



ICAO

Doc 10121

Manual on Ground Handling

First Edition, 2019



Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION



| ICAO

Doc 10121

Manual on Ground Handling

First Edition, 2019

Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Published in separate English, Arabic, Chinese, French, Russian
and Spanish editions by the
INTERNATIONAL CIVIL AVIATION ORGANIZATION
999 Robert-Bourassa Boulevard, Montréal, Quebec, Canada H3C 5H7

For ordering information and for a complete listing of sales agents
and booksellers, please go to the ICAO website at www.icao.int

First edition, 2019

Doc 10121, *Manual on Ground Handling*

Order Number: 10121

ISBN 978-92-9258-821-2

© ICAO 2019

All rights reserved. No part of this publication may be reproduced, stored in a
retrieval system or transmitted in any form or by any means, without prior
permission in writing from the International Civil Aviation Organization.

FOREWORD

Ground handling forms a significant and critical part of the aviation industry. Larger aircraft, an increase in ground support equipment and faster turnarounds all contribute to the challenge of improving operational safety. With the growth of air traffic and the proliferation of third party ground handling companies, ground operations on airport aprons have become increasingly complex and potentially hazardous.

It is important that the safety, reliability and consistency of flight operations continue on the ground. Apron areas are often the most congested and busiest areas of an airport with aircraft turnarounds being carried out under significant space and time constraints. Unlike other areas of the aviation industry, the ground handling sector is currently not subject to the level of regulation in areas such as flight operations, air traffic management and aerodrome operations. However, some States already plan to better regulate ground handling activities.

For several years the air operator, aerodrome and ground handling sectors of industry, together with a number of State regulators, have been concerned with the level and extent of damage to aircraft during ground handling and the rate of safety occurrences to aircraft, passengers and airport workers. This concern continues to be shared internationally by various groups and organizations.

The *Manual on Ground Handling* addresses these concerns and was developed in close cooperation with industry representatives to benefit from the experience and expertise of those working “hands on” in aircraft turnaround operations.

The guidance in this manual represents “accepted industry good practice” that has been proven in the field. Care should be taken when using the material and guidance as it might not be applicable or appropriate for use in all States or organizations. There may also be some overlap with State occupational health and safety regulations that protect personnel working airside; however, this manual shows how both aircraft and personnel safety can be included in an appropriate safety management system (SMS).

TABLE OF CONTENTS

	<i>Page</i>
Foreword	(v)
Glossary.....	(ix)
Chapter 1. Introduction.....	1-1
1.1 Scope	1-1
1.2 Safety in ground handling.....	1-3
1.3 Safety culture in ground handling	1-4
1.4 Safety management in ground handling	1-5
1.5 Safety management is “good for business”	1-9
1.6 Importance of standard operating procedures.....	1-11
1.7 Contribution of industry organizations to ground handling safety	1-11
Chapter 2. Guidance for States	2-1
2.1 Ground handling safety	2-1
2.2 Assessment of the impact of ground handling as part of the SSP.....	2-2
2.3 Management of the ground handling impact on safety	2-2
2.4 Determination of appropriate safety promotion actions	2-3
Chapter 3. Guidance for air operators.....	3-1
3.1 Relationship between GHSPs and air operators	3-1
3.2 SMS interfaces with GHSPs.....	3-1
3.3 Provision of standard operating procedures	3-3
3.4 Interfaces with GHSPs in emergency response planning.....	3-3
3.5 Specific guidance for general and business aviation operators.....	3-4
Chapter 4. Guidance for ground handling service providers	4-1
4.1 Organizational requirements for a GHSP	4-1
4.2 Implementation of safety management principles by GHSPs.....	4-2
4.3 Requirement for standard operating procedures	4-11
4.4 Communication, cooperation and coordination between air operators, aerodrome operators and GHSPs	4-11
4.5 Human factors	4-12
4.6 Recruitment of temporary staff	4-14
4.7 Training, qualification and competency	4-14
4.8 GSE standards and maintenance.....	4-14
4.9 Occupational health and safety	4-15

Chapter 5. Guidance for aerodrome operators	5-1
5.1 Relationship between the GHSP and aerodrome operator.....	5-1
5.2 SMS interfaces with GHSPs	5-2
5.3 Operational safety considerations in relation to ground handling	5-3
5.4 Apron design for safe operations.....	5-9
5.5 Communication, cooperation and coordination between air operators, aerodrome operators and GHSPs	5-11
5.6 Interfaces with GHSPs in emergency response planning.....	5-11
Chapter 6. Operational interfaces — Processes and policies	6-1
6.1 Introduction.....	6-1
6.2 General safety	6-1
6.3 Turnaround activities	6-5
Appendix A. References	App A-1
Appendix B. List of ground handling services	App B-1
Appendix C. Ground handling risks mapping.....	App C-1
Appendix D. Models applied by States for ground handling safety oversight.....	App D-1
Appendix E. Examples of risk assessments	App E-1
Appendix F. Safety performance indicators for ground handling.....	App F-1
Appendix G. Human factors: the “Dirty Dozen”	App G-1
Appendix H. Turnaround plan	App H-1

GLOSSARY

DEFINITIONS

When the following terms are used in this manual, they have the following meaning:

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aircraft Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Commercial air transport operation. *An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.*

Dangerous goods. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Note.— Refer to Chapter 3 of Annex 18 — The Safe Transport of Dangerous Goods by Air for dangerous goods classification.

General aviation operation. An aircraft operation other than a commercial air transport operation or an aerial work operation.

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

Industry codes of practice. Guidance material developed by an industry body, for a particular sector of the aviation industry to comply with the requirements of the International Civil Aviation Organization's Standards and Recommended Practices, other aviation safety requirements and the best practices deemed appropriate.

Note.— Some States accept and reference industry codes of practice in the development of regulations to meet the requirements of Annex 19 — Safety Management, and make available, for the industry codes of practice, their sources and how they may be obtained.

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

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

ABBREVIATIONS AND ACRONYMS

A-CDM	Airport collaborative decision-making
ADP	Airside driver permit
APOC	Airport operations centre
APU	Auxiliary power unit
AVP	Airside vehicle permit
CAA	Civil aviation authority
ERP	Emergency response plan
FOD	Foreign object debris
GHSP	Ground handling service provider
GSE	Ground support equipment
IMS	Integrated management system
OSHE	Occupational safety, health and environment
PPE	Personal protective equipment
SMS	Safety management system
SOP	Standard operating procedure
SPI	Safety performance indicator
SPT	Safety performance target
SSP	State safety programme
ULD	Unit load device

Chapter 1

INTRODUCTION

1.1 SCOPE

1.1.1 The intent of this manual is to address the ground handling services that form an integral part of the aviation system and contribute directly to flight and aerodrome safety. The content of this manual provides guidance for all stakeholders involved in the ground handling of aircraft that might impact the safety of operations. This impact should be assessed locally as the hazards, risks and resulting risk management and mitigation measures may need to be tailored to specific circumstances or be site specific.

1.1.2 Ground handling is defined in Annex 6 — *Operation of Aircraft* as “services necessary for an aircraft’s arrival at, and departure from, an airport, other than air traffic services”. A list of these services is provided in Appendix B of this manual. Annex 14 — *Aerodromes, Volume I — Aerodrome Design and Operations* does not specifically refer to ground handling but contains provisions on apron management service, ground servicing of aircraft, aerodrome vehicle operations and surface movement guidance and control systems, including safety requirements relating to ground handling. Aerodrome operators have responsibilities relating to the safety of operations at the aerodrome including those that take place in the terminal area and on aircraft stands. These responsibilities also cover the provision of facilities and the protection of personnel and passengers. Organizations that provide ground handling may be subject to licensing or other authorization criteria set by the aerodrome operator.

1.1.3 Annex 19 — *Safety Management* defines safety as “the state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level”. Annex 19 also defines a safety management system (SMS) as “a systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures”.

1.1.4 This manual brings together the ground handling operation and the principles of SMS to highlight safety improvements in the overall system for ground handling service providers (GHSPs) as well as air and aerodromes operators. It also provides guidance for States to assist with the inclusion of ground handling in their State safety programmes (SSP).

1.1.5 Ground handling services, both for commercial air transport and general aviation, aim to maintain the regularity and efficiency of flight and aerodrome operations. Ground handling services can be provided by an air operator, an aerodrome operator or an independent company. When provided by an air operator or an aerodrome operator, this entity is considered, for the purposes of this manual, as a GHSP. In such cases, the relevant interfaces, internal to the organization or as otherwise appropriate, should be established for the management of safety.

1.1.6 There are market and operational differences that apply for general aviation operations. The basic provisions aimed at GHSPs contained in this guidance document acknowledge these differences and consider specific provisions to accommodate them. Guidance for general aviation can be found in 3.5.

1.1.7 Since ground handling involves various stakeholders operating through complex interactions, guidance is provided in the next chapters for States, air operators (including general aviation), GHSPs, as well as aerodrome operators, as shown below in Table 1-1. All stakeholders shall, as a minimum, comply with the laws, regulations and procedures of those States in which their operations are conducted.

Note.— Some of the ground handling services discussed in this manual are already addressed by existing ICAO Standards and Recommended Practices (SARPs) or industry provisions, e.g. aircraft maintenance is covered by Annex 8 — Airworthiness of Aircraft, or aircraft fuelling is addressed in the Manual on Civil Aviation Jet Fuel Supply (Doc 9977). These other provisions should be considered in conjunction with the guidance included in this manual.

Table 1-1. Structure of the manual

Chapter 1 Introduction	Chapter 2 Guidance for States	Chapter 3 Guidance for air operators	Chapter 4 Guidance for GHSPs	Chapter 5 Guidance for aerodrome operators	Chapter 6 Operational interfaces — Processes and policies
<ul style="list-style-type: none"> • Scope • Safety in ground handling • Safety culture • Safety management • Importance of standard operating procedures (SOPs) • Contribution of industry organizations 	<p>Assess the impact of ground handling for the SSP</p> <p style="text-align: center;">↓</p> <p>Ensure the impact is managed</p> <p style="text-align: center;"><i>and</i></p> <p>Determine appropriate safety promotion actions</p>	<p>GHSP / air operator relationship</p> <p>SMS interfaces with GHSPs</p> <p>Provision of SOPs</p> <p>Emergency response plan (ERP) interfaces</p> <p>General and business aviation specifics</p>	<p>GHSP organizational requirements</p> <p>Implementation of safety management principles</p> <p>Requirement for SOPs</p> <p>Coordination</p> <p>Human factors</p> <p>Temporary staff</p> <p>Training</p> <p>Equipment</p> <p>Occupational health and safety</p>	<p>GHSP / aerodrome operator relationship</p> <p>SMS interfaces with GHSPs</p> <p>Operational safety considerations</p> <p>Apron design</p> <p>Coordination</p> <p>ERP interfaces</p>	<p>General safety (walking, driving, foreign object debris (FOD), adverse weather, etc.)</p> <p>Turnaround activities (marshalling, loading, etc.)</p>
<p>Appendices: references, list of ground handling services, examples.</p>					

1.2 SAFETY IN GROUND HANDLING

1.2.1 Safety must be a priority for any organization involved with aviation. The information contained in this manual, if followed, should lead towards an acceptable level of safety to aircraft, infrastructure, equipment and third parties. Ground damage and staff injuries have significant direct and indirect costs and cause major disruptions in operations. In addition, undetected or unreported errors when servicing the aircraft can affect its load and balance, aerodynamics, airworthiness or performance. These errors occur much less frequently, but their consequences can be catastrophic.

1.2.2 There has been much debate as to the direct and indirect costs of damage to aircraft but it is suggested to be billions of United States Dollars (USD) per annum; the ground damage rate is currently around 5 per 10 000 movements. GHSPs often calculate the cost of damage and repair to an aircraft, while air operators add lost revenue, compensation and delay. There is also the cost of personal injury and fatalities to ground personnel.

1.2.3 Despite considerable efforts by air and aerodrome operators, GHSPs and regulators, serious accidents and incidents still occur. This suggests that there are still many areas of improvement needed. Some of the main causal factors are:

- a) staff issues which include quality of training, shortages, low wages, unattractive working conditions, high turnover, absenteeism, excessive overtime and fatigue;
- b) continued competition between service providers for ground handling contracts driven by air operators looking for the lowest costs in third party operations. This results in GHSPs struggling to maintain appropriate staffing levels;
- c) difficult working conditions, including apron congestion with equipment and vehicles, and operations at night or in poor weather conditions;
- d) a conflict between efficiency (such as “on-time departure” performance) and the use of safe working practices;
- e) pressure on staff resulting from increasingly short turnaround times;
- f) an underdeveloped safety culture within organizations; and
- g) issues arising from maintenance and operability of ground support equipment (GSE), including aging equipment.

1.2.4 Many incidents can occur in the brief period before aircraft departure when few safety nets exist and there are commercial pressures for on-time departures. Reports from industry show a significant percentage of ground damage and loading errors are “found on arrival” indicating a large number of aircraft are dispatched with unreported damage or potential weight and balance errors. Increasing economic pressure faced by industry to cut costs can lead to a lack of quality control, unsafe working practices, reduced staff training and lower quality of GSE maintenance. The outsourcing of ground handling operations, while providing some financial efficiencies, should not be seen by the air operator as a way of transferring risk and responsibility.

1.2.5 A GHSP has to strike a balance between profitability and safety, therefore a balance between service performance and safety performance needs to be achieved. It should never be the case that safety procedures are broken to achieve service targets. This is developed further in the *Safety Management Manual* (Doc 9859) through safety risk management and the concept of “safety space”.

1.2.6 The ability to provide ground handling services in a safe manner is also challenged by an evolving environment, in particular due to aircraft, which are increasing in size and number, often requiring more, larger or complex GSE. Available space on the apron is often constrained and allotted time for turnaround ever more reduced. The GHSPs also have to evolve quickly to cater for changing air operator business models.

1.2.7 A significant change over the past few years has been the propensity for ground handling to be outsourced by the air operators. Globally, it is estimated 75 per cent of all ground handling operations are outsourced to third party handlers.

1.2.8 Ground handling competition has been a very important issue over the past few years leading to both positive and negative developments. Competition has without a doubt reduced costs and provided air operators who outsource their ground handling operations with improved choice of provider. However, there has been continued pressure on independent GHSPs to reduce the costs of their operations. The desire for GHSP sustainable profitability while delivering services to air operators, often struggling with their own profitability, has resulted in a difficult operating environment. There appears to be a drive from air operators to negotiate for the lowest handling fees possible while the GHSPs attempt to secure the critical mass to survive and invest for the future. Ultimately, there needs to be a balance between competition, cost efficiency and safety.

1.2.9 While air operators and aerodrome operators are regulated by States, GHSPs are generally not directly regulated. As a result, there are no globally applicable regulatory provisions for ground handling. There are, however, industry-developed and implemented standards for the management and operation of ground handling services and standardized operational procedures, and an associated audit programme.

1.3 SAFETY CULTURE IN GROUND HANDLING

1.3.1 Annex 19 highlights the need for States and service providers to promote a safety culture. For a GHSP this should be an expression of how safety is perceived, valued and prioritized by management and personnel. A safety culture is a set of values, behaviours and attitudes regarding safety issues shared by every member at every level of the organization. A safety culture should be the normal, everyday operating mode and part of everyone's behaviour, not optional or discretionary. Good indicators of a positive safety culture are:

- a) a positive attitude and awareness of all staff towards known hazards, safety risk management and compliance processes with agreed control and mitigation measures;
- b) an environment which allows continuous improvement and safety enhancements, shown by the capacity to learn from accidents, incidents, near misses and other safety indicators;
- c) a willingness for management, supervisors and staff to discuss safety and operational issues and an ease of transmitting safety-related communications across the organization; and
- d) continuously evaluating safety-related behaviours across the organization shown by positive supervision and oversight of operations, which works with staff to identify and develop safe working practices.

1.3.2 The greater the number of employees that show these behaviours and characteristics, the better will be the safety culture. Safety culture should be meaningful to GHSP's personnel and is often reflected in how they think, talk and act. The maturity of a safety culture will have a direct impact on safety performance. If employees believe safety is not important then non adherence to standard operating procedures (SOPs), corner-cutting and workarounds will result. A safety culture should exist at all times, not just when a manager or a regulator is watching. It has been suggested that a safety culture is an intangible concept whose true worth is only perceived by its absence.

