircraft should not start the top engine until the aircraft has been aligned with the taxiway and is at a safe distance from buildings/blast screens. This position should be marked on the taxiway centreline for the guidance of the tug crew.

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<sup>1</sup> "Cul-de-sac" - a street or passage closed at one end.

## Engine Test Running

7.18 Engine runs and check starts should be controlled and only carried out with the prior approval of the aerodrome operator who should specify the conditions to be applied, for example:

- a) Where possible, engine runs should be carried out on agreed, selected and prepared remote areas, preferably equipped with engine baffles/detuners;
- b) Engine runs at above idle power should not be permitted in cul-de-sacs or, for example, in areas where the jet efflux would impact on stands, equipment areas or works areas;
- c) Engine runs approved 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 effect other apron areas and busy taxiways;
- e) Where necessary, engine runs should be safeguarded by ramp operations staff who should arrange for any rear of stand roads to be closed and, if needed, sections of taxiway;
- f) The area 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) There should be a continuous contact with ATC while the engine run-up takes place.

## Fumes and Noise

7.19 In approving engine running or self-manoeuving on the apron the following should be taken into account:

- a) The concentration of fumes present in an aerodrome area is in direct relation to the time engines are run, the type of engine and power settings used and the strength and direction of the surface wind;
- b) To prevent an unacceptable noise nuisance and build-up of fumes, the running of engines in the direct vicinity of buildings, workplaces and congregations of staff or passengers should not be approved;
- c) Where workplaces, such as cargo-sheds and engineering facilities, have to open directly on to stand areas, a specific risk assessment is required to determine how best to operate all facilities safely and without risks to health, in respect of noise and fumes.

7.20 Aerodrome operators should develop policies and procedures to minimise the effects of engine noise, vibration and fumes on their local population.

### **Suction - Ingestion**

7.21 The intake suction of jet engines is a hazard, even at idle power, and the flow characteristics of air into an engine are such that items can be picked up from in front of, from below, and from the sides of the intake. Even small items ingested can damage the engine, but the larger engines are quite capable of ingesting large objects from several metres away with catastrophic effect.

7.22 The extent of the danger zone depends on the size of the engine, the mounting height and the power setting. Managers of aircraft handling staff should calculate and promulgate to their staff the safe distances for operating around the types of aircraft they operate. See figure 1.



**Figure 1** Engine Danger Zone

7.23 Personnel entering the danger zone in front of a running jet engine expose themselves to the risk of being sucked in, almost invariably resulting in serious or fatal injury.

## Foreign Object Damage

7.24 'Foreign object damage' or 'foreign object debris', both abbreviated to FOD, are a potential source of catastrophic damage to aircraft - particularly engines. FOD can also be a tripping or slipping hazard resulting in injury to personnel and passengers.

7.25 As part of the safety management system, aerodrome operators should include instructions, services, facilities and initiatives to combat the risks arising from FOD. The aerodrome operator should establish a programme to educate all apron users on the hazards and requirements associated with FOD and to stress the responsibilities of all personnel employed on the apron to minimise risks from FOD.

7.26 Aerodrome operators must ensure that there are programmes of regular apron sweeping, cleaning and inspection, including rapid reaction to fuel and other liquid and chemical spillages. They should also provide facilities for the disposal of solid and liquid aircraft waste and FOD protection. They should pay particular attention to such prime FOD generators as contractors' areas and baggage facilities.

7.27 All vehicles and equipment used on the aprons should be maintained in a clean and serviceable condition, not only for reasons of safe vehicle operation but also to minimise the leakage of fluids and depositing of FOD from these vehicles.

7.28 Rules and arrangements should be in place for the removal of hazards from the apron such as abandoned vehicles and equipment.

## Propellers

7.29 Aerodrome operators should issue instructions to safeguard apron operations around propeller driven aircraft. Apron staff must be alert to the dangers of running propellers and should be stimulated by suitable awareness campaigns. At some aerodromes there are relatively few propeller driven aircraft currently and ramp staff are likely to be less familiar with the precautions to be observed, particularly for staff of airlines which themselves offer no propeller driven services. Aerodrome operators should also ensure that the safeguarding of 'propeller areas' is included in airline operating procedures.

7.30 Aerodrome operators should provide suitable apron layouts and facilities that provide proper clearances for the operation of propeller aircraft types, with particular emphasis on ground clearance for propeller tips and the proximity of airbridges and other ramp equipment when the aircraft is at, or approaching, its parking position. Stands at which this cannot be achieved should not be used for propeller aircraft.

7.31 Passengers should not be allowed to walk on the apron when propellers are turning. Where it is operationally essential to have the propellers turning, passengers must be effectively controlled (see paragraphs 4.1 to 4.2 for further guidance).

## **Rotors**

7.32 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, due regard should be given to the other characteristics of rotary operations, including:

- a) The heavy down draught produced by helicopter movements;
- b) The vulnerability of helicopters and aircraft to jet blast, strong winds and rotor downwash from other helicopters;
- c) The risk of reduced ground clearance caused by the drooping of the rotor (blade sailing) as it runs down following engine shut down or drive disconnection;
- d) The ease of approach to the chosen helicopter stands in hover and hover-taxi mode and the least interference from/for taxiing fixed wing aircraft;
- e) The risks associated with tail rotors.

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

7.34 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Aircraft Blast and Fumes - Arrival, Engine Start and Push

Back is included at Appendix F.

7.35 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Aircraft Engine Ground Runs and the Use of Auxiliary Power Units is included at Appendix G.

7.36 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Foreign Objects on the Apron and the Removal of Hazards is included at Appendix H.



## 8 Falls and falling objects

### 8.1 General

8.1.1 Access to external elevated levels on and around aircraft will be required when aircraft are on the stand. Such work includes catering, cargo and baggage handling at the aircraft holds doors, some cleaning activities and maintenance.

8.1.2 It is not sufficient merely to indicate the presence of an edge from which a person may fall. There must be suitable and effective measures to prevent any person falling a distance likely to cause personal injury. Measures must also be taken to prevent people or aircraft being struck by falling objects. However, preference should be given to providing a safe place of work rather than relying on personal protective equipment, information, instruction, training or supervision to prevent these events. Nevertheless, even where all other reasonably practicable measures have been taken to prevent falls, personal protective equipment (PPE), for example a safety harness and lanyard, may still be necessary if a significant risk of falls remains.

8.1.3 Provision of head protection is not considered normally necessary for activities around aircraft on the apron; ground support equipment can and should be designed and used in such a way as to render such PPE unnecessary. However, head protection may be necessary for other activities on the apron, such as construction work or maintenance of plant.

8.1.4 By its very nature all access equipment has to be used in close proximity to the aircraft. Drivers may need to seek assistance, e.g. from a person appointed to guide the vehicle, to ensure the correct positioning of the access equipment so that there are no gaps large enough for a person to fall through, as well as preventing the access platform or its chassis striking the aircraft. Drivers should also make allowance for the change in height of an aircraft during loading/unloading as this might cause the aircraft to touch the access equipment resulting in damage to the aircraft.

8.1.5 If any damage to the aircraft is suspected, this must be reported immediately to a responsible person, for example the aircraft commander or other technical representative of the aircraft operator.

8.1.6 Suitable access equipment should always be used to gain access to heights. Work from surfaces such as vehicle cabs, roofs of buildings and equipment is not acceptable unless these places have been designed or adapted to make them safe for such work. Mobile elevating work platforms (MEWPs) can often provide flexible and safe means of access to heights. They should be used in accordance with a safe system of work and procedures which minimise the risk of injury and damage to the aircraft.

8.1.7 Some places may be temporarily adapted to make work at heights safe. For example, some aircraft have attachment points on their wings for running lines and harnesses. The health and safety of the engineers preparing such places of work for use should be considered, as well as the prevention of damage to the aircraft.

8.1.8 Work at heights above two metres should only be undertaken from equipment fitted with guardrails to all sides, so far as reasonably practicable. Edge protection may not be necessary to sides which are fitted with access steps or sides where the proximity of the body of the aircraft prevents falls.

8.1.9 Toe boards and/or other protective devices (e.g. a personal belt to which tools can be attached) may be necessary if there is a risk of objects falling and damaging the aircraft or injuring people working below. It should be remembered that even if falling objects do not directly cause injury or aircraft damage, they can become a source of Foreign Object Debris, or may cause people to trip and be injured.

8.1.10 Where guardrails etc. cannot be fitted, other means, such as the use of PPE, should be considered. It should be noted that where the potential height of a fall is less than four metres, the use of lanyard and harness systems as fall arrest devices may not prevent injury as the worker may hit the ground before the device becomes effective. Advice should be obtained from the equipment supplier.

8.1.11 Where falls of less than two metres may occur, each situation should be assessed for the likelihood of injury and aircraft damage, and appropriate preventive measures taken. For example, the likelihood of injury is increased if there are obstructions, such as low profile equipment with sharp edges, onto which people may fall, or the work is taking place alongside a traffic route.

8.1.12 As with all equipment, means of access and means for preventing falls (including those integral to the aircraft) should be maintained in an effective state, in efficient working order and in good repair if continued protection against injury and aircraft damage is to be ensured. A regime of inspection may also be required to ensure that any deterioration in the equipment which may affect health and safety or aircraft safety is detected and rectified in good time. This inspection should be carried out by people with sufficient knowledge, experience and training to identify and prioritise defects. The results of inspections should be recorded and kept until at least the next inspection and longer if the inspection results are used for monitoring serviceability trends.

8.1.13 Paragraphs 12.1 to 12.4.4 and 18.1 to 18.8 contain further general advice on equipment.

8.1.14 In all cases where access or work at heights is required, employers should always ask themselves 'Have I taken suitable and effective measures to prevent any

person falling a distance likely to cause personal injury?’ And ‘Have I done enough to ensure that the aircraft will not be damaged by the work?’

## **8.2 Access to Aircraft Doorways**

8.2.1 Safe access to aircraft entry/service doorways is particularly important as the height of fall from the doorway of an aircraft may, in extreme cases, result in a fatal injury. Aircraft doors and doorways are also particularly vulnerable to damage. Such damage may go undetected for some time. For example, damage to escape slides may not be immediately apparent and may not be discovered until the next periodic inspection of the slide assembly or until it is used in an emergency.

8.2.2 Proper planning, safe systems of work and instruction and training are required to ensure that aircraft doors are opened in such a way that no one is exposed to the risk of a fall and the risk of damage to the aircraft is minimised.

8.2.3 Airlines should ensure that they do not require aircraft doors to be opened in a manner which exposes people to unnecessary risk. The types of vehicles commonly used to service aircraft rarely have means to prevent falls from the edge that is adjacent to the aircraft when in use. In some circumstances the access equipment can be brought close to the aircraft before a person has to approach the leading edge. Examples are when the aircraft doors open inwards (see figure 2), upwards, are powered open and closed, or otherwise avoid the need for people to approach the edge of the access equipment or the aircraft doorway.



**Figure 2** Inward Opening Aircraft Door

8.2.4 Where the aircraft has outwards opening doors, which may foul the access equipment during opening and closing, employers should establish whether the safest option, for both the worker and the aircraft, is to open the door from

inside. This may require co-operation and co-ordination with the airline operating the aircraft.

8.2.5 If opening the door from the inside is not the safest option, employers should ensure that people work at the unprotected edge of the access equipment for the shortest time that is practicable. The floor on which the employee is standing should not have any defects that are likely to cause them to slip, trip or fall. Secure handholds should also be provided.

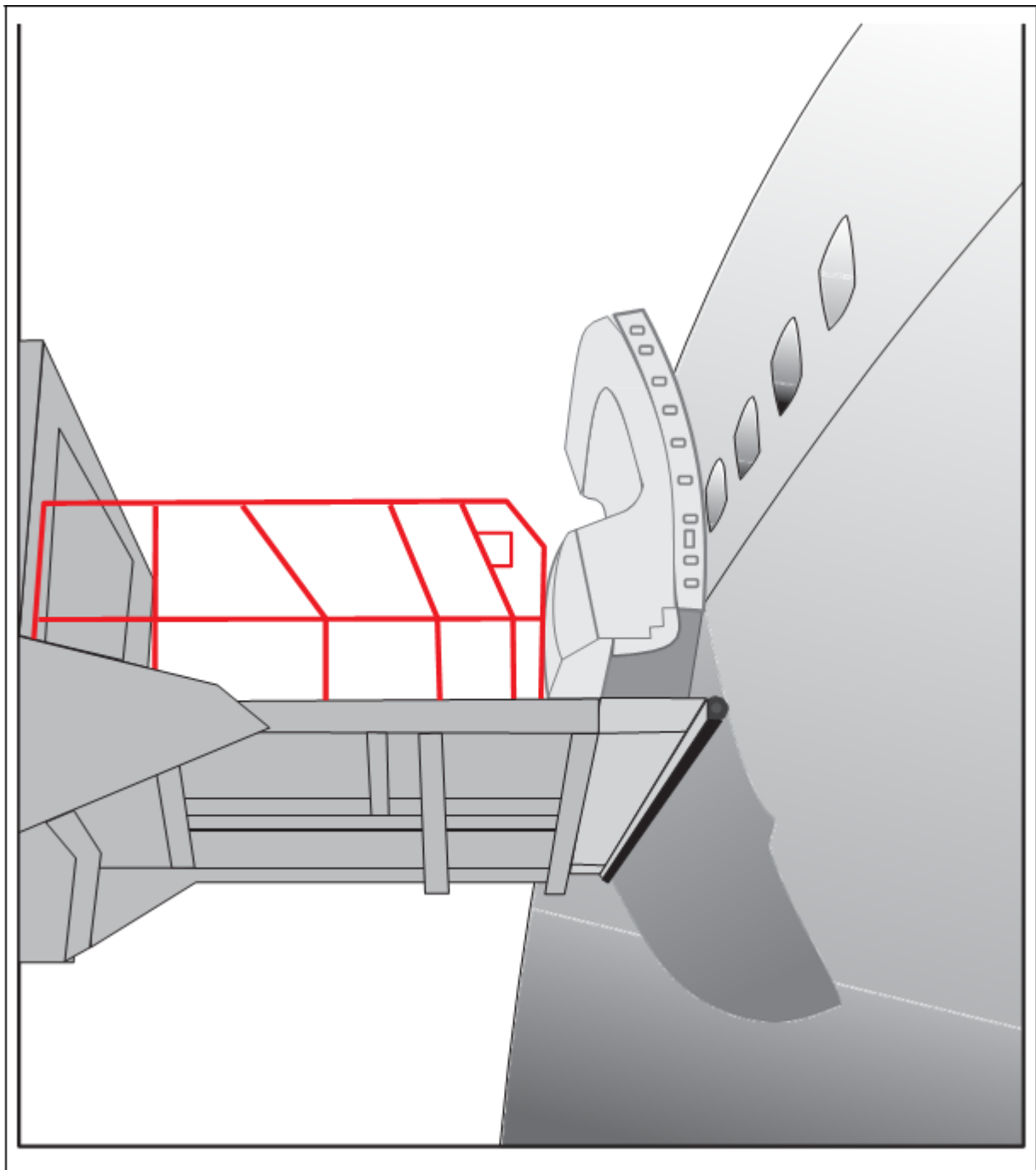
8.2.6 Where an extra wide platform can be positioned against the aircraft, the increased width can provide additional protection against falling (see figure 3) and reduce the risk of damage to the aircraft door. There should be a safe system of work in place for opening the door, and employees should be given information, instruction and training on the task.

