

Airside Safety Management

CAP 642

Published by the Civil Aviation Authority, 2018

Civil Aviation Authority
Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

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First published 1995
Issue 1 – March 1995
Issue 2 – 28 February 2003
Issue 2, incorporating amendments to 4 November 2005
Issue 2, incorporating amendments to 5 September 2006
Issue 3 – November 2018

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The latest version of this document is available in electronic format at: www.caa.co.uk

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Introduction

CAP 642, Airside Safety Management, was originally produced in 1995 to provide guidance to aircraft, aerodrome/airport operators, third party employers and contractors concerning safe operating practices for airside activities.

The document has been through several iterations since then and remains a key document discussing airside safety management for both aviation safety and health and safety stakeholders, employers and employees.

The CAP provides general guidance for those engaged in activities taking place on the airside areas of aerodromes, principally but not exclusively, at civil aviation sites. The document contains advice and guidance for the management of airside safety to help minimise potential ground damage to aircraft, particularly during ground handling activities and occurrences associated with the health and safety of workers and passengers.

With the support and contributions from industry stakeholders and the UK Health and Safety Executive (HSE), the UK Civil Aviation Authority (CAA) established a joint Working Group (WG) to review ground handling operations and airside safety under the auspices of [GHOST](#) (Ground Handling Operations Safety Team). The document was drafted in collaboration with those stakeholders and contains guidance which should be considered as good or best-practice, whilst at the same time accepting that respective company procedures may reflect variance or adaptation of the subjects discussed herein.

Status and purpose

Adherence to this guidance is not compulsory upon any stakeholder, unless where specifically stated (i.e. where Health and Safety legislation is quoted or referenced). Where stakeholders chose to follow the guidance and apply it as a local requirement, they would normally be doing enough to comply with the applicable laws.

The guidance in this document illustrates how risks might be identified and provides advice about how airside safety can be managed within the context of a systematic and structured management approach within a Safety Management System (SMS). Operators, and service providers, and their contracted employers (at every level) 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 collaboratively.

CAP 642 sets out the hazards and risks that respective employers operating in the airside environment should be expected to consider and manage, but it should be noted that this guidance is not necessarily comprehensive nor exhaustive. Employers are ultimately required to determine the hazards their employees and others face and assess the risk posed by these hazards. Where information has not been provided to cover a particular

situation, it is expected that users will be guided by the general safety management principles to identify and create a safe working and operating environment.

Applicability

Ensuring the safety of individuals and 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 that will affect the various employers 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 one location equally applying at another.

Whilst this document is primarily aimed at aerodrome operators, airlines and ground handling service providers, it may be equally applicable to activities at unlicensed 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'.

Any organisation, regardless of size or complexity of operation, or whether subject to direct oversight and regulation by CAA, should establish a Safety Management System through the application of the general principles outlined in this document and from further more comprehensive guidance found on the [CAA website](#) and other resources such as the [Eurocontrol Skybrary](#). SMS is discussed further in Chapter 1.

Airport 'by-laws'

At the discretion of the aerodrome operator, certificate or licence holder specific local rules may apply at an airport/aerodrome. These might fall under conditions of use, or be promulgated separately, via airport 'by-laws', Managing Directors or Operational, Safety Instructions that all airport stakeholders must adhere to as requirements.

Where appropriate these rules may be encompassed within an airport's SMS and communicated to all relevant stakeholders as necessary. Where formal by-laws are not provided, it is for management to decide which rules and regulations need to be in place to satisfy the circumstances and to ensure that these are widely promulgated or accessible to all stakeholders and users of the airport.

IATA Ground Operations Manual (IGOM)

The guidance in this document does not take precedence over the information and operational instructions or considerations contained within the IGOM, it merely seeks to complement, where applicable. The CAA accepts that there may be examples where guidance contained within this document might differ with the IGOM. However, this document seeks to reflect what CAA, together with stakeholders considers as good and safe practices, particularly for those stakeholders whose employers, due to their size and complexity do not adopt the IGOM and/or are not IATA members. For GA, Business and

Corporate aircraft operators, the National Business Aviation Association's International Standard for Business Aircraft Operations (IS-BAO) may be referred to.

Amendment

This document is subject to continuous review and amendment if so required. Questions, suggestions for improvement or new material should be sent to: content@caa.co.uk

References

Useful references and further reading

Documents published by the Civil Aviation Authority (CAA) are available for purchase from TSO, PO Box 29, Norwich, NR3 1GN (Telephone 0870 600 5522). Many CAA documents are also available from the CAA's website at www.caa.co.uk/publications.