1.3.3 GHSPs vary considerably in their size, organizational makeup and service provision. There is also a wide number of large private GHSPs operating in multiple States, others that are State-owned or operated by an aerodrome, and some that are small and only operate in one State. This diversity will affect the maturity of the safety culture globally. There are significant national cultural differences affecting how an individual is perceived in society. The organizational culture may therefore be significantly affected by the national culture and this may provide some difficulties for multinational companies trying to develop an SMS.

1.3.4 Care needs to be taken when operating with a multicultural workforce as safety risk perception, communication, job status and leadership style will vary. Similarly, reporting culture varies widely with many cultures not adhering to or using an open reporting or just culture system. If GHSP staff avoid reporting for fear of losing their jobs then valuable data and information on safety will be lost. This is one of the main barriers to operating an open reporting or “just culture” system. A just culture is one that is fair and encourages open reporting of accidents and incidents. However, it does not tolerate deliberate harm and wilful damaging behaviour.

1.3.5 A poor safety culture would be represented by an organization that, in effect, encouraged non-compliance with safe working practices or SOPs. Poor safety culture is often reflected in poor performance in other areas such as training, supervision, and vehicle and equipment management. A significant number of accidents can be traced to unsafe behaviours. Poorly designed equipment or operations, poor systems and poor working conditions can all encourage unsafe behaviours.

1.3.6 As with SMS, the promotion of a safety culture is critical and begins with the accountable executive. It is transmitted through agreed policies, training and promotional material. Safety culture maturity and effectiveness can be assessed through various methodologies including, but not limited to, interviews, staff surveys and observations.

Note.— The “accountable executive” is known in many States as “accountable manager”.

1.4 SAFETY MANAGEMENT IN GROUND HANDLING

1.4.1 An SMS provides a business-like approach to safety. It should therefore be seen as a business tool helping GHSPs manage risks and making the right business decisions. The “ownership” of safety processes belongs with an organization’s management. Senior managers are in the position to weigh safety risks against the cost of mitigation, and where priorities and resources are allocated. Managing safety does make good business sense in aviation and many good practices are also applicable to good business practice.

1.4.2 The use of a SMS and its principles provide accountable executives and operational managers a method for managing safety resulting in a set of beliefs, systematic practices and procedures for mitigating and monitoring safety. The implementation of SMS in aviation is relatively new; however, the principles have been in use by other hazardous industries, such as petrochemicals and nuclear, for much longer.

1.4.3 Accidents, incidents and occurrences will still happen even with an SMS. However, the system will assist an organization to be proactive as well as reactive in controlling known risks using a framework or structure that can improve the effectiveness of its operation. The use of safety management principles has proven its efficiency in safety-critical industries including aviation. They contribute to preventing accidents and incidents, and have proven to have a positive cost-benefit ratio considering the financial impact these events could have.

1.4.4 ICAO has required the use of SMS in a number of aviation sectors for many years and is gradually expanding SMS to other sectors. While currently the ground handling sector is not required to have an SMS, many States already require it and this manual strongly recommends that SMS principles, combined with industry best practice, should be adopted by GHSPs.

1.4.5 In circumstances where an air operator with a functioning SMS contracts services from a GHSP, the hazards and safety risks resulting from the GHSP's activities should be addressed by the SMS of the air operator. However, in cases where both the air operator and GHSP have their own SMS then the safety responsibilities and interactions of both systems should be coordinated.

1.4.6 Key to the success of an SMS is the full involvement by accountable executives and senior managers. These senior positions usually control budgets and can allocate resources to safety. Accountability not only lies with senior management for their own organization but also the safety assurance of third parties. SMS can help with this by ensuring safety is a consideration in all third party contracts. An important concept is that accountability cannot be delegated; however, responsibility can be delegated and it is acceptable for other managers and supervisors within a GHSP to manage safety on a day-to-day basis.

1.4.7 There are a number of key principles that need to be applied for a ground handling company to benefit from the investment in safety management. Principles highlighted by safety professionals and organizations globally as key components of a world class system include:

- a) **Effective policies and SOPs developed with the involvement of the GHSP's personnel and relevant stakeholders.** Successful organizations have used a systems approach to safety management by using and adapting industry standards and best practice guidance. An integrated approach across safety, quality, security and environment allows processes and values to become embedded in the way a company does business.
- b) **A proactive method of hazard identification and safety risk assessment/management.** Many of the hazards associated with ground handling that have been identified are known to industry. It is critical that a GHSP provides appropriate safety risk assessment and mitigations to these hazards and makes them known to staff. It is important to note that some of the hazards encountered when working on the apron are generated by third parties or other organizations working as part of aircraft turnarounds.
- c) **Competent and trained personnel with regular refresher programmes.** An initial and ongoing training programme allows an organization to strengthen the skills each employee needs to carry out their job. Further development and "refresher" training brings all personnel to a higher level of competence, skills and knowledge.
- d) **A strong process of monitoring and reviewing activities and change management.** Business models are constantly evolving and changing, and operational changes can result in new hazards being generated and risk assessed. Hazards from change can occur, for example, from the introduction of new handling equipment, air operators changing aircraft type or the introduction of seasonal personnel.

1.4.8 An accountable executive can demonstrate a positive approach to safety management by:

- a) "Walking the Talk" — the accountable executive is a role model and personnel watch and listen to their actions and words. When they are out at locations, offices, airports and out stations they always use the opportunity to discuss and promote safety. Their actions reflect their beliefs and encourage personnel to commit time and effort to ensuring and improving safety. The accountable executive leads from the front at all times.
- b) Creating a positive safety culture — key to this is the development and acceptance of an open reporting culture with appropriate non-disciplinary policies that allow lessons to be learnt from accidents and incidents. A positive safety culture allows senior management to get a true picture of what is going on with their operation and to better understand the risks.

- c) Inspiring personnel through a safety vision — safety policies and vision or mission statements need to be brought to life so that they become an ingrained part of everyday work. This includes emphasizing to all staff that safety matters and their input is needed to support safety objectives and incident reporting processes.
- d) Leading safety forums — it is vital that the accountable executive leads the highest level safety meetings. It is also important to be seen at all safety meetings, regardless the level, to show support and promote the safety culture.

1.4.9 Appendix 2 of Annex 19 highlights four components and 12 elements as the minimum requirements for SMS implementation. The degree and depth of detail for each element will depend on the size and complexity of the individual GHSP and the concept of scalability should be applied. The framework is described in Table 1-2 below. Further details on what these mean for a GHSP may be found in Chapter 4.

Table 1-2. Annex 19 framework for an SMS

<i>Components (4)</i>	<i>Elements (12)</i>
1. Safety policy and objectives	1.1 Management commitment 1.2 Safety accountability and responsibilities 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

Scalability

1.4.10 The safety management processes implemented by a GHSP should be commensurate with its size and the complexity of its services.

1.4.11 The principles of good SMS apply to all organizations, companies and operators irrespective of their size and complexity of operation. The four components and 12 elements of the ICAO SMS framework can be used appropriately for both large and small organizations alike. Scalability does not mean picking particular elements; all the elements are applicable but will vary in scale. The individual GHSP should carry out an analysis of its activities to determine the right level of applicability and resource to manage its SMS. Even small GHSPs could be involved in activities having significant safety risks or be affected by other organizations working around them.

1.4.12 Many GHSPs already have an SMS in place and recognize the benefits this brings to their business. These benefits can be equally obtained by small, medium and large providers. The key benefits of using SMS principles are: compliance with regulations; the ability to win and retain contracts; the avoidance of business disruption; and the

motivation and retention of key staff. For small organizations, the low volume of incidents and safety data will mean it is more difficult to identify trends. Other more qualitative means of assessing safety might be required such as safety meetings and collaborating with other service providers or industry representative bodies.

Note.— Further information on scalability can be found in Doc 9859 and the Safety Management International Collaboration Group's (SM ICG) SMS for small organizations.

Interfaces between organizations

1.4.13 Annex 19 states that “[a] service provider’s interfaces with other organizations can make a significant contribution to the safety of its products or services”. The SMS of the air operator, aerodrome operator and GHSPs should interact effectively. Chapters 3 and 5 of this document include a focus on the safety management interfaces with GHSPs, and the air and aerodrome operators.

1.4.14 The GHSP should be aware of the interfaces that exist between itself and other companies or organizations as well as parts of its business that might influence its safe operations. The SMS should list and indicate both internal and external interfaces. Once the interfaces have been recognized, the GHSP should consider the critical nature of each interface. Important to the interface is whether the organization has an SMS and whether data sharing is required. The GHSP should identify any hazards related to the interfaces and carry out joint hazard analysis and safety risk assessments. For a GHSP, the critical interfaces will be with the air operator it contracts with and the aerodrome operator on whose property they operate and facilities they use. Collaboration between each of these three key stakeholders is critical to ensuring a safe operation. Each organization has the responsibility to identify and manage hazards that affect their own organization. Operational safety benefits can be achieved through an enhancement of safety as a result of shared ownership of safety risks. This also allows transfer of knowledge and working practices that could improve the effectiveness of either organization.

1.4.15 As part of ensuring the safety performance of outsourced services, air operators must ensure sufficient oversight of their GHSPs. In addition to audits from the various operators they contract with, GHSPs may be audited by aerodrome operators and/or States as part of their safety assurance tasks. Industry organizations have developed auditing programmes that provide common sets of standards and are aimed at reducing the risk of ground damage and personnel injuries.

1.4.16 Harmonized standards and standardized procedures are the backbone of ICAO regulations. They are also the basis of safety assurance, increased safety performance and efficient operations. In the absence of global regulations for ground operations, there is a risk that regulations and the resulting standards and procedures are developed and implemented within States on an ad hoc basis and without regard to harmonization. This situation not only hinders global standardization but may also create additional safety risks. Programmes exist that have established standards and procedures for ground operations that reflect industry best practices. The standards and procedures are implemented through audit programmes that replicate State oversight activities, assessing the management capabilities (including validating the implementation of safety management principles) as well as the operational performance of a GHSP against published audit checklists and by onsite observations. The industry-based programmes may also include a registration scheme with periods in which audits must be repeated to ensure continual conformance to the standards. The standards and procedures are also continually reviewed and updated by industry experts to remain current, address new safety risks, and incorporate new technology. The audit checklists are similarly maintained.

1.4.17 Industry-based auditing programmes also aim to reduce the number of audits conducted by air operators to which GHSPs are subjected. In some cases, the GHSP is audited by different airlines against the same criteria on a regular and frequent basis. This practice, although meeting the airlines’ regulatory obligations, is a tremendous burden on the GHSP which has to take relevant staff off line to accommodate the audits that seem to be an unnecessary duplication. A single audit performed by the industry-based audit programme and the resultant audit report may, if recognized by the relevant stakeholders, be used by the airlines to replace the duplicating audits (e.g. IATA Safety Audit for Ground Operations (ISAGO) Programme and IBAC International Standard for Business Aircraft Handling (IS-BAH) Programme).

Note.— Further guidance on interface management as it relates to SMS is provided in Doc 9859.

Management systems

1.4.18 GHSPs typically provide ground operations and other services for customer air operators at multiple airports, which may be located in different States. The GHSP corporate headquarters and legal identity may also be in a different State. The GHSP may also hold different legal identities if so required by the State in which it operates. This can create a complex organizational structure and management framework. However, there should be a common set of management systems for the provision and oversight of all ground services provided by the GHSP throughout its network of operations. In addition, the processes and procedures implemented by the GHSP for the ground operations should be developed on industry best practices and wherever possible standardized, especially for aircraft types.

1.4.19 The corporate management systems, which include safety, security and quality, should exist at a corporate level and directly influence the way in which the service level agreements and other contractual arrangements made with customer airlines are executed. As advocated in this manual, the implementation of an SMS in the GHSP's organization is essential to address safety risks, reduce ground damage and personal injuries. The SMS should be compatible with the SMS required of an air and aerodrome operator.

1.4.20 When implementing safety management procedures, consideration should be given to interfaces with other requirements such as quality, performance, security, environmental or occupational health, and safety management. To a certain extent, implementation can be combined; a number of organizations already operate with an integrated management system.

Note.— Guidance on integrated management systems can be found in Doc 9859 and SM ICG's Safety Management System (SMS) Integration: Points to Consider.

1.4.21 These requirements may have different goals; care and coordination are needed when defining indicators or procedures that may impact several management objectives. Operational performance targets and indicators should be realistic and not have a negative effect on safety. For example, time-based performance targets (such as baggage delivery time) can lead to pressure affecting safety records, or occupational safety requirements can lead to procedures conflicting with safety requirements (such as placing high-loaders in firm contact with aircraft to reduce fall hazard for personnel, as opposed to placing them at a reasonable distance to avoid aircraft damage).

1.4.22 Other management systems that should be established at the corporate level and implemented throughout the network include documentation control, personnel training and asset/equipment procurement and maintenance.

1.4.23 An independent assessment of the GHSP's corporate management systems and oversight capabilities should be conducted on a regular basis. The assessment should also verify that ground operations are conducted throughout the network in accordance with corporate policies and procedures, and that local requirements are met. The local requirements include those set by the aviation authority, airport, or customer airlines.

1.5 SAFETY MANAGEMENT IS “GOOD FOR BUSINESS”

1.5.1 An SMS effectively gives a company or organization a way to control risks to their business. In aviation, managing safety should be seen as a core activity and not an “add on” process. In the ground handling sector many GHSPs already have an SMS in place, without any requirement from their regulator, through the adoption and implementation of industry-based standards. They have done this as they already see a direct safety benefit from its introduction and use. There will always be risks in the aviation business but there needs to be a balance and an SMS allows a systematic approach to identifying hazards, applying a formal safety risk assessment process and putting in place mitigations to reduce the risk to an acceptable and defensible level. SMS provides an objective framework and an organizational risk structure, which supports an organization with the management of safety and therefore business risk.

- 1.5.2 An effective SMS has been shown to provide many business benefits including:
- a) a clear and documented approach aimed at achieving safe operations that is understood by all personnel and other stakeholders with whom they are involved;
 - b) the direct involvement of personnel and managers at all levels in understanding and managing the identified operational risks;
 - c) the ability from this involvement to build a positive safety culture, which promotes open reporting and an ethos of learning from accidents and incidents;
 - d) a constructive approach to applying mitigations and controls to hazardous operations carried out by the organization;
 - e) a method for identifying and potentially removing operational inefficiencies;
 - f) the possibility of decreasing insurance premiums, improving reputation and enhancing brand image and value, which allows better effectiveness in business tenders;
 - g) its use as a defence from legal action and a proven method of showing compliance with State regulator requirements;
 - h) a demonstration that a business is socially responsible and helps maximize the productivity of its workers; and
 - i) building a more competent workforce of committed personnel able to function in a safe environment to the benefit of the company's profitability.

1.5.3 It is often suggested that an SMS is expensive and time consuming. There is no doubt that a commitment to implementing an effective SMS does require time, effort and financial inputs. There will be training and administrative costs but overall there will be a greater payback with organizations being able to better comply with regulations, help minimize injuries, lost time to personnel and damage to aircraft and equipment. Employees are more productive in a safe environment and many GHSPs have effectively introduced a voluntary management system where State regulations may currently not require its implementation. Therefore, the added value of an SMS should be seen as providing a workplace that is more efficient, more productive and the costs of injuries and damage significantly reduced. Many organizations have benefited from better legislative compliance, reduction of accidents and incidents, less wasted management time on accident investigation and a reduction in adverse publicity.

1.5.4 There are potentially longer term benefits, which include implementing improvements and reducing hazards to processes and procedures, the improvement in employee and equipment performance and avoidance of fines associated with non-compliance. Overall the benefits of an SMS far outweigh the costs of implementation and administration. A strong SMS, based on good practice, has significant benefits for the company, the personnel, its key stakeholders and regulators.

1.6 IMPORTANCE OF STANDARD OPERATING PROCEDURES

1.6.1 SOPs provide instructions to personnel on the “who does what, when and how” for the safe completion of their tasks. SOPs are mitigations to hazards and reduce safety risks; they are a safety enhancement to ensure that organizations publish and enforce clear, concise and accurate procedures that specify how an individual’s responsibilities are to be coordinated during the GHSPs’ activities. SOPs should be clear, comprehensive and readily available.