Whatever platform is used, the moveable side guardrails should be adjusted to be close enough to the aircraft to protect the workers without causing damage to the aircraft; it must be kept in mind that a gap of more than 300 mm will not ensure the safety of the workers and that the aircraft may move during loading and unloading. Guardrails should be moved into position as soon as is practicable and certainly before the doorway is used. The last task before the access equipment is withdrawn from the aircraft should be to retract the guardrails. It is equally important that any controls that move the platform should be located so that the operator has a clear view of the platform in order to prevent the platform striking the aircraft.

8.2.7 Sometimes, aircraft doors are left open for reasons other than access, for example to keep the aircraft cooler in hot weather whilst cleaners etc. work inside. When doors are left open, suitable means to prevent a fall should be in place. These include placing aircraft steps at the doorway; although particular aircraft operator's or aerodrome operator's security requirements need to be kept in mind.

8.2.8 The straps and their attachments which are often fitted to aircraft doorways are not sufficient as a means to prevent a fall, as they are not designed to withstand the forces generated by a person falling or leaning against them.

8.2.9 If other means of preventing a fall cannot be provided, then the aircraft doors should be kept shut. If necessary, the aircraft's air conditioning should be used to keep working temperatures comfortable. Where possible, this should be provided by an safely positioned mobile air conditioning unit, rather than the aircraft's auxiliary power unit (APU), as the APU generates considerable noise for those working outside the aircraft. Any aerodrome policies on the use of GPU/APUs should be kept in mind.



**Figure 3** Wide Access Platforms

### 8.3 Other parts of the aircraft

8.3.1 Access to parts of the aircraft other than the doorway may be gained by a suitable MEWP, although other measures may be used if they are suitable and effective. The edge protection around the working platforms should be maintained so as to prevent persons falling.

8.3.2 Over-wing access presents a risk of falling. Lightweight fall restraint devices

incorporating a lanyard and harness have been found to be effective for such access. Any equipment which interfaces with the aircraft surfaces should be approved by the aircraft manufacturer. Some aircraft manufacturers already provide attachment points for harnesses on wings of their aircraft and, in such cases, the manufacturer's guidance on their use must be followed.

#### **8.4 Other Falls Associated with Aircraft**

8.4.1 A significant number of accidents occur as the result of falls through uncovered access points in the internal floors of aircraft when covers have been temporarily lifted. Accordingly, covers should be replaced when the access way is not in use and uncovered access points should be provided with a temporary barrier.

## 9 Airbridge Operations

9.1 There have been a number of reported incidents involving airbridges which have occurred in aerodromes, with potential for major aircraft damage and/or serious injury to personnel. These have included:

- collapse and other extensive structural failure
- uncommanded or unexpected movements
- obstructions, such as vehicles and equipment, being struck by the airbridge, due in part to the failure of detection devices
- rotten floors and leaking roofs creating slip and trip hazards.

9.2 These incidents have commonly been caused either by incorrect installation or inadequate maintenance of the equipment, or poor procedures leading to operator error.

### Installation

9.3 The efficient and safe in-service operation of these walkways depends on their correct installation. Therefore, they should be inspected after installation and before being put into service for the first time.

9.4 Detailed advice cannot be given on the content of such an inspection, but it is unlikely to be adequate unless it is based on the findings of a risk assessment. Such an assessment will need to cover the appropriate issues outlined in paragraph 9.9.

9.5 The process of installation may be subject to the requirements of the Functional Specification as per IATA AHM 900.

### Airbridge Equipment

9.6 The following auxiliary equipment should be fitted to apron drive airbridges:

- a) Audible and visual warnings that operate automatically when the bridge is in motion;
- b) In order to overcome downward and rearward blind spots for the operator, CCTV or sight mirrors to cover blind areas in which the airbridge is able to manoeuvre;
- c) Pressure sensitive safety hoops which, when they touch an object, cut out the motive force thus stopping movement of the bridge;
- d) Means to prevent falls from the leading edge of the airbridge, such as doors or guardrails, for use when the airbridge is not in place against an aircraft. (The comments in paragraphs 8.1 and 8.2.8 are also relevant in relation to



airbridges).

## **Ground Markings**

9.7 Apron-drive airbridges are vulnerable to obstructions. Significant damage has occurred when items of equipment have been parked in the operating area of airbridges. For stands equipped with an apron-drive airbridge, 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 airbridge operators should bring improperly parked vehicles to the aerodrome operators attention.

9.8 For stands equipped with an apron-drive airbridge, a ground marking in the form of a parking box should be provided to show the position of the airbridge wheels when it is fully retracted so that the prescribed safe clearance can be maintained between any aircraft and the bridge structure.

9.9 To assist marshallers and tow-on 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.

9.10 The extendable portion of rail-drive airbridges should be highlighted by conspicuous marking (such as retroreflective chevrons) to indicate to pilots, drivers and apron staff that the bridge is extended.

## **Airbridge maintenance and unserviceability**

9.11 Aerodrome operators should establish a schedule of preventative maintenance, including inspection by competent people.

9.12 Such inspection and maintenance regimes are unlikely to be adequate unless they consider the following points:

- the structural integrity of the airbridge, including components vulnerable to catastrophic failure and the potential for water ingress to cause corrosion to the walkway or its control and drive systems
- the electrical safety of the airbridge and the potential for electrical failure to cause uncommanded or unexpected movement
- the mechanical integrity of the drive and control systems of the airbridge, including the condition of the hydraulic fluid and the components on which it impinges
- the conditions of wheels and tyres

- the devices for detecting obstructions (if any), such as closed circuit television (CCTV) or sensor rings.

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

### **Operating Procedures**

9.14 Aerodrome operators should ensure that they develop and promulgate Standard Operating Procedures (SOPs) for airbridges. These should include emergency back-off and wind-off procedures. Instructions for emergency back-off action should be displayed in the airbridge cab and in the case of manual wind-off, at the point of operation.

9.15 Procedures that are specific to the stand or airbridge should normally be placarded at the airbridge control position. This is particularly important if the procedures relate to different configurations for particular aircraft types.

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

9.17 Further advice on airbridge operation is given in paragraph 6.32.

### **Operator Training**

9.18 A system should be established for the training, testing and certification of airbridge operators. An Airbridge Operator's Certificate (or permit), endorsed for the appropriate type of airbridge, should be issued by the appropriate authority when a satisfactory level of competence has been demonstrated. The demonstration of competence should include a practical test. Procedures should be established to ensure that airbridge operators attempt to operate only those types of airbridge on which they have been assessed as competent. Airbridges with different operating characteristics or control/warning systems should be considered to be different types of airbridge.

9.19 Certificates should only be issued to those staff who regularly operate airbridges as part of their job function, as it is these staff who remain fully familiar, in good operational practice and up to date with operational changes and airbridge modification states. Certificate holders should be subject to regular revalidation to confirm that they remain competent to operate the equipment. The aerodrome

operator should also establish an audit system to ensure airbridge operator competency and adherence to standards, records of airbridge incidents and major faults should also be examined. If responsibility for training and/or testing of airbridge 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 organisations in order to ensure that adequate levels of safety are achieved. Following an accident or incident, airbridge operators should be subject to revalidation on request of the aerodrome operator and it should be possible to suspend an operator's certificate pending re-training.

9.20 If a new type of airbridge is introduced, all Airbridge Operator's Certificate holders who will be required to operate (or trainers who will be required to give instruction on) the equipment, should undertake training and testing to demonstrate their competency and familiarity with the new equipment before being permitted to use it operationally.

9.21 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Passenger Airbridges is included at Appendix I.

## 10 Manual Handling

10.1 Manual handling is a term that applies to activities such as lifting, lowering, pushing, pulling or supporting a load by hand or bodily force. It accounts for almost 50% of reported accidents by the air transport industry. Commonplace manual handling activities in the industry include, for example, ground crew operations such as the loading or unloading of an aircraft and lifting tow bars onto and from aircraft or towing vehicles. The provision of assistance for incapacitated or disabled passengers will require particular thought.

10.2 Safety and Health consideration should be taken into account in accordance with the requirements set by the applicable legislation.

10.3 The best means of avoiding risk is to eliminate the hazard altogether, for example, by mechanised handling techniques. These include the use of ambulifts to assist the movement of incapacitated or disabled passengers onto the aircraft and handling aids for baggage. Where it is not reasonably practicable to eliminate the hazard, and ground staff are required to undertake manual handling, the legislation requires that:

- A suitable and sufficient risk assessment is made of each task which is considered to present a risk of injury. This should address the task, the load, the working environment and the capabilities of the individuals concerned
- Action is taken on the results of the assessment, appropriate steps are taken to reduce the risk of injuries from manual handling
- Information is provided on the weight and centre of gravity of the loads that are to be lifted where it is reasonably practicable to do so.

10.4 Baggage handling gives rise to more manual handling problems than any other activity at aerodromes. The following may help reduce injury from baggage handling. All these suggestions will require co-operation and co-ordination between the aerodrome operator, airlines and ground handling companies:

- Proper planning of new and refurbished facilities can provide significant reductions in the risk of injury, as well as increasing efficiency
- Examine the entire handling operation (where possible, from the first moment a bag is handled by a worker to the last) and consider whether a change of process or equipment could eliminate any stages of manual handling
- Handling systems should be integrated with each other where possible. Different pieces of equipment should be compatible with each other and positioned to prevent unnecessary handling between, for example, security scanners, conveyors, dollies and aircraft loading equipment
- Use conveyors (or similar) that are of a suitable height to minimise the risk of

injury from lifting or lowering items to or from such equipment.

- Consider the environment in which manual handling is undertaken. Floors should be dry and adequately maintained. There should be sufficient space to allow people to turn whilst handling, if such turning is unavoidable. There should be no gaps between equipment that result in people having to throw baggage. Lighting should be sufficient to allow tasks to be carried out safely. Ambient temperature should be kept at a reasonable level (e.g. in baggage halls), or warm clothing provided where this is not possible (e.g. on the apron)
- Ensure that automated systems are properly maintained to minimise consequential poor manual handling techniques
- Ensure that training is relevant to the tasks that people are undertaking. It may be necessary to target training to specific activities such as moving bags in the confines of the aircraft baggage hold
- Provide general indication of the weight of each bag. This could be achieved by the attachment of a 'heavy bag' label at check in with instruction and training given to employees on how to deal with such baggage.

10.5 The primary objective must be to reduce the requirements for manual handling. It is good practice to review each stage of the baggage handling process with the aim of eliminating any unnecessary stages. For example, it might be possible to eliminate some stages by using a baggage transfer vehicle that can adjust to the correct height of the aircraft hold door. This eliminates manual handling from the transfer vehicle to a belt loader.

## 11 Noise

11.1 There are many sources of noise on an aerodrome. Excessive noise exposure can result in both short-term and permanent hearing loss. It can also compromise effective communication during safety-critical tasks. Employers must ensure that they take steps to comply with the relevant regulations.

11.2 The primary source of noise on aerodrome aprons are aircraft engines, APUs and support equipment such as mobile ground power units. Many of these sources are highly mobile and exhibit variability in their noise emissions. Therefore, the level of ambient/background noise and, potentially, levels of personal noise exposure, can fluctuate very significantly and can greatly exceed the action levels.

11.3 Employers should try to reduce the noise exposure of both their employees, and others at work on the apron exposed to the noise created by their activities, without relying on hearing protection. Some suggestions are:

- a) Where fixed electrical ground power units (with power generation sited away from employees on the apron) and fixed air conditioning units are provided on the stands, aircraft operators should make full use of these facilities to minimise the need for APUs or mobile units which generate high levels of noise;
- b) Where existing noisy ground support plant is used it should be engineered to minimise noise output. In some instances this may require retrospective remedial action, e.g. partial enclosure, to reduce noise emission;
- c) Before the procurement of new plant, noise emission data provided by the supplier, should be taken into account in deciding whether to purchase, and whether further protective measures may be needed. The aerodrome operator may set minimum standards for new equipment;
- d) The amount of time that workers spend in the vicinity of noisy plant and equipment should, if possible, be minimised by planning and organising work accordingly;
- e) Work associated with cargo holds or other service points near the APU could be undertaken when it is not running;
- f) For vehicle operators an acoustic cab could be fitted, provided that the vehicle can be operated with the doors and windows kept closed. If this is not reasonably practicable, it may be feasible for drivers to use hearing protection.

11.4 The areas in which hearing protection is required should be marked and warning notices displayed, so far as is reasonably practicable. This may be difficult on the apron itself, but relatively easy within or on equipment, e.g. in cabs of vehicles where the second action level may be exceeded for part or all of the time.

