สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Guidance Material on Apron Management and Apron Safety

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0. Introduction

0.1 Background

a) There are a large number of activities taking place on aprons within a congested and time-sensitive environment. Accidents, incidents and occurrences can affect the safety and health of personnel as well as cause aircraft damage.

b) Ensuring safety on the apron is primarily the responsibility of the aerodrome operator, however, all third parties operating on the apron have a responsibility to ensure the safety of their specific operations.

c) Apron hazards should be identified and, when necessary, mitigation measures should be developed as part of the aerodrome operator's safety management system (SMS). All staff operating on the apron need to be made aware of its hazards: this may be achieved through general safety introduction training for all staff with unescorted access to the apron areas.Part of this training includes aerodrome operating procedures related to apron management and safety.

d) The need for close liaison between the aerodrome operator, aircraft operator, ATS and other third parties is paramount. Stand allocation, aircraft arrival or departure time, start-up clearances, dissemination of information to operators, notification of work in progress and non-availability of facilities, security arrangements and the availability of safety services, are all items of vital importance to both ATS and the Aerodrome operators. The operational efficiency and safety of whichever system is adopted, depends very largely upon this close co-operation.

e) Airside vehicles constitute a continual hazard to both people and aircraft and require vigilance at all times for all those working airside. Aerodrome operators may be able to eliminate or minimise the risks by keeping pedestrians and vehicles apart where possible, for example by the use of passenger boarding bridges (airbridge) and marked or barriered walk-ways

f) The aerodrome community, under the leadership of the aerodrome operator, should carefully examine all safety issues and implement corrective measures in a timely manner.

0.2 Purpose

a) The advice and guidance in this document is best described as 'Accepted Good Practice' and represents an acceptable way of doing things.

b) The guidance in this document illustrates how risks might be identified and provides advice about how apron management and apron safety can be managed within the context of a systematic and structured management approach within a Safety Management System (SMS).

c) It is impossible to guarantee that adherence to the guidance in this document will always satisfy all regulatory requirements under all possible circumstances nor will it guarantee safety. This is simply because service providers (at every level) themselves are ultimately responsible for deciding on the appropriateness and applicability of any particular safety arrangements with respect to their own specific circumstances and for monitoring the suitability and success of the arrangements.

d) In many cases the responsibility for performing a particular function is not placed on a specific individual and will be delegated to a particular individual or organization within an aerodrome, or may be shared. In such circumstances the delegation or division of responsibility must be clearly documented and accepted by all parties involved.

e) Ensuring the safety of individuals and of aircraft in airside areas is a complex undertaking and the content of this document cannot be taken in isolation. There are many associated systems and procedure documents, for example the Aerodrome Manual. These systems will affect the various organisations that operate in airside areas at an aerodrome . It is important to recognise that not only will each organisation need to develop its own systems to complement those it interfaces with but that no two aerodromes are alike and that no assumptions can be made based on the solutions used at another location.

0.3 Applicability

This Guidance Material applies to:

1) Thai aerodrome operators operating a public-use aerodrome.
2) The Civil Aviation Authority of Thailand (CAAT) inspectors with certification and safety oversight responsibilities

Whilst this document is primarily aimed at aerodrome operators operating a public-use aerodrome, airlines and ground handling service providers, it may be equally applicable to activities at private aerodromes, heliports and military aerodromes. In these cases the term ‘Aerodrome Operator’ should be considered as the ‘person in charge of safety at the aerodrome’ or for example, the ‘Accountable Manager’.

0.4 Effective Date

28 January 2022

0.5 Reference

1) Requirement of The Civil Aviation Authority of Thailand No.14 on Aerodrome Standards B.E. 2562
2) Rule of The Civil Aviation Authority of Thailand on Standards for Public Aerodrome Manuals B.E.2562
3) Rule of Department of Civil Aviation on Standards of Aerodrome Operating Procedures B.E. 2557

4) Doc 9137 Aerodrome Services Manual Part 8 Aerodrome Operational Services, First Edition 1983
5) Doc 9157 Aerodrome Design Manual Part 2 Taxiways, Aprons and Holding Bays, Fifth Edition 2020
6) Doc 9981 Procedures for Air Navigation Services – Aerodromes, Third Edition 2020
7) Doc 10121 Manual on Ground Handling, First Edition 2019
8) Civil Aviation Authority, Airside Safety Management (CAP642), 2018
9) Aerodromes Council International, Airside Safety Handbook Fourth edition 2010
10) Aerodromes Council International, Safety Management Systems Handbook – First Edition 2016

0.6 Definitions and Acronyms

0.6.1 Definitions

When the following terms are used in this document, they have the following meanings:

Aircraft stand. A designated area on an apron intended to be used for parking an aircraft.

Apron. A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Apron management service. A service provided to regulate the activities and the movement of aircraft and vehicles on an apron.

Ground handling. Services necessary for an aircraft's arrival at, and departure from, an airport, other than air traffic services.

Operations manual. A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Safety assessment. An element of the risk management process of an SMS that is used to assess safety concerns arising from, inter alia, deviations from standards and applicable regulations, identified changes at an aerodrome or when any other safety concerns arise.

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

0.6.2 Acronyms

APU Auxiliary Power Unit
ATS Air Traffic Service
FOD Foreign Object Debris/Damage
GHSP Ground Handling Service Providers
PPE Personal Protective Equipment
RTF Radiotelephone/Radiotelephony
SOP Standard Operating Procedure
VDGS Visual Docking Guidance System

1. Types of Aprons

An apron is a defined area intended to accommodate aircraft for purposes of loading and unloading passengers, mail or cargo, fuelling and parking or maintenance. The apron is generally paved but may occasionally be unpaved; for example, in some instances, a turf parking apron may be adequate for small aircraft.