1.6.2 SOPs are the result of a careful process, often conducted over a period of many years, which considers all likely outcomes; deviation from an SOP may lead to an unexpected and unsafe outcome. Failure to follow established procedures has been found to be a causal factor in many accidents and serious incidents, as such SOPs are not discretionary and must be followed precisely as an effective method of avoiding accidents. Management at all levels must insist on the proper use of SOPs. However, deviations from SOPs may occur when the risk is not foreseen by the SOP and/or when following the SOP would affect safety. Any deviation should be recorded and analysed to improve understanding and to support the development of operational specific and appropriate procedures.

1.6.3 Initial training provides the opportunity to establish the disciplined use of SOPs and recurrent training offers the opportunity to reinforce that behaviour. Effective SOPs should be continually reviewed and renewed, and are the product of healthy collaboration at all levels within the organization.

1.6.4 The multiplicity of SOPs for the same task provided by different air operators, such as aircraft chocking and placement of safety cones, is confusing and counterproductive. Air operators, aerodrome operators and GHSPs should cooperate to develop and use a harmonized common set of procedures. Aircraft manufacturers, GSE manufacturers and States can also provide valuable contribution to such developments.

1.6.5 Industry organizations have developed standardized procedures covering both commercial aviation and general aviation based on current best practice (e.g. *IATA Ground Operations Manual* (IGOM) and IBAC IS-BAH).

1.6.6 The SOPs serve the purpose of describing how to safely undertake tasks and activities for operations but should also include aspects such as quality, performance, security, occupational health and safety. Organizations should encourage feedback on the effectiveness and applicability of SOPs to ensure they are fit to manage the risks associated with the tasks and operational conditions. The organization should have an open reporting system that encourages feedback on aspects of the organization, so that any issue can be investigated and corrected.

1.7 CONTRIBUTION OF INDUSTRY ORGANIZATIONS TO GROUND HANDLING SAFETY

1.7.1 Industry representative organizations (e.g. ACI, ASA, IATA and IBAC) provide services and resources contributing to safety improvement to their members, such as working groups, documentation, SOPs, guidance material, representation, safety data, etc.

1.7.2 Standardization bodies also provide services and resources such as working groups, documentation, guidance material, etc. Examples of standardization bodies are International Organization for Standardization (ISO), SAE International, European Committee for Standardization (CEN) and European Organisation for Civil Aviation Equipment (EUROCAE).

1.7.3 Aircraft manufacturers, GSE manufacturers and information technology (IT) providers also provide services and resources such as working groups with customers and users to review aircraft and GSE design, working groups to enhance and adapt GSE compatibility with the aircraft, documentation and training modules. Examples of documentation provided are the aircraft maintenance manual and the aircraft characteristics for airport planning.

1.7.4 In many States there will be a strong link to national occupational health and safety requirements for personnel working for GHSPs. Globally these will vary depending on the maturity of the national regulations but where they do exist they should be integrated into the aviation SMS requirements as the same safety principles apply. Some States already require SMS for all companies and organizations and have provided guidance on the integration of both aviation and occupational safety, which can be found in Appendix A. States should ensure aviation and occupational health and safety regulations are not in conflict.

Chapter 2

GUIDANCE FOR STATES

2.1 GROUND HANDLING SAFETY

2.1.1 Given the increasing complexity of the global air transportation system and its interrelated aviation activities, strong coordination is required between all stakeholders to assure the safe operation of aircraft. ICAO supports the continued evolution of a proactive strategy to improve safety performance. The foundation of this proactive safety strategy is based on the implementation of an SSP that systematically addresses safety risks.

2.1.2 A number of States have identified, through their aviation risk management process, a number of areas or activities that should be included in the SSP. These States have specifically identified ground handling as requiring further investigation and possible action.

2.1.3 As part of their SSP, States should:

- a) assess the impact of ground handling operations on aviation safety (see 2.2);
- b) ensure this impact is managed according to a regulatory framework addressed to air operators, GHSPs and/or aerodrome operators (see 2.3); and
- c) determine appropriate safety promotion actions (see 2.4).

2.1.4 The SSP is an integrated set of activities aimed at improving aviation safety. The requirement for an SSP recognizes that States, as well as service providers, have safety responsibilities and provides a framework within which some organizations such as air operators, aerodrome operators or maintenance organizations are required to establish an SMS. As the ground handling sector is an important part of the aviation system, States should consider treating this area in the same way as other organizations by promoting the use of safety management principles as detailed in Annex 19. States can extend the applicability beyond that required in Annex 19 or promote the voluntary application of SMS by GHSPs. Doc 9859 gives guidance on this “Discretionary SMS applicability”. A number of ground handling organizations have voluntarily developed and implemented an SMS as part of the parent air operator SMS or as a standalone SMS for the GHSP itself.

2.1.5 States should weigh the possible safety benefits of extending an SMS against the added cost to industry and the regulator. Ultimately the extension of SMS into the ground handling domain should be seen as a positive move, which will bring benefits to the regulator and industry stakeholders. In circumstances where the State operates as the service provider there should be clear separation from the service provider and State oversight functions to ensure there is not a conflict of interest.

2.1.6 States working in conjunction with the air and aerodrome operators should provide guidance to GHSPs to develop safety management principles. If an SMS is developed by the GHSPs, it should correspond to the size and complexity of the activities and the hazards and associated risks inherent in these activities. An SMS does not have to be complicated to be effective. Regulators must allow GHSPs to “customize” or adapt their SMS, within the ICAO framework, to suit their particular type of operation. States should use the ICAO SMS framework to develop their own internal processes and also use these to provide oversight, guidance and encouragement to GHSPs. Some programmes, such as ISAGO, require a GHSP to implement an Annex 19-compliant SMS.

2.1.7 States should consider the safety, regularity of operations and economic impacts of competition, or the lack thereof, for ground handling services provided on aerodromes. In some cases these impacts can be either positive or negative. States should determine the appropriate level of competition for their particular environment.

2.2 ASSESSMENT OF THE IMPACT OF GROUND HANDLING AS PART OF THE SSP

2.2.1 Globally, ground handling has been identified as an area where safety improvements can be made, and, therefore, should be assessed as part of an SSP. States, through their SSP, should continuously use accident, incident and other relevant safety occurrence data to identify their main areas of concern and assess the effectiveness of actions taken. An example of a ground handling risk assessment can be found in Appendix E.

2.2.2 Annex 13 — *Aircraft Accident and Incident Investigation* puts requirements on States to establish and operate a mandatory incident reporting system to collect information about actual or potential safety hazards. This mandatory accident and incident reporting scheme is a key part of a State's aviation safety system. It is critical that States have both the mechanism and discipline to record occurrences. For aviation safety data to be of most benefit States should have a programme of data analysis to identify issues and trends. In addition, the notification and analysis of lower level incidents is a key way for a State to move from a reactive accident investigation model to a more proactive approach to improving aviation safety.

2.2.3 Also, States are encouraged to implement a voluntary incident reporting system to facilitate the collection of information that could not be captured by the mandatory incident reporting system. States should support incident reporting by creating a non-punitive environment through appropriate adjustments in their legislative and regulatory frameworks.

2.2.4 Safety occurrence reporting aims to improve safety of aircraft operations by timely detection of operational hazards and system deficiencies. It plays an essential role in accident prevention, enabling the identification of appropriate remedial actions by prompt analysis of safety data and by the exchange of safety information. It is important to establish the relationship between the reporting requirements set by State regulators and international organizations.

2.2.5 GHSPs can range from large multinationals to small local companies, both with their own safety cultures and processes handling either commercial scheduled air transport, business aviation or general aviation. The State should tailor its approach to include a balance between oversight and safety promotion with regards to national or local circumstances, the type of GHSP and the services provided. The State may also need to identify the most relevant stakeholders to focus its oversight or safety promotion activities on including GHSPs, air and aerodrome operators.

2.3 MANAGEMENT OF THE GROUND HANDLING IMPACT ON SAFETY

2.3.1 States have various ways to ensure ground handling services are provided safely, such as: safety oversight, including a regulatory framework; data collection and analysis; and safety promotion activities. States may decide that direct certification or licensing is required for the GHSP; however, there are other ways to encourage the uptake of SMS principles through the provision of strong guidance material, as illustrated in this manual.

2.3.2 Safety assurance can be provided directly by the State and/or indirectly through a requirement placed upon the air operators and/or aerodrome operators. In some States, involvement of all three stakeholders in providing safety assurance for ground handling activities has proven to positively enhance safety. Safety oversight could range from simple basic compliance models to complex performance-based systems. Industry best practice, including auditing programmes as referenced in 1.4, can be used as a tool to support the full range of regulatory oversight. In such cases, States should have a process to access industry audit reports.

2.3.3 A State oversight programme alone may not be sufficient to ensure a high safety level by the GHSPs. The air operator, through its own internal audit programme, should provide a high degree of liaison and a strong interface between the two partners as a result of their service contract. Similarly, the aerodrome operator should, through a local licensing agreement, have in place airside safety requirements with which both the GHSP and the air operator will be obliged to comply. At each individual aerodrome, the aerodrome operator should provide an overall safety coordination function bringing together all parties at regular airside safety forums.

2.3.4 The oversight solution for GHSPs chosen by the State should ensure that GHSPs:

- a) use ICAO safety management components (as developed in 4.2);
- b) develop and comply with SOPs (examples shown in 4.3 and Chapter 6); and
- c) conduct initial training and ongoing competency management (as developed in 4.5).

2.3.5 Examples of oversight models, proformas and guidance material adopted by different States are provided in Appendix D.

2.3.6 States should be encouraged to work closely and cooperate with each other to harmonize their approach to the recommendations contained in this manual.

2.4 DETERMINATION OF APPROPRIATE SAFETY PROMOTION ACTIONS

2.4.1 Safety promotion actions to be undertaken by States should be determined according to industry safety maturity. Compliance with Annex 19 requirements on State safety promotion may include the following:

- a) promote the development of just culture within GHSPs;
- b) promote safety culture of the ground handling agents, ensuring they are aware of the main risks related to their activities;
- c) promote the use of hazard analysis and safety risk assessment processes adapted to the GHSP specific activities;
- d) encourage safety occurrence reporting, through simple and harmonized processes;
- e) promote the scalability of safety management principles;
- f) promote the sharing of safety information between operators of each aerodrome through the implementation of national and/or local apron safety committees involving GHSPs;
- g) promote the inclusion of safety provisions and objectives in contractual agreements established between air operators and GHSPs and/or between aerodrome operators and GHSPs;
- h) encourage air operators, aerodrome operators and GHSPs to harmonize safety management principles and procedures;
- i) encourage the use of common safety performance indicators (SPIs) across air operators, aerodrome operators and GHSPs, and sharing of relevant data;

- j) encourage air operators, aerodrome operators and GHSPs to use or accept industry best practice and adopt common sets of harmonized operational procedures; and
- k) encourage and promote the use of new technology for fixed and mobile GSE, aimed to reduce aircraft ground damage and injuries to personnel (standards are referenced in Appendix A, 5).

2.4.2 States may also consider setting up national safety forums and working groups that encourage all stakeholders involved in the provision of ground handling to cooperate and coordinate their activities and share information on safety issues that are of mutual interest. As part of these initiatives, occurrence data reported to the State can be shared with air operators, GHSPs and aerodrome operators. Examples of State initiatives are included in Appendix A, 6.

2.4.3 States should consider encouraging cooperation between the national occupational health and safety agency and civil aviation authority (CAA).

Chapter 3

GUIDANCE FOR AIR OPERATORS

3.1 RELATIONSHIP BETWEEN GHSPS AND AIR OPERATORS

3.1.1 Annex 6 — *Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes*, states that air operators engaged in commercial air transport shall demonstrate “ground handling and maintenance arrangements consistent with the nature and extent of the operations specified” and that “ground handling arrangements and procedures” shall be contained in the operations manual.

3.1.2 In addition to these general arrangements and procedures, local agreements between the air operator and GHSPs should be established before the commencement of operations. Such agreements should cover:

- a) date of effectiveness;
- b) termination period;
- c) liability and indemnity; and
- d) standard and scope of work.

3.1.3 The agreement should cover the specifics of the services to be provided. If such an agreement involves the use of third parties then those outsourced services should be covered by similarly detailed contractual agreements.

Note.— Information on contract specifics between GHSPs and air operators can be found in IATA’s Airport Handling Manual (AHM), Chapter 8, Ground handling agreements.

3.1.4 Due to the nature and type of operations, differences exist in the handling procedures and selection for commercial air transport, and general and business aviation. Nevertheless, both types of operators should establish basic safety requirements for ground handling activities.

3.1.5 In the case of general and business aviation aircraft, including those operated as per Annex 6, Part I, ground handling services may be requested on short notice without being covered by long-term formal agreements.

3.2 SMS INTERFACES WITH GHSPS

3.2.1 When operational functions are outsourced, the air operator retains responsibility for ensuring safety performance requirements are met. An air operator should have a process for coordination with an external GHSP to ensure the ongoing management of safety risks in operations conducted by the provider for the air operator. The provider’s safety performance should also be considered in the GHSP selection process.

3.2.2 While all GHSPs may not necessarily be required to have an SMS, it is nevertheless the air operator’s responsibility to ensure its own safety performance requirements are met. It is essential for the air operator’s SMS to interact as seamlessly as possible with safety systems of the GHSP that provide products or services pertinent to the

safe operation of aircraft. The organization's SMS and the provider's safety systems should be compatible and complementary through appropriate interfaces.

Safety considerations as part of the GHSP selection process

3.2.3 Safety is an essential part of the selection process when tendering for ground handling services. The following safety items should be evaluated:

- a) organizational management, including;
 - 1) management control and oversight;
 - 2) training, qualification and competency;
 - 3) occupational health and safety;
 - 4) operational procedures and supervision;
 - 5) management and oversight of outsourced functions; and
 - 6) GSE requirements and maintenance programme;
- b) an operational SMS, with particular regards to;
 - 1) accident and incident reporting and investigation;
 - 2) hazard identification and risk mitigation; and
- c) use or implementation of industry best practice for operational procedures and safety management.

Ongoing safety requirements for contracted GHSPs

3.2.4 The air operator's SMS requirements should be included in any contract or service agreement, so that GHSPs understand the air operator's expectations from an operational safety perspective. A key principle is that accountability for safety risk cannot be transferred. The air operator and GHSP need to work closely together to ensure an integrated approach to operational safety.

3.2.5 As part of the SMS interfaces between the air operator and the GHSP, the air operator should ensure that:

- a) there is a clear policy establishing safety accountability and authority flow between the air operator and the external GHSP;
- b) the GHSP has a safety reporting system commensurate with its size and complexity that facilitates the early identification of hazards, risk assessment and mitigation, and safety data is shared between itself and other GHSPs to assist in indicating potential safety issues;
- c) the air operator's safety review board includes GHSP representation, where appropriate;
- d) SPIs are developed to monitor the GHSP, where appropriate;

- e) the air operator's safety promotion process ensures GHSP personnel are provided with the organization's applicable safety communications; and
- f) any GHSP roles, responsibilities and functions relevant to the air operator's emergency response plan (ERP) are developed and tested.

Ongoing safety oversight of GHSPs

3.2.6 Some ways for the air operator to ensure the continued implementation of safety requirements include, but are not limited to:

- a) regular audits and turnaround inspections (these can be based on industry programmes and oversight carried out by aerodrome operators, States or other third parties);
- b) review of relevant reported occurrences and investigations; and
- c) continued oversight by air operator representatives at the station, as applicable.

3.3 PROVISION OF STANDARD OPERATING PROCEDURES

3.3.1 According to Annex 6, Part I, the commercial air operator is required to "develop policies and procedures for third parties that perform work on its behalf". This will typically include procedures, as necessary, for the safe provision of ground handling, including aircraft-type specific requirements and aircraft limitations.

3.3.2 The air operator should develop a turnaround plan that facilitates the coordination of all activities in the turnaround process, taking into consideration aircraft-type specific requirements and limitations. Ideally, the turnaround plan should allow for local variations in the operational environment.

Note.— Turnaround plan, processes and procedures to be provided by air operators are described in Chapter 6, including relevant interfaces.

3.3.3 As a general principle, air operators should consider the adoption of common sets of harmonized operating procedures based on industry best practices (see Appendix A, 3).

3.4 INTERFACES WITH GHSPS IN EMERGENCY RESPONSE PLANNING

3.4.1 The air operator should ensure the GHSP is fully conversant with the ERP and how it interfaces with that of the aerodrome operator and other stakeholders.