Signs may also be placed at apron access points.

11.5 On the apron one employer's activities may cause the employees of other employers to be exposed to noise. For example, high levels of noise from an APU will affect baggage handlers and others working in the vicinity of the aircraft. The various employers involved will usually need to agree who is to co-ordinate their action on noise. Normally, this will be the employer in overall control of the work. This employer should make sure that the noise exposure that his work activity generates is assessed and reduced, and that the information on noise is made available to all affected employees; the actual employer of each worker provides any training and personal protective equipment needed. In most cases exchange of information and collaboration between employers will be needed to ensure that duties are fulfilled without unnecessary duplication.

11.6 Where communication between personnel is essential or audible alarms are used to assure safety, a thorough assessment of the environment must be carried out to ensure that any risks that result from the use of hearing protection are properly managed.

## 12 Work equipment (including machinery)

### 12.1 General

12.1.1 Work equipment includes every item on the apron, including vehicles, specialist equipment such as cargo loaders, fixed equipment such as airbridges and FEGP Units and hand tools.

12.1.2 The hazards to health and safety and aircraft safety from work equipment can arise when it is moved, installed, used, maintained or dismantled. They include hazards from:

- Machinery
- Hot or cold surfaces
- Instability (collapsing or overturning)
- Objects or people falling or being ejected from the equipment
- Disintegration, deterioration or malfunctions in the equipment or its controls
- Improper use of the equipment (for example using it for a purpose for which it is not suitable)
- Fire or overheating.

12.1.3 Dependent on the process involved, the hazards may always be present with the equipment, (such as its weight which may affect how easily it can be moved or lifted), or transitory (such as the risk of striking the aircraft when equipment is raised or lowered).

12.1.4 In order to protect people and aircraft, all companies at aerodromes should ensure that:

- a) Equipment is suitable (i.e. with regard to its initial integrity, the place where it will be used and the purpose for which it will be used);
- b) Equipment is maintained in a safe condition;
- c) Equipment is inspected in certain circumstances to ensure that it is, and continues to be, safe for use. Any inspection should be carried out by a competent person and a record kept until the next inspection and longer if the inspection results are used for monitoring serviceability trends.

12.1.5 Companies should also ensure that the risks created by the use of the equipment are:

- a) eliminated, where possible; or



b) controlled by:

- taking appropriate 'hardware' measures, e.g. providing suitable guards, protection devices (such as buffers to surfaces which interface with the aircraft), markings and warning devices (such as Emergency Stop buttons), and
- taking appropriate 'software' measures, such as following safe systems of work (e.g. ensuring maintenance is only performed when equipment is shut down) and providing adequate information, instruction and training.

12.1.6 The measures should be selected on the basis of an assessment of the risks. As part of the assessment, the hierarchy of controls should be considered. In many cases, a combination of measures may be necessary.

12.1.7 Whatever the combination of measures, companies need to ensure that people using work equipment have received adequate training, instruction and information for the particular equipment.

## **12.2 Mobile work equipment (including vehicles)**

12.2.1 Mobile work equipment poses additional hazards to people and aircraft. Such equipment or vehicles may strike people, aircraft or other work equipment. Furthermore, unless it is operated correctly and loose articles are suitably secured, objects may fall and strike people or aircraft nearby and may also create a FOD hazard.

12.2.2 Consequently, companies and their staff should ensure that where mobile work equipment is used for carrying people or objects, it is suitable for this purpose (i.e. there is proper seating and stowage areas). In some cases, measures may need to be taken to reduce the risks to the operator, any other people being carried, anyone else who might be affected (such as passers-by) and aircraft. This may include measures to prevent the work equipment rolling over, or people or objects being thrown from the equipment (i.e. seatbelts or other restraints). The measures should be based on the findings of a risk assessment.

## **12.3 Lifting equipment**

12.3.1 Lifting equipment also poses risks to people and aircraft. People may fall from elevated working positions, or may be struck by loads falling or released from the equipment. Lifting equipment may overturn or collapse, resulting in injury and damage. Aircraft may be struck and damaged by lifting equipment as it moves up or down.

12.3.2 In order to ensure that the risks to people and aircraft are controlled, lifting equipment should be:

- strong and stable enough for the particular use and marked to indicate safe working loads
- positioned and installed to minimise any risks
- used safely, i.e. the work is planned and organised, and is performed by competent people, and
- subject to ongoing thorough examination and, where appropriate, inspection by competent people.

12.3.3 It may sometimes be difficult to determine what is, and what is not, lifting equipment.

At aerodromes, the following should always be considered to be lifting equipment:

- catering vehicles, ambulifts and other hi-loaders
- de-icers with a boom assembly
- cargo loaders
- mobile elevating work platforms (MEWPs, 'cherry pickers')
- lifting platforms on toilet and potable water servicing vehicles and refuelling vehicles
- forklift trucks.

12.3.4 The following are not regarded as lifting equipment or lifting operations:

- airbridges (any lifting which occurs during manoeuvring is entirely incidental to their main function)
- escalators (these have specific legal requirements).

## **12.4 New machinery**

12.4.1 Before purchasing a machine, users need to consider:

- a) Where and how it will be used;
- b) What it will be used for;
- c) Who will use it (skilled employees, trainees);
- d) What risks to aircraft safety and staff health and safety may result;
- e) Comparison of how well these risks are controlled by different manufacturers' equipment.

12.4.2 Manufacturers can demonstrate compliance with the essential health and

safety requirements by designing and manufacturing a product to a harmonised standard. A number of harmonised standards specific to ground support equipment have been published by IATA AHM 900.

## 13 Hazardous Substances and Dangerous Goods

### 13.1 Substances hazardous to health

13.1.1 Some substances are defined as hazardous to health. These substances can be toxic, corrosive, irritant or otherwise harmful to health (e.g. biological agents). Some of these substances may also damage aircraft, for example, by corroding control surfaces.

13.1.2 Substances can be:

- a) used in a work activity (such as hydraulic oil or cleaning products); or
- b) those that arise or are encountered during a work activity (such as engine exhaust fumes, microbes in aircraft toilet waste, leaks from containers of dangerous goods).

13.1.3 The Law 04/L 183 2013 on Transport of Dangerous Goods and CAA Regulation 08/2014 on Conditions And Methods Of Transporting Dangerous Goods By Air or any act amending it is the main legislation that applies to exposure to such substances. Cargo's that are hazardous to health may also be subject to the requirements for the carriage of dangerous goods.

13.1.4 Aerodrome operator, ground handling providers, and air operators should assess the risks arising from the work with hazardous substances. This assessment should consider the risk created by the use, handling, or release of the substance. First and foremost, the assessment should show whether exposure to the hazardous substance can be eliminated - for example, could a less hazardous substance be used instead?

13.1.5 If exposure cannot be prevented then it should be adequately controlled. This could be achieved, for example, by ensuring chemicals cannot splash onto people or aircraft, or that fumes cannot accumulate near to people or aircraft. The use of personal protective equipment should only be used as a last resort. However, personal protective equipment may be a useful back-up for employees undertaking such tasks as emptying and cleaning toilets, who might use protective gloves, and overalls. Eye/face protection might also be useful in some circumstances.

13.1.6 Operators should note that commercially supplied hazardous substances should have certain health and safety information on the container and that suppliers of substances have to make available other relevant information on a safety data sheet. This information may be used as a basis for the assessment. For other hazardous substances such as engine fumes and toilet waste, employers may need to seek specialist advice and, if necessary, arrange for atmospheric sampling or other testing to be carried out.

13.1.7 Naturally, any control measures selected must be effective and in some instances it may be necessary to monitor the exposure of people to hazardous substances to ensure that they are not exposed to harmful levels.

## **13.2 Radioactive substances**

13.2.1 Exposure to substances which emit radiation can cause damage to health. Radiation may cause immediate harm, e.g. radiation burns, or may cause changes in cell DNA, which can eventually lead to cancers.

13.2.2 The control of risks to health from radiation is subject to the Law No. 03-L-104 on Protection from Non-Ionized, Ionized Radiation and Nuclear Security, and Regulation 08/2014 on Conditions and Methods of Transporting Dangerous Goods by Air or any act amending it. This regulation lay a number of duties on 'radiation employers', who include those who transport or store radioactive substances. By Law No.04/L-067 was established also the Agency on Radiation Protection and Nuclear Safety which is in charge for the establishment of standards for the protection of individual's society and the environment from potential harmful effects of ionizing radiation.

13.2.3 Operators need to assess the risks from exposure to radiation and to ensure that exposure is restricted. They should also have in place contingency plans. Staff working with radioactive substances, including those handling radioactive cargo should be competent in order to ensure their safety, the safety of those working with them and the safety of the aircraft.

13.2.4 Under the regulations, operators may have to appoint Radiation Protection Advisors to give competent advice on the measures needed to protect staff health and safety.

13.2.5 Some radioactive substances may also be toxic or corrosive etc. and may, therefore, also be subject to the Regulation, as outlined above. Radioactive substances which form part of a cargo consignment may also be subject to the requirements relating to the transport of dangerous goods (see paragraphs 13.4.1 to 13.4.4).

## **13.3 Flammable substances**

13.3.1 As with substances hazardous to health, flammable substances may be used as part of a process (such as aircraft repairs), handled as cargo, or encountered accidentally, for example as the result of a spillage. They may be solid, liquid or gaseous. Fire and explosion are the main hazards associated with these substances. Such events may cause considerable injury to people and damage to aircraft. However, these substances may also be hazardous to health or may damage aircraft

in other ways, for example because they are corrosive.

13.3.2 The risks from work involving flammable substances, including storage and transport, should be assessed. Where possible, the flammable substance should be eliminated, or substituted for a substance which is non-flammable. There may be a balance to be struck between the risks involved, for example, if the proposed substitute carries a greater hazard to health than the flammable substance.

13.3.3 Where the substance cannot be eliminated, or substituted, then appropriate precautions need to be in place. Control of the risks of flammable substances can be considered in terms of removing at least one side of the 'Fire Triangle'. See Figure 4.



**Figure 4** The Fire Triangle

13.3.4 This may include a combination of:

- safe storage, away from sources of ignition, incompatible substances (such as oxidisers) and mechanical damage
- adequate ventilation to remove flammable vapours or gases
- dispensing and decanting in a way which reduces spills and releases
- use of equipment specifically designed for use with flammable substances
- good housekeeping to remove flammable residues
- adequate procedures for dealing with emergencies and spillages, including training, information and instruction for staff.

13.3.5 The flammable substance which is likely to be found in the greatest quantity at aerodromes is aircraft fuel. Guidance on working with fuel safely is not reproduced in this publication. Sources of detailed guidance include Technical Publication – TP 18 Aircraft Fuelling. Most aerodromes will also operate 'Hot work permits' intended to reduce the risk of fire, including fuel fires.

13.3.6 Currently, there is no specific legislation on the use of flammable substances

on the apron (although work with flammable substances in aircraft hangars may be subject to ramp safety awareness procedures and operator fire hazard policy).

13.3.7 Flammable cargo may also be subject to the requirements relating to the transport of Dangerous Goods.

## **13.4 Transport of Dangerous Goods**

13.4.1 The transport of Dangerous Goods is covered by Regulation 08/2014 Conditions and Methods of Transporting Dangerous Goods by Air or any act amending it.

13.4.2 Transport of dangerous goods by air is also subject to the IATA Dangerous Goods Regulations and the ICAO Technical Instructions. Further advice on these standards can be obtained from the CAA - Flight Safety Department, email: [infocaa@caa-ks.org](mailto:infocaa@caa-ks.org).

13.4.3 Note that compliance with these standards does not necessarily mean that the requirements of Kosovo law covering transport of Dangerous Goods by other modes of transport have been met.

13.4.4 Similarly, compliance with the standards relating to the transport of Dangerous Goods by air does not guarantee that the requirements of Law 04/L-183 On Transport of Dangerous Goods and Law No. 04/L-161 On Safety And Health at Work have been met, and vice versa.

## 14 Inadequate Lighting, Glare and Confusing Lights

14.1 During darkness and periods of low visibility apron areas must be provided with a good standard of lighting of sufficient coverage and brilliance to enable pilots and ramp staff to operate safely and effectively. The illuminance of aircraft stands must comply with the standards set by Regulation No. 17/2017 on Certified Aerodromes.

14.2 Care must be exercised to ensure that no lighting installation can give distracting or confusing signals to pilots or cause dazzle or glare for any people on the airfield, including ATC staff in the visual control room.

14.3 It is equally important that every workplace has suitable and sufficient lighting to ensure people can work safely. In general, lighting should achieve a reasonably uniform illuminance on all relevant work areas and should avoid sudden changes in luminance (for example, where apron roads run underneath buildings). However, there may be a need for local lighting at specific areas where people are at work, for example within aircraft cargo holds.

14.4 Aerodrome operators should introduce arrangements to control and co-ordinate the provision/installation of airside lighting systems.

14.5 The introduction of many new lighting installations which fall outside the regulations governing Aeronautical Ground Lighting (AGL) are subject to prior approval by the CAA. Large systems should always be subject to an operational trial, including where judged necessary a flight trial, to confirm the best adjustments for the luminaires. Apron lighting should be regularly checked for damage and disturbance of the settings of the luminaires.

14.6 Area lighting is normally mounted on pylons or scaffolds and should be subject to the following:

- a. The mounting height, brilliance and mounting angles of the luminaires should achieve the illuminance and fall of light required without causing dazzle to pilots and other persons;
- b. The layout of mounting pylons should be such that overlapping cover is provided which does not give rise to areas of deep shadow, such as on the 'lee side' of a large aircraft;
- c. Floodlighting, including mobile equipment, in contractors' work areas should be strictly controlled and subject to regular checks to ensure that glare/dazzle are eliminated.

14.7 To avoid dazzle, vehicles on the aprons must use dipped headlights whenever vehicle lights are required.



14.8 Any lighting used on the apron must not conflict with aircraft guidance systems and if coloured lights are used they must not be capable of confusion with colour coded aviation lights.