1.1 Passenger Terminal Apron

The passenger terminal apron is an area designed for aircraft manoeuvring and parking that is adjacent or readily accessible to passenger terminal facilities. This area is where passengers board the aircraft from the passenger terminal. In addition to facilitating passenger movement, the passenger terminal apron is used for aircraft fuelling and maintenance as well as loading and unloading cargo, mail and baggage. Individual aircraft parking positions on the passenger terminal apron are referred to as aircraft stands.

1.2 Cargo Terminal Apron

Aircraft that carry only freight and mail may be provided a separate cargo terminal apron adjacent to a cargo terminal building. The separation of cargo and passenger aircraft is desirable because of the different types of facilities each requires both on the apron and at the terminal.

1.3 Remote Parking Apron

In addition to the terminal apron, airports may require a separate parking apron where aircraft can park for extended periods. These aprons can be used during crew layovers or for light periodic servicing and maintenance of temporarily grounded aircraft. While parking aprons are removed from the terminal aprons, they should be located as close to them as is practical to minimize the time for passenger loading/unloading as well as from a security point of view.

1.4 Service and Hangar Aprons

A service apron is an uncovered area adjacent to an aircraft hangar on which aircraft maintenance can be performed, while a hangar apron is an area on which aircraft move into and out of a storage hangar.

1.5 General Aviation Aprons

General aviation aircraft, used for business or personal flying, require several categories of aprons to support different general aviation activities.

1.5.3 Itinerant Apron

Itinerant (transient) general aviation aircraft use the itinerant apron as temporary aircraft parking facilities and to access fuelling, servicing and ground transportation. At aerodromes servicing only general aviation aircraft, the itinerant apron is usually adjacent to, or an integral part of, a fixed-based operator's area. The terminal apron will generally also set aside some area for itinerant general aviation aircraft.

1.5.4 Base Aircraft Aprons or Tiedowns

General aviation aircraft based at an aerodrome require either hangar storage or a tiedown space in the open. Hangared aircraft also need an apron in front of the building for manoeuvring. Open areas used for base aircraft tiedown may be paved, unpaved or turf, depending on the size of aircraft and local weather and soil conditions. It is desirable that they be in a separate location from the itinerant aircraft aprons.

1.5.5 Other ground servicing aprons

Areas for servicing, fuelling or loading and unloading should also be provided as needed.

1.6 Helicopter Apron

When an airport is also intended to serve extensive helicopter operations it may be necessary to plan for a helicopter terminal and apron. The location for such a terminal may depend on the type of helicopter traffic.

2. Apron Management

2.1 General

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

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

c) Apron management services may be provided by the aerodrome traffic service unit, by a unit set up by the aerodrome operators, by the operator in the case of a company terminal, or by co-ordinated control between Air Traffic Service (ATS) and the aerodrome operators or operating company.

2.2 Co-ordinated Management

a) A written agreement or pre-agreed standard operating procedure (SOP) should exist between both parties defining the method of coordination and points of transfer of responsibilities, where co-ordination between air traffic service unit and apron management unit is required.

b) One form of the co-ordinated apron management service is where radio control of aircraft requiring start-up or push-back clearance on the apron is vested in the Air Traffic Control Service Unit, and the control of vehicles is the responsibility of the aerodrome operator. At these aerodromes, instruction to aircraft are given on the understanding that safe separation between the aircraft and vehicles not under radio control is not included in the instruction.

c) The Apron Management Unit provided by the Aerodrome operator maintains close communication with the Air Traffic Control Service Unit and is responsible for aircraft stand allocation, dissemination of movement information to aircraft operators by monitoring ATC frequencies, and by updating basic information continuously on aircraft arrival times, landings and take-offs.

d) Responsibility for marshalling service, leader van service, gate and parking allocation, start-up, push back and taxi clearances, control of vehicles on the apron, maneuvering areas are clearly and unambiguously assigned

2.3 Aircraft Stand Allocation

a) Overall responsibility for aircraft stand allocation should be retained by the aerodrome operator although for operational convenience and efficiency a system of preferred user stands may be

established. Instructions should clearly state which stands may be used by which aircraft or groups of aircraft. Where considered desirable, a preferred order of use of stands should be laid down. Apron control staff should be given clear guidance on the stand occupancy times to be permitted and the steps to be taken to achieve compliance with the rules.

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

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

d) Procedures and communications with interested parties will be needed to close and re-open stands for planned maintenance work (air bridge repairs, apron slab replacement, and line painting) or due to accidents, incidents or spillages.

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

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

g) Adequate aircraft stand clearances and apron safety lines have been provided in accordance with applicable standards. Apron safety lines include wing tip clearance lines and service road boundary lines.

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

2.4 Engine Management on Aircraft Arrival/Departure

a) When entering 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 may be particularly important in locations where there are stands on the opposite side of the taxiway or taxilane. A trained member of airline or handling personnel should ensure that the area behind the aircraft and the zone immediately in front of the engine intakes are clear of personnel, vehicles, FOD and equipment before engine start.
b) The aircraft anti-collision beacon must be switched on before an engine is started.
c) The number of engines started before pushback commences should be the minimum to meet technical and passenger service needs.
d) During start up and pushback, engine power settings should not normally exceed ground idle