Documents published by the Health and Safety Executive are available from HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 6FS (Telephone 01787 881165). Most are available to download free from www.hse.gov.uk.

The following documents contain regulations, guidance or information concerned with airside safety. The documents listed below are the main legislative documents that those responsible for air side safety management must be familiar with.

Legislation (as amended)

- [European Aviation Safety Agency \(EASA\) – Aerodrome Regulations](#)
- [Civil Aviation Publication \(CAP 168- Licensing of Aerodromes](#)
- [Air Navigation Order 2016](#)
- [The Health and Safety at Work etc. \(HSW\) Act 1974](#)
- [The Management of Health and Safety at Work Regulations \(MHSWR\) 1999](#)

Definitions and abbreviations

Although there are many terms used in this document that have a particular meaning, the following are of particular significance:

Definitions	
Apron	A defined area on a land aerodrome provided for the stationing of aircraft for the embarkation and disembarkation of passengers, the loading and unloading of cargo, mail, fuelling, parking or maintenance. In order to reflect industry used terminology, use of the word 'Stand' or 'Ramp' may be used.
Manoeuvring Area	That part of an aerodrome provided for the take-off and landing of aircraft and for the movement of aircraft on the surface, excluding the apron and any part of the aerodrome provided for the maintenance of aircraft.
Movement Area	That part of an aerodrome intended for the surface movement of aircraft, including the manoeuvring area, aprons and any part of the aerodrome provided for the maintenance of aircraft. NOTE: Manoeuvring Area and Movement Area are generic terms intended to describe the 'airside' part of an aerodrome, rather than just those pavements or surfaces on which aircraft movements take place.
Runway	A defined rectangular area on a land aerodrome, prepared for the landing and take-off run of aircraft along its length.
Taxiway	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: ▪ Aircraft stand taxilane: a portion of an apron designated as a taxi route intended to provide access to aircraft stands only ▪ Apron taxiway: a portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron ▪ Rapid exit taxiway: a taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimising runway occupancy times.

Abbreviations	
ACOP	Approved Code of Practice published by HSE
AGL	Aeronautical Ground Lighting
ANO	The Air Navigation Order
ANO(DG)	Air Navigation (Dangerous Goods) Regulations
APU	Auxiliary Power Unit
ATC	Air Traffic Control
ATEX	Protection of Workers Potentially at Risk from Explosive Atmospheres Directive
BS	British Standard
BS EN	Harmonised European Standard
CDG	The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations by Road
CAD	Chemical Agents Directive
CAP	Civil Aviation Publication (published by CAA)
CCTV	Closed Circuit Television
COSHH	Control of Substances Hazardous to Health Regulations (as amended)
CDM	Construction (Design and Management) Regulations
dB	Decibels
dB(A)	Decibels A-weighted (to reflect the response of the human ear)
EASA	European Aviation Safety Agency
FEGP	Fixed Electrical Ground Power
FOD	Foreign Object Debris or Foreign Object Damage
GPU	(Auxiliary) Ground Power Unit
HSE	Health and Safety Executive
HSG	Health and Safety guidance booklets (published by HSE)
HSW Act	Health and Safety at Work etc. Act
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation

Abbreviations	
ILS	Instrument Landing System
INDG	Guidance leaflets published by HSE
IRR	Ionising Radiation Regulations
L_{ep, d}	Personal noise exposure
LOLER	Lifting Operations and Lifting Equipment Regulations
LVP	Low Visibility Procedures
MEWP	Mobile Elevating Working Platform
MHSWR	Management of Health and Safety at Work Regulations
MOR	Mandatory Occurrence Report
POB	Persons on board
PPE	Personal Protective Equipment
PUWER	Provision and Use of Work Equipment Regulations
REPIR	Radiation (Emergency Preparedness and Information) Regulations
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
RTF	Radiotelephone/radiotelephony
SMS	Safety Management System
SOP	Standard Operating Procedure
VDGS	Visual Docking Guidance System

Chapter 1

General principles of safety management

Introduction

- 1.1 Those operating on aerodromes need to manage aviation safety and health and safety. Failure to adequately manage either may lead to loss of life, injury, ill health and subsequent business, economic and reputational losses.
- 1.2 The precautions which protect aircraft often also protect people. Consequently, the management of health and safety and the management of aviation safety share common themes. The key elements of both are:
- Leadership and commitment from management that includes clear policies, targets and standards to be achieved and the setting out of responsibilities and accountabilities;
 - A method for identifying hazards, assessing risks and controlling those risks;
 - A method of monitoring and review that includes inspection and audit, incident investigation and data trend analysis;
 - Documented processes and procedures.