14.9 Illuminated stand designator signs should, where possible, be prominently placed at a standard position at the head of stand to give unambiguous indication to pilots of stand location/identification.

14.10 Where the location of lighting for aerodrome landside sites, is visible from the airfield, the levels of brilliance and direction of any light display should be such that there is no glare or dazzle to confuse or distract pilots or ATC staff.

14.11 Traffic lights controlling crossings of taxiways/taxilanes should be clearly identifiable to vehicle drivers but must be shielded from the vision of pilots.

14.12 Guidance on the design, installation and maintenance of Aeronautical Ground Lighting with reference to the safety of personnel is given in paragraphs 17.1 to 17.8.

## 15 Adverse weather conditions (including winter operations)

### 15.1 Adverse Weather Conditions

Besides snow and ice, other adverse weather conditions affect the safety of aircraft operations on aprons, principally strong surface winds and low visibility conditions. As part of the safety management system, aerodrome operators should issue information about the precautions to be taken in anticipation of these conditions and with emphasis on the safety requirements for apron operations.

### 15.2 Strong Winds

15.2.1 When meteorological warnings of strong winds are received, they should be promptly relayed to airlines and operators.

15.2.2 When strong wind conditions are experienced, the first problems encountered are of light FOD being carried across the airfield, causing engine ingestion threats to aircraft on stands, taxiways and runways. Plastic bags and sheeting are particular problems.

15.2.3 As wind speeds rise, baggage containers, unsecured equipment, large debris (mostly from the aprons), can be blown across the Movement Area causing a damage hazard to aircraft in all areas. There is also a risk of personal injury and damage to vehicles and equipment by 'flying' debris. The principal requirements and precautions are included in the model procedures at Appendix H to this Chapter.

15.2.4 It is not always feasible or necessary to position a large aircraft into wind at aerodromes. Where there is a requirement for aircraft to be positioned into wind and/ or picketed, this should be the responsibility of the airline manager, agent or owner concerned. Aerodrome operators may assist by the allocation of suitable stands and other airfield areas for this purpose.

15.2.5 As wind speeds rise, there is a requirement for airline managers, agents or owners concerned to ensure that windmilling propellers and rotors are feathered and/or secured.

### 15.3 Low Visibility Procedures (LVP)

15.3.1 Aerodrome operators will have in place comprehensive arrangements and rules to safeguard low visibility operations on the manoeuvring area and these issues are not discussed in detail here. Further information about the implementation of low visibility operation and procedures can be found in Regulation 17/2017 and in ICAO Annex 14 and in the relevant Aerodrome Manual.

15.3.2 In most airfield layouts, aprons border directly on to the taxiway system, therefore, when LVPs are in force, there is an impact upon apron operations and there is a requirement for ramp staff to be aware of the implications for taxiway operations and to comply with any requirements and limitations that are notified.

15.3.3 Visibilities which might qualify as low in aircraft operational terms might be considered reasonable by some aerodrome users. When visibility is reduced however, it must be ensured that staff are aware of the additional safety requirements to maintain safe operations.

15.3.4 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Strong Winds is included at Appendix J.

15.3.5 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Apron Operations in Low Visibility Conditions is included at Appendix K.

## **15.4 Winter operations**

15.4.1 Managers of aerodromes that continue to operate during severe winter conditions of snow and ice are recommended to agree and publish a comprehensive snow clearance plan. The equipment and manpower will be dictated by the scope of the plan itself, but should be sufficiently flexible to deal with the full range of extremes that can be expected locally.

15.4.2 During winter conditions additional precautions and arrangements are required, by all those involved with airside operations. Before the winter season starts, safety instructions should be issued to highlight the hazards of winter operations and detail the measures to be taken to mitigate the effects on the apron. It is good practice to arrange briefings for the managers and staff of user airlines/companies on working and operating in winter conditions.

15.4.3 The aerodrome operator should establish that they, airlines and handling agents have arrangements in place for the following:

- a. The treatment and de-icing of aprons and airside roads, with particular attention to taxiways, stands and push-back areas;
- b. The clearance and de-icing of critical areas peripheral to stands such as loading bridge movement areas, bridge steps and drive wheels, passenger routes (including external steps and ramps), FEGP units and other fixed service equipment. The de-icing method should not introduce slip and trip hazards of its own;
- c. Where an aircraft is occupying a stand, the use of sprays or other means to

clear and de-ice aircraft wheels, wheel runs/ruts and access routes for loading baggage, freight and catering;

- d. When meteorological frost/snow warnings are received and when freezing conditions are expected or observed, warnings should be transmitted to all apron operators and staff by the best local means;
- e. Additional apron inspections should be introduced to detect freezing hazards;
- f. Where possible, apron areas should be set aside for the parking of aircraft de-icing rigs and the storage of bulk de-icing agents.

15.4.4 Airlines and operators should be required to take special care to avoid spillages of water on aprons during freezing conditions and the washing of vehicles/equipment and the flushing of tanks, except into containers, should be prohibited in all airside areas.

15.4.5 Airlines and operators should be urged to undertake self-help measures to clear and de-ice equipment and vehicle parking areas and should be required to remove their equipment from such areas to enable clearance/de-icing to be completed. Handlers should be required to tow-off static aircraft when requested, to enable stand clearance/de-icing to be completed.

15.4.6 A model Safety Instruction that may be suitable for issue by an Aerodrome Authority dealing with Winter Operations and Apron Hazards is included at Appendix L.

## 16 Slips and trips

16.1 Slips and trips account for almost a quarter of accidents to people at aerodromes. Whilst some of these accidents are difficult to prevent, many could be avoided by simple measures which can and should be taken. Law No. 04/L-161 on Safety and Health at Work is the relevant legislation.

16.2 Slips and trips may be caused by a variety of obstructions, loose items and defects in walkways, stairs and other areas. Loose items include FOD, which is of course a source of risk to aircraft as well. Improperly stowed cables (for example, from fixed or mobile electrical ground power units) can also cause people to trip over. Slips can be caused by spillages, for example from hydraulic leaks.

16.3 The initial design and construction of work areas can contribute as much to the risk of slips and trips as to its reduction. Sudden changes in level, poor drainage, and insufficient surface roughness of the floor can all increase the risk of slips or trips. The aerodrome operator should ensure that the risks from slips and trips are considered at the design of new or refurbished facilities, and are eliminated or controlled by good design, as much as possible.

16.4 Poor maintenance of surfaces can also contribute to the risk of slips and trips. Damage such as potholes and excessive wear increase the risk that slips will occur, as well as also being a potential source of FOD. Aerodrome maintenance programmes should be developed by the aerodrome operator to discover areas in need of attention before they become a source of danger. Airlines and ground handlers should assist, for example by reporting parts of the apron which have been damaged, or are becoming excessively worn.

16.5 Dealing with the temporary sources of risk, such as FOD requires the whole aerodrome community to play a part. Loose items should be removed by whoever notices them; some of them will only be suitable for the FOD bin. Larger items, such as cables, should be reported to the owner of the piece of equipment concerned, who should in turn have the items removed or tidied away promptly. If the owner of a larger piece of equipment cannot be established, the FOD should be reported to the aerodrome authority.

## 17 Electrical Hazards

17.1 There are a variety of sources of electrical hazards on the apron, including lighting, fixed or mobile electrical ground powers units, power supplies to other apron equipment (such as airbridges) and the aircraft itself. The Law No. 04/L-161 on Safety and Health at Work is the principal health and safety legislation, but the requirements in the Regulation No. 17/2017 on Certified Aerodromes relating to inspection of work equipment will also apply to many electrical systems on the apron.

17.2 Again, design and installation can significantly reduce risk. Proper means of isolation should always be provided to electrical systems. These should be lockable. Where possible, isolators should be designed so that people cannot gain access to parts which carry dangerous electrical currents unless the power is switched off. The aerodrome operator should ensure that redundancy is designed into systems where isolation would cause severe inconvenience (for example, as with the AGL system), so that one circuit can be isolated and worked on safely, whilst the second circuit keeps vital services operating.

17.3 Electrical equipment should always be used safely. Plugs should be used with the sockets for which they were designed. Circuits should not be overloaded, and should be suitable for the environment in which they are used. Cables should not be left in positions where they could be damaged.

17.4 Of particular note is the use of ground power units (GPUs). Many GPUs have an electrical interlock which detects when the aircraft is connected. This interlock can be bypassed. However, this facility is intended for maintenance purposes only. Interlocks should not be bypassed, even temporarily, whilst the GPU is in normal use. If the GPU will not operate unless the interlock is bypassed, then the GPU is faulty, and it should be withdrawn from service for repair.

17.5 All electrical systems should be properly maintained. This will require a programme of inspection and test to identify defects before they become a source of danger. It also requires everyone promptly to report to their employer, and/or the operator or owner of the equipment, any defects they discover during the course of their work. All maintenance of electrical systems should be carried out by competent people to an adequate standard.

17.6 Maintenance on all electrical systems (including those onboard aircraft) should always be carried out safely. Preferably, systems should be isolated from all sources of electrical power and 'proved dead' by testing. All sources of supply should be locked open whilst work is in progress. Where systems contain capacitors which could retain a significant amount of stored energy, this energy should be safely discharged before work commences and capacitors should be left shorted

out whilst work is in progress.

17.7 Work on, or adjacent to, exposed live electrical systems should only take place as a last resort when isolation would give rise to other significant hazards to health and safety, or when there is no other way of determining the source of the fault. In these circumstances, those involved should be specifically authorised and be using a safe system of work, with appropriate PPE, tools and equipment, supervision, training, information and instruction in place.

17.8 Where contractors are to be used to undertake electrical work, they should be subject to the assessment, control and monitoring arrangements by the operator or relevant responsible authorities.

## 18 Faults and defects

18.1 Aerodrome operators should promulgate and maintain comprehensive fault reporting procedures for all apron equipment and installations provided by the aerodrome. Clear instructions should be issued and repeated by notice at main installation sites.

18.2 For staff of airlines or operators, simple 'one shot' fault reporting is best. Faults on vital operational equipment, or facilities, that could affect aircraft safety, such as airbridges and VDGS, should be reported to a single unit. An Operations Control Centre or Safety Unit is best. By this means the appropriate and immediate safety decisions can be made/actioned and at the same time a prompt engineering response can be initiated.

18.3 Details of all reported faults and their rectification should be recorded.

18.4 For faults where a hazard to aircraft or to aerodrome operations existed or was thought possible, consideration should be given to filling an MOR. Further details can be found in Regulation 09-2017 Reporting, Analysis And Follow-Up Of Occurrences In Civil Aviation, and Regulation 11-2017 Laying Down A List Classifying Occurrences In Civil Aviation to be Mandatorily Reported According to CAA Regulation No. 09/2017.

18.5 Occurrence reports should be made to CAA Office (Tel 038-248 629) or CAA Duty Officer (Tel. +383 (0)44 613 567), e-mail [mor@caa-ks.org](mailto:mor@caa-ks.org); [infocaa@caa-ks.org](mailto:infocaa@caa-ks.org).

18.6 All employers should ensure that there are systems in place to enable staff to report defects and faults in the operator's equipment. Action should be taken on these reports, within in a timescale which reflects the seriousness of the defect or fault and the risk to people and/or aircraft.



## 19 Movement Area Inspections

19.1 The requirement for inspections and maintenance of airfield facilities is implicit in the aerodrome certifying process and the associated legislation. The Aerodrome Services and Operations Manual must contain the requirements and accountabilities for the inspection and auditing of all the safety systems airside on a systematic basis. The results should be recorded/ reported and fed back into the safety management system.

19.2 Aerodrome operators should maintain inspection schedules for all apron equipment and facilities it provides. The results of these inspections should be recorded. Serviceability/availability records should be maintained on the principal systems for audit and management purposes.

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## Appendix A

### Model Ramp Operation Procedures - Aircraft Chocking

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1 Aircraft chocks are used to prevent the movement of an aircraft whilst on the ground.
- 1.2 The method used for chocking will vary depending upon the aircraft type and the requirements of individual airline operators. These procedures are minimum company requirements.
- 1.3 In adverse weather conditions, particularly periods of high winds, the chocking procedures will change and high wind procedures must be followed.
- 1.4 Aircraft type or operator specific instructions are appended to this procedure and must be followed where appropriate.

#### 2 The Procedure

##### 2.1 Aircraft arrival

- Prior to aircraft arrival you must ensure that you have the correct number of chocks available and that you are positioned behind the aircraft stop line.
- All engines must be spooled down and anti-collision lights off before the chocking process begin.
- Multi-engine propeller driven aircraft are normally to be chocked at the nose wheel by placing one chock forward and one aft of the nose wheel. Single engine propeller driven aircraft should be chocked fore and aft of the main wheels

- All jet aircraft are to be chocked fore and aft of the outer main wheels.
- Always approach aircraft from the head of the stand and where possible avoid approaching from the side.
- When placing the chock in position leave a 3 cm gap between chock and tyre for ease of removal.
- Never place your hand between the chocks and the tyre.
- Once the chocks are in place, stand in clear view of the flight deck and use the appropriate recognised hand signal to confirm 'chocks in' by placing both hands above the head, fists clenched with thumbs extended inwards.
- Repeat the 'chocks in' signal to the flight dispatcher if an air stairs is to be docked onto the aircraft.

## **2.2 Aircraft departure**

### **Pushback**

- Chocks should only be removed at the request of the aircraft commander.
- Ensure that all chocks are removed before pushback commences.
- If a chock is found to be stuck it may be removed by tapping with a spare chock or by easing the aircraft off of the chock after the aircraft brakes have been released using the tug and tow bar.
- If a chock still cannot be removed request the advice of the aircraft commander.
- After removal chocks must be returned to their designated storage area.

### **Powerback**

- When requested by the aircraft commander, the wingman will remove the chock positioned aft of the nose wheel.
- The chock forward of the nose wheel must remain in position until the aircraft has powered away.
- After removal, chocks must be returned to their designated storage area.