2.5 Aircraft Pushback

a) Aerodrome operators shall establish procedures or ensure that procedures are in place to ensure aircraft pushbacks are conducted safely.
b) Aircraft pushback operations have the potential for accidents involving personal injury/fatalities for ground crews and damage to aircraft, vehicles and equipment. It is recommended that all stakeholders (aerodrome operators, airlines and ground handlers) conduct and coordinate safety assessments to establish and promulgate general rules and requirements for the safe conduct of pushback operations. The development of detailed procedures, within the general rules and requirements issued, may remain the responsibility of airline operators/handling agents. Aerodrome operators should maintain safety management arrangements to audit compliance with pushback requirements. When considering rules to ensure aircraft pushbacks are done as safely as possible. The following should be considered prior to or during the operation:
    1) Detailed written operating procedures should be produced by the aerodrome operator and airline operators/handling agents for use by their personnel. These procedures should ensure the safety of the aircraft and the personnel involved;
    2) A check of the aircraft to ensure that there are no missing panels or damage has occurred and all doors/holds and service panels are closed;
    3) Ground crews are to ensure areas behind the aircraft are clear of obstacles, and that the aircraft is positioned in such a way as to avoid concentrating break-away blast at buildings, parked or taxiing aircraft or persons on the apron

4) Do not commence a pushback if it will conflict with another pushback already in progress or with an aircraft that is ready to taxi as well as with other traffic on the apron, are avoided.
5) Vehicle operators should be aware of dangers associated with passing behind an aircraft being pushed back.
6) Unless required to ensure the safety of the aircraft, personnel involved in the pushback should stay within the aircraft tug. Personnel working outside the aircraft tug, such as the headset operator, are particularly vulnerable to injury and employers may have safety assessments and safe working practices in place to address the hazards. Where safety assessment has shown it to be advisable, 'tail look-out' and/or 'wing-walkers' should be used to safeguard the rearward movement of the aircraft and prevent collisions with other aircraft, vehicles or personnel. Procedures for these personnel should be written down and should ensure the safety of the aircraft and the people involved. Personnel should be trained to ensure they are familiar with the procedures;
7) All tug drivers should be trained and competent in aircraft push and tow operations in all weather conditions;
8) Pushback crews, and those carrying out supervisory roles should be nominated for the respective tasks, trained and competent.
9) For those aerodromes providing apron management services, aerodrome operators should ensure good cooperation and exchange of information between apron management services, ATC and ground service providers.

c) Normally, the head-set operator should be in verbal contact with the flight deck crew throughout the pushback, except for exceptional circumstances. Where there is a possibility that verbal communication will not be available for any reason, the head-set operator and other members of the ground crew should be trained to use internationally agreed hand signals.
d) Before the Aircraft Commander calls for pushback, he/she must ensure that the tug driver is in the tug, ready to push. The tug driver must listen to the exchange between the aircraft crew and ATC so that the tug crew has a full understanding of the detail of the ATC approval. If the tug driver has not heard the pushback instruction he must not push the aircraft and the tug driver must confirm with the flight deck for pushback instructions.
e) To reduce the possibility of an unauthorised pushback and consequent risk of collision etc, tug drivers should monitor the relevant radiotelephone/ radiotelephony (RTF) frequency on which the pilot is obtaining its ATC pushback approval and be prepared to challenge the pilot if an error is perceived.

2.6 Power-back

a) Powering back an aircraft is inherently less directionally accurate than pushback 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.

b) Before approving power-backs the aerodrome operator should consider The following items and taking aircraft characteristics, apron layout/configuration, and stand occupation frequency and the stand clearances available and any gradients involved on stands or taxiways into consideration:
   1) The procedures are authorised in the aircraft manufacturer's manual;
   2) The procedures to be used are incorporated in the airline's operations manual;
   3) Pilots are trained and experienced in power-back operations;
   4) The aircraft is directed by a trained ground handling marshaller using standard power-back marshalling signals;
   5) 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 power-back operations;

c) When aircraft operators request to "power-back" from an aircraft stand. Given the potential hazards created by power-back operations, a safety assessment should be carried out prior to approval of the 'power-back' or self manoeuvring operations. The safety assessment shall include the following factors, at the minimum:
   1) jet blast or propwash;
   2) surface conditions;
   3) noise levels;
   4) communication with other apron users that a power-back is about to take place (especially if there is a rear of stand road);
   5) manoeuvring space;
   6) conflict with other traffic (pushback, power-back or taxiing); and
   7) effect on pedestrians, buildings, vehicles, mobile equipment and other aircraft.

d) The aerodrome operator should assess the effects of noise, vibration, blast and emissions, observed during the trial, in order to decide the suitability of the procedure demonstrated. It is not possible to state finite limits of noise, blast and emissions to suit all locations and

all aircraft types; therefore, aerodrome operators should decide the limitations to be met in accordance with local aerodrome regulations and procedures.

e) 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 safety assess the associated hazards and put in place control measures to reduce the risks to as low a level as reasonably practicable.

2.7 Self-manoeuvring

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

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

c) Prior to deciding to adopt self-manoeuvring operations aerodromes should conduct a joint safety assessment with the aerodrome users. Self-manoeuvring on open, unmarked aprons should be subject to special procedures and a marshalling service should be available for all aircraft arrivals. The aerodrome operator should determine which combination of aircraft stands and conditions require a marshalling service on departure.

d) Safety assessments should ensure that the following are considered:

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

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

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

4) Where appropriate, and as deemed necessary due to health and safety considerations, passenger areas and apron personnel working areas should be protected by blast screens. Passengers should not be subjected to blast, excessive noise or fumes
5) Safety instructions should be issued, specifying the maximum aircraft sizes to be permitted on individual stands so as to ensure that any prescribed safe clearances (such as aircraft to stand) are maintained. Pilots should also be required to exercise caution and use the minimum engine power settings needed to complete a satisfactory manoeuvre.