3.4.2 The air operator should ensure the ERP of any GHSP it contracts with:

- a) is coordinated with the local ERP processes in effect at the airport as well as any requirement from the air operator ERP;
- b) defines its role and responsibilities, in coordination with all other stakeholders;
- c) establishes direct contact with external entities and service providers that can play key roles in the emergency;

- d) contains the basic requirements necessary for a contingency plan that can be activated in the event of an emergency situation; and
- e) supports the response to the emergency with all relevant stakeholders.

3.4.3 Communication protocols should be established and shared between the air operator, GHSPs, aerodrome operators and other relevant stakeholders to facilitate the initial activation of the response to an emergency, including an up-to-date emergency contact list.

3.4.4 In some States, emergency or crisis response is assumed by a governmental authority rather than by the operator. In such cases, an ERP should focus on and address interaction with and participation in the State response to an emergency or crisis.

3.4.5 It is important that liaison with external stakeholders continues beyond the incident. Maintaining regular lines of communication and attending meetings chaired by these external entities are useful for gaining insight into their areas of expertise.

3.4.6 Where possible, exercises should be carried out with all involved third parties. This will build a network of contacts and provide assurance that the air operator can request assistance when required during an incident.

Note.— Expanded guidance on the coordination of emergency response planning is given in Doc 9859.

3.5 SPECIFIC GUIDANCE FOR GENERAL AND BUSINESS AVIATION OPERATORS

3.5.1 The scope of general and business aviation operations includes commercial air transport, general aviation and helicopter operations, each of which falls under a different part of Annex 6. In general aviation, the responsibility held by the operator in commercial air transport rests either with the aircraft owner or pilot-in-command.

3.5.2 General and business aviation operations occur in an environment with variable operational and business requirements. A single solution for ensuring the safety and regularity of ground handling operations may not always be possible requiring GHSPs to develop procedures to accommodate local differences. For general aviation, this requirement to provide procedures does not exist. The turnaround process for general aviation aircraft is typically simpler and it is more likely the GHSP will have its own set of operating procedures.

3.5.3 Performance-based standards can be facilitated through use of industry “codes of practice”. Such standards and recommended practices should be flexible in nature so that business and general aviation GHSPs can implement the requirements that pertain to their operations and set aside those that are not relevant. For example, the IBAC IS-BAH contains a set of standards and recommended practices that are based on business aviation best practices, designed to be flexible in nature so that business and general aviation GHSPs such as fixed base operators (FBOs) and business aircraft handling agencies (BAHAs) can implement the requirements.

Chapter 4

GUIDANCE FOR GROUND HANDLING SERVICE PROVIDERS

4.1 ORGANIZATIONAL REQUIREMENTS FOR A GHSP

4.1.1 The GHSP should have a documented organizational structure commensurate with the size and complexity of its operations.

4.1.2 The GHSP should have a system for the management and control of documentation and/or data used directly in the conduct or support of ground handling operations, to include:

- a) a means of identifying the current version of operational documents, including SOPs;
- b) a distribution process that ensures availability of the current version of the ground operations manual to appropriate personnel in all areas where ground handling operations are conducted;
- c) review and revision, as necessary, to maintain the currency of information contained in documents;
- d) retention of documents that permits easy reference and accessibility;
- e) identification and disposal of obsolete documents; and
- f) control and dissemination of externally acquired and used documents.

4.1.3 The GHSP should have a designated accountable executive who has ultimate authority over the safe operation of the organization and should be familiar with the laws, regulations and procedures, pertinent to the performance of his or her duties, prescribed for the services being provided. The accountable executive should ensure all personnel are familiar with laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the ground handling service.

4.1.4 The GHSP should be staffed by trained and competent management and line personnel to ensure safe and efficient operations. A GHSP should develop job descriptions, duties and responsibilities for each additional functional position dealing with the servicing and handling of aircraft.

4.1.5 A GHSP should establish and maintain an SMS that is commensurate to the size and complexity of the operation.

4.1.6 The GHSP should have an integrated management system that brings together all the systems and processes of the organization into one framework, enabling the organization to work as a single unit with unified objectives. The SMS will form a key part of the integrated management system.

4.2 IMPLEMENTATION OF SAFETY MANAGEMENT PRINCIPLES BY GHSPS

4.2.1 The implementation of safety management principles by a GHSP can be scaled based on a “system description” that is a summary of the organization processes, activities, and internal and external interfaces. The following section describes the 12 SMS elements from Annex 19, which can be implemented by GHSPs, according to the nature of their operations.

4.2.2 If a service is outsourced to a third-party, the GHSP still holds overall responsibility for the safety of services they provide. The safety standards specified in the GHSP’s SMS must not be reduced by any products and services provided by external organizations.

4.2.3 GHSPs may be audited by air operators, aerodrome operators and other regulatory bodies (including the State of the air operator), and should cooperate with them as appropriate. The GHSPs should share with the relevant stakeholders any audit reports and findings that need a joint corrective action.

4.2.4 SMS Element 1.1 — Management commitment

4.2.4.1 The following text is extracted from Annex 19:

“1.1.1 The service provider shall define its safety policy in accordance with international and national requirements. The safety policy shall:

- a) reflect organizational commitment regarding safety, including the promotion of a positive safety culture;
- b) include a clear statement about the provision of the necessary resources for the implementation of the safety policy;
- c) include safety reporting procedures;
- d) clearly indicate which types of behaviours are unacceptable related to the service provider’s aviation activities and include the circumstances under which disciplinary action would not apply;
- e) be signed by the accountable executive of the organization;
- f) be communicated, with visible endorsement, throughout the organization; and
- g) be periodically reviewed to ensure it remains relevant and appropriate to the service provider.

1.1.2 Taking due account of its safety policy, the service provider shall define safety objectives. The safety objectives shall:

- a) form the basis for safety performance monitoring and measurement as required by 3.1.2;
- b) reflect the service provider’s commitment to maintain or continuously improve the overall effectiveness of the SMS;
- c) be communicated throughout the organization; and
- d) be periodically reviewed to ensure they remain relevant and appropriate to the service provider.”

4.2.4.2 GHSPs should define their safety policy in accordance with international and national requirements and be signed and dated by the accountable executive of the organization. The safety policies should reflect the positive organizational commitments regarding safety, including a clear statement about the provision of necessary human and financial resources for its implementation. The policy should be communicated with visible senior management endorsement throughout the organization. The safety policy should encourage safety reporting and clearly show which types of behaviours are unacceptable and include the conditions under which disciplinary action would not apply.

4.2.5 SMS Element 1.2 — Safety accountability and responsibilities

4.2.5.1 The following text is extracted from Annex 19:

“1.2 Safety accountability and responsibilities

The service provider shall:

- a) identify the accountable executive who, irrespective of other functions, is accountable on behalf of the organization, for the implementation and maintenance of an effective SMS;
- b) clearly define lines of safety accountability throughout the organization, including a direct accountability for safety on the part of senior management;
- c) identify the responsibilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the organization;
- d) document and communicate safety accountability, responsibilities and authorities throughout the organization; and
- e) define the levels of management with authority to make decisions regarding safety risk tolerability.”

4.2.5.2 The leadership of ground handling safety is the responsibility of the management who weighs risk against financial viability and is able to allocate appropriate resources. Safety is important from a practical perspective, a must from a moral and legal perspective, and a vital part of a senior manager’s function.

4.2.5.3 The drive and commitment from senior managers establishes a set of beliefs, systematic practices and integrated procedures for mitigating and monitoring safety risk. It is in management where safety culture is developed and championed.

4.2.5.4 In the case of GHSPs, senior management is accountable for the management of safety. An important concept is that responsibility for safety can be delegated but not the accountability. The safety management philosophy requires that responsibility and accountability for safety are retained within the management structure and it is here that ongoing commitment to an effective safety programme is driven.

4.2.6 SMS Element 1.3 — Appointment of key safety personnel

4.2.6.1 The following text is extracted from Annex 19:

“1.3 Appointment of key safety personnel

The service provider shall appoint a safety manager who is responsible for the implementation and maintenance of the SMS.

Note.— Depending on the size of the service provider and the complexity of its aviation products or services, the responsibilities for the implementation and maintenance of the SMS may be assigned to one or more persons, fulfilling the role of safety manager, as their sole function or combined with other duties, provided these do not result in any conflicts of interest.”

4.2.6.2 The GHSP should appoint a person who fulfils the role of safety manager. This individual is responsible for the implementation of the SMS and is ideally a management official who reports to the accountable executive. The SMS responsibilities of the appointed manager are to be documented and reporting lines are to be clearly defined, especially between the appointed manager and the accountable executive. The reporting lines are generally defined on an organizational chart and may be defined within the job description.

4.2.6.3 When a GHSP operates at several locations, the safety manager will interface with an individual designated at each station with the authority and the responsibility for:

- a) implementation at station-level of the corporate SMS;
- b) ensuring safety in station operations as fundamental operational priorities; and
- c) the day-to-day administration and operation of the SMS at the station-level.

4.2.7 SMS Element 1.4 — Coordination of emergency response planning

4.2.7.1 The following text is extracted from Annex 19:

“1.4 Coordination of emergency response planning

The service provider required to establish and maintain an emergency response plan for accidents and incidents in aircraft operations and other aviation emergencies shall ensure that the emergency response plan is properly coordinated with the emergency response plans of those organizations it must interface with during the provision of its products and services.”

4.2.7.2 The ERP of a GHSP should allow a planned reaction to an aircraft accident or another type of adverse event that could result in fatalities, serious injuries, considerable damage and/or a significant disruption to operations. A GHSP should:

- a) identify the regulations in effect at the airport, with the aerodrome operator and/or responsible authorities, as well as any requirement from air operators;
- b) define its role and responsibilities, in coordination with all other stakeholders;
- c) establish a timeline on actions to be taken in response to events;
- d) participate as required to the air and aerodrome operator emergency exercises; and
- e) document, review and periodically test its ERP to ensure its relevance.

4.2.7.3 Communication protocols should be established and shared between the GHSP, the aerodrome operator, air operators and other relevant stakeholders to facilitate the initial activation of the response to an emergency, including an up-to-date emergency contact list.

4.2.8 SMS Element 1.5 — SMS documentation

4.2.8.1 The following text is extracted from Annex 19:

“1.5.1 The service provider shall develop and maintain an SMS manual that describes its:

- a) safety policy and objectives;
- b) SMS requirements;
- c) SMS processes and procedures; and
- d) accountability, responsibilities and authorities for SMS processes and procedures.

1.5.2 The service provider shall develop and maintain SMS operational records as part of its SMS documentation.”

4.2.8.2 The GHSP's SMS should be documented in a form commensurate to the size and complexity of its operations and made available to all personnel.

4.2.8.3 Operational records of a GHSP's SMS should include safety risk assessments, safety reports, SPIs, safety management training records, etc.

Note.— Examples of risk assessments for ground handling activities can be found in Appendix E.

4.2.9 SMS Element 2.1 — Hazard identification

4.2.9.1 The following text is extracted from Annex 19:

“2.1.1 The service provider shall develop and maintain a process to identify hazards associated with its aviation products or services.

2.1.2 Hazard identification shall be based on a combination of reactive and proactive methods.”

4.2.9.2 Processes to identify hazards include, but are not limited to:

- a) **Proactive methods**, which involve the analysis of various safety information, including:
 - 1) collecting data from low severity incidents to identify potential hazards and trends;
 - 2) engaging personnel in identifying and reporting hazards in their tasks;
 - 3) conducting internal and external workshops and safety committees;
 - 4) carrying out formal inspections; and
 - 5) conducting safety surveys, operational safety audits, safety monitoring and safety assessments;

b) **Reactive methods**, which consists in the analysis of past outcomes or events, including:

- 1) trend monitoring and investigation of internal and external safety occurrences; and
- 2) identifying and investigating irregularities and other non-routine operational occurrences that might be precursors to an accident or incident.

4.2.9.3 A non-punitive safety reporting system should be implemented and easily accessible to all personnel to communicate occurrences and safety issues. Safety reporting should include both mandatory and voluntary reporting systems and be compliant with State requirements. Examples of means to report safety relevant information are paper or electronic forms, emails or telephone hotlines.

4.2.9.4 Hazards encountered in, or generated by ground handling can be categorized under the following areas:

- a) **materials** (dangerous goods, fuel, oil, de-icing fluids, hydraulic fluids, etc.);
- b) **equipment** (aircraft type, aircraft movement, GSE, fixed infrastructure, maintenance, etc.);
- c) **environment** (adverse weather conditions including extremes of temperature, apron design and infrastructure, jet blast, ingestion, etc.);
- d) **people** (training, third parties, complacency, stress, peer-pressure, time pressure, fatigue, lone working, etc.); and
- e) **system** (incorrect or inadequate procedures, etc.).

4.2.10 SMS Element 2.2 — Safety risk assessment and mitigation

4.2.10.1 The following text is extracted from Annex 19:

“2.2 Safety risk assessment and mitigation

The service provider shall develop and maintain a process that ensures analysis, assessment and control of the safety risks associated with identified hazards.”

4.2.10.2 The safety risks associated with an identified existing or potential hazard are assessed in the context of the potentially damaging consequences related to the hazard. Safety risks are generally expressed in two components:

- a) likelihood of an occurrence; and
- b) severity of the consequence of an occurrence.

4.2.10.3 Typically, matrices that quantify safety risk acceptance levels are developed to ensure standardization and consistency in the safety risk assessment process. Separate matrices with different risk acceptance criteria are sometimes used to address long-term versus short-term operations. Doc 9859 provides examples of such matrices and specific examples for ground handling can be found in Appendix E of this manual.

4.2.10.4 Safety risk assessments should be conducted by the appropriate manager and should include experienced personnel and third parties involved in the considered activities.

4.2.10.5 Following a safety risk assessment, identified mitigation measures may require the development or adaption of: SOPs; modification of, or additional training; changes to equipment; etc.

4.2.10.6 A risk register should be used for the purpose of documenting risk assessment information and monitoring risk mitigation (control) actions. An example of a risk register can be found in Appendix E of this manual.

4.2.11 SMS Element 3.1 — Safety performance monitoring and measurement

4.2.11.1 The following text is extracted from Annex 19:

“3.1.1 The service provider shall develop and maintain the means to verify the safety performance of the organization and to validate the effectiveness of safety risk controls.

Note.— An internal audit process is one means to monitor compliance with safety regulations, the foundation upon which SMS is built, and assess the effectiveness of these safety risk controls and the SMS. Guidance on the scope of the internal audit process is contained in the Safety Management Manual (SMM) (Doc 9859).

3.1.2 The service provider’s safety performance shall be verified in reference to the safety performance indicators and safety performance targets of the SMS in support of the organization’s safety objectives.”

4.2.11.2 GHSPs should develop procedures to verify the safety performance of the organization and to validate the effectiveness of the safety risk controls. SPIs, targets and alerts are means to assess the continued safety performance of an operator. They can be based on the results of internal or external audits, ramp inspections, occurrence reporting, etc., and may be aligned with some of the SPIs of the air and aerodrome operators the GHSP interfaces with.

4.2.11.3 Indicators relative to the number of safety events reported should be analysed with care as they can be biased by the reporting rate. An increase in reported safety occurrences can, for instance, either mean these events are more frequent or their reporting rate is improving — which indicates an improving safety culture. Moreover, if an effective just culture is not in place amongst front-line personnel, the use of this kind of indicator can impede the adequate reporting of incidents.

4.2.11.4 GHSPs should take the opportunity to develop a suite of indicators. Examples of SPIs that can be used are:

- a) **leading indicators** — metrics measuring inputs to the safety system to manage and improve safety performance;
- b) **lagging indicators** — metrics measuring events that have already occurred and that have an impact on safety; and
- c) **precursor events** — metrics that indicate less severe failures or “near misses” which, when combined with other events, may lead to an accident or serious incident; these can be seen as a subset of lagging indicators.

4.2.11.5 Figure 4-1 gives examples of SPIs for ground handling activities. More examples of such indicators can be found in Appendix F.