### **Free Standing Aircraft**

- Chocks should only be removed at the request of the aircraft commander.
- One chock should normally remain forward of the nose wheel until the engine start sequence has been completed and the 'chocks away' signal is received from the flight deck. Single engine propeller driven aircraft should

remain chocked forward of the main wheels until the 'chocks away' signal is received from the flight deck.

- The aircraft commander will return the 'chocks away' signal by placing both hands above the head; fists clenched with thumbs extended outwards as part of his sign off procedure.
- After removal chocks must be returned to their designated storage area.

### **3 Key Safety Points**

- Only trained and authorised personnel or trainees under supervision are allowed to chock or un-chock aircraft.
- Operating procedures and safe working practices must be followed at all times.
- Correct manual handling techniques must be used when lifting and carrying chocks.
- Never approach an aircraft until the engines have spooled down and the anti-collision lights have been turned off.
- Never remove chocks from an aircraft without the permission of the flight deck or the aircraft commander.

## Appendix B

### Model Safety Instruction - Operation of Visual Docking Guidance System

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

Most aircraft parking stands at airport are equipped with Visual Docking Guidance (VDGS). When a stand is not equipped, or the VDGS is unserviceable or not calibrated for a particular type of aircraft, a marshalling service must be provided.

#### 2 System

The Visual Docking Equipment (VDE) provides both directional and stopping guidance. The azimuth display is aligned for interpretation from the left hand flight deck seat. Details of the VDE system and instructions for its use by pilots are contained in the AIP.

#### 3 Responsibility for Operation of VDGS

**3.1** The system is switched on by airline or handling staff. In the case of airbridge served stands, one set of VDE control switches are mounted in a panel in the airbridge cab; a second set of switches are mounted in a conspicuously marked panel in a prominent position at the head of stand. Either set of switches will operate the equipment and on all pier served stands timer switches are used which automatically switch off the VDE after 10 minutes. On non-pier served stands a single set of switches is provided, mounted in a conspicuously marked panel at the head of stand; the VDE on these stands do not have timer switches and the VDE must be switched off when the aircraft is safely parked on the stand.

**3.2** Airline or handling staff must ensure that the stand is unobstructed by vehicles or equipment and that the airbridge is retracted and correctly parked

before the arrival of the aircraft and before switching on the VDGS. Switching on the VDGS signifies to the aircraft commander that these actions have been completed and it is safe for the aircraft to enter the stand. Once the VDGS has been switched on, the person responsible for stand safety and VDGS operation must not leave the stand until the aircraft has parked, unless the VDGS is switched off again.

## **4 Marshalling Service**

- 4.1** A marshalling service is provided on those stands not equipped with VDGS or with known unserviceability. The marshalling service is also available on request to all airlines by calling the operations control centre.
- 4.2** The operations control centre should be called for assistance if the handling staff is in any doubt about safety or the VDGS equipment that is available.
- 4.3** During aircraft emergencies and at other times when the resources of the ramp operations service are fully committed, marshalling staff may not be able to attend before the aircraft arrives. Accordingly handling staff should give the flight deck crew assistance to stop short safely on the stand centreline and await the arrival of the marshallers.
- 4.4** When directing an aircraft, with his/her attention firmly fixed on that aircraft, a marshaller is at risk from vehicles. Drivers must be alert to the presence of one or more marshallers and always give way. Personnel must not walk or drive between an inbound aircraft and a marshaller directing that aircraft under any circumstances.

## **5 Airbridge Unserviceability**

When an airbridge is out of service or cannot be fully retracted and/or parked in its safe position, the stand will be withdrawn from use or, if practicable, allocated to aircraft types that can safely be marshalled on to a 'Stop Short' position clear of the airbridge. The decision for a 'Stop Short' operation may well affect other operations. See 6.2 below.

## **6 Stop Short Procedure**

- 6.1** The need to 'Stop Short' will be indicated to the flight crew by one of three methods:
  - a. An electronic sign, mounted above the VDE display which flashes in red – STOP SHORT. The switches for these signs are co-located with the VDGS switches both in airbridge cabs and also at head of stand locations, the switch function is prominently marked;

- b. On stands equipped with rail drive bridges by a conspicuous painted 'STOP SHORT' sign mounted on the taxiway side of the airbridge cab;
- c. By marshalling signals.

**6.2** It is essential that the Airport Operations Centre and the Ramp Operations Unit are notified immediately if it is intended to stop an aircraft short. The Ramp Operations Unit will assess the precise Stop Short capability of the stand for the aircraft type specified and provide marshalling assistance as necessary.

**6.3** Whenever a 'STOP SHORT' sign is displayed, and in the absence of marshalling signals, pilots should enter the stand using the centreline for guidance and stop the aircraft before reaching the airbridge or any other obstacle. The stopping position should be as far forward as possible consistent with safety and the ability to serve the aircraft door(s) with steps. If the aircraft tail is not clear of the taxiway/taxilane ATC should be advised.

**6.4** The 'STOP SHORT' indication will be removed by Airport Engineers when they have repaired and retracted the airbridge.

## **7 Emergency Stop Procedure**

**7.1** The Emergency Stop facility is provided to enable an instant warning to be given to pilots that there is an immediate safety threat to their aircraft, or to personnel on the apron, and that the aircraft should be stopped immediately to avert the danger.

**7.2** The need to make an Emergency Stop is indicated to the pilots by the illumination of a flashing red electronic EMERGENCY STOP sign which is positioned beside the VDE display.

**7.3** Two switch locations are provided for the Emergency Stop system. One gated switch is fitted in the airbridge cab co-located with the bridge controls; a second gated switch is located at a prominent and conspicuously marked position at the head of stand at apron level.

**7.4** Whilst an aircraft is moving on the stand, a responsible member of the operator's staff must be located at the head of the stand switch. Any person (irrespective of employer or function) who perceives a safety threat should activate the system, or request the staff member at the switch to activate the system, to tell the pilot to stop.

**7.5** The pilot will normally advise Air Traffic Control that an Emergency Stop on



stand has been made. If appropriate, Air Traffic Control will initiate a 'ALERT' emergency response, in accordance with Airport Emergency Procedures. The Airport Fire Service and the ramp Operations Unit will then attend the incident and take any safety action required.

## **8 VDGS Safety Summary**

Airline and handling staff receiving an arriving aircraft should:

- a. Arrive at the allocated stand in good time before the aircraft;
- b. Check that the airbridge is safely parked/retracted and that there is no other obstruction or FOD on the stand;
- c. Display 'STOP SHORT' if necessary. Report this event to the superior and the Airport Safety Unit;
- d. Switch on the VDGS when the stand is safe for use by an aircraft and, for non-timer systems, switch it off again when the aircraft has come to a halt;
- e. Ask for marshalling assistance if there is any doubt whether the stand can be used safely.

## Appendix C

### Model Ramp Operation Procedures - Aircraft Push-back (Conventional Tugs)

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

##### 1.1 Pushback

This procedure describes the pushback operation in which an aircraft is pushed backwards from its parking gate by a tug or tractor, to a position on the taxiway where it can safely move off under its own power.

##### 1.2 Tractor/tug

- 1.2.1 A vehicle designed specifically to move aircraft on the ground, the usual design will be a four wheeled vehicle that connects to the aircraft using a tow bar.

##### 1.3 Safety

- 1.3.1 Safety is an essential part of all ramp procedures and you must always consider how safe every activity you undertake is. Most ramp procedures will be working with dead aircraft i.e. the aircraft is stationary and all engines are switched off. During any pushback procedure you will be working with live aircraft, this means that the aircraft will be moving with the aid of the tug, also the engines will be starting at some time prior to, during, or after the pushback.
- 1.3.2 As well as your own safety it will be your responsibility as part of the pushback team to ensure the safety of those around you, whether directly involved in the pushback or on surrounding stands.

- 1.3.3 Communications during the pushback will come in the form of hand signals or headset communications, in whichever form you give or receive instructions you must ensure that they are clearly understood, should there be any doubt then the instructions must be clarified before any part of the pushback procedure is undertaken.
- 1.3.4 Remember! During the pushback the captain passes control of his aircraft to the pushback crew. You now have a live aircraft full of fuel and passengers and the safety of everyone concerned is paramount.
- 1.3.5 Irrespective of any ATC clearance or information given to you by the crew of the aircraft, while you are pushing or towing an aircraft, you are responsible for avoiding collisions with other aircraft, vehicles, buildings and obstructions.

## **2 Procedures – Conventional Tug and Towbar**

### **2.1 Selection of Tug and Towbar and Bypass pin**

- First select the correct bypass pin.
- Bypass pins are machined to fit exactly in the systems of specific aircraft and only the correct pin can be used.
- Failure to use the correct bypass pin or any pin at all may result in damage to the aircraft and/or towbar and could endanger the pushback crew.
- Also remember to only use a pin that is marked as serviceable.
- Select the correct towbar. All towbars are designed to fit a range of particular aircraft types and are labelled accordingly, and if you are unsure of the suitability of a particular towbar you should consult your supervisor.
- Failure to use the correct towbar may result in damage to the aircraft.
- Select the correct tug.
- If the correct tug is not available you should consult your supervisor.
- Carry out a full pre-trip inspection of both tug and towbar before use.
- Towbars should always be pulled behind the tug when driving to and from the aircraft, never pushed.

### **2.2 Arrival at the aircraft.**

- On approaching the aircraft the tug driver should carry out a brake check (at least 10m away from the aircraft), before lining up with the aircraft nose gear and stopping at a suitable distance from the aircraft to allow for tow bar

connection.

- The towbar should now be uncoupled from the rear of the tug and aligned with the connection point of the aircraft nose leg.
- The steering bypass pin (if required) should now be fitted and permission sought from the flight deck crew for tow bar connection.
- The towbar can then be safely connected to the aircraft.
- If the towbar has an adjustable wheel carriage, this should be used to minimise the need to physically lift the bar.
- To connect some towbars may require the assistance of one or more other members of staff.
- You should always use correct lifting techniques, and be prepared to seek assistance when connecting or disconnecting towbars to prevent personal injury.
- When the towbar (and bypass pin if required) is correctly connected to the aircraft the tug can be driven very slowly forward to connect to the eye of the towbar.
- A guide person (usually the headset operative) is required for this operation, using recognised hand signals.
- This operation must be carried out under complete control, as any excess force used during the coupling of tug and bar could result in damage to the aircraft or towbar.
- If the tug is to be left unattended after it has been connected to the aircraft, the engine should be switched off and a wheel chocked for safety.

### **2.3 The commencement of the pushback.**

- Prior to the commencement of the pushback you, the driver, will have carried out the pre-departure walkround as detailed earlier in these procedures and liaised with the headset operative to ascertain the type of pushback to be carried out.
- Now remove the wheel chock securing the tug (if applicable), and
- When seated safely in the tug check that Neutral or Park have been selected and the parking brake is applied before starting the engine.
- Wait for the 'brakes released' signal from the headset operative (as detailed in the section on hand signals).
- When the 'brakes released' signal is received, select the required direction of travel and the correct gear (for most pushbacks first gear will suffice), and while holding the tug on the foot brake, release the parking brake and then

after a final visual check to confirm that it is safe to move off, slowly release the foot brake using the power of the engine tickover to gently take up any slack between tug/ bar and aircraft.

- Using the throttle, slowly increase the power to set the speed of the pushback to a pace where the headset operative can comfortably hold position with the tug and aircraft without having to either run or dawdle.
- Where possible, the headset operative should always walk on the inside of a turn and he must remain in full view of both the flight deck and the tug driver throughout the pushback.
- You must remain fully aware of the position of other members of the pushback team at all times and be prepared to stop if you lose sight of any team member.

## **2.4 Continuation of the pushback**

- The pushback should continue at a safe walking pace, and any changes of direction (turns) should be kept to the minimum necessary to achieve the final positioning of the aircraft at the release point. You should not attempt to change gear during the pushback manoeuvre.
- When turning the aircraft you must be careful not to exceed the limits marked on the nose leg or fuselage as to do so will result in severe damage to the aircraft's steering mechanism.
- The red line on the wheel bay doors shows the limit of turn allowable during a normal pushback operation, to exceed these lines without 'breaking' the steering scissors will result in damage to the aircraft steering mechanism even with a bypass pin in place.

## **2.5 Completion of the pushback**

- As you come to the final few metres of the push back, you should endeavour to align the tug and towbar with the aircraft fuselage; this will make the disconnection process easier and far safer.
- You should slowly reduce the throttle power to tick-over and then gently apply the foot brake to finally stop the aircraft. Only when you are sure that a complete stop has been reached and you have selected neutral gear should you give the headset operative the 'brakes set' signal.
- The headset operative will signal confirmation when the aircraft brakes are 'set' and move in to lower the towbar wheel carriage. When the wheels are supporting the towbar the headset operative will remove the tow pin (this may require a slight forward or rearward movement of the tug to facilitate) to allow the tug to move clear of the aircraft.

- The tug should pull away from the tow bar eye (to a distance of at least 5m) to allow the bar to be safely removed from the aircraft.
- The headset operative can now disconnect the bar from the aircraft nose leg. If the disconnection process requires two men, the tug driver should place the tug at ninety degrees to the aircraft after pulling back from the towbar eye and select Neutral/Park gear, apply the park brake and then assist with the towbar.
- Re-couple the towbar to the tug and then drive to the apron edge adjacent to the aircraft and await its departure.
- When the headset operative has released the aircraft, after showing the flight deck that he has removed the steering bypass pin (if fitted) and returned to the apron you should connect the bar to the rear of the tug in readiness to return to the park when the aircraft taxis away.
- The disconnection of tug and bar from the aircraft is a 'safety critical' time requiring a high level of concentration by all concerned.
- Under no circumstances should any bypass pin be removed before the towbar is disconnected and clear of the aircraft.