Safety Management Systems (SMS)

- 1.3 In recent years our understanding of how accidents and incidents happen has improved. More emphasis is now placed on the causal factors involved and the organisational factors that contribute to errors being made. Organisational factors include how an organisation operates, how it sets out its procedures, how it trains its personnel and what level of importance it gives to safety issues identified within the organisation.
- 1.4 ICAO provides an 'SMS Framework' within Annex 19 and the Safety Management Manual (Doc 9859) The objective of safety risk management components is to identify hazards, assess the related risks and develop appropriate mitigations in the context of the delivery of the organization's products or services. Safety assurance is accomplished through ongoing processes that monitor compliance with international standards and national regulations. Furthermore, the safety assurance process provides confidence that the SMS is operating as designed and is effective. Safety promotion provides the necessary awareness and training. The four components and twelve elements that comprise the ICAO SMS framework are as follows:
1. Safety policy and objectives

- 1.1 Management commitment and responsibility
 - 1.2 Safety accountabilities
 - 1.3 Appointment of key safety personnel
 - 1.4 Coordination of emergency response planning
 - 1.5 SMS documentation
 - 2. Safety risk management
 - 2.1 Hazard identification
 - 2.2 Safety risk assessment and mitigation
 - 3. Safety assurance
 - 3.1 Safety performance monitoring and measurement
 - 3.2 The management of change
 - 3.3 Continuous improvement of the SMS
 - 4. Safety promotion
 - 4.1 Training and education
 - 4.2 Safety communication
- 1.5 A Safety Management System (SMS) provides for a proactive approach to safety by identifying causal factors and taking actions before an event happens. SMS helps by having a greater understanding of the hazards and risks affecting the safety of the organisation. These hazards and risks could have a severe impact on an organisation in terms of financial cost and reputation. An SMS is an effective way to take the organisation beyond compliance with the regulations with an organised approach to managing safety.
- 1.6 The SMS sets out the organisation's structure, identifies the accountabilities and responsibilities of key personnel members and documents the policies and procedures to manage safety effectively. An effective SMS allows the hazards and risks that could affect the organisation to be identified, assessed and prioritised so that appropriate mitigation measures can be put in place to reduce the risks to as low as reasonably practicable (ALARP). Reducing a risk to ALARP does not mean that the risk has been eliminated as some level of risk still remains; however, the organisation has accepted the remaining level of risk
- 1.7 A risk may be described as ALARP if all reasonable actions have taken place to mitigate the risk and where the cost (in terms of time, effort and money) of taking further action would be disproportionate to any further reduction in the level of risk.

- 1.8 Whether or not this guidance material is suitable for your organisation will depend on various factors including the size, complexity and level of risk associated with the activities it discharges. The structure and content of an SMS should be essentially the same for any organisation but it should be proportionate, with the level of detail reflecting the size, complexity and level of risk faced by the organisation. It is important to understand that there is no 'one size fits all' in terms of SMS development and implementation; what is important is to develop an SMS that works for the organisation and that it is demonstrably, effective.
- 1.9 All aspects of an SMS should be clearly documented in order to keep an accurate record of why decisions were made, why actions were taken and why any changes were implemented. Documentation should be controlled and in a suitable format so that it can be clearly understood by its own staff, by third party organisations that are contracted, and where applicable, the CAA.
- 1.10 It is implicit when considering what is reasonably practicable, that hazards have been identified and risks assessed. The primary function of identifying the hazards and assessing the risks airside is to determine whether enough has been done to prevent an incident or accident that may lead to fatalities, injuries and ill health and/or damage to aircraft. In this way, risk assessments assist in determining whether enough has been done to meet the requirements of aviation law and health and safety legislation and are a key component in any system for managing aircraft safety and occupational health and safety. Risk assessment can also indicate what improvements need to take priority, and thereby assist in developing budgets and business cases.
- 1.11 When undertaking risk assessments, the following key questions should be considered:
- What are the hazards to people and aircraft from the activity, location or task?
 - Who or what can be harmed and how?
 - What are the risks? Are they being controlled? If not, what more needs to be done, by whom and by when?
 - Have the results of the assessment been recorded?
 - Does the assessment need to be reviewed and revised? When and how often?
- 1.12 A hazard is anything which can cause harm or damage, a risk is the chance, great or small, that people or aircraft will be harmed or damaged by a hazard. This is a function of the likelihood (probability) that harm will occur and the severity of that harm. A number of typical hazards associated with operational airside activities are discussed within Chapter 2.