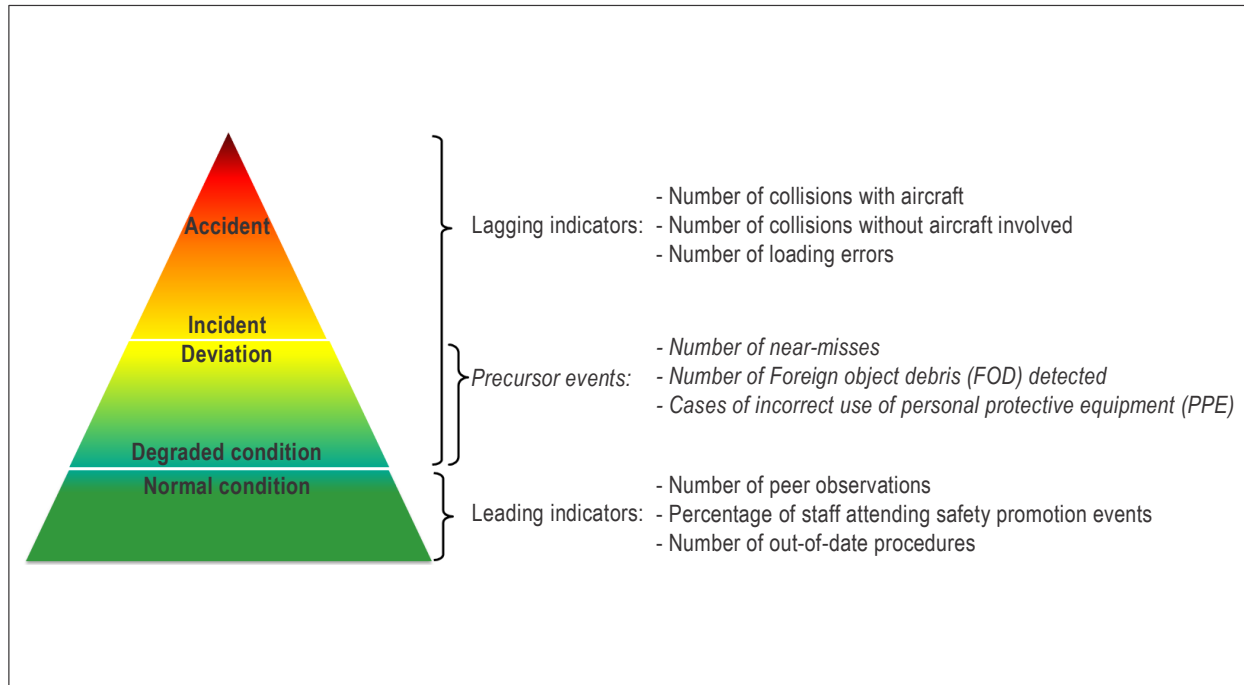


Figure 4-1. Leading and lagging indicators

4.2.11.6 An SPI is used for monitoring and assessing safety performance. A safety performance target (SPT) is a planned or intended target for an SPI over a given period that aligns with the safety objectives. SPTs define short- and medium-term safety performance management outcomes. They are expressed in numerical terms and should be specific, measurable, accurate, reliable and timely (SMART). SPTs must always contain achievement dates with milestones if the target is to be achieved in phases or over an extended period of time.

Note.— General information on SPIs, SPTs and alert levels is given in Doc 9859.

4.2.11.7 A GHSP should have a safety assurance programme with a detailed internal evaluation process and sufficient resources to ensure the effectiveness of the management system at all stations. The safety assurance programme should:

- a) comply with applicable safety regulations and requirements of the air and aerodrome operators;
- b) identify any hazards to operations;
- c) monitor the effectiveness of safety risk controls; and
- d) be validated using SPIs and SPTs.

4.2.12 SMS Element 3.2 — The management of change

4.2.12.1 The following text is extracted from Annex 19:

“3.2 The management of change

The service provider shall develop and maintain a process to identify changes which may affect the level of safety risk associated with its aviation products or services and to identify and manage the safety risks that may arise from those changes.”

4.2.12.2 GHSPs should inform and coordinate any change in their procedures that may affect the aerodrome operator, air operators or other organizations they may interface with. Changes affecting GHSPs can be internal or involve external organizations and should be jointly assessed with them. Examples of such changes are:

- a) evolution of aerodrome infrastructure;
- b) significant management changes (acquisitions, mergers, etc.);
- c) new contracts, aircraft types or procedures;
- d) changes in regulations; and
- e) acquisition of new types of GSE.

4.2.13 SMS Element 3.3 — Continuous improvement of the SMS

4.2.13.1 The following text is extracted from Annex 19:

“3.3 Continuous improvement of the SMS

The service provider shall monitor and assess its SMS processes to maintain or continuously improve the overall effectiveness of the SMS.”

4.2.13.2 As part of its SMS, a GHSP should implement a continuous improvement process. This process may include self-evaluation, follow-up actions and internal audit processes.

4.2.13.3 When a GHSP uses an integrated management system, this continuous improvement process would be included as part of the regular quality controls and reviews.

Note.— Generic guidance on the continuous improvement of an SMS can be found in Doc 9859.

4.2.14 SMS Element 4.1 — Training and education

4.2.14.1 The following text is extracted from Annex 19:

“4.1.1 The service provider shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform their SMS duties.

4.1.2 The scope of the safety training programme shall be appropriate to each individual's involvement in the SMS.”

4.2.14.2 SMS training for all personnel should, as a minimum, address the following:

- a) the importance of the GHSP's SMS framework, safety policy and safety culture;
- b) the individual involvement of the personnel in the SMS, including the use of an occurrence reporting system, application of safe working and operating practices, and response to emergency situations; and
- c) human factors and human error.

4.2.14.3 Managers and supervisors responsible for implementing components of SMS should receive more detailed training covering all 12 elements, as relevant to their duties.

4.2.15 SMS Element 4.2 — Safety communication

4.2.15.1 The following text is extracted from Annex 19:

“4.2 Safety communication

The service provider shall develop and maintain a formal means for safety communication that:

- a) ensures personnel are aware of the SMS to a degree commensurate with their positions;
- b) conveys safety-critical information;
- c) explains why particular actions are taken to improve safety; and
- d) explains why safety procedures are introduced or changed.”

4.2.15.2 Safety communication is two-way. Personnel should be encouraged to voluntarily report safety issues and management should then openly provide feedback on the analysis made and measures taken.

4.2.15.3 Safety information can be developed by the GHSP or may come from the air operators, aerodrome operators or the State. Some ways to convey safety information to personnel are through:

- a) newsletters;
- b) posters and campaigns;
- c) safety bulletins;
- d) video clips;
- e) team safety briefings; and
- f) social media.

4.3 REQUIREMENT FOR STANDARD OPERATING PROCEDURES

4.3.1 The GHSP should establish and maintain SOPs for all activities it undertakes, including the use of facilities and equipment that enable service personnel to support the arrival and departure of aircraft. The SOPs may contain checklists to be used by personnel during all phases of service provision and in emergencies to ensure compliance with the operating procedures. All SOPs should be included within the GHSP's operations manual and be complementary to the air operators' manuals.

4.3.2 The operations manual should be amended or revised as is necessary to ensure the information contained therein is kept up to date. All amendments or revisions should be issued to all personnel who are required to use this manual.

4.3.3 The GHSP should ensure all personnel are instructed in their particular duties and responsibilities as described in the SOPs and the relationship of such duties to the operation as a whole. The operations manual and appropriate safety risk assessment should be made available to all personnel. A copy of the specific SOPs should be made available to each employee, as relevant to their tasks.

4.3.4 The GHSP should have a formal written process that controls the turnaround operation, such as a turnaround plan. This document should describe the successive phases, tasks and responsibilities required for the arrival, handling and departure of the aircraft.

4.3.5 Work instructions contained in operations manuals or checklists should observe human factors principles to ensure they are understood by all personnel. Particular emphasis should be made to the actual language being used, layout, use of diagrams and charts, and the working environment in which the document is going to be used. Human performance principles, which include developing and adapting work instructions, should also be considered and include the specific contextual influences on individuals during day-to-day operations.

Note 1.— Processes and procedures to be developed by GHSPs are described in Chapter 6, including relevant interfaces with air and aerodrome operators.

Note 2.— Industry codes of practice may be used by the GHSPs as the basis for the development of an operations manual and may be recognized by air or aerodrome operators and the State.

4.4 COMMUNICATION, COOPERATION AND COORDINATION BETWEEN AIR OPERATORS, AERODROME OPERATORS AND GHSPS

4.4.1 Communication, cooperation and coordination amongst GHSPs and air and aerodrome operators are key elements in ensuring the regularity, efficiency and safety of operations. The GHSP should share experiences and participate in:

- a) ground operations groups;
- b) airport safety committees;
- c) national safety forums; and
- d) GHSP networks.

4.4.2 In order to ensure efficient aircraft operations and best use of capacity, it is essential that GHSPs actively participate in airport collaborative decision-making (A-CDM) as relevant to local air and aerodrome operators' requirements. To facilitate best use of the air traffic management system, GHSPs play an important role by providing accurate estimation of turnaround times and off-block times at departure aerodromes to calculate estimated take-off time.

Note.— Guidance on A-CDM can be found in the Manual on Collaborative Air Traffic Flow Management (ATFM) (Doc 9971), Part III, Airport collaborative decision-making.

4.4.3 To facilitate coordination, communication and collaborative decision-making, GHSPs should participate in an airport operations centre (APOC) processes, if established and required by the air or aerodrome operator.

4.5 HUMAN FACTORS

4.5.1 This manual is not intended to provide detailed material on human factors in ground handling. However, ground handling is a complex process often with many different organizations working in close proximity to each other, each providing a part of the overall turnaround process. The main focus of SMS is on the organizational processes and procedures but it relies heavily on the way humans operate within the system. Each of the service providers involved with the turnaround will have its own hazards and appropriate safety risk assessments and mitigations, however there will be hazards generated by the close working environment and each organization needs to be aware of the additional hazards. The organization, and the way it operates, can also have a significant impact on human performance. Therefore, the SMS requires an assessment of the human contribution to safety and how the organization can affect the human in the workplace.

4.5.2 Human factors need to be addressed by the GHSP as part of its SMS to optimize human performance within the system. This can be achieved by analysing the task, the individuals involved and the GHSP, and how these can each impact safety behaviour.

4.5.3 The task or job should be designed with ergonomic principles taking into account typical human performance limitations, ensuring they are not overloaded and are able to carry out their tasks in all operational circumstances. The physical design of the workplace, its environment, the equipment and the mental abilities of the person to make decisions, as well as their perception of the task and risks, need to be considered.

4.5.4 Individuals will have varying strengths and weaknesses related to their attitudes, skills and personalities.

4.5.5 A company's culture and organizational attitudes can have considerable influence on individuals and group behaviour. A positive culture should be established, this promotes employee involvement and commitment at all levels and highlights where deviations from safe working practices is not acceptable.

4.5.6 The ground handling environment still relies heavily on people. However, as technical systems become more reliable, the remaining occurrences are largely related to human error.

4.5.7 Human factors or operator error has been identified by industry as being responsible for over 90 per cent of accidents involving damage to aircraft and infrastructure. Common causes of such accidents have been highlighted as poor training and supervision, failure to follow SOPs, distraction and work pressure. As part of their SMS, GHSPs should identify and target root causes related to human factors and take appropriate mitigating actions.

The “Dirty Dozen”

4.5.8 There is a considerable amount of research and academic material on the subject of human factors. One commonly used concept is the “Dirty Dozen”. The Dirty Dozen refers to 12 of the most common human error preconditions or conditions that can act as precursors to accidents or incidents. These 12 elements influence people to make mistakes. Since its introduction for aircraft maintenance in 1993, all areas of the aviation industry have found the Dirty Dozen a useful introduction to discussions into human error within their businesses, organizations and workplaces.

4.5.9 While the Dirty Dozen has increased awareness of how humans can contribute towards accidents and incidents, the aim of the concept is to focus attention and resources on reducing and capturing human error. There are examples of typical countermeasures designed to reduce the possibility of any human error causing a problem for each element. These 12 elements can cause people to make mistakes; however, the list is not exhaustive as there are over 300 elements in the *Human Factors Training Manual* (Doc 9683).

4.5.10 GHSPs should conduct an analysis of the human factors aspects of their operations and organization. The Dirty Dozen concept is an efficient and simple methodology to conduct this analysis.

4.5.11 The 12 elements are shown in Figure 4-2 and detailed in Appendix G.

1. Lack of communication	2. Distraction	3. Lack of resources	4. Stress
5. Complacency	6. Lack of teamwork	7. Pressure	8. Lack of awareness
9. Lack of knowledge	10. Fatigue	11. Lack of assertiveness	12. Norms “the way we do things around here”

Figure 4-2. The “Dirty Dozen” elements

Note.— Further details on human factors issues can be found in Doc 9683; United Kingdom Health and Safety Executive’s Health and safety guidance (HSG) 48, Reducing error and influencing behaviour; and IATA’s AHM, Chapter 6, Management and safety.

4.5.12 A significant safety issue when working in a round-the-clock environment, such as in ground handling activities, is fatigue. The GHSP should establish and implement a fatigue management programme designed to ensure personnel do not carry out their duties when fatigued.

Note.— Guidance on fatigue management can be found in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

4.6 RECRUITMENT OF TEMPORARY STAFF

4.6.1 GHSPs should be aware of the issues when employing temporary, seasonal or third party temporary agency staff. Some examples are, but not limited to:

- a) establishing and maintaining competency;
- b) ensuring awareness of the safety policy and reporting system;
- c) ensuring inexperienced staff do not work unsupervised; and
- d) ensuring procedures are established for the infrequent use of equipment.

4.6.2 GHSPs should consider maintaining an appropriate balance between temporary workers and permanent employees within the operational teams to ensure sufficient levels of experience and competency.

4.7 TRAINING, QUALIFICATION AND COMPETENCY

4.7.1 Personnel should be given initial and recurrent training commensurate with their responsibilities to carry out their job in a safe manner. The objective of training is to promote safety awareness and to provide personnel and their management with competency for their tasks. Comprehensive training records should be maintained for each employee.

4.7.2 GHSPs should develop a training programme including theoretical training, on-the-job training and regular competency checks. Recurrent training should reflect the periodicity required for particular subject areas. The training programme should be outlined in the GHSP's operations manual and include regular reviews and updates.

4.7.3 Training can be provided through internal programmes or an external service provider. Training should be conducted by personnel who have demonstrated competence on the subject to be instructed and who have the skills to deliver the training effectively.

4.7.4 GHSP personnel should have team resource management or human factors training, with recurrent training.

4.7.5 A GHSP should train all relevant personnel in the functions they are to perform in an emergency, including the use of any emergency equipment required and their obligations during an emergency evacuation.

4.7.6 The GHSP should ensure personnel meet local and national competency requirements and have processes in place to ensure training objectives are met.

Note.— Further information for setting a training programme can be found in IATA's AHM, Chapter 11, Ground operations training program.

4.8 GSE STANDARDS AND MAINTENANCE

4.8.1 The GHSP should ensure vehicles and equipment used airside meet all national, local and aerodrome requirements for its intended use and that its condition is such that it will not endanger vehicle users, other vehicles, pedestrians, aircraft or property.

4.8.2 When purchasing new GSE, the GHSP should consider human factor principles regarding the controls of the vehicle; the objective should be to ensure standardized controls across the GSE fleet. It should also ensure that controls are intuitive with appropriate consideration of the operating environment they will be used in. The GHSP should also consider the environmental cost of new equipment, favouring low or zero emissions technology where feasible.

4.8.3 All GSE should, where applicable, meet existing international manufacturing standards as those referred to in Appendix A, 5.

4.8.4 The GHSP should ensure GSE is only used for the purpose it is designed for, including specific aircraft types, and SOPs are provided for its use.

4.8.5 The GHSP should have a programme ensuring all GSE (including pooled or outsourced equipment):

- a) is maintained in accordance with instructions and/or guidance from the GSE manufacturer;
- b) is subject to scheduled preventive maintenance inspections;
- c) is serviceable and in good condition prior to being used in ground operations;
- d) is reported and tagged as “out of service” when found to be defective and not used in airside operations;
- e) maintenance is documented in records and such records are retained for a period as specified by applicable regulations; and
- f) is subjected to an inspection prior to first use in operations.

4.8.6 The GHSP should have a documented GSE maintenance control system, including records of all equipment maintenance and inspections.

4.8.7 Maintenance should be conducted in accordance with the applicable requirements; the GHSP should provide staff, facilities and other resources necessary to the person responsible for its maintenance control system.