### **3 Key Safety Points**

- Only trained and authorised personnel or trainees under instruction may perform the pushback operation.
- Always select the correct tug, towbar and bypass pin for the aircraft type and series to be pushed back.
- Follow operating procedures and safe working practices at all times.
- Remain aware of other persons at all times and be prepared to stop the pushback if safety is compromised.
- Take account of the prevailing weather conditions when assessing the safety of the operation.

## Appendix D

### Model Ramp Operation Procedures - Towbarless Tug Vehicle (TLTV) Operation

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

##### 1.1 Pushback

This procedure describes how an aircraft is pushed backwards from its parking gate by a towbarless tug to a position on the taxiway where it can safely move off under its own power, or be towed away.

##### 1.2 Tug

The tug is specifically designed to move aircraft without the use of a conventional towbar.

##### 1.3 Safety

- 1.3.1 Safety is an essential part of all ramp procedures. Many ramp procedures will be working with 'dead' aircraft, i.e. the aircraft is stationary and the engines switched off. During any pushback procedure, however, the aircraft will be 'live'. This means that the aircraft will be moving with the aid of a tug and, if the aircraft is departing, the engines will be starting at some time prior to, during or after the push.
- 1.3.2 As well as your own safety it will be your responsibility as part of the pushback team to ensure the safety of those around you, whether directly involved in the pushback or on surrounding stands.
- 1.3.3 Communications during the pushback will come in the form of hand signals or headset communications. Whichever form in which you give or receive

instructions you must ensure that they are clearly understood – standard hand signals should be used at all times. Should there be any doubt, the instructions must be clarified before any part of the pushback procedure is undertaken.

- 1.3.4 Remember! During the pushback the captain passes control of his aircraft to the pushback crew. You can now have a live aircraft full of fuel and passengers and the safety of everyone is paramount.
- 1.3.5 Irrespective of any ATC clearance or information given to you by the crew of the aircraft, while you are pushing or towing an aircraft, you are responsible for avoiding collisions with other aircraft, vehicles, buildings and obstructions.

## **2 Ramp Operating Procedures**

### **2.1 Preparation**

- Before starting the procedure ensure that the TLTV is approved for use on the particular aircraft type and that the aircraft operator has approved the use of TLTV on its aircraft. Refer to the aircraft type/operator panel in the tug.
- Before driving the TLTV make sure a pre-trip inspection is carried out.

### **2.2 Starting and Manoeuvring**

- Start the tug by turning the ignition key. A buzzer will sound to indicate that the tug is not yet ready for operation. When the buzzer has stopped (which should only be a few seconds) check the operating panel for fault warning lights. If any fault or warning lights are displayed, switch the tug off and report the unserviceability to your Supervisor.
- Go to the gate and cradle controls –the closed position is indicated by a green light and the lowered position is indicated by a red light. If necessary, move the joystick into the raised position and wait for the green light to come on.
- When the green light comes on make sure the cab is facing away from the drive wheels. If the cab is facing the drive wheels use the cab rotate button to turn the cab around.

NOTE: The cab will only rotate if both doors are closed and the tug is in Neutral gear.

- 3rd gear must be selected when positioning the TLTV from the parking area



to the aircraft. The TLTV must not be driven from the parking area with the cab facing the drive wheels. This position is for positioning on and off the aircraft and pushback only.

- On arrival at the aircraft ensure that the steering bypass pin is inserted. Inform the flight crew that you are going to connect the tug before moving the tug into position.

### **3 Aircraft Attachment**

- To position the tug at the aircraft, rotate the cab so you are facing the drive wheels.
- Position the TLTV using the red guide line that runs down the body of the tug. Aim the red line at the centre of the nose gear.
- Drive towards the nose gear and stop 2m from it. Engage the hand brake and put the TLTV into Neutral gear.
- Check that there are no surface mounted taxiway/stand light fittings that could foul the lowered cradle. If there are, a conventional towbar must be used.
- Move the joystick into the 'lowered' position and hold there until the red 'lowered' light is indicated.
- Check that the tug is set for the correct wheel size and wheelbase. If not, adjust the wheel size using the wheel size buttons.
- Put the tug into 1st gear and drive towards the aircraft so that the cradle is positioned either side of the nose gear.

**NOTE:** When the tug is driven in the lowered and opened position the buzzer will sound to let the driver know that the cradle and gate are open and lowered.

- When positioning the tug toward the nose wheel, always be ready to brake and watch for the green nose wheel engaged light. When engaged the buzzer will sound.
- When engaged, put the tug in to Neutral, take your foot off the brake and make sure the handbrake is off. The brakes on the TLTV must be off when closing the gate. It must be allowed to be pulled on to the aircraft, otherwise the nose wheel will be pulled and may cause damage

### **4 Aircraft Pushback**

- When the aircraft is ready to depart, the tug driver will wait until the headset operative gives him the 'brakes released' signal.

- When the signal is given, the TLTV cradle must be put into the raised position using the joystick. Push the joystick to the closed position and wait until the green 'closed' light comes on, then engage the hand brake. The green light will confirm that the cradle is fully raised.
- At this point the red flashing bypass pin light will come on. Check that the pin is still in place. This will be confirmed by pressing the yellow button.
- Select the appropriate gear for the size of the aircraft and commence the pushback in a smooth controlled manner.
- If the rate of turn becomes too acute, the '80%' warning light is activated. When this occurs adjust the angle to take pressure off the nose wheel. Should the '100 %' warning activate, the push must be stopped and the TLTV repositioned and reconnected.
- On completion of the pushback the aircraft and TLTV must be aligned.
- The joystick should be moved into the lowered position. When the cradle is fully lowered the red 'lowered' light will illuminate.
- Having received confirmation that the cradle has lowered, the driver must pass the 'set brakes' signal to the headset man. When 'set brakes' is confirmed, the TLTV driver must move the joystick into the 'opened' position. When the red 'opened' light signal illuminates, Reverse gear can be selected and the TLTV can move away from the aircraft.
- On completion of the pushback the cradle must be closed and raised, and the cab rotated away from the drive wheels.
- When the headset operative has released the aircraft, and after showing the flight deck that the steering bypass pin has been removed, the TLTV may then be driven to the appropriate parking position. The handbrake must be applied and Neutral gear selected. The joystick must be moved into the 'lowered' position. This will be confirmed by the green 'lowered' light signal.
- [Insert procedures for pushback and tow, including ensuring aircraft nav lights on at night or in low vis (and anti-coll if procedures etc require)]

## 5 Key Safety Points

- Only trained and authorised personnel or trainees under instruction are allowed to operate a Towbarless tug.
- Always perform a pre-trip inspection.
- Follow the published operating procedures and safe working practices at all times.
- Chocks must not be removed until the tug is connected and secured

- Never 'lift' the aircraft until instructed to do so by the aircraft commander.
- Never use a TLTV on an unauthorised aircraft type or if the aircraft operator has not approved the use of a TLTV on its aircraft.

## Appendix E

### Model Safety Instruction - Aircraft Power-back Procedures

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1** Airport must be satisfied that any power-back manoeuvres carried out at the airport are conducted safely, in accordance with an agreed procedure and with minimum disturbance to other apron users. Prior agreement, in writing, to perform power-backs must be obtained by an airline and will be subject to the provisions of this Safety Instruction being met. However, once a procedure has been approved, 'blanket' agreement may be given. This instruction details the requirements for the regular/routine employment of power-back procedures, by airlines, for aircraft departure.
- 1.2** The approval procedure for ad-hoc power-back, by single aircraft and to overcome special conditions, is detailed in the current Airport Safety Instruction.

#### 2 Power-Back Requirements

- a. Before approval of power-back manoeuvres can be considered, the following conditions must be satisfied:
- b. Authorization and procedures for power-back must be included in the aircraft manufacturer's manual.
- c. The power-back procedure must be in accordance with the air operators Operations Manual.
- d. Any pilot intending to use power-back must be trained and experienced in the procedure.
- e. The aircraft anti-collision beacon(s) must be switched on before the engines

are started.

- f. The power-back manoeuvre must be guided by a trained power-back marshaller, provided by the airline, using standard ICAO power-back marshalling signals.
- g. At the start of the manoeuvre a minimum of forward movement is permitted, sufficient only to ease any 'flat' out of the aircraft's tyres.
- h. The minimum engine power settings should be used, sufficient to get/keep the aircraft moving.
- i. Wing walkers must be employed to safeguard the rearward movement of the aircraft, ensure safe wingtip clearances and to avoid collisions with other aircraft, vehicles or personnel.
- j. The power-back manoeuvre should end with the aircraft aligned with the centreline of the taxiway.
- k. At no time during the power-back manoeuvre should the aircraft's wings sweep adjacent parking stands, whether or not they are occupied.

### **3 Power-Back Demonstration**

Before agreement for power-back can be given, Operations Manager will require observing a trial/demonstration of the full power-back manoeuvre using the aircraft type, aircraft weight, engine power settings and procedure intended for operational use. An assessment will be made on the effects of engine noise, vibration, blast overpressures and fumes, observed during the trial, to determine the suitability of the procedure.

### **4 Applications**

Airlines who wish to introduce regular power-back departures for their aircraft should, in the first instance, apply in writing to the Operations Manager giving details of the aircraft type(s) concerned.

## Appendix F

### Model Safety Instruction - Aircraft Blast and Fumes

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1 This instruction covers the engine handling requirements and procedures to be used at airport during apron operations and is issued to remind all flight and ground crews of the hazards that may result from engine blast and fumes. These procedures are intended to promote safe aircraft movement without the risk of damage to buildings, aircraft or equipment and injury to staff/passengers in the apron areas.
- 1.2 There is a hazard from the blast created by all engines, particularly jet engines. The risk is greatest in areas which cannot be protected by blast screening and from aircraft with high tail-mounted engines. Staff working behind blast screens or in open buildings close to a stand, and passengers on the opposite side of an apron cul-de-sac can also experience unpleasant engine fumes.

#### 2 Arrival Procedures

- 2.1 There is a particular risk of blast damage or injury when an arriving aircraft is turning on to the stand centreline. The risk is further increased if for any reason the aircraft stops, then applies the additional thrust required to 'break away' and continue the manoeuvre.
- 2.2 Commanders of aircraft are to keep all engines running (notwithstanding any fuel economy measures) in order to limit the need for high thrust levels. Ideally the aircraft should be kept moving to ensure that break away power is not required. Exceptions, specifying aircraft type and stand concerned are notified to Airlines concerned.

**2.3** Thrust levers must not be exercised for test reasons when the aircraft is on stand and engines should be shut down as soon as operationally practicable once the aircraft is parked.

**2.4** Aircraft anti-collision beacon(s) must remain on until the engines have run down.

### **3 Departure Procedure – Engine Start**

**3.1** Flight deck crew and ground crew should be in verbal contact (if verbal contact is not possible, standard hand signals must be used).

**3.2** Before engines are started the aircraft anti-collision beacon(s) must be switched on.

**3.3** Ground crews must ensure that the area immediately behind an aircraft, plus the zone immediately in front of the engine intakes, is clear of staff, passengers, vehicles and equipment before giving clearance for engine start. Additionally, before giving start clearance to the pilots of any wide body aircraft, ground crews must ensure that:

- a. No other aircraft is on or approaching the taxiway centreline, or about to pushback on to the centreline, in the area behind the aircraft awaiting start.
- b. Passengers are not boarding or disembarking via steps from an aircraft in any area behind the aircraft that may be affected by jet blast.

**3.4** Ground crews must notify pilots of any potential hazard that could be created by the starting of engines.

**3.5** On wide-body aircraft, a single engine start-up only is permitted on stands in cul-de-sacs. The remaining engines must not be started until the aircraft is pushed back and aligned with the taxiway/taxilane centreline.

**3.6** The tail mounted engine of MD11, DC10 and L1011 aircraft is not to be started in a cul-de-sac until the aircraft is aligned with the taxiway/taxilane centreline and pulled forward until the rear of the aircraft is a minimum of 100 metres from the blast screen (a painted stop bar is provided in all cul-de-sacs to indicate the nose wheel position).

### **4 Push-Back Procedure – Blast Precautions**

**4.1** Ground crews must ensure that the area into which an aircraft is to be pushed is clear of staff, passengers, vehicles and equipment, before the push-back

operation is started.

- 4.2** During all push-back manoeuvres aircraft engine settings should not exceed idle power.
- 4.3** Aircraft on the inner stands of a cul-de-sac must, after push-back, be pulled forward until the rear of the aircraft is a minimum of 100 metres from the blast screen before the aircraft tug and towbar are disconnected (a painted stop bar is provided in cul-de-sacs to indicate the nose wheel position).
- 4.4** All push-back manoeuvres are to end with the aircraft aligned with the taxiway/ taxilane centreline.
- 4.5** If a cross bleed start is necessary, ensure that the aircraft is pulled or taxied forward to the head of the cul-de-sac (or at least 200 metres from the blast screen) before the cross bleed engine start is commenced.

**NOTE:** This may require the pilot to obtain ATC clearance to move from the normal push-back position.

## **5 Taxyng**

Pilots must use the minimum power necessary to get/keep the aircraft moving, particularly when in the cul-de-sac aprons.

## **6 Safety in the Vicinity of Works Areas**

Development and maintenance work in the Movement Area occasionally involves sections of the Area being totally withdrawn from use. At other times aircraft access has to be restricted due to the work in progress; notification is always given by the issue of a Safety Instruction. These sections are always coned, barriered or fenced off and are marked at night with red obstruction lights along their perimeters. Pilots are to use minimum power when in the vicinity of these working areas and should never direct jet-blast towards the areas.

## **7 Aircraft Self Manoeuvre**

- 7.1** The aircraft stands at the airport are designed for the nose-in parking of aircraft and for subsequent push-back by aircraft tug. The following exceptions may apply:
  - 7.1.1** Permanent permission for propeller driven commuter type aircraft, to reverse off stands under their own power, can be given for operators/airlines whose procedures are approved. Such approval is under the provisions of the current Safety Instruction entitled – Aircraft Power-Back Procedures which



should be consulted for details of the method of application. Only in exceptional circumstances will any other aircraft be permitted to reverse off a stand under its own power. Specific clearance must be obtained for each movement and pilots must comply with the clearance instructions.