2.8 Marshalling Service

a) A marshalling service should be available to aircraft on request and provided where guidance systems do not exist or are unserviceable. Marshalling guidance may also be required to avoid a temporary safety hazard.
b) The marshalling service is normally, but not necessarily exclusively, provided by the aerodrome operator. The principal considerations are as follows:
   1) Marshalling training can be provided by the airport or third party companies. appropriate training and competency checks should be given to ensure that staff remains current. Note that different signals are required for helicopter marshalling.
   2) To ensure compliance with regulation and standards, it is recommended that this is audited by the aerodrome operator and findings communicated and followed up as required in any corrective action plans. Only the Standard marshalling signals for fixed-wing aircraft and helicopters are included in Annex 2 — Rules of the Air (Appendix 1, Section 5), as laid down in the Regulation of Civil Aviation Board No.94 on rules of the air should be employed.
   3) Except where full self-manoeuvring is permitted, a marshalling service should be provided automatically on unmarked stands not equipped with VDGS or where the VDGS or other stand facilities have known unserviceabilities. A marshalling service should also be available on request;
   4) A distinctive high-visibility jacket or vest should be worn by the marshaller to easily distinguish them from other apron personnel.
   5) Marshalling signals should be performed at a steady pace and should not become stylized with local variations from the standard. Illuminated marshalling wands are available for marshalling in darkness or low visibility. If sight lines from the approaching aircraft become obstructed during a manoeuvre, then two-man marshalling should be used to ensure continuity of safe guidance

c) Marshallers shall:

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

2.9 Aircraft Visual Docking Guidance Systems (VDGS)

2.9.1 General

a) Stopping an aircraft in the correct location to enable the air bridge and various services to successfully connect to it requires precise guidance. In order to achieve this, visual docking guidance systems (VDGS) have been implemented at many airports.

b) The basic elements involved in the systems are to provide left / right guidance as well as stopping position guidance. The calculation of the aircraft stopping position needs to take into account:

1) The movement envelope of the air bridge (if provided)
2) The location of the fuel hydrants and length of hose available
3) The location of any other fixed services (e.g. Fixed Electrical Ground Power – FEGP)
4) The space required around the aircraft for apron servicing
5) Clearance from the taxiway or roads

c) The aircraft type itself is a key factor. Details will need to be provided by the manufacturer on the overall aircraft docking and stopping position. Many different systems are in use around the world and it is recommended that details of the systems in use at your aerodrome are made available to users. Whichever system is used, there remains a need to keep it up to date with airline fleet changes.

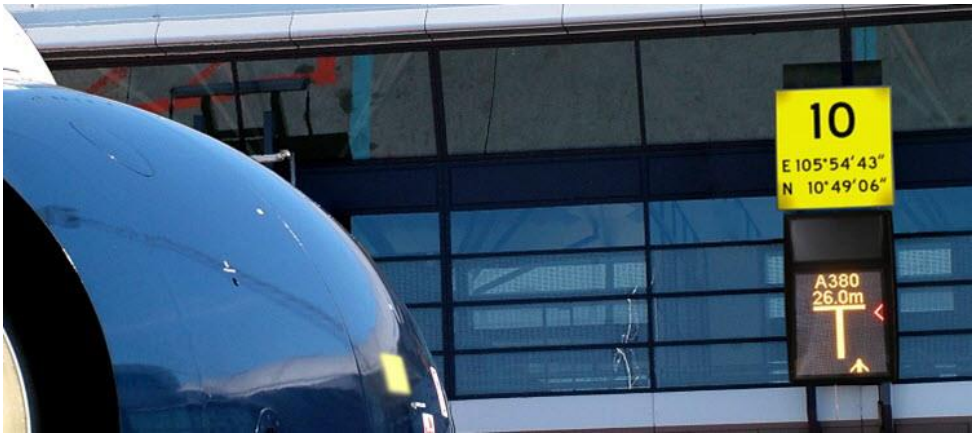

Figure 1 An example of a VDGS.

2.9.2 Preparation of Stand

a) 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 personnel to ensure that the stand is free from obstructions, FOD and equipment. The handling personnel should also ensure that, where provided, the airbridge is fully retracted and correctly parked with the drive wheels in the parking box provided before the arrival of the aircraft. These actions must be completed by the handler prior to the VDGS being activated and switched on.

b) Aerodrome operators should ensure that VDGS are regularly checked for serviceability and calibrated for accuracy. As part of it local operating procedures for its aircraft parking stands, consideration should be made for the operation of VDGS, including training and on-going competency.

c) Switching on the VDGS normally signifies to the aircraft commander that the stand is clear and is safe to enter. Once the VDGS is switched on, the stand should 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. Therefore, the VDGS must be attended during aircraft arrival.

2.10 Operation of Air Bridges

An air bridges or aerobridge (or PBB – Passenger Boarding Bridge) is typically defined as a suspended, moveable tunnel which extends from a building to an aircraft, enabling passengers to board and disembark easily and efficiently. These aerobridges allow for the safe and efficient transfer of passengers between the aircraft and the airport terminal without being affected by weather conditions, and improve security by limiting access to aprons and operational areas.

2.10.1 Movement of Passenger Boarding Airbridges

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

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

c) Aerodrome operators should provide ground markings in which passenger-boarding bridges should be parked with the wheel base in the designated position.when not in use. This marking should include the prohibited area in which vehicles and equipment may not park. Further information may be found in the Requirement of The Civil Aviation Authority of Thailand No.14 on Aerodrome Standards B.E. 2562.

d) Aerodrome operators should consider installing height restriction signage, markings to indicate difference in level, instructing users not to leave any garbage in the rotunda or on the top landing of the outside stairs and ensuring emergency exits remain unobstructed at all times. In addition, some aerodrome operators have installed tyre guards for extra protection.

Figure 2 Height restriction signage.

2.10.2 Operating Procedures

a) Aerodrome operators should ensure that they develop and promulgate SOP 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. Depending on each airbridge, the stowed position should withstand winds of up to 150 km/h and the extended position up to 90 km/h.

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

c) 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.

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

e) 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.

2.10.3 Airbridge Maintenance and Unserviceability

a) Aerodrome operators should establish a schedule of preventative maintenance including inspection by competent people in accordance with the manufacturer's guidelines or better. Clear records should be kept of any preventative maintenance or repair.

b) Such inspection and maintenance regimes should be based on risk and with reference to the manufacturer's requirements.