- 1.13 Under health and safety law, consideration must be given to the risks to the health and safety of employees from other organisations, visitors, members of the public and anyone else who may be affected by the activity or task.
- 1.14 There are various sources of advice which may be consulted when considering whether existing precautions are adequate, and what additional precautions may be necessary. These include CAA and HSE guidance and Industry codes of practice or Standards for comparable activities in other industries.
- 1.15 The general principles for prevention consist of a broad hierarchy of measures such as contained in HSE's advice concerning the management of health and safety, for example:
- Avoiding the risk
 - Evaluating those risks which cannot be avoided
 - Combating risks at source
 - Adapting the work to the individual
 - Adapting to technical progress
 - Replacing the dangerous by the non-dangerous or less dangerous
 - Developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors relating to the working environment
 - Giving collective protective measures priority over individual protective measures
 - Giving appropriate instructions to personnel

Further guidance material, tools and information regarding SMS can be found on the CAA website (<https://www.caa.co.uk/sms>) and from the HSE in managing health and safety (<http://www.hse.gov.uk/pubns/books/hsg65.htm>).

Compliance with statutory requirements

- 1.16 The requirements for the safe operation of aerodromes, with respect to aircraft safety and for the safety of individuals at their places of work, are contained within formal legislative requirements which form part of United Kingdom/GB (HSE) law. It is therefore incumbent on those who provide a workplace, all employers and all employees, to comply with the safety requirements that are set out in the relevant Statutory Instruments. Nothing in CAP 642 substitutes the requirements of the law.
- 1.17 The CAA and the HSE recognise the potential for confusion concerning which organization enforces safety at aerodromes. As a result both parties are

engaged to work together to resolve any overlaps and to detect any potential areas of conflict. Airside regulatory requirements are enforced by the CAA, and together with the HSE and HSENI have developed a Memorandum of Understanding (MoU) which sets out the framework for liaison between the two regulators. Specifically, the MoU aims to ensure co-ordination of policy issues, enforcement activity and investigation in respect of aircraft and the systems in which they operate.

Control of contractors and third party service providers

- 1.18 The use of contractors in the airport environment needs to be adequately managed and should form part of any safety management approach.
- 1.19 Courts have ruled that employers retain some responsibility for health and safety during activities carried out by their contractors. These legal responsibilities cannot be delegated. Some aviation standards, such as [EU-965/2012 \(EU Air Operations\)](#) require Air Operator's Certificate holders to ensure that their contractors safety and operational standards are satisfactory and meet the applicable requirements.
- 1.20 Working in partnership with contractors will support effective safety management. Reasonable and practicable steps that should be taken include:
- Reviewing the contractors' safety provisions to ensure they are adequate to maintain safety;
 - Co-ordination and control arrangements to carry out work; and
 - Auditing, monitoring and reviewing/assessing safety performance
- 1.21 The HSE provides guidance for employers on the Management of Contractors in [HSG 159](#).

Assessing contractors

- 1.22 It is recommended that any assessment of contractors should use a number of criteria, including:
- i. Appointing a supervisor to oversee the activity, especially in relation to aircraft turnaround (described further in Chapter 3). This could be a member of personnel, or a nominated agent. They should have sufficient authority to control the activities involved. For construction additional specific legal requirements need to be followed including the appointment of a principal contractor, see HSE website for further information.
 - ii. Good practice includes agreeing and writing down a plan for contracted activity. To be effective it is essential that all parties are involved.

- iii. Where practicable, the undertaking of joint risk assessments for relevant processes. These assessments could inform the performance standards and the plan. Joint risk assessments will need to take account of differences between companies' management, supervision, equipment and training.
- iv. Agreeing performance standards, for example, frequency of vehicle maintenance and standards for training and refresher training. These may be set through reference to standards imposed on the client and contractor employers by the aerodrome operator or AOC holder.