4.9 OCCUPATIONAL HEALTH AND SAFETY

4.9.1 The objective of occupational safety, health and environment (OSHE) or workplace health and safety is to ensure the health, safety and welfare of personnel at work. Regulations related to this area vary considerably globally but their intention is to provide a duty of care for the health and safety of all personnel. At aerodromes the apron is a busy place of work and personnel face many potential hazards, particularly from the movement and operation of aircraft and ground vehicles. Failure to eliminate or control these hazards may lead to accidents or cases of ill health.

4.9.2 OSHE regulations usually differ from the regulations related to aircraft or aviation safety. However, many of the SMS principles can and do apply to both people and aircraft. Therefore, it is possible to integrate processes and procedures for aircraft ground handling that complement each other providing a safe operating environment for both personnel and aircraft.

4.9.3 GHSPs should provide systems for managing health and safety in the workplace, suitable equipment and welfare facilities for their personnel. This should help to ensure personnel conduct their activities in a safe manner and not to put themselves or other people at risk. GHSP personnel also have an individual duty to cooperate with their own employer in relation to health and safety.

4.9.4 Organizations who share a workplace should cooperate to provide a safe and healthy workplace. The aerodrome operator in most cases is the provider of the physical apron areas and work equipment, and therefore has duties to ensure, as is reasonably practicable, the health and safety of others, particularly in common use areas.

4.9.5 To ensure the health and safety of its personnel, the GHSP should:

- a) assess the risks to their own personnel and put in place measures to control these risks;
- b) assess the risks generated by its operations to other personnel and put in place measures to control these risks;
- c) cooperate and coordinate with all of the other organizations involved in turnaround;
- d) implement a system to control and manage any contractors; and
- e) implement a system to monitor the activity at the turnaround.

4.9.6 The degree of risk should be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk.

4.9.7 Common hazards at aerodromes include, but are not limited to:

- a) Moving vehicles — Airside vehicles are an ever present hazard and extreme vigilance is necessary from all those working airside. As segregation of vehicles and personnel involved in an aircraft turnaround is not typically practical, requiring a safe system of work to be developed. This provides an opportunity for partnership in planning involving all those with a direct interest in safety on the apron. Where more than one organization is servicing an aircraft, effective coordination and cooperation is essential to prevent vehicles striking people.
- b) Manual handling — Manual handling is a term that applies to activities such as lifting, lowering, pushing, pulling or supporting a load. The manual handling of baggage and cargo onto and off aircraft presents a safety risk of manual handling injury or musculoskeletal disorders to the personnel involved in these tasks. Similar risks are also present where baggage can be manually handled, for example security check-points, passenger check-in desks. The primary objective should be to reduce the requirements for manual handling by using mechanical assistance, wherever practicable.
- c) Working at height — Each year there are reports of employees injuring themselves after falling from a height. Access to external elevated levels on and around aircraft will be required when aircraft are on the stand. Safe access to aircraft doorways is particularly important and it is vital that equipment used has appropriate edge protection and all personnel are trained in its use.
- d) Moving aircraft and live aircraft engines — The movement of aircraft on the ground, either under their own power or towed, creates a number of hazards. In particular, operating jet or propeller engines can cause fatal or serious injuries. Initial and recurrent training should be used to emphasize the hazards working around aircraft and the safety risk mitigation measures put in place by GHSPs. Particular emphasis should be made on the hazards for personnel involved with rotary wing operations.
- e) Noise — Excessive noise exposure can result in both short term and permanent hearing loss. The primary sources of noise on aprons are aircraft engines, auxiliary power units (APUs) and support equipment such as mobile ground power units. GHSPs should try to reduce the noise exposure of both their personnel and others at work on the apron exposed to the noise created by their activities. However, as all noise cannot be eliminated a local noise exposure assessment should be carried out.

- f) Machinery and equipment — In some States regulations exist for the provision and use of belt conveyors, cargo loaders, catering trucks, baggage tugs and most equipment found on aprons. Requirements for GSE should ensure the equipment is suitable for the location and the purpose for which it will be used, it is maintained in an efficient condition, all drivers are provided with information and training, and there are proper controls, including emergency stops, guards and interlocks.
- g) Hazardous substances — Hazardous substances can be either those used in a work activity, such as hydraulic oil or cleaning products, or those arising from a work activity such as exhaust fumes. Many of these can be toxic, corrosive, irritants or otherwise harmful to health. The term can also apply to biological agents, which could be met at airports in toilet waste. If exposure to these substances cannot be prevented then it should be adequately controlled, for example by ensuring chemicals cannot splash onto personnel or that fumes cannot accumulate near to people. The use of personal protective equipment should only be used as a last resort. GHSPs should note that commercially supplied hazardous substances should have health and safety information on the container.
- h) Lighting — Provisions on lighting for aprons is found in Annex 14 — *Aerodromes* and the *Aerodrome Design Manual* (Doc 9157), Part 4 — *Visual Aids*. Bright continuous lights and bright flashing lights can cause glare to pilots, vehicle drivers and wing men, adversely affecting their night vision, and should be avoided wherever possible. The GHSPs should report to the aerodrome operator any areas where the floodlighting is insufficient.

Note 1.— Further details of turnaround activities and the associated risks can be found in Chapter 6.

Note 2.— Further information can be found in documents published by national OSHE organizations such as the Airline Ground Safety Panel (AGSP) of the United States Occupational Safety and Health Administration (OSHA) and the Australasian Aviation Ground Safety Council (AAGSC).

Chapter 5

GUIDANCE FOR AERODROME OPERATORS

5.1 RELATIONSHIP BETWEEN THE GHSP AND THE AERODROME OPERATOR

5.1.1 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.

5.1.2 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.

Ground handling licence or concession

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

5.1.4 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.

5.1.5 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.

5.1.6 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.

5.1.7 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.

5.1.8 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.

5.1.9 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.

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

- a) compliance with local airport rules, regulations, standards and SOPs;
- b) reporting of accidents and incidents, as part of the SMS;
- c) participation in relevant local safety, performance and quality committees or processes;
- d) participation in emergency response planning and exercises;
- e) 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;
- f) provision of the agreed services on behalf of the aerodrome operator;
- g) provision of sufficient insurance to cover any damage to aircraft or infrastructure, to be determined on consultation with the aerodrome operator;
- h) emergency response planning and business continuity processes;
- i) provisions for termination of the licence; and
- j) sanctions or restrictions in case of non-compliances.

5.1.11 Continued compliance to some of these requirements can be validated through existing industry programmes such as those mentioned in Appendix A, 2.

5.2 SMS INTERFACES WITH GHSPS

5.2.1 Processes should be in place between the organizations providing handling services and the aerodrome operator with regard to the SMS. These should include but not be limited to:

- a) exchange, sharing and analysis of safety data (e.g. reports, statistics);
- b) provision of joint safety promotion activities (e.g. posters, campaigns, videos);
- c) production of joint safety assessments of changes (in particular if multiple organizations are affected by the change); and
- d) participation in joint safety committees of the aerodrome (e.g. ramp/apron safety committee, safety oversight committee, SMS committee).

5.2.2 The aerodrome operator's SMS should monitor and provide safety oversight of activities and services conducted at the airport as defined in the ground handling licence provided to the GHSP, taking into consideration the party-specific capabilities and responsibilities relative to the services provided.

5.2.3 The oversight provided by the aerodrome operator should include spot checks and audits of specific portions of the GHSP's operations as defined in the ground handling licence provided by the aerodrome operator.

5.2.4 The aerodrome operator should request GHSPs to share any third-party audit reports and findings that are relevant to the safety of aerodrome operations to identify joint corrective actions.

5.2.5 Under the leadership of the aerodrome operator, the airport community should carefully examine all safety issues on the apron and implement corrective measures in a timely manner.

5.2.6 The aerodrome operator should establish and coordinate an apron safety committee to address safety concerns identified on the apron and to coordinate campaigns, workshops, seminars and meetings to promote apron safety.

5.2.7 Safety promotion supports communication and dissemination of lessons learned, and enables continuous improvement. This safety promotion process should be applied not only by aerodrome operators but also to all stakeholders operating on the apron.

5.2.8 The aerodrome operator should ensure third-party companies operating airside, including GHSPs and contractors, have completed safety risk assessments for the safety relevant activities of their personnel. Once hazards and residual risks have been identified, they should be eliminated or reduced as much as reasonably practicable.

5.2.9 Training of all personnel operating on the apron should be provided to ensure they are competent for the duties they carry out. Personnel should be fully aware of the hazards present on an apron and their responsibilities in regard to safety. Where appropriate, the basis of the training material should be made available by the aerodrome operator but can be dispensed by the relevant third parties.

5.3 OPERATIONAL SAFETY CONSIDERATIONS IN RELATION TO GROUND HANDLING

5.3.1 Local aerodromes safety rules

5.3.1.1 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.

5.3.1.2 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:

- a) aircraft stand allocation;
- b) marshalling service;
- c) follow me (leader vehicle);
- d) blast precautions;
- e) apron cleaning;
- f) aircraft pushbacks, power-back and towing;
- g) operation of fixed apron facilities (see 5.3.6.1);
- h) vehicle movements;

- i) apron discipline; and
- j) dissemination of information.

Note.— Refer to the Procedures for Air Navigation Services — Aerodromes (Doc 9981), Part II, Chapter 7 for procedures on apron safety rules at aerodromes.

5.3.1.3 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.

5.3.1.4 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.

5.3.2 Vehicles and drivers on the apron

5.3.2.1 Aerodrome operators should have the overall responsibility for managing the operation of ground vehicles and equipment on the apron, in compliance with State regulations.

5.3.2.2 The aerodrome operator should develop rules for the safe operation of vehicles on the apron including a formal driver training, assessment and licensing scheme for all drivers operating on the movement area, including escort of third parties not having undergone aerodrome driver training temporarily accessing the airside.

5.3.2.3 The aerodrome operator should develop and maintain specific standards for the general condition of airside vehicles, such as adequate markings and serviceable lights, brakes and tires. Regular vehicle checks should be conducted either by the aerodrome operator or by the GHSP to ensure compliance with these standards.

5.3.2.4 The aerodrome operator should issue an airside vehicle permit (AVP) for any vehicle operating airside. Issuance of AVPs allows the aerodrome operator to exercise better control of the number of vehicles and/or mobile equipment units operating airside and to monitor compliance with safety requirements.

Note.— Refer to PANS-Aerodromes, Part II, Chapter 9 for procedures on airside driver permits (ADP) and vehicle/equipment safety requirements.

5.3.3 Passenger movements on the apron

5.3.3.1 Passengers can embark and disembark aircraft either through contact stands, using jet bridges, or via the apron. When passengers have free access to the apron, particular care has to be taken by the air operator or GHSP to ensure their passengers' safety from the hazards inherent to the apron environment (jet blast, vehicle movements, etc.).

5.3.3.2 The safety of passengers walking on the apron should be ensured, as such the aerodrome operator should:

- a) provide clear, easy-to-follow walkways and/or signage for passengers (ideally, a short and direct path between the gate or bus and the aircraft should be provided);
- b) place restrictions on running aircraft engines in the vicinity of passengers and take measures to protect passengers from excessive engine noise, jet blast and moving propellers; and

- c) position air operator, GHSP or aerodrome personnel in such a way as to ensure passengers follow the designated path to/from the terminal/aircraft.

5.3.4 Safety of personnel on the apron

5.3.4.1 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.

5.3.4.2 Hazards and residual risks may be handled as follows:

- a) Eliminate — cease doing the task; remove the hazard altogether.
- b) Reduce — minimize the time exposed to the hazard; substitute with something less hazardous.
- c) Isolate — physically isolate people from the hazard (fit guards, enclose the hazard).
- d) 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.
- e) Provide personal protective equipment (PPE) — issue PPE appropriate to the identified hazard, provide training, do fitness testing, monitor use, perform regular maintenance.
- f) Discipline — put procedures in place requiring personnel to behave in a particular way.

5.3.4.3 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.

Note.— National regulations related to workplace health and safety may already be established and must be followed.

5.3.4.4 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.

5.3.5 Foreign object debris (FOD) management

5.3.5.1 Debris on the airport presents a hazard to aircraft in a number of ways. All personnel operating at the aerodrome should be educated about the hazards posed by debris. Commitment to active FOD prevention will manage the safety risk of a FOD related occurrence.

5.3.5.2 Aerodrome operators should develop a comprehensive FOD management programme, including prevention, detection and evaluation of FOD on the airport.

Note.— Refer to PANS-Aerodromes, Part II, Chapter 5 for procedures on the implementation of a FOD management plan for aerodromes.

5.3.5.3 Useful measures to help reduce the risks from FOD include:

- a) ensuring aircraft stands are checked prior to the arrival of flights by the party responsible for receiving the aircraft;
- b) ensuring regular sweeping and cleaning of the apron and adjacent areas;
- c) providing appropriate FOD containers for users to deposit FOD they pick up;
- d) installing catch fencing in open areas of the airport to trap wind-blown debris such as newspapers and plastic sheeting;
- e) organizing regular joint air and aerodrome operators, and GHSP FOD walks to check for FOD and to identify its sources;
- f) organizing campaigns and publicity to remind staff of the dangers presented by creating FOD;
- g) ensuring contractors involved in construction projects are aware of the need to contain all their materials on-site and not allow spillages to enter the aircraft areas;
- h) setting up a runway/taxiway/stand inspection or sweeping schedule of suitable frequency; and
- i) analysing items of FOD to identify the likely contributors.

5.3.6 Use of fixed apron facilities

5.3.6.1 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:

- a) passenger boarding bridges;
- b) fuel hydrant system;
- c) fixed electrical ground power;
- d) preconditioned air;
- e) visual docking guidance system;
- f) centralized de-icing facilities;
- g) potable water system; and
- h) waste disposal facilities.

5.3.6.2 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.

5.3.6.3 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.

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

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

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

5.3.7 Fuelling activities

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

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

Note.— Guidance related to aircraft fuelling can be found in Doc 9977 — Manual on Civil Aviation Jet Fuel Supply.

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

5.3.7.4 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.

5.3.8 Adverse weather conditions

5.3.8.1 Adverse weather on an airport presents particular difficulties to maintaining normal operation in terms of airside capacity and safety. Weather conditions which may affect the normal operations on an airport include:

- a) strong wind;
- b) thunderstorms and lightning;
- c) extreme temperatures;
- d) winter operations; and
- e) low visibility.

5.3.8.2 The aerodrome operator should ensure procedures are implemented by the affected stakeholders for the management of operation in the conditions listed above. These procedures should seek to maintain the safety of operations and have a limited impact on the capacity of the airport.

5.3.8.3 Aerodrome operators should carry out a safety risk assessment of the adverse weather conditions as related to the local airport environment and topography. Any risk mitigation measures identified, such as warning procedures or limitations to the operations, should be issued to airport users.

5.3.8.4 Relevant information on future and current status of adverse weather conditions should be provided to aerodrome users in a timely manner so that all relevant safety measures can be taken.

5.3.8.5 The aerodrome operator should evaluate if the level of adverse weather activity requires the installation of physical warning systems, such as visual and audible alarm or signalling systems, allowing for the rapid promulgation of information to personnel operating on the movement area.

5.3.8.6 Lightning strikes at airports are of particular concern to personnel working airside as well as the safety of ground handling activities. Depending on the results of the lightning strike safety risk assessment, mitigation measures may include a three tiered lightning warning system consisting of:

- a) Level 1 — Strong probability of lightning on the airport, resulting in the promulgation of a general warning of approaching thunderstorms message.
- b) Level 2 — Lightning activity identified within proximity of the airport, resulting in the promulgation of a warning message indicating that level three may be imminent. Individual stakeholders may wish to take preventative action at this point.
- c) Level 3 — Lightning activity identified within close proximity of the airport, resulting in a high lightning strike probability message being promulgated. Actions to be taken in this case may include limitations to certain operational activities or even a cease of operations.

Note.— The notion of proximity to the airport needs be established based on local topography and meteorological conditions. In many cases an 8 km radius for level 2 and 5 km radius for level 3 warnings are used.

5.3.8.7 In the case of level 3 lightning warnings, the aerodrome operator should establish, in collaboration with air operators, the air navigation service provider, GHSPs and other relevant stakeholders, a commonly agreed framework for ceasing non-essential activities throughout the duration of the warning. This framework should include a clear decision-making process for the cessation and resumption of operations. The final decision to cease operations during a weather event can lie with the individual employers, the aerodrome operator or according to a jointly agreed framework.