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

2.10.4 Operator Training

a) The safe operation of an air bridge should require specific training. It is recommended that operators receive theoretical training followed by a practical test and successful demonstration in order to receive a permit for a specific air bridge type. Training should include:
   1) Manoeuvring, steering, and speed of operation
   2) Adverse weather conditions
   3) Approach to the aircraft

4) Setting the auto leveller
5) Security and safety procedures concerning any doors
6) Backing off the aircraft
7) Correct parking
8) Use of cameras, mirrors and visual checks for any obstructions (including parked mobile equipment and vehicles)
9) Emergency procedures

b) Training can be provided by the aerodrome directly or given by third party companies including handling agents. If other organizations deliver training, audits should be carried out by the aerodrome operator to ensure that defined standards are being met. If new air bridges or models with different controls are installed, then suitable training material and specific permits will need to be developed.

c) 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.

d) 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 employers 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 licence pending re-training

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

2.11 Leader Van Service or Follow - Me

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

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

c) The use of any such vehicles during normal operations will be decided by the aerodrome operator, based on operational safety requirements. The following elements should be considered:
   1) Vehicle with flashing or rotating lights and / or the words 'FOLLOW ME', clearly identified, and equipped to operate in the movement area
   2) Importance of radio communications, more particularly clearances and read-back
   3) Enhanced situational awareness
   4) Both vehicle operator and the pilot should know where marshalling begins following landing, or ends prior to take-off
   5) ATC taxi routing instructions should be given to, acknowledged and read-back by the vehicle operator and monitored by the pilot
d) Follow-me vehicles should be easily identified either by a distinct marking or colour and be adequately equipped.

3. Apron Safety

The aerodrome operator shall establish apron safety procedures, or ensure that such procedures are in place. These shall include, as a minimum, the following:

3.1 Means and Procedures for Jet Blast, Noise and Fumes Protection

The associated safety hazards caused by jet blast, vibration, noise, 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 personnel.

3.1.1 Blast Precautions

a) The aerodrome operator shall ensure that all apron users are made aware of the hazards arising from jet blast and propeller slipstreams.
b) All vehicles and wheeled equipment must be left properly braked and, where appropriate, on jacks or chocked to minimize the risk of movement when subjected to jet blast or propeller slipstream. Where practicable, equipment should be parked in areas where the risk of jet blast is minimized. Particular care must be exercised with apron equipment having a large flat side surface area.
c) Foreign object debris (FOD) may be moved by jet blast, creating additional hazards and it is thus necessary to ensure that aprons are kept clean.
d) The responsibility for the safety of passengers walking across aprons, rests with the aircraft operator or its handling agent. The relevant procedures shall be in line with the safety requirements established by the aerodrome operator. All staff operating on the apron shall be aware of the risk to passengers on aprons from jet blast, propeller slipstream and rotor wash and should be prepared to take appropriate action when necessary.
e) When designing or making changes to apron layouts, consideration should be given to jet blast and, if necessary, the installation of blast protection fences.

3.1.2 Fumes and Noise

In approving engine running or self-manoeuvring on the apron, the following should be considered:

1) The concentration of fumes present in an aerodrome area is in direct relation to the length of time engines are run, the type of engine and power settings used and the strength and direction of the surface wind;

2) Where workplaces, such as cargo-sheds and engineering facilities, have to open directly on to stand areas, a specific safety assessment is required to determine how best to operate all facilities safely and without risks to health, in respect of noise and fumes.

3.1.3 Engine Test Running

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

a) Where possible, engine ground runs should be carried out on agreed, selected and prepared remote areas, preferably equipped with engine baffles/de-tuners;
b) Engine ground runs at above idle power should not be permitted in cul-de-sacs or, for example, in areas where the jet blast would impinge on stands, equipment areas or works areas;
c) Engine ground runs on stands in regular use in apron areas should be limited to check starts and idle power only;
d) Where engine running is permitted on the apron, a remote area should be chosen where the jet-blast will not affect other apron areas and busy taxiways;
e) Where necessary, engine ground runs should be safeguarded by Aerodrome Operations personnel who should arrange for any rear-of-stand roads and, if needed, sections of taxiway to be closed;
f) The area around the engine intakes, behind and adjacent to the cone of the blast should be clear of equipment and the ground must be firm and without loose tarmac, stones or other material;
g) The engineer in charge of the ground run must ensure that the aircraft wheels are safely chocked and that the aircraft cannot move forward under any circumstances;
h) Ground running must not take place when passengers are being embarked/ disembarked on any adjacent or opposite stands, except when such passengers are using an airbridge;
i) A trained member of airline or handling personnel is to be positioned on the stand and should be in verbal contact with the flight deck. He/she will communicate by radiotelephony or interphone with the flight deck to ensure that the engine(s) are shut down if persons or vehicles move into the danger area in front of, behind or in the vicinity of a live engine. For this purpose and if the radiotelephony or interphone link is unserviceable, internationally agreed standard hand signals by day and light signals by night must be used.

3.1.4 Rotors Precaution

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

a) Helicopter arrivals are marshalled, unless the helicopter apron is remote and configured for self-manoeuvring. Marshalling assistance/safeguarding may also be required for departure;
b) Ideally passengers should not be allowed to walk on the apron when rotors are turning. Where it is operationally essential to keep rotors running passengers must be effectively controlled;
c) Personnel, vehicles and ground equipment should remain well clear of the rotor disk until it has come to rest. If as above, running the rotors is essential, handling personnel must be trained accordingly;
d) Suitable signs should be provided to warn drivers and apron personnel that they are approaching an area where helicopter operations are handled. All airside drivers and handling personnel should be briefed to maintain a good look-out and should be trained to look upwards as well as horizontally to detect and give-way to helicopter movements.