Performance monitoring

- 1.23 To be effective, performance monitoring should consider adherence to the safety systems in place:
- Methods of work: standing instructions or method statements for the contractors' personnel should be clear how confirmation that the plan for the activity is being followed and what procedures are in place to monitor compliance;
 - Aerodrome procedures should be in place and should be clear to all working on the aerodrome.
 - Methods of identifying, reporting and recording deviations from instructions and rules should be clear, as should those methods that are in place to identify and monitor trends in these deviations.
- 1.24 Individuals monitoring performance should be trained and competent to identify unsafe practices, and where applicable, empowered to stop unsafe activities. [CAP 700 \(Operational Safety Competences\)](#) provides guidance concerning the desired competencies that may be required by individuals conducting performance monitoring.

Control of ground handling service providers during turnaround

- 1.25 The use of contractors at aerodromes to provide services for aircraft is increasing. At many aerodromes, airlines or aircraft operators are the clients for turnround services. They may employ contractors directly or utilise the services of a handling agent, who subcontracts the provision of individual services during aircraft turnround. There may be a mix of service providers; some contracted locally, others on the basis of international contracts.
- 1.26 Whatever the arrangements, the airline/aircraft operator should consider the elements discussed in the relevant paragraphs on apron/stand management and

turnround. Further details concerning aircraft turnround can be found in Chapter 3 of this document.

Aerodrome operator

- 1.27 The duty of the aerodrome operator (who is usually the aerodrome licence or certificate holder) is to provide and maintain an aerodrome which is safe for aircraft and people to use.
- 1.28 Each aerodrome operator is required to maintain an Aerodrome Manual, as an integral part of the operator's safety management system. The manual should complement the aerodrome operator's approach to quality management, including the management of the business, customer-critical processes and health and safety. EASA Aerodrome Regulation and the ANO require that the aerodrome manual contains all necessary information and instructions to enable the aerodrome operating personnel to perform their duties and sets out information and instructions that are to be included in the Manual. The Manual should be disseminated widely so that all stakeholders who undertake tasks that can affect aircraft safety, are familiar with the relevant parts of the document and parts that are applicable to their tasks, duties and responsibilities.
- 1.29 The standard of occupational health and safety is not considered as part of the Aerodrome Certificate or Licence, and the HSE does not licence aerodrome operators. However, under occupational health and safety regulations the aerodrome operator must provide an aerodrome which is safe for aircraft and people to use. This includes:
- An aerodrome layout which is safe, for example such that pedestrians and vehicles can move about safely;
 - Equipment provided by the aerodrome operator which is safe, for example airbridges and fixed electrical ground power for aircraft use;
- 1.30 The people who need to be protected include the aerodrome operator's own employees, the personnel of contractors and tenants, visitors, members of the public.
- 1.31 Many precautions will protect both aircraft and people, which include:
- Properly planned and adequately maintained infrastructure;
 - Adequate standards of specification and maintenance of equipment which interfaces with the aircraft;
 - Adequate standards of specification and maintenance for vehicles, whether directly serving aircraft or not;
 - Adequate driver and operator training;

- Properly planned and executed aircraft turnrounds;
- Good co-operation and co-ordination between all operators.

- 1.32 As the central organisation at the aerodrome, the aerodrome operator has a key role in developing co-operation and co-ordination between all the users of the aerodrome. It may consider establishing committees or other discussion groups for ensuring aircraft safety, setting aerodrome-wide health and safety standards or agreements.
- 1.33 The operators of aerodromes should also take a proactive role in monitoring standards, for example by introducing aerodrome-wide safety assurance programmes or procedures for auditing companies operating at the aerodrome. The implementation of a ground operator licensing system may be a suitable solution at some aerodromes. Those aerodromes which have the power to make 'by-laws' may consider taking actions against employers or persons that consistently breach their regulations and requirements.

Aircraft operators

- 1.34 In addition to the risks to the safety of aircraft, the operator of the aircraft (usually the airline) will need to consider the health and safety of persons not in its employ who are affected by its activities.
- 1.35 Airlines and other stakeholders should co-operate with each other, the aerodrome operator and service providers, to agree uniform standards for performance and monitoring. This may reduce the time and effort required for individual airlines to develop such standards and reduce the probability of human error resulting from a wide variety of standards. Whilst not compulsory, adoption or adherence to the IGOM/ISAGO, as minimum standards, may be considered the best way to achieve uniformity and to deliver standardisation for airside operational practices including aircraft turnround activities.