Applications should be made to the Operations Control Center.

- 7.1.2 As a matter of routine airport may require some small and medium size aircraft to turn on selected stands where circumstances and stand dimensions permit. In this event aircraft will be marshalled into position.
- 7.1.3 Conversely, pilots who wish their aircraft to be turned on stand, for subsequent self-manoeuving on departure, must obtain specific clearance for each movement and must comply with the clearance instructions. A marshalling service will be provided.

Applications should be made to the Operations Control Center.

## **8 General**

- 8.1 It is essential that the contents of this Instruction are given the widest circulation to pilots, engineering and other ground staffs concerned with the movement of aircraft.

## Appendix G

### Model Safety Instruction - Aircraft Engine Ground Runs and the use of Auxiliary Power Units

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

Airport is responsible for the safe ground running of aircraft engines on the aerodrome and the control of blast, fumes and ground noise. This instruction sets out the rules and procedures for aircraft engine ground runs and the use of aircraft auxiliary power units (APUs) and ground power units (GPUs).

#### 2 Definition

- 2.1** For the purpose of this Instruction, an engine ground run is defined as any engine start-up not associated with the planned aircraft departure.

#### 3 Approval

- 3.1** Permission for an engine ground run must be obtained in advance from the Air Traffic Control and Operations Control Center.
- 3.2** The following details must be provided when seeking permission to carry out an engine run:
- Airline
  - Aircraft type and registration
  - Requested location for engine run
  - Planned start time
  - Expected duration
  - Number of engines to be run simultaneously

- Level of engine power to be used
- Type of maintenance/check
- Why the engine run is required

3.3 Any variation to the details given above must be the subject of a further permission.

## 4 Safety

4.1 All personnel concerned with engine ground running must be fully familiar with these rules and with the following requirements, which must be complied with at all times

### 4.2 Aircraft Parked on Stands

4.2.1 On stands in cul-de-sacs and other selected stands, engine ground runs will be limited to check-starts and idle power. For checks requiring the use of greater power settings it will be necessary to move the aircraft to a more suitable location, as directed by the Operations Control Center.

4.2.2 The aircraft must be positioned correctly on the stand in such a way that engine running will not harm persons or cause damage to aircraft, buildings, installations, vehicles or equipment in the vicinity.

4.2.3 All apron equipment must be placed at a safe distance from the aircraft.

4.2.4 Where applicable, the rear of stand road must be closed, to safeguard vehicular traffic, before any approved engine run is permitted.

4.2.5 The aircraft anti-collision beacon(s) must be switched on before engines are started and must remain on for the duration of the ground run.

4.2.6 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.

4.2.7 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.

4.2.8 A trained member of airline or handling staff is to be positioned on the stand in verbal contact with the flight deck. He/she will communicate by R/T 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 R/T or interphone link is unserviceable, hand signals by day and light signals by night may be used.

- 4.2.9 Any operator requiring advice on the safety aspects of paragraph 4.2 above should contact the Airport Safety Unit.

#### **4.3 Aircraft in Other Areas**

- 4.3.1 If engine ground running is approved to be carried out in any other location, it is the responsibility of the engineer in charge to ensure that the area behind the aircraft, which could be subjected to blast, is clear of persons, vehicles and equipment and that the ground is firm and free from loose tarmac, stones and other materials. The area immediately in front of the engine intake(s) must also be clear. A look out must be provided as in paragraph 4.2.8 above.
- 4.3.2 Any operator requiring advice on the safety aspects of paragraph 4.3.1 above should contact the Airport Safety Unit.
- 4.3.3 During all ground running of engines, other than in the Maintenance Area, a listening watch must be maintained on the ATC Ground Movement Control frequency to ensure the prompt initiation of emergency procedures if required.

### **5 Auxiliary Power Units**

- 5.1 Aircraft APUs generates high level of noise and significant fumes which can cause disturbance to those on nearby aprons, in buildings and in residential areas. The noise of an APU may mask the noise of an approaching vehicle, thus endangering staff.
- 5.2 Airlines and handlers are to ensure that APUs are used for the absolute minimum time necessary to meet operational needs.
- 5.3 APUs are not to be used as a substitute for either FEGP or GPUs.

### **6 Ground Power Units**

- 6.1 Constantly running GPUs can cause high noise levels on the apron, are an additional obstruction to free movement around a parked aircraft and, if poorly maintained, may deposit oil spillage on the stand.
- 6.2 In apron areas where FEGP is provided and serviceable, GPUs are not to be used. Where there is no alternative to the use of GPUs they should be promptly shut down when power is no longer required.

- 6.3** When purchasing new GPUs, airlines and handling agents are urged to make low working noise levels a prime requirement in the selection process.

## Appendix H

### Model Safety Instruction - Foreign Object Debris/Damage

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1 Airport is responsible for taking adequate measures to ensure the safety of aircraft, vehicles and persons using the aprons. A fundamental element of the safety effort is to maintain the aprons in a clean condition and free from obstructions.
- 1.2 Foreign objects are regularly deposited on the Movement Area and it is essential that all airport personnel understand the danger to flight safety that such objects represent. Foreign objects may be ingested into aircraft engines causing damage leading to engine failure, which is especially critical if it occurs in flight, particularly if it occurs during the take-off phase. At best, such damage leads directly to premature engine removal and replacement. In addition, damage caused by foreign objects can occur to tyres and undercarriages, control systems and other parts of the airframe. All such damage could lead to in-flight failures and inevitably requires expensive repairs to be made. All foreign objects are a threat to aircraft safety.
- 1.3 Every individual has a responsibility to ensure that the risk of damage to aircraft from FOD is minimised. Any item of FOD found by a staff member in the course of their work should be removed and placed in the bin provided. An item of FOD seen in an area that a staff member is not authorised to enter should be brought to the attention of a supervisor. All operators should introduce staff procedures that reflect these responsibilities.
- 1.4 Foreign Object Debris (FOD) is a general term which applies to all loose objects which are a danger to the safety and integrity of an aircraft and which, therefore, must not be left in any area so as to constitute a hazard. The list of

FOD items most frequently found on the apron is long and principally includes:-

Plastic and paper bags/sheets, rags, empty oil and hydraulic fluid cans, empty soft drink cans, nuts and bolts, tools and equipment, luggage wheels and tags, metal cutlery, burst ballast bags, broken wooden items and miscellaneous rubbish.

The presence of FOD is due mainly to the carelessness of staff and their lack of understanding of the consequences.

## **2 General Rules**

### **2.1 Responsibilities**

No FOD is to be deposited or left on any part of the Movement Area. It is the direct responsibility of airlines, handling agents, fuelling companies, cleaning companies, catering companies, engineering operatives/contractors and all other users of the aerodrome to ensure that it is maintained in as safe and clean a condition as possible and that all FOD is removed as soon as it is found. Great care must be exercised by all those working on the apron, particularly those working on aircraft, to ensure that no FOD is left behind from their operation.

### **2.2 Aprons Areas**

After completing the ground handling, refuelling and servicing of an aircraft the stand areas must be left clean and tidy. FOD must be removed or placed in the containers provided. All apron equipment which could be blown away must be secured to some fixed object, or stored in a safe place not exposed to wind or aircraft engine blast effect.

### **2.3 Vehicles on the Movement Area**

Before proceeding from one area of the airport to another via a route that involves crossing the Movement Area, all vehicles must be carefully inspected to ensure that anything that is carried in or on the vehicle is secured, that all doors and tail or side boards are closed and securely locked shut and that no parts of the vehicle or trailer are loose and likely to become detached.

### **2.4 Spillages**

Airport maintains cleaning equipment and crews at readiness for the immediate clean-up of spillages. All spillages of materials must be reported immediately to the RFFS, for their action. This is especially important when the spillage is fuel or any other inflammable material.

## **2.5 Removal of Apron Hazards**

- 2.5.1 The parking or abandonment of unserviceable ground equipment or vehicles, contractor's materials and miscellaneous objects on the aprons constitutes a safety hazard and contributes to apron congestion.
- 2.5.2 Unserviceable equipment, vehicles, contractors' materials or other miscellaneous objects (hereinafter referred to as 'the Object') are found to be creating an obstruction or a hazard they will be marked with a notice by Ramp Operation Unit or any staff responsible for the safety of the same area.
- 2.5.3 If an offending Object is considered to be an immediate hazard it will be removed immediately and without prior notice.
- 2.5.4 Airport accepts no responsibility for any damage to the Object before, during or after removal to the compound.



## Appendix I

### Model Safety Instruction - Passenger Airbridges

Important note: This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

There are two specific types of bridge in use, referred to as either rail-drive or apron-drive airbridges.

#### 2 Passenger Airbridge Service

- 2.1 Use of the airbridge by an aircraft operator, owner or handling agent, shall constitute prior acceptance of the conditions set out hereunder.
- 2.2 Airport will carry out its schedule of engineering preventative maintenance during the quiet hours.
- 2.3 Airport will carry out an operational daily inspection of all airbridges during the quiet hours.
- 2.4 Airport will maintain and clean the airbridges and is responsible for the maintenance of airbridge operating standards.
- 2.5 Except as otherwise expressly provided in this instruction the conditions of use of Airport, as promulgated, shall apply to the use and operation of airbridges.

#### 3 Airbridge Operator Certification

- 3.1 Airbridges may be operated only by persons holding an Airbridge Operator's Certificate issued by the authorized authorities, endorsed for the appropriate type of airbridge. Certificates are restricted to those persons who operate airbridges regularly as an essential part of their job function.

- 3.2 The issue of a certificate is subject to the satisfactory completion of a course of training, followed by an airbridge driving test, where candidates must be able to demonstrate a high standard of familiarity and safety proficiency in the operation of the airbridge.
- 3.3 Certificates must be re-validated every two years by the nominated airbridge training instructor. Airport may also require a certificate holder to be submitted for a revalidation check on request. Operators must comply with any other requirements or conditions which may be determined from time to time by Airport.
- 3.4 The airbridge certificates remain the property of Airport. In circumstances where, in the opinion of Airport, the operator has acted negligently or recklessly in the operation of an airbridge, Airport reserves the right to suspend unconditionally and immediately the certificate for a specified period pending retraining or to withdraw the certificate altogether.

#### **4 Airbridge Operator's Responsibilities**

- 4.1 It is essential that a careful check is made to ensure that no vehicles or equipment are parked beneath, or in the manoeuvring area of, the airbridge. Additionally the bridge must be free of debris and correctly parked before an aircraft enters the stand. This is particularly necessary on stands equipped with apron-drive bridges, as safe clearance from aircraft engines and wings may not otherwise be maintained. If bridges are not fully retracted for any reason, aircraft must be Stopped Short (see paragraph 8 below).
  - 4.1.1 Apron-drive bridges are fitted with an audible warning and flashing lights which operate whenever the speed control is operated and the bridge is moving.
  - 4.1.2 In the interests of safety, whenever an apron-drive bridge is moved, a 'look out' should be positioned on the apron to assist the bridge operator. This precaution is particularly necessary on bridges which are not fitted with CCTV, or where the CCTV is unserviceable.
  - 4.1.3 All bridges are fitted with an interlocked safety barrier and will not move unless the barrier is correctly positioned across the mouth of the bridge.
  - 4.1.4 All airbridges are fitted with a safety canopy and an autoleveller device. The canopy provides fire and weather protection for bridge users and the autoleveller compensates for trim changes experienced during aircraft refuelling and the loading and unloading of passengers.

- 4.1.5 The airbridge operator must ensure that the autoleveller is engaged before loading or unloading the aircraft. Whenever the airbridge is docked to the aircraft the autoleveller must remain engaged.
- 4.2 In the event of the loading or unloading of very heavy cargo, the airbridge must be withdrawn from the aircraft as the rapid trim changes may be beyond the capability of the autoleveller system.
- 4.3 Airbridges should not be left unattended when passengers are being embarked or disembarked. Should the bridge go out of limits while loading or unloading is taking place, the bridge is to be removed and repositioned.
- 4.4 When bridges are not being used for passenger loading or unloading they should be retracted into their parking box and closed down. Airlines and handlers are advised that whenever a bridge is docked to an aircraft a qualified airbridge operator should be in attendance, unless an approved and serviceable safety shoe device is employed.
- 4.5 Aircraft operators are reminded that they are responsible for the security of their aircraft and docked airbridges make aircraft vulnerable. To prevent unauthorised access via airbridges, airlines should either deploy personnel to control access to their aircraft or remove the airbridge from it.
- 4.6 Whenever an apron-drive bridge has been removed from an aircraft it must be parked in its parking box and closed down. Whenever a rail-drive airbridge has been similarly removed it should be fully retracted and closed down.
- 4.7 The aircraft passenger door is to remain closed until the airbridge has been correctly docked and must be closed before the bridges is retracted.

NOTE: This does not apply to certain aircraft, with integral passenger steps, when alternative procedures have been specifically authorised by Airport Safety Department.

- 4.8 Airbridges must not be moved when passengers are on the airbridge.

## **5 Operation of Airbridges**

Rail-drive airbridges and apron-drive airbridges must be operated in accordance with the instructions contained in the Airport Standard Operating Procedures (SOPs) booklet which is issued to all certified operators.

## **6 Parking Boxes**

- 6.1 Parking boxes are painted on the apron to indicate to all concerned with aircraft arrivals and departures the correct parking positions for the apron-drive airbridges.
- 6.2 Both wheels of the bridge must be within the box whenever the bridge is in the parked position.

## **7 Visual Docking Guidance System (VDGS)**

All stands equipped with airbridges are provided with VDGS. Details of these installations and the method of use are described in the Safety Instruction dealing with VDGS.