3.2 Arrangements of Safety Precautions during Aeroplane Refuelling Operations

3.2.1 Fuelling Activities

a) Aircraft fuelling is a significant hazard on aprons and the cause of many accidents and incidents.Aerodrome operators should ensure personnel operating on the apron are familiar with the general safety precautions related to fuelling activities.
b) A fuelling safe zone should be established (a minimum radius of 3 m is recommended) around the aircraft fuelling receptacles, fuel vents and fuelling equipment. Within this zone, the use of portable electronic devices (e.g. mobile telephones, handheld radios, pagers, photographic flash bulbs or electronic flash equipment) and other sources of ignition or fire are prohibited.
c) Fuelling activities should be included in apron safety awareness training for all personnel, especially in driver training, so as to make staff aware of the safety risks associated with high-pressure hoses delivering fuel to the aircraft from fuel hydrants and the presence of the electrical bonding wire.

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

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

a) A single person should be in charge of the fuelling process
b) Fuelling zones should be established around all filling and venting points in use on the aircraft and vehicle
c) The aircraft should be chocked
d) All hoses used in fuelling should be electrically bonded
e) Personnel should not be able to generate sources of ignition accidentally
f) Equipment used should be intrinsically safe
g) Escape routes for staff, passengers and vehicles should be free of obstructions
h) Aircraft APUs should not be started during fuelling
i) Emergency fuel cut-off switches should be provided and clearly signed at the head of stand and remain unobstructed at all times
j) All staff in the vicinity of the fuelling operation should be trained in the operation of any hydrant emergency shut-off system and appropriate fire fighting equipment should be readily available
k) Fuel spillage should he immediately brought to the attention of the fuelling overseer. Detailed instructions should be laid down for dealing with fuel spillage
l) No smoking or naked lights within the fuelling zone

3.2.3 Fueling With Passengers on Board, Embarking or Disembarking

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

a) Flight crew and ground staff should be made aware
b) Aircraft emergency chute deployment areas should be clear of obstructions and cabin aisles and emergency exits must be kept clear
c) If attached to an air bridge, main door must remain open
d) The aircraft internal ‘NO SMOKING’ and ‘EXIT’ signs must be illuminated
e) Seat belts should not be fastened
f) Passengers should be advised that fuelling is taking place
g) Adequate numbers of cabin staff must be present to assist with a possible evacuation

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

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

Figure 3 Safe aircraft fuelling requires training, appropriate signs and markings and detailed procedures. Dublin Airport

3.3 Arrangements for Apron Sweeping and Cleaning

3.3.1 Apron Sweeping and Cleaning

a) The aerodrome operator should ensure that at regular intervals, aircraft stands and adjacent areas should be cleaned in order to remove oil, grease and rubber marks.

b) Spillages during fuelling operations can occur and a procedure to absorb the spilt fuel followed by proper disposal should be devised. At some airports it is possible to wash the fuel into the drainage system but at others an absorbent material needs to be used to soak up the fuel and ensure correct disposal. Local or national environmental protection guidelines should be adhered to at all times. A requirement should exist for those involved to report all spillages to the relevant authorities and the airport. Those responsible for the spill should be given the opportunity to proceed with containment, clean-up and disposal. If they are unable to do so in a timely fashion, airport maintenance and / or specialized contractors can be used and a cost recovery process should be initiated.

c) Additional procedures may be required for spillages of:

1) Toilet waste

2) Ice cubes from aircraft galleys or catering trucks
3) Oil and hydraulic fluid
4) Other chemicals or HAZMAT

d) The cleanliness of paved areas is vital to prevent foreign object damage (FOD) to the engines of taxiing aircraft. A regular programme should be instituted for the mechanical sweeping of aprons and taxiways so that in a given period of time all the operational paved areas where aircraft taxi or park will have been swept. In addition, sweeping should be available "on request" to deal with those areas on which loose material has accumulated since the last regular sweeping and which represent a hazard to aircraft. It is unlikely that there will be any requirement to sweep the runway on a regular basis unless the aerodrome is located in a dusty or sandy area.

e) Sweeping and cleaning can be done by dedicated staff or third party contractors. Particular care and attention should be given to work sites and contractor compounds.

f) 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.

g) Aerodrome operators should have in place agreed policies and arrangements for the removal of hazards from the apron such as abandoned vehicles and equipment and typically may levy a charge for the service.

3.3.2 Foreign Object Debris (FOD) Control

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

b) It is important that all personnel with access to the movement area understand their role in the prevention of FOD. FOD control is normally a module of the initial training given to personnel with access to the movement area.

c) It is necessary to have an established process to regularly clear the movement area of FOD. Removing FOD is the responsibility of everyone.

d) FOD may be controlled by ensuring that all personnel with movement area access, in particular inspection/maintenance personnel and ground handlers, are aware of situations which may potentially cause FOD.

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

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

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

Note: Further information may be found in Doc 9981 Procedures for Air Navigation Services – Aerodromes, Third Edition 2020, Chapter 5 FOREIGN OBJECT DEBRIS (FOD) CONTROL.