Note.— Additional guidance on adverse weather operations can be found in the Manual of All-Weather Operations (Doc 9365). Specific procedures for the management of adverse weather conditions on an airport may be found in the ACI Apron Safety Handbook.

5.3.9 Surface de-icing and snow removal on stands

5.3.9.1 The presence of snow and/or ice on an apron results in a reduction in surface friction and covering of surfaces, lighting, pavement, markings and signage. It can cause a serious risk to the safety of operations, personnel and passengers.

5.3.9.2 An aerodrome snow removal plan should include procedures for the removal of snow and ice from apron stand areas. Particular attention should be given to walkways used by passengers.

5.3.9.3 The following should be considered when developing the snow removal plan to ensure rapid response in case of contamination of an aircraft stand:

- a) including GHSPs in the plan with dedicated tasks for removal of contaminants on aprons;
- b) providing snow removal equipment or chemicals on or near the stands; and
- c) establishing a communication procedure for staff operating on the apron to contact the snow removal teams.

5.4 APRON DESIGN FOR SAFE OPERATIONS

5.4.1 When designing new or adapting existing aprons, aerodrome operators should take into consideration criteria allowing for the safety of ground handling activities on stands. These criteria may include:

- a) sufficient space between stands to enable personnel and equipment to move safely and efficiently;
- b) staging areas for GSE;
- c) adequate access and egress routes for fuel, handling and emergency vehicles;
- d) clearly delineated and visible access points for passengers;
- e) sufficient floodlighting; and
- f) appropriate separation or protection from sources of jet blast.

5.4.2 GSE staging areas should be provided on an apron with clearly delineated or marked areas for the equipment needed on the adjacent stands.

5.4.3 In circumstances where air operators using the airport require the use of unit load devices (ULDs) for transporting bags or freight, the aerodrome operator should provide adequate storage areas or facilities to allow for the safe storage of ULDs.

5.4.4 The design of ground equipment staging areas should consider the following criteria:

- a) positioning of the staging area outside of the stand safety line and, if provided, the boarding bridge operating ranges;
- b) marking of the staging areas with a solid white outline sized either for one piece of equipment or given a larger outline for multiple pieces of GSE;
- c) connecting the staging area to a service road to ease access to the apron area; and
- d) installation of a blast fence or other protection, where a storage area is located near taxiways or sources of jet blast.

Note 1.— Annex 14 — Aerodromes, Volume I — Aerodrome Design and Operations, contains provisions on aprons.

Note 2.— Guidance on apron design can be found in Doc 9157 — Aerodrome Design Manual, Part 2 — Taxiways, Aprons and Holding Bays.

5.4.5 The aerodrome operator should take into consideration operational requirements when designing apron service roads. These may include:

- a) the ability to accommodate the largest vehicles expected to use the service roads, in terms of both physical size and weight;
- b) adequate bearing strength, height clearances and turning radii to accommodate existing and expected GSE;
- c) the required height clearances for the types of vehicles operating on the service roads;
- d) adequate clearance between parked aircraft and the service road;
- e) passenger drop off areas within close proximity of the terminal building to accommodate passenger bussing operations; and
- f) roadways for emergency vehicles where needed.

5.4.6 In the case where a service road passes under a limited overhang of a parked aircraft, height limitations should be imposed and clearly marked or signed.

5.4.7 Where a service road crosses a taxiway or aircraft stand taxilane, appropriate markings and signs should be provided.

5.4.8 When planning and designing stand facilities, planned aircraft type requirements should be taken into consideration (i.e. passenger boarding bridge operation, fuel hydrants, pre-conditioned air, fixed electrical ground power, potable water supply, etc.).

5.4.9 All fixed equipment should, where applicable, meet existing international manufacturing standards, as those referred to in Appendix A, 5.

5.4.10 Using fixed aircraft servicing installations may relieve apron congestion and reduce aircraft turnaround time. Where the apron is used by a variety of aircraft, a compatibility study should be performed to determine the appropriate installation locations.

5.4.11 The positioning of fixed stand facilities should take into consideration aspects related to ground handling safety such as:

- a) sufficient distance between the facility access points and sources of jet engine intake or blast;
- b) adequate distance and height clearances for the movement of ground service equipment and vehicles; and
- c) protection of facilities from damage caused by vehicle movement.

5.4.12 Where a fuel hydrant system is provided, an emergency fuel stop button should be available within close proximity to the aircraft stand and clearly marked and signed.

5.4.13 Where a visual docking guidance system (VDGS) is provided, an emergency stop button should be available within close proximity to the aircraft stand and clearly marked and signed. The activation of this button should immediately display the word STOP to the pilot on the VDGS.

5.4.14 When planning and designing baggage make-up areas, aerodrome operators should consider operational requirements related to the activities in these areas.

5.5 COMMUNICATION, COOPERATION AND COORDINATION BETWEEN AIR OPERATORS, AERODROME OPERATORS AND GHSPS

5.5.1 Aerodromes are often operated around a series of complex interrelated processes conducted by a multitude of different organizations. These organizations need to be adequately coordinated in the planning and execution of daily operations. The development of collaborative decision-making processes organized around the key business processes can help improve safety, efficiency and punctuality of operations.

5.5.2 The collaborative environments of larger airports may include many operational partners but they often feature collaborative decision-making in fragmented operational areas. Aerodrome operators should consider implementing an APOC to facilitate and integrate these segregated areas of collaboration. The inclusion of GHSPs in the APOC processes should be evaluated by the aerodrome operator.

5.5.3 A-CDM is a collaborative process with a strong focus on data aiming to ensure efficient aircraft operations and best use of capacity. Within the A-CDM process, data is collected and shared among operational partners to allow for more efficient planning and tactical management of the operation. In the case where such a system is to be implemented, the aerodrome operator, GHSPs and air operators should work together to establish and develop the A-CDM.

5.6 INTERFACES WITH GHSPS IN EMERGENCY RESPONSE PLANNING

5.6.1 Aerodrome operators should ensure all GHSPs operating at the aerodrome participate in the aerodrome ERP. This participation can be ensured through coordination between existing plans or inclusion in exercises, as appropriate.

5.6.2 Communication protocols should be established and shared between the aerodrome operator, GHSPs, air operators and other relevant stakeholders to facilitate the initial activation of the response to an emergency, including an up-to-date emergency contact list.

5.6.3 The aerodrome operator should be provided with an up-to-date copy of each GHSP's ERP and should receive the final report and improvement action plan for all exercises conducted at the aerodrome.

Chapter 6

OPERATIONAL INTERFACES — PROCESSES AND POLICIES

6.1 INTRODUCTION

6.1.1 This chapter describes the responsibilities, procedures and actions expected of the main stakeholders: aerodrome operators; air operators; and GHSPs. In some cases, the actions to be taken by or responsibilities of each stakeholder are detailed in Chapters 3, 4 and 5. Not all stakeholders will have a role to play in each of the procedures described in the subsections of this chapter.

6.1.2 Processes and policies developed by air operators should consider using industry best practice as a basis, as referenced in Appendix A, 3. Human performance principles also need to be considered to ensure that operational context is considered such that policies and processes are developed to support the specific environment and task demands.

6.1.3 In cases where processes and policies are not provided by an air operator, for instance in the case of general aviation or flight diversion, the GHSP should have their own set of processes and policies. They can be based on industry best practice (see Appendix A, 3) and in compliance with aerodrome instructions.

6.1.4 This chapter is structured with an initial section on general safety considerations, followed by specific guidance on the activities of an aircraft turnaround, laid out in their typical chronological sequence.

6.2 GENERAL SAFETY

6.2.1 Walking and working airside

Aerodrome operator

6.2.1.1 The aerodrome operator should set the overall design and operation of the airside areas.

6.2.1.2 The aerodrome operator should set and ensure the application of general safety policies and procedures, such as: access to airside; apron discipline; use of PPE; etc.

Air operator

6.2.1.3 The air operator should set and ensure the application of general safety rules on aircraft turnaround, such as driving in the vicinity of, walking around and approaching the aircraft.

GHSP

6.2.1.4 The GHSP should ensure training is in place and compliance by its personnel with air and aerodrome operator general safety policies and procedures.

6.2.1.5 The GHSP should assess the local safety risks and job tasks to identify any additional required PPE such as: high-visibility clothing; safety shoes or boots; clothing appropriate to weather conditions; gloves; face protection; or safety goggles.

6.2.2 Vehicle and equipment operation

Aerodrome operator

6.2.2.1 Aerodrome operators should have the overall responsibility for managing the operation of ground vehicles on the apron in compliance with State regulations. The aerodrome operator should develop rules for the operation of vehicles on the apron including formal driver training, assessment and a licensing scheme for all drivers operating on the movement area.

6.2.2.2 The aerodrome operator should develop, in conjunction with local GHSPs, an agreed set of minimum standards for the condition and maintenance of airside vehicles. Regular vehicle checks may be conducted by the aerodrome operator to ensure compliance with these standards.

6.2.2.3 The aerodrome operator should issue an AVP for any vehicle operating airside. Issuance of AVPs allows the aerodrome operator to exercise better control of the number of vehicles and/or mobile equipment units operating airside and monitor compliance with safety requirements.

GHSP

6.2.2.4 GHSPs should ensure all their personnel are trained and competent to operate the vehicles and equipment they are expected to drive and operate, in accordance with the manufacturer's and air and aerodrome operators' requirements. Particular emphasis should be given to: priority to aircraft; passengers and emergency vehicles; reporting of aircraft damage; and equipment manoeuvrability limitations.

6.2.2.5 GHSPs should ensure vehicle/equipment maintenance schedules are followed and serviceability checks are conducted. Particular attention should be given to, but not limited to: brakes; rubber protective bumpers; safety systems; and all other proximity sensors, as applicable.

6.2.2.6 GHSPs should ensure their vehicles and personnel comply with the aerodrome driving rules.

6.2.2.7 GHSPs should ensure they have the means to safely remove ground handling equipment that may break down on areas where they may impact safety.

Note.— Refer to PANS-Aerodromes, Part II, Chapter 9 for procedures on ADPs and vehicle/equipment safety requirements.

6.2.3 Foreign object debris (FOD)

Aerodrome operator

6.2.3.1 Aerodrome operators should develop a comprehensive FOD management programme including detection, prevention and evaluation of FOD on the airport.

Note.— Refer to PANS-Aerodromes, Part II, Chapter 5 for procedures on the implementation of a FOD management plan for aerodromes.

Air operator

6.2.3.2 Air operators should develop a comprehensive FOD management programme including detection, prevention and evaluation of FOD. Air operators' personnel should be made aware of the hazards of FOD to aircraft and individuals.

GHSP

6.2.3.3 GHSPs should participate in the aerodrome operator's and air operators' FOD management programmes and should encourage all personnel to adhere to it.

6.2.3.4 Supervisors should constantly be aware of the potential for FOD and be knowledgeable of their area of responsibility and ensure personnel are aware of and are participating in the FOD prevention programme effort.

6.2.3.5 Personnel should be made aware of the hazards of FOD to aircraft and individuals. To measure programme effectiveness, incidents caused by FOD should be reported. All personnel working airside have an individual responsibility to remove any FOD they see.

6.2.3.6 It is recommended to use the following elements as part of FOD prevention:

- a) a physical FOD inspection is conducted prior to each aircraft arrival and departure;
- b) observing personnel at work for proper FOD prevention practices;
- c) undertaking a spot check of general housekeeping in work areas;
- d) following up on corrective actions recommended from investigations and observations;
- e) ensuring equipment operators clean out their vehicles prior to and during their shift;
- f) ensuring adequate FOD promotional material is displayed; and
- g) accountability for tools and parts.

6.2.4 Equipment approaching the aircraft*Air operator*

6.2.4.1 The risks associated with equipment moving in close proximity to or approaching the aircraft are significant and are a main cause of damage to aircraft. Air operators should define the rules to be followed regarding all equipment approaching an aircraft, including but not limited to speed, brake checks, situations where a guide person is needed, clearance from the fuselage and equipment chocking.

GHSP

6.2.4.2 GHSPs should pay special attention to the risks associated with equipment moving in close proximity to or approaching the aircraft, and ensure their personnel are trained according to the rules provided by the air operators.

6.2.4.3 GHSPs should ensure GSE servicing the aircraft avoids any contact with the fuselage, especially GSE servicing aircraft doors, this is often referred to as a "no-touch policy" (some exceptions can be considered such as passenger boarding equipment).

6.2.4.4 When positioning GSE, adequate clearance should be maintained between all GSE and the aircraft to allow vertical movement of the fuselage during the entire ground handling process.

6.2.4.5 Ground equipment which interfaces with the aircraft passenger doors (e.g. passenger steps, catering vehicles, etc.), should have platforms of sufficient width that will allow the aircraft doors to be opened/closed with the equipment in place and the safety rails deployed.

6.2.5 General safety during fuelling operations

Aerodrome operator

6.2.5.1 The aerodrome operator should ensure all personnel working on apron areas are aware of the safe working practices appropriate to the aircraft fuelling and defuelling operations.

Air Operator

6.2.5.2 The air operator should develop policies and procedures for basic safety during fuelling, including precautions for fuelling with passengers on board.

GHSP

6.2.5.3 The GHSP should ensure its personnel is aware of precautions during fuelling operations, safety zones, use of portable electronic devices and sources of ignition, connection of electrical equipment to the aircraft, parking restrictions and emergency procedures including fuel spillages.

6.2.5.4 The GHSP should provide specific training to personnel on safety measures applicable during fuelling with passengers on board. Management should verify the application of safety measures, in particular, the provision of clear areas for the deployment of evacuation slides.

Note.— Guidance related to aircraft fuelling can be found in Doc 9977.

6.2.6 Adverse weather conditions

Aerodrome Operator

6.2.6.1 The aerodrome operator should ensure relevant information on adverse weather conditions is provided to aerodrome users in a timely manner, as well as any applicable restrictions to the operations, such as low visibility procedures.

Air Operator

6.2.6.2 The air operator should develop policies and procedures for the ground handling of their aircraft during adverse weather conditions which could include extreme temperatures, environmental contamination, and instances such as high winds, low visibility and electrical storms where it is unsafe for servicing operations to be conducted.

GHSP

6.2.6.3 The GHSP should ensure its personnel is aware of hazards and precautions to take during adverse weather conditions and that notice of such conditions is communicated to front line personnel in an effective and timely manner.

6.2.7 General awareness of dangerous goods

Aerodrome operator

6.2.7.1 The aerodrome operator should have procedures in place to respond to incidents involving dangerous goods.

Air operator

6.2.7.2 The air operator should develop policies and procedures for the carriage of dangerous goods on their aircraft.

GHSP

6.2.7.3 The GHSP should develop policies and procedures on dangerous goods, including their storage, handling, loading and unloading.

6.2.7.4 The GHSP should ensure its personnel is qualified to identify, document, package, handle and load dangerous goods, as required by their responsibilities in the operation.

6.2.7.5 The GHSP should have procedures to ensure accidents and incidents related to dangerous goods are reported to the air operator and, as applicable, to regulatory authorities. Refer to Annex 18 — *The Safe Transport of Dangerous Goods by Air* for provisions on dangerous goods.

Note.— Further information can be found in the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284) and IATA's Dangerous Goods Regulations (DGR).

6.3 TURNAROUND ACTIVITIES

6.3.1 Turnaround Coordination

Air operator and GHSP

6.3.1.1 Air operators and GHSPs should agree on roles and responsibilities during the aircraft turnaround to ensure an adequate level of safety and efficiency is achieved. A typical aircraft turnaround may involve the activities of several independent ground handling companies such as: fuelling providers; catering providers; baggage and cargo; etc., as a result a degree of coordination is required.

6.3.1.2 Air operators and GHSPs should ensure this coordination is achieved by the establishment of a turnaround plan. A turnaround plan is a detailed description of duties and their relation in a chain of activities during aircraft turnaround, examples can be found in Appendix H. The designation of a turnaround coordinator can facilitate the adherence to the plan.

6.3.1.3 The person in charge of turnaround coordination should ensure all necessary information on the status of the flight is transmitted to the aerodrome operator, in particular the estimated off-block time or any other information as required by the aerodrome operator.