Ground handling service providers

- 1.36 Contractors on the apron are often required to work to tight timescales to complete their respective tasks in the time allowed for aircraft turnround. However, all those involved should take adequate account of each other's safety needs, for example ensuring that their vehicles or parked equipment is not blocking escape routes of a refuelling vehicle, and that vehicles are not parked in such a way as to hinder or prevent other vehicles having safe ingress/egress access to aircraft.
- 1.37 Where a handling agent has been appointed, service providers should co-ordinate with them to ensure that safety procedures are understood and implemented by the handling agent. They should be working to an agreed plan for the turnround and each service provider should ensure that they have a copy

of this plan. In addition, each service provider should have a supervisor or leading hand who can control the various stages of the turnaround. In all instances plans should also be shared and coordinated with the airport operator and other stakeholders as applicable.

- 1.38 Service providers should ensure that any subcontractors they engage undergo an assessment, control and monitoring processes as appropriate as may be outlined and in accordance with company procedures.

Airside safety committees (ASC)

- 1.39 Aerodromes need effective forums with airside stakeholders with the aim of communicating, promoting and maintaining safety standards and discussing airport, apron or ramp safety issues within an open and just culture.
- 1.40 It is therefore recommended that aerodrome operators establish an ASC. The 'committee' might typically be headed by the aerodrome's airside safety manager or equivalent manager with responsibilities for airside safety. There should be no barriers to membership or attendance, which should consist of many different organisations including airline operators, ground handling service providers, the ANSP and representatives from the emergency services.
- 1.41 Meetings should be scheduled on a regular basis, with notes and actions from meetings communicated and promulgated to the wider airside community, with agreed actions recorded and followed-up for closure.

Chapter 2

Identifying hazards and managing risks

Introduction

- 2.1 This chapter discusses some of the potential hazards typically encountered on the aerodrome and the risk control measures that may be applied to them. However, effective safety management requires co-operation and co-ordination between the aerodrome operator, ground service providers, airlines and other aerodrome users and contractors.

Controlling hazards

Vehicles striking people and/or aircraft

- 2.2 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.
- 2.3 The layout of an aircraft parking stand can be so designed to minimise activities which present a higher risk and operators should consider the use of fixed services such as fixed electrical ground power or pre-conditioned air on the aircraft parking stand in order to reduce the number of vehicles operating around aircraft.

Hazards to passengers on the apron

- 2.4 At aerodromes where airbridges are not provided or where they are provided but the airlines choose not to use them, then passengers may become exposed to the hazards on the ramp. The risk of injury to passengers is generally higher due to their vulnerability and general lack of awareness of the dangers around them. Passengers should therefore be supervised and monitored where practicable, to ensure adherence to marked walkways or within safety railings or barriers for as long as possible or unless otherwise directed by airside personnel enroute to or from aircraft.
- 2.5 When operating outside of the safe areas, active management of passengers and vehicles may be required. Such routes should be clear and unambiguous and should not require passengers for example to walk underneath aircraft wings or in close proximity to aircraft engines or propellers or require to them to walk in conflict with other vehicular traffic.

- 2.6 Aerodrome operators should consider any unusual circumstances in which passengers may be found on the Apron when not embarking or disembarking an aircraft e.g. evacuation of the terminal building or aircraft. Adequate infrastructure and control methods should therefore be considered and provided in order to manage and control passengers in these circumstances. The elements which may be considered include:
- a) Apron layout and stand configuration
 - b) Provision and resourcing of passenger supervision
 - c) Safe traffic routes:
 - Physical segregation
 - Permanent route demarcation and clear crossing points e.g. roads or taxiways that do not dissect the pedestrian/passenger routes between the terminal and the aircraft.
 - Use of moveable barriers and chains to create a temporary safe route across the apron for passengers to follow.
 - Traffic control e.g. positive control of vehicular traffic may be required from the airline or handling agent with routes that do not pass below aircraft wings, beneath fuel vents or close to propellers or rotors of aircraft.
 - Routes should also be clear of electrical cables, fuel hoses and other ramp equipment; this may require the use of temporary mobile passenger guidance barriers - such as 'Passenger Integrated Guidance Systems' (PASSENGER INTEGRATED GUIDANCE SYSTEMS).
 - d) Running of aircraft engines in the vicinity of passengers
 - e) Information to passengers of the safe route to follow
 - f) Transportation to and from remote stands