3.4 Arrangements for Equipment for Operation on Apron

3.4.1 Safety Concerns and Appropriate Measures

a) Work equipment includes every item on the apron, including vehicles, non-motorized mobile equipment, specialist equipment such as cargo loaders, fixed equipment such as airbridges and mobile or fixed electrical ground power units and hand tools.

b) 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:

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

c) Aerodrome operators should ensure that the equipment installed on an apron is suitable, maintained in a safe condition and 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 to monitor serviceability trends.

d) In order to protect aircraft and people, all companies at aerodromes and aerodrome operator should also ensure that the risks created by the use of the equipment are:

1) Eliminated, where possible; or
2) 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.

e) The measures should be selected on the basis of an assessment of the risks. In many cases, a combination of measures may be necessary. Whatever the combination of measures, stakeholders need to ensure that people using work equipment have received adequate training, instruction and information for the particular equipment.

f) The 5 simple steps listed below are the basis of a safety assessment

1) dentify the hazards
2) Decide who may be harmed and how
3) Evaluate the risks and decide whether the existing control measures are adequate or whether more should be done
4) Record the findings
5) Review the assessment and revise if necessary

3.4.2 Use of Fixed Apron Facilities

b) A number of fixed equipment is often provided by the aerodrome operator on the apron or aircraft stands. The equipment will normally be operated by the GHSPs. Typical fixed equipment on an aircraft stand includes, but is not limited to:

1) passenger boarding bridges;
2) fuel hydrant system;

3) fixed electrical ground power;
4) preconditioned air;
5) visual docking guidance system;
6) potable water system; and
7) waste disposal facilities.

c) The aerodrome operator should make available training standards, material and procedures for the usage of fixed apron equipment and ensure any third party operating the equipment is trained to do so. A licensing process, including mandatory training, testing and recurrent training may be implemented to ensure the training standards are adhered to.

d) The aerodrome operator should establish and implement an appropriate maintenance programme for each of the fixed equipment listed above. Maintenance records should be documented and archived

e) Any unserviceable equipment should be removed from service immediately and a notification of inoperability sent to users.

f) Aerodrome operators should establish a clear process to report and document all faults and maintenance activities so as to ensure traceability.

g) In the case of an audit, maintenance records and fault reports should be shared with airport users,as appropriate.

3.5 Arrangements for Reporting Incidents and Accidents on an Apron

a) Any accident and incident shall be reported through the aerodrome safety management system. The person causing the incident and accident or the witness shall also report their supervisors immediately.

b) When accidents, incidents and occurrences are caused in apron, procedures and processes need to be in place to:
1) Deal with the aftermath and effects
2) Report and record all the pertinent details to enable subsequent investigation
3) Ensure emergency services attendance
4) Establish safe temporary closures of the area affected
5) Clean up and return to service
6) Communicate with other aerodrome users

c) Ideally there should be a telephone number or radio reporting method for everyone involved in, or who is witness to an accident, incident or occurrence. It is recommended that a single, central, easily remembered telephone number be used. At some aerodromes,

online reporting (e-mail notification) has been implemented. There should be a clear requirement for everyone working airside to report accidents, incidents and occurrences in a timely manner. Non-punitive reporting should be encouraged.

d) The Accident and Incident Reporting Form may be used. The person causing the incident and accident or the witness shall give detailed information to aerodrome responsible person without hesitation.

e) The staff receiving these calls or report should have 'action sheets' or similar forms to record call details and subsequent actions such as notifying the fire service, aerodrome operations and other relevant agencies. Operations or safety standard staff should go to the scene to record all details and whenever possible, take photographs and make visual records.

f) At some aerodromes an automatic computerized notification system may be in place, relaying key occurrence details over a computer network to interested parties. Safeguards should be established to address privacy concerns. Some aerodromes are equipped with clearly identified and readily accessible emergency direct dial phones on the apron for timely notification of occurrences.

g) Once the immediate health and safety needs of the people involved have been dealt with, a more comprehensive report should be completed. This should include all relevant details in order to enable a full investigation to identify the root cause(s). Full details of all accidents, incidents or occurrences should be recorded in a database to enable queries and detailed analysis.

h) The reporting need to comply with The CAAT Requirement No.22/2562 on Reporting of Civil Aviation Occurrences relating to accidents, incidents and mandatory occurrence reporting.

3.6 Arrangements for Assessing The Safety Compliance of All Personnel Working on The Apron

3.6.1 Coordination Affecting Aerodrome Safety

a) The coordination between aerodrome operator ,aeroplane operators, air navigation service providers and all other relevant stakeholders should be existed to ensure the safety of operations.

b) This should be an on-going process and ideally, joint meetings should be held, in order that individuals dealing with an accident, incident, occurrence or aircraft / airport related emergencies will be able to work together much more effectively.

c) The aerodrome operator should ensure that all users of the aerodrome, including ground- handling agencies and other organizations that perform activities independently at the aerodrome in relation to flight or aircraft handling, comply

with the safety requirements of the aerodrome operator. The aerodrome operator monitors such compliance.

d) Many airside operations involve co-operation, both formal and informal between two or more departments of an organisation and often between two or more separate employers. This is a complex matrix that requires cooperation, co-ordination and good understanding and agreement.

e) The benefits of co-ordination are obvious: increased rapport, a mutual exchange of safety-related information and the same standards of safety discipline applied across the whole aerodrome operation.

f) The aerodrome operator should act as the focal point in coordinating best practice for all employers on the aerodrome; for example, by acting as the Chairman of the Airside Safety Committee.

3.6.2 Active Performance Monitoring and Management

a) Airside safety performance and management should be pro-active, rather than reactive, at all levels of the management structure. Monitoring should be part of the daily routine, not a set piece procedure kept 'on ice', for use only following an incident or accident.

b) Accident investigation looking into causal factors suggest that as much as 50% of all serious aircraft accidents have resulted from non-compliance with procedures at some point. Clearly it is important that all safety-related activities are described by documented procedures. Such procedures should include defined performance measures and monitoring systems where appropriate.

c) Self monitoring and control should be the basic principle underlying all safety of work routines at aerodromes. All personnel should be aware of and adhere to the safety standards for their work set by management. Safety audits should be carried out regularly to ensure that international as well as national and local procedures and standards are fully observed.

d) Companies operating on the apron should establish measures to ensure and monitor that safety performance procedures are implemented correctly and are achieving their intended objective. The aerodrome operator should conduct a similar programme of audits to assess the effectiveness of aerodrome-wide procedures.

e) Any deficiencies that are identified in an audit should be considered and appropriate remedial action or measures taken. The audit should be followed up to ensure that these remedial actions and measures are effective. In this way

deficiencies in procedures that could lead to an unsafe situation should be remedied before an incident or accident occurs.