## **8 Stop Short Procedures**

- 8.1 If an airbridge is unserviceable or cannot be fully retracted the stand must be withdrawn from use or, if practicable, allocated to aircraft types that can safely be stopped short of the airbridge for passenger steps to be used. The need to Stop Short will be indicated to flight crews by one of the following methods:
  - a) An illuminated sign which flashes in red 'STOP SHORT'.
  - b) A STOP SHORT sign displayed on a rail-drive airbridge.
  - c) By marshalling signals.
- 8.2 Full stop short procedures are described in the Safety Instruction dealing with VDGS.

## **9 Fault Reporting**

- 9.1 In the event of any malfunction/failure occurring to an airbridge, or of a bridge obstructing a stand, Operations Control Centre (OCC) must be advised immediately, telephone \_\_\_\_\_ giving the stand number and brief details of the fault. OCC will alert Airport Engineering Department (who should not be contacted directly) to attend and rectify the fault. OCC will also alert Ramp Operations Unit who will decide any limitations necessary and provide a marshalling service.
- 9.2 If an airbridge fails when in contact with an aircraft OCC should be notified as in 9.1 above. The airbridge may be wound away from the aircraft using the emergency procedure as described in the Airbridge SOPs within the operations manual , to permit a normal pushback to be carried out. Instructions for emergency wind back are also prominently displayed in airbridge cabs.

The STOP SHORT warnings must be displayed to prevent the next arriving aircraft colliding with the extended airbridge.

## **10 Emergency Stop and Emergency Back-off Action**

(Instructions on Emergency Stop and emergency back-off procedure for your types of airbridge should be inserted here.)

## **11 Accident Reporting Procedure**

It is the responsibility of the airbridge operator to report all accidents involving serious injury to personnel, damage to aircraft or the airbridge, in accordance with the procedure detailed in the current Airside Accident Safety Instruction.

## Appendix J

### Model Safety Instruction - Strong Winds

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1** Strong wind conditions can give rise to hazards from wind-blown items and in very strong winds there is a possibility of structural damage to aircraft. The principal threats are of engine ingestion or airframe damage to aircraft on stands, taxiways and runways; the severity of the threat of obstruction of a runway to an aircraft taking off or landing cannot be stated too strongly. There is also a danger of personal injury for apron staff and damage to vehicles and equipment.
- 1.2** This Instruction details the requirements, and precautions to be taken, when strong winds are expected/experienced at Airport.

#### 2 Strong Wind Warnings

When meteorological warnings of strong winds are received by Airport, the details of the warning will immediately be broadcast by a message on the staff information system.

#### 3 Responsibilities in Strong Winds

- 3.1** When a strong wind warning has been issued, or when strong wind conditions are experienced, the following actions must be taken by airlines, handling agents, operators and staff:
- a. Extra vigilance must be exercised to prevent accumulations of FOD and to ensure that all loose items are removed or safely stowed (plastic bags and sheeting are a particular threat to engine ingestion in all areas of the airfield.). Action must be taken to ensure that covers are securely fastened on all waste

containers.

- b. All ground equipment and vehicles on the aprons, not in immediate use, must be parked in the areas provided with parking brakes applied.
- c. Equipment in use on stands must be secured with parking brakes set. Equipment without parking brakes must be chocked or removed.
- d. Large items of equipment that are vulnerable to winds, such as empty freight containers, must be secured to a fixed object or removed to a protected area.
- e. All loose items in contractor's works areas must be secured or removed.
- f. Staff observing any obstruction or equipment moving in the wind, irrespective of ownership, must take action to secure it.
- g. Handling staff should take special precautions when towing aircraft and should refer to the company's operations manual for specific guidance.
- h. Aircraft rubbish and equipment that is normally temporarily placed on the stand, such as bagged waste, blankets or headsets, must be removed or securely stored immediately it is removed from the aircraft.

#### **4 Airbridges**

When wind speeds exceed 30 kts, airbridge cabs should be fully lowered with the shutters closed and where possible positioned to face out of wind, to avoid structural damage. Airport Engineering will initiate this airbridge safeguarding.

#### **5 Positioning and Picketing of Aircraft**

Airlines who wish to position their aircraft facing into wind should advise the Operations Control Centre and request allocation to a suitable stand or other airfield area. Owners of General Aviation - GA aircraft or their agents should contact the Ramp Operation Unit if they have any problems in picketing their aircraft.

#### **6 Towing of Aircraft**

Airline operators are responsible for issuing instructions on the limiting wind speed for the towing of their aircraft.

#### **7 Cancellation of Strong Wind Warnings**

When strong winds have subsided, or are no longer expected, a cancellation message will be broadcast on the staff information system.

## Appendix K

### Model Safety Instruction - Apron Operations in Low Visibility Conditions

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

Low visibility procedures (LVPs) are introduced at Airport when the Runway Visual Range (RVR) is reduced to 800 metres or is forecast to fall below this value, or when the cloud ceiling is reduced to 300 feet or below or is forecast to fall to 200 feet or below. The decision to declare LVPs is taken and initially notified by ATC. LVPs are for the protection of aircraft operating down to the very lowest visibilities and are designed to protect runways, precision approach aids and aircraft movements by limiting vehicular movements to the minimum necessary and stopping all engineering works on the Manoeuvring Area. Airport is responsible for safeguarding the Manoeuvring Area and the attention of all staff is directed to this instruction which gives the procedures for operating on the apron in low visibility.

#### 2 Low Visibility Warnings

When LVPs are declared by ATC, Airport will immediately arrange for the broadcast of a warning to airlines and staff by a message on the staff information system.

#### 3 Responsibilities During LVPs

When aware that LVPs are in force, staff should comply with the following:

- a. Only vehicles operated by Airport Operations, ATC, the Airport Fire Service, aircraft tugs (see b) ) and vehicles escorted by Airport Operations are permitted on the Manoeuvring Area and these will be under the positive control of ATC.



- b. Tugs involved in a push-back operation are permitted to enter the taxiway, when coupled to an aircraft and must recover to the stand by the most direct means when the push-back is complete.
- c. Tugs with aircraft under tow may do so only under escort by a Airport Operations vehicle.
- d. Warning signs denoting that LVPs are in force will be positioned at the approaches to the Manoeuvring Area and drivers must comply with the instructions on these signs.
- e. Drivers must be familiar with the limits of the aprons and must not enter a taxiway by crossing the double white painted lines that mark the boundary between the taxiways and the aprons.

#### **4 Low Visibilities on Aprons**

When visibilities are reduced to values of 200 metres or less staff should observe the following precautions:

- a. Vehicles should be operated with dipped headlights, and where fitted, fog lights, illuminated and drivers should proceed with extreme caution.
- b. Vehicle obstruction lights should be switched on.
- c. Only essential journeys on the aprons should be undertaken.
- d. All staff should be alert to the sudden appearance of an aircraft entering a stand and be prepared to give way accordingly.

#### **5 Cancellation of LVPs**

When ATC notify that LVPs are cancelled, Airport will immediately arrange to advise staff by a message on the staff information system.

## Appendix L

### Model Safety Instruction - Winter Operations and Apron Hazards

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1 The current Safety Instruction entitled 'AIRPORT SNOW CLEARANCE PLAN' summarises snow clearance responsibilities and arrangements for the manoeuvring area. Those provisions are not repeated here.
- 1.2 This instruction sets out the precautions to be taken on the aprons in winter conditions, including the responsibilities of operators on the apron when freezing conditions are experienced or expected.

#### 2 Notification

- 2.1 When meteorological warnings of frost or freezing conditions are received, or freezing conditions are observed on the apron, details will be transmitted to airlines, operators and staff.
- 2.2 Airport will make every effort to disseminate information on the changing weather situation. It is the responsibility of airlines, handling agents and operators to warn passengers and staff of the likely presence of snow and/or ice in their operational areas and to take self-help measures whenever possible.
- 2.3 Any winter hazards not specifically mentioned in Airport staff information system messages should be notified to the Airfield Maintenance Unit for action.

#### 3 Airport Responsibilities

Airport will assess any freezing conditions and arrange for de-icing and gritting

operations as deemed necessary. Airbridges, including outside steps, and fixed stand equipment will be de-iced by Airport staff, as will passenger routes and any associated steps/ramps. Any airline experiencing difficulty should contact the Ramp Operations Unit for advice and assistance.

#### **4 Precautions in Freezing Conditions**

Winter weather brings extra hazards which require awareness and more care on the part of personnel working on the aprons, if accidents are to be avoided. Simple precautions that can reduce accident risks should be taken as follows:

- a. Allow additional time for all ramp activities and take extra care when walking across apron surfaces which may be slippery.
- b. Take extra care when driving, especially when approaching an aircraft, or on the approaches to a road junction. When driving, bear in mind that vehicles require a greater distance in which to stop safely.
- c. Do not leave a vehicle unattended with the engine running simply to keep the cab warm or to charge the battery.
- d. Ensure attention is given to vehicle inspection prior to use. Check the operation of lights, battery condition and that sufficient anti-freeze is used in coolants and other fluids.
- e. Surfaces, particularly painted areas, treated with de-icing/anti-icing materials initially become more slippery. Staff and passengers should be warned to exercise extra care in these circumstances.
- f. High visibility clothing should be worn in accordance with current instructions.
- g. Make allowance for other staff whose movements may be restricted by difficult working conditions.
- h. Salt must never be used to de-ice apron surfaces due to the corrosive effect upon aircraft. Operators should contact the Airfield Maintenance Unit if they have any queries about the suitability of de-icing or anti-icing materials.

#### **5 Avoidance of Water Spillage from Vehicles/Installations**

**5.1** In freezing conditions, or when freezing conditions are forecast, action must be taken to avoid the unnecessary formation of ice on apron and road surfaces. Operators of specialist vehicles involved in the carriage of water must take special precautions as follows:

- a. Operators of potable water tankers and toilet servicing vehicles must be vigilant that there is no spillage or leakage leading to subsequent freezing. The flushing of potable water tanks is not permitted on apron surfaces.

- b. Care must be taken in the use of potable water points to contain spillage and overflow to a minimum.
- c. The washing of apron equipment, vehicles or aircraft is not permitted except in the specialist washdown areas provided.
- d. Catering vehicle operators should ensure that any excess ice from aircraft galleys is disposed of properly and not dumped on the apron.
- e. If a spillage occurs the RFFS should be informed immediately.

**5.2** All operators of aircraft parked on stand during freezing conditions should ensure that galley drains are not left dripping on to apron surfaces and that when aircraft tanks are drained the drained water is disposed of where it cannot present an ice hazard if it subsequently freezes.

## Appendix M

### Model Terms of Reference – Airside Safety Committee

**Important note:** This Appendix represents a model instruction that might reflect the management organisation and procedures at an airport. The material contained in this Appendix is intended to act as an example that can be modified to suit the actual arrangements at an airport. The job titles, responsibilities and procedures will not necessarily be suited to or appropriate at any particular aerodrome and are intended only to illustrate the type of procedures that are likely to be required in order to adequately manage the safety of aircraft and people in airside areas.

#### 1 Introduction

- 1.1 The aim of the Airside Committee is to promote and maintain airside safety. It is the premier forum for the discussion and resolution of all apron safety issues.
- 1.2 The chairman of the Committee should be chaired by an aerodrome operator's official, responsible for aerodrome operations; and  
The aerodrome operator's safety manager should act as the secretary of the Committee(s).

#### 2. Organization of the committee

- 2.1 Membership will comprise selected Airport managers and a broad representation of the airside operators and agencies across the airport. Individual representatives should be of a suitably senior level and should preferably be the nominated Operations Safety Manager.
- 2.2 The following are eligible to be represented:
  - a. Aircraft Operators;
  - b. Companies providing aircraft handling services;
  - b. Fuelling companies.
  - c. Local emergency services: – Police, Fire Service and Ambulance Service;
  - d. Air Navigation Service Provider (s);
  - e. Airport specialist departments with airside responsibilities and interests;

- f. Aerodrome wildlife management
  - g. Specialist representatives may be co-opted from time to time at the discretion of the chairman.
- 2.3 The Committee will hold regular meetings. Meeting agendas will be circulated in a timely manner together with any relevant papers for members' consideration. There will be a full distribution of Minutes of meetings. Any actions arising from meetings will be annotated in the Minutes and it is implicit that these will be followed through.
- 2.4 The Committee may from time to time establish and nominate specialist Working Groups to consider and report on particular safety issues.
- 2.5 Committee tasks
- 2.6 The Committee will receive and consider briefings on planning issues and provide operational safety advice on medium and long term changes expected in the industry, such as the introduction of new aircraft, major equipment and new regulations. It will also provide an interface for the examination and resolution of inter-company safety issues.
- 2.7 The tasks of the Airside Safety Committee(s) should be:
  - (1) to receive and evaluate reports on operational safety issues;
  - (2) to receive reports and statistical information on accidents and incidents, and propose solutions;
  - (3) to advise on manoeuvring area/apron safety issues such as:
    - (i) promotion of apron safety discipline;
    - (ii) FOD prevention;
    - (iii) developing measures for safe operations;
    - (iv) considering actions to resolve manoeuvring area/apron safety problems;
    - (v) apron equipment issues;
    - (vi) adherence to vehicle traffic issues;
    - (vii) new and/or updated safety instructions;
    - (viii) personal protective clothing/equipment issues;
    - (ix) methods to develop and promote apron safety awareness initiatives,
    - (x) snow and ice clearance issues;
    - (xi) proposed aerodrome works;
    - (xii) proposed changes/developments to the movement area;
    - (xiii) standard operating procedures, etc.

## Bibliography

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- Regulation No 06/2013 Rules of the Air;
- Regulation No 08/2014 Conditions And Methods of Transporting Dangerous Goods by Air and any act amending it;
- Regulation No. 09/2017 on the Reporting, Analysis and Follow-Up of Occurrences in Civil Aviation
- UK CAP 642 – Airside Safety Management
- ICAO Annex 14 Aerodromes (Volumes I and II)
- ICAO Annex 2 Rules of the Air
- ICAO Annex 18 The Safe Transport of Dangerous Goods by Air
- IATA Airport Handling Manual - AHM
- ACI Airside Safety Handbook
- IATA Apron Markings and Signs Handbook
- ACI Markings and Signs Handbook