Vehicles, ground service equipment (GSE) and people movement

- 2.7 Vigilance is necessary for all those working airside to be aware of the potential hazards associated with the movement of ground vehicles and GSE. Physical segregation between vehicles, GSE and people is the most effective risk control within aerodromes. Well organised traffic and pedestrian routes, including one-way systems, speed limits, adequate and appropriate ground markings and lighting are all aspects all need to be considered when looking at risks associated with vehicles, GSE and people.
- 2.8 Some aerodromes have service delivery systems built into the stands (such as fuel hydrants and fixed electrical ground power), thus reducing the number of

vehicles that have to attend an aircraft. However, such systems are rare at smaller aerodromes and in such cases other methods will need to be considered. Where such systems are installed, it is important that safe contingency procedures are available to cater for equipment failure.

2.9 All parties operating on the aerodrome should co-ordinate with each other in relation to the parking, storage and movement of vehicles and GSE. Elements to consider may include:

- Aerodrome traffic rules
- Vehicle and GSE maintenance
- Driver training, permits and refresher training
- Behaviour of pedestrians (including passengers)
- Reversing vehicles
- Suitability of vehicles and GSE
- Safe parking of vehicles and GSE
- PPE
- Day and night operations
- Inclement weather, including low visibility conditions
- Emergency procedures

2.10 In reality, it is likely that a combination of measures 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 also need to be considered.

Aircraft parking safety practices

General considerations – operation of the stand

2.11 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 with stakeholders, or other owner/operator agreements. It is therefore good practice for aerodromes and other stakeholders to develop and establish the responsibilities and where practicable, conduct joint risk assessments with the aerodrome users and then seek to establish agreed safe working practices within that hierarchy. In any case, there are duties stated within [HSE's MHSWR](#) regulations to ensure that those sharing a workplace, however temporary, must to cooperate and coordinate to ensure that they meet the applicable regulatory requirements.

- 2.12 The aerodrome operator and the ANSP are 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. Information documents/instructions and requirements should be based upon the subjects described in the following paragraphs.

Ownership of stand/parking bay

- 2.13 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, ground handling personnel also have specific responsibilities (see Chapter 3 Aircraft Turnround).
- 2.14 Where practicable, a stand supervisor, turnround co-ordinator or equivalent person with safety responsibilities should be nominated to control and manage the turnround process and should be clearly identified to all personnel working on the stand. As described in Chapter 3, the supervisor, turnround co-ordinator or delegated responsible person(s) in accordance with respective company procedures, should be working to an agreed plan for the turnround process and have sufficient authority to control the activities around the aircraft and to recognise and intervene where safety matters arise.

Vehicle and equipment operations

- 2.15 Further guidance for vehicle operations and maintenance is contained in Chapter 4 of this publication. Prior to aircraft arrival GSE should be/remain parked in the equipment areas provided. Service vehicles and baggage trolleys should stay clear of the stand and equipment, such as ground power units or any other equipment with trailing cables or hoses, should be fully retracted and stowed. The stand must be clear of all obstructions, including chocks and cones, and equipment prior to the arrival of the aircraft allocated to the stand. Other considerations for the safe docking and parking of an aircraft are described in the following paragraphs.

Stand markings

- 2.16 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. Further guidance and details on markings, signs and stand design considerations are contained within CAP 637 (Visual Aids Handbook).

Self-maneuvring – stand configurations and safety considerations

- 2.17 Self-maneuvring 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-maneuvring and the blast effects are smaller. Some airports also employ what is known as 'remote holding', which is where loaded aircraft are towed from the stand to a remote area in order to wait for an ATC delayed slot time, therefore vacating the stand for another aircraft. This might involve small/medium sized aircraft being positioned nose-out on a remote stand where self-maneuvring off the remote stand is not considered a blast problem.
- 2.18 Self-maneuvring 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-maneuvring, 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.
- 2.19 Prior to deciding to adopt self-maneuvring operations aerodromes should conduct a joint risk assessment with the aerodrome users. This should include consideration of other methods of aircraft handling. Self-maneuvring 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.
- 2.20 Risk assessments should ensure that the following are considered:
- a) Stand entry routes, parking positions and departure routes should be marked with standard paint markings, in accordance with the requirements noted in the applicable Aerodrome regulations and [CAP 637 \(Visual Aids Handbook\)](#) or, in the event of non-mandatory markings, the ACI Apron Markings and Signs Handbook;
 - 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, and where appropriate, equipment parking areas should be protected by blast screens or located remote from the stands;
 - d) Where appropriate, and as deemed necessary due to health and safety considerations, passenger areas and apron personnel working areas should

be protected by blast screens. Passengers should not be subjected to blast, excessive noise or fumes;