4. Relationship Between The GHSP and The Aerodrome Operator

4.1 General

a) In many cases, the aerodrome operator and GHSPs have an intricate relationship on the airport whereby they both provide important services to the air operator. This relationship should be governed by a ground handling licence or concession but also relies on close collaboration and cooperation to ensure safe and regular operations.

b) The nature and variability in day-to-day airport operations requires a certain amount of flexibility by the stakeholders involved. The regular delays and changes to the scheduled operation throughout the day imply that the GHSPs, aerodrome operator and air operator should, when relevant, establish close coordination and communication processes to allow for the reallocation of resources and management of disruptions.

4.2 Ground Handling Licence or Concession

a) The aerodrome operator should require each GHSP to sign a licence or concession agreement for it to operate on the airport.

b) The ground handling licence or concession should detail and govern the relationship between the aerodrome operator and the GHSP, and cover aspects such as oversight of safety, security and environment, responsibilities, liability, services provided, use of space, performance standards and cost recovery.

c) The provision of a licence or concession by the aerodrome operator to each GHSP operating at the aerodrome will ensure a formal relationship is established and allow for a clear definition of the scope, responsibilities, liabilities and specific operations required of the GHSP.

d) A description of the services provided by the GHSP for the air operator also needs to be included in the ground handling licence or concession agreement issued by the aerodrome operator, in particular when these operations are relevant to the safety of airport ground operations.

e) The licence or concession provided to the GHSP by the aerodrome operator should also contain a requirement for the GHSP to have an agreement (where applicable) with each air operator they service. This agreement should as a minimum establish the scope of activities, responsibilities and allocation of liabilities between the two parties.

f) The handling of general aviation aircraft does not necessarily require a formal agreement, however, the scope of activities and responsibilities of the GHSP should at least be clearly established with the aerodrome operator.

g) The agreement between the GHSP and the air operator should not conflict with the requirements the aerodrome operator may have established in its specific agreement with the GHSP.

h) The rights and obligations of the GHSP should be clearly established in the licence or concession, including general and operational obligations such as:

1) compliance with local airport rules, regulations, standards and SOPs;
2) reporting of accidents and incidents, as part of the SMS;
3) participation in relevant local safety, performance and quality committees or processes;
4) participation in emergency response planning and exercises;
5) establishment of an agreement with every air operator prior to services being rendered (where applicable), with such agreement at a minimum addressing issues of liability between the parties;
6) provision of the agreed services on behalf of the aerodrome operator;
7) provision of sufficient insurance to cover any damage to aircraft or infrastructure, to be determined on consultation with the aerodrome operator;
8) emergency response planning and business continuity processes;
9) provisions for termination of the licence; and
10) sanctions or restrictions in case of incompliances.

4.3 Operational Safety Considerations in Relation to Ground Handling

4.3.1 Local Aerodromes Safety Rules

a) A large number of activities take place on aprons within a congested and time-sensitive environment. Although responsibility for safety is shared, the aerodrome operator is well positioned to influence safety across the many organizations conducting operations on the apron.

b) The aerodrome operator should establish and issue SOPs for operations on the apron or ensure that such procedures are in place. In relation to ground handling, these should include, as a minimum, the following:

1) aircraft stand allocation;
2) marshalling service;
3) follow me (leader vehicle);
4) blast precautions;
5) apron cleaning;
6) aircraft pushbacks, power-back and towing;
7) operation of fixed apron facilities;
8) vehicle movements;

9) apron discipline; and
10) dissemination of information.

c) The aerodrome operator should ensure all GHSPs and relevant third parties are adequately trained on the local aerodrome safety rules. This training can be performed by the aerodrome operator or a third party.

d) The aerodrome operator should, without prejudice to just culture, enforce or ensure apron safety rules are enforced by means of audits, training and inspections. Enforcement may include sanctions when rules are intentionally and unjustifiably violated by operators. These sanctions may take various forms, such as cash penalties, a points system, which may include suspension of driving permits or airside access for periods of time, or mandatory refresher training.

4.3.2 Safety of Personnel on the Apron

a) The health and safety of all personnel working airside, whether employed by the aerodrome operator, air operators or third parties, need to be considered carefully. The appropriate employer should assess risks covering each task that airside personnel are required to carry out.

b) Hazards and residual risks may be handled as follows:
1) Eliminate — cease doing the task; remove the hazard altogether.
2) Reduce — minimize the time exposed to the hazard; substitute with something less hazardous.
3) Isolate — physically isolate people from the hazard (fit guards, enclose the hazard).
4) Control — create a safer working environment, require work permits to be issued, ensure appropriate supervision is in place, train personnel, require personnel to follow procedures.
5) Provide personal protective equipment (PPE) — issue PPE appropriate to the identified hazard, provide training, do fitness testing, monitor use, perform regular maintenance.
6) Discipline — put procedures in place requiring personnel to behave in a particular way.

c) The aerodrome operator should ensure personnel operating on the apron wear required PPE and follow the established procedures when carrying out a specific task. PPE may include ear plugs, high-visibility vests/jackets, safety shoes, gloves, goggles, hard hats, respirators and fall protection. Ideally, all personnel working on the airside areas should be expected to wear PPE as part of a general safety culture.

In such a safety culture, any person identified without the appropriate PPE should be challenged by any other individual working on the airside.

d) Movements of aircraft on the apron area can generate jet blast that can project any loose objects at high velocities causing damages to vehicles or aircraft, or injury to personnel. Personnel operating on the apron should be made aware of the safety risks related to jet blast and propeller wash.