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

Out of service or 'dead' aircraft handling

2.21 In addition to the above considerations, handling personnel pushing back a 'dead' aircraft for towing must follow local procedures, which may take into account the following considerations:

- a) That trained personnel should 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;
- b) That tug crews assigned the task associated with the movement of an aircraft on any part of the manoeuvring area should liaise with ATC for the necessary approvals and obtain a specific clearance before entering the manoeuvring area. The tug driver is normally required to advise ATC when the manoeuvre is complete;
- c) 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, in accordance with Rules of the Air regulations it is the tug driver who is responsible at all times for ensuring that the aircraft does not collide with vehicles, aircraft, buildings or other obstructions;
- d) 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 clearance 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 the ATC;
- e) 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 circumstance involving the towed aircraft, the tug driver should be able to advise Airfield Operations or the Rescue and Firefighting Service (RFFS) of the POB;

- f) 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; however, towbar-less tugs may require specific procedures regarding the display of navigation lights that must be agreed with both the aerodrome and Air Traffic Control.

Preparation of stand

Visual docking guidance system (VDGS)

- 2.22 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 and clearways are free from obstructions, FOD and equipment (vehicles are usually permitted to wait in clearways when aircraft arrive on stand). 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.
- 2.23 VDGS assist in the safe manoeuvring of aircraft onto stand. Aerodrome operators should ensure that VDGS are regularly checked for serviceability and calibrated for accuracy. As part of its local operating procedures for its aircraft parking stands, consideration should be made for the operation of VDGS, including training and on-going competency. Further information may be found in the [EASA Certification Specification and Guidance Material for Aerodrome Design Manual, Chapter M –Visual Aids for Navigation \(Lights\)](#).
- 2.24 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.
- 2.25 Where a VDGS is provided the aerodrome operator should arrange for the stopping guidance to be calibrated and indicated for all selected user aircraft, in a clear and unambiguous manner. Azimuth guidance indication should also be regularly checked for accuracy. It is often the case with modern or advanced VDGS that the system self-checks prior to arming, however all systems should be subject to regular serviceability checks as deemed appropriate, the results of which should be recorded in line with local maintenance and serviceability

procedures. Details of VDGS available at the aerodrome should be promulgated in the UK Aeronautical Information Publication.

Stop short system

- 2.26 On stands equipped with VDGS, an indicator system should be provided to advise the pilot to Stop Short; this may be because the airbridge is unserviceable and passenger steps may be used, or due an obstruction or due to works at the head of stand for example. 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

- 2.27 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. 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.
- 2.28 The following locations may offer the best control positions:
- 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. Emergency Stop switches should be manned in accordance with local procedures and instructions.
 - 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.

Aircraft arrival

- 2.29 Fundamental to the safe management of aircraft movement on stand during the arrival phase 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 taken into consideration by the person in charge of the turnround:

- a) Before the aircraft enters the stand, ensure by personal visual inspection that there are no potential hazards to the safe aircraft parking operation (such as FOD, vehicles or equipment illegally parked in the inter-stand clearway, or equipment poorly positioned);
- b) Before the aircraft enters the stand, the drive wheels of an apron-drive airbridge must be positioned in the marked parking box or pre-position box provided;
- 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 fully stopped, brakes applied, the engines have shut down and the aircraft anti-collision beacon has been extinguished, can the wheel chocks be put in place. Only then should the airbridge be driven from its parking position and docked to the aircraft, or steps be positioned beside the aircraft;
- g) The aircraft passenger door should remain closed until the airbridge has 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.

Aircraft arrival on stand and safety considerations

- 2.30 In general, some of the hazards generated during the arrival of an aircraft on stand are, jet blast, vehicle driving standards, vehicle and ground equipment indiscriminately parked/stowed, misleading ground markings, visual docking guidance, signs and marshalling signals.

Control of the parking/docking operation

- 2.31 Ground handling personnel are responsible for certain 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 personnel. The nominated supervisor should control the progress of the operation and the actions of the handling team and should include considerations with regard to the protection of the marshallers whilst carrying out the task, particularly where they are required to be positioned