6.3.2 Load planning

Air operator

6.3.2.1 Amongst air operators there are different processes and models to perform load planning and load control functions. Some examples are:

- a) load planning and load sheet performed by the GHSP at each station;
- b) centralized load planning and load sheet performed by the GHSP;
- c) centralized load planning and load sheet performed by the air operator; and
- d) load planning and load sheet performed by the air operator's flight crew.

6.3.2.2 Air operators are responsible to inform the GHSP (as applicable) of the process and procedures to be followed.

6.3.2.3 When the GHSP provides load planning and load control functions, operators will provide all relevant aircraft data, standard weights and limitations to the GHSP.

Note.— Refer to Annex 6 — Operation of Aircraft for provisions on aircraft mass and balance.

GHSP

6.3.2.4 The GHSP should develop procedures in accordance with requirements of the air operators to include load planning, production of a load instruction/report, finalization of a load sheet, last minute changes and special load Notification to Captain (NOTOC), as applicable.

6.3.2.5 The GHSP should ensure any verbally received load information, which could affect aircraft weight and balance, is documented and communicated to the person responsible for final calculation of weight and balance prior to each flight.

6.3.3 Aircraft arrival

Aerodrome operator

6.3.3.1 In cases where stand allocation is provided by the aerodrome operator, it should ensure the allocated stand is serviceable and suitable for the aircraft characteristics. In cases where stand allocation is provided by the GHSP, the air operator or an apron management service, the responsibility to ensure the stand is serviceable and suitable will lie with this entity.

6.3.3.2 The initially allocated stand and any changes should be communicated to the GHSP in a timely manner.

Air operator

6.3.3.3 Air operators should ensure the phraseology, signals and procedures regarding communication between GHSP personnel and flight deck for arrival are established, practiced and used by flight crew when communicating with GHSP personnel and vice versa.

6.3.3.4 Air operators should ensure procedures regarding aircraft ground movement are established, including: actions before arrival; standard arrival procedure; use of GSE (including chocks, cones); danger areas; and back-up communication.

GHSP

6.3.3.5 Personnel performing the turnaround should be positioned away from hazard zones. GSE required for aircraft handling should be available, serviceable and positioned well clear of the aircraft path normally outside the equipment restraint area.

6.3.3.6 The GHSPs personnel in charge of arrival should conduct a FOD check on stand prior to aircraft arrival. They should also ensure that the emergency stop procedures are understood and the equipment and infrastructure to be used is serviceable.

6.3.3.7 If the GHSP provides marshalling services, it should do so as agreed with the aerodrome operator. Standard hand signals and agreed phraseology (if applicable) should be used for all communication between the flight deck and ground personnel. Personnel performing marshalling or wing-walking functions should be distinguishable to the flight crew and utilize during daytime operations either wands or mitts, of a high-visibility colour, or during low visibility/night operations lighted wands.

6.3.3.8 All personnel should understand the use of the aircraft anti-collision lights and not approach the aircraft until the flight crew have switched off these lights indicating the aircraft is safe to approach. When an aircraft is known to have an unserviceable APU, specific procedures will need to be followed to connect the ground power prior to the anti-collision lights being switched off and the engines spooled down.

6.3.3.9 The GHSP should ensure the required number of serviceable chocks are available for the aircraft type to be chocked. The aircraft should not be approached to position the nose wheel chocks until the aircraft has come to a complete stop. Once the nose wheel chocks have been inserted the main wheel chocks can then be positioned. The GHSP personnel should notify the flight deck crew that the chocks are inserted.

6.3.4 Passenger boarding bridges and passenger stairs

Aerodrome operator

6.3.4.1 The aerodrome operator should make available training standards and procedures for the usage of each type of passenger boarding bridge operated at the airport.

6.3.4.2 The aerodrome operator should ensure any third party operating boarding bridges is trained to do so, according to the established training programme.

Air operator

6.3.4.3 The air operator should develop policies and procedures for the use of passenger boarding bridges and passenger stairs on their aircraft, including operation of doors and communication with cabin crew.

GHSP

6.3.4.4 GHSP personnel operating a passenger boarding bridge or passenger stairs should be qualified to do so and familiar with the safety features of the equipment they are operating. This might include the use of auto-levelling devices, safety barriers, canopies and walking surfaces.

6.3.5 Ground power and preconditioned air

Aerodrome operator

6.3.5.1 The aerodrome operator should make available training material and procedures for the usage of fixed ground power and preconditioned air units.

6.3.5.2 The aerodrome operator should ensure fixed ground power and preconditioned air units are serviceable and adapted to the aircraft requirements. Any inoperable equipment should be removed from service immediately and users notified.

Air operator

6.3.5.3 The air operator should develop policies and procedures for the use of ground power and preconditioned air on their aircraft, including sequencing and communication with the flight and cabin crew.

GHSP

6.3.5.4 GHSP personnel operating mobile or fixed ground power and preconditioned air units should be qualified to do so and familiar with the features of the equipment they are operating. This might include the positioning for mobile units, avoidance of improper uncoupling events, connection, unit starting and stopping, service delivery and precaution against hazards such as arc-flash and fire.

6.3.6 Loading and unloading

Air operator

6.3.6.1 The air operator should develop policies and procedures for the loading and unloading of its aircraft which might include operation of cargo doors, load classifications and priorities, sequencing, load securing, special precautions for aircraft hold fire detection systems and special loads such as live animals, dangerous goods, urgent aircraft parts and other air operator materials.

GHSP

6.3.6.2 GHSP personnel should be qualified to perform assigned loading and unloading functions. This may include manual handling, understanding a loading instruction and report, reporting the final load including deviations, ULD serviceability, aircraft hold inspection and other characteristics, such as tipping tendency.

6.3.7 Elevating Equipment

Air operator

6.3.7.1 The air operator should develop policies and procedures for the use of elevating equipment on their aircraft, such as use of chocks/stabilizers, proximity restrictions and doors operation.

GHSP

6.3.7.2 GHSP personnel operating elevating equipment should be qualified to do so and familiar with the features of the equipment they are operating. This might include height and proximity restrictions during positioning, raising and lowering the elevating platform and usage of fall protection devices.

6.3.8 Toilet and potable water servicing

Aerodrome operator

6.3.8.1 The aerodrome operator should provide facilities to uplift potable water and dispose of aircraft toilet waste.

6.3.8.2 The aerodrome operator should coordinate with the GHSP to ensure adequate procedures are in place to manage any spillages during toilet servicing in accordance with local health, safety and environmental regulations.

Air operator

6.3.8.3 The air operator should develop policies and procedures for toilet and water servicing on their aircraft, including liquid quantities required for specific aircraft potable water and toilet configurations.

GHSP

6.3.8.4 GHSP personnel performing toilet and potable water servicing should be qualified to do so and familiar with the features of the equipment they are operating. This might include health and safety precautions, fluid type and volume requirements, leakage inspection, overflow avoidance, spillage procedures and waste disposal.

6.3.9 Air start unit

Aerodrome Operator

6.3.9.1 In the case of air start engine start-up on stand, special precautions should be taken regarding jet blast. Safety precautions could include temporary closure of rear of stand roads or information to users.

Air operator

6.3.9.2 The air operator should develop policies and procedures for the use of an air start unit on its aircraft. This may include the minimum specifications for volume and pressure of air supply and unit positioning for the safe start of the preferred engine.

GHSP

6.3.9.3 GHSP personnel performing air start procedures should be qualified to do so and familiar with the features of the equipment they are operating. This should include precautions for correct and safe connection to the aircraft, operator communication with the flight crew and other team members.

6.3.10 Aircraft departure

Aerodrome operator

6.3.10.1 The aerodrome operator should ensure protection against jet blast and engine ingestion effects is in place, where applicable.

6.3.10.2 The aerodrome operator, in coordination with the air navigation or apron management service provider, should consider the development of standard pushback procedures for the movement of aircraft on aprons and taxiways.

Air operator

6.3.10.3 The air operator should develop policies and procedures for the safe departure of their aircraft. Special regards to the proper use of anti-collision lights by flight crew should be included.

6.3.10.4 The air operator should ensure the phraseology, signals and procedures regarding communication between ground and flight deck related to the departure are established, practiced and used by flight crew when communicating with ground staff and vice versa.

GHSP

6.3.10.5 GHSP personnel performing aircraft departure procedures should be qualified for the method being utilized (pushback, taxi-out or power-back) and familiar with the features of any equipment they are operating. This should include aircraft pre-departure inspection, stand safety check including FOD inspection, use and removal of aircraft steering bypass pin, maximum nose gear turn limits and specific airport infrastructure limitations.

6.3.11 Towing*Aerodrome operator*

6.3.11.1 The aerodrome operator, in coordination with the air navigation or apron management service provider, should consider the development of standard aircraft towing routes and procedures, such as use of anti-collision lights and communication with air traffic control, for movements on aprons and taxiways.

Air operator

6.3.11.2 The air operator should develop policies and procedures for towing of their aircraft, including type of towing equipment suitable to aircraft type, connection and disconnection of equipment to the aircraft, communication between the ground and the flight deck, use of anti-collision lights and emergency procedures.

GHSP

6.3.11.3 GHSP personnel performing aircraft towing procedures should be qualified to do so and be familiar with the features of any equipment they are operating. In addition to those already mentioned under aircraft departure, this should include communication with personnel in the cockpit and specific aircraft requirements such as fuel and load distribution.

6.3.12 Aircraft de-icing and anti-icing*Aerodrome operator*

6.3.12.1 The aerodrome operator should define the location and facilities used for aircraft de-icing and anti-icing on the airport.

6.3.12.2 The aerodrome operator should develop or ensure procedures are in place for the collection and recovery of de-icing and anti-icing fluids.

6.3.12.3 The aerodrome operator, when responsible for the storage or handling of de-icing and anti-icing fluid, should ensure pre-season, receipt and other required quality assurance checks are performed.

Air operator

6.3.12.4 The air operator should develop policies and procedures for de-icing and anti-icing of their aircraft, including methods, types of fluids to be used, restrictions on the application of the fluids, communication between flight crew and de-icing personnel and reference to holdover time.

GHSP

6.3.12.5 GHSP personnel performing aircraft de-icing and anti-icing procedures should be qualified to do so and be familiar with the procedures applicable to fluids or forced air operations and any equipment they are operating. This might include theory of flight and the impact of contamination, fluid characteristics and application, fluid quality checks, aircraft no-spray areas and communication with the air operator's flight crew.

6.3.12.6 In the event the pilot-in-command denies and/or disagrees with the type of de-icing being applied, in the interest of safety, the GHSP is obliged to notify the airline's officials and local CAA to make an independent assessment and review the decision.

6.3.12.7 GHSP responsible for the storage or handling of de-icing and anti-icing fluid should ensure preseason, receipt, truck filling and other required quality assurance checks are performed, and that the fluid meets specification prior to being used in operations.

Note.— Guidance on aircraft de-icing and anti-icing is available in the Manual of Aircraft Ground De-icing/Anti-icing Operations (Doc 9640).

Appendix A

REFERENCES

1. SAFETY MANAGEMENT

Annex 19 — *Safety Management*

Doc 9859 — *Safety Management Manual*

Safety Management International Collaboration Group (SM ICG):
Safety Management System (SMS) Integration: Points to Consider
SMS for Small Organizations
SMS for Small Organizations: Considerations for Regulators

Civil Aviation Authority (CAA) of New Zealand, *Implementing Safety Management Systems — Guidelines For Small Aviation Organisations*

United Kingdom CAA, *CAP1059: Safety Management Systems: Guidance for small, non-complex organisations*

2. OVERSIGHT PROGRAMMES

International Air Transport Association (IATA):
IATA Safety Audit for Ground Operations (ISAGO)
IATA Operational Safety Audit (IOSA)
IATA De-Icing/Anti-Icing Quality Control Pool (DAQCP)
IATA Fuel Quality Pool (IFQP)
IATA Drinking-Water Quality Pool (IDQP)

International Business Aviation Council (IBAC):
International Standard for Business Aircraft Handling (IS-BAH)

3. OPERATIONAL PROCEDURES

Annex 2 — *Rules of the Air* (marshalling signals)

Annex 18 — *The Safe Transport of Dangerous Goods by Air*

Doc 9284 — *Technical Instructions for the Safe Transport of Dangerous Goods by Air*

- IATA: *IATA Ground Operations Manual (IGOM)*
Airport Handling Manual (AHM)
Dangerous Goods Regulations (DGR)
Live Animal Regulations (LAR)
Perishable Cargo Regulations (PCR)
Temperature Control Regulations (TCR)
IATA Cargo Handling Manual (ICHM)
- IBAC: IS-BAH
- SAE: *AS6285 (Aircraft Ground De-icing/Anti-Icing Processes)*
ARP6257 (Aircraft Ground De-icing/Anti-Icing Communication Phraseology for Flight and Ground Crews)
AS6286 (Training and Qualification Program for De-icing/Anti-Icing of Aircraft on The Ground)

4. AERODROMES

Annex 14 — *Aerodromes, Volume I — Aerodrome Design and Operations*

Doc 9137 — *Airport Services Manual, Part 7 — Airport Emergency Planning*

Doc 9981 — *Procedures for Air Navigation Services — Aerodromes*

Airports Council International (ACI):

Apron Markings and Signs Handbook

Apron Safety Handbook

Emergency Preparedness and Contingency Planning Handbook

Safety Management Systems Handbook

5. FIXED AND MOBILE GSE

IATA, AHM, Chapter 9, Airport handling ground support equipment specifications

International Organization for Standardization (ISO) standard ICS 49.100, *Ground service and maintenance equipment*, including ISO 6966-1:2005, *Aircraft ground equipment — Basic requirements — Part 1: General design requirements* and 6966-2:2014, *Aircraft ground equipment — Basic requirements — Part 2: Safety requirements*

EN 1915-1 to 1915-4, *Aircraft ground support equipment — General requirements*

EN 12312-1 to 12312-20, *Aircraft ground support equipment — Specific requirements*

EN 60079-10 for External Power Sources for Energizing Aircraft

SAE International standards developed by AGE-3 Aircraft Ground Support Equipment Committee

6. STATE AND INDUSTRY WORKING GROUPS

United Kingdom Ground Handling Operations Safety Team (GHOST): www.caa.co.uk/ghost

Agencia Estatal de Seguridad Aérea (AESA) (Spain) forum Foro sobre Seguridad Operacional del Servicio de Asistencia en Tierra:

https://www.seguridadaerea.gob.es/lang_castellano/home.aspx

IATA Ground Operations Group: <http://www.iata.org/>

Australasian Aviation Ground Safety Council: <https://www.aagsc.org/>

Airlines for America: <https://publications.airlines.org>

United Kingdom Flight Safety Committee (UKFSC): <https://www.ukfsc.co.uk/>

7. SAFETY CHECKLISTS AND OBSERVATION FORMS EXAMPLES

UKFSC Sample Safety Office Checklist: <https://www.ukfsc.co.uk/>

CAP1010: Self-monitoring checklist: ramp / aircraft loading activities — Guidance document:

<http://www.caa.co.uk/cap1010>

8. GENERAL REFERENCES

European Commercial Aviation Safety Team (ECAST): *Ramp Resource Management Training Syllabus Development*

Transportation Research Board Airport Cooperative Research Program (ACRP) 29: *Ramp Safety Practices*

<http://www.trb.org/main/blurbs/166314.aspx>

Appendix B

LIST OF GROUND HANDLING SERVICES

1. GROUND ADMINISTRATION AND SUPERVISION

Ground administration and supervision include:

- a) representation and liaison services with local authorities or any other entity, disbursements on behalf of the airport user and provision of office space for its representatives;
- b) load control, messaging and telecommunications;
- c) handling, storage and administration of unit load devices (ULDs); and
- d) any other supervision services before, during or after the flight and any other administrative service requested by the airport user.

2. PASSENGER HANDLING

Passenger handling includes any kind of assistance to arriving, departing, transfer or transit passengers, including checking tickets and travel documents, registering baggage and carrying it to the sorting area.

3. BAGGAGE HANDLING

Baggage handling includes handling baggage in the sorting area, sorting it, preparing it for departure, loading it onto and unloading it from the devices designed to move it from the aircraft to the sorting area and vice versa, as well as transporting baggage from the sorting area to the reclaim area.

4. FREIGHT AND MAIL HANDLING

4.1 Freight handling includes cargo warehouse activities, physical handling of export, transfer and import freight, handling of related documents, customs procedures and implementation of any security procedure agreed between the parties or required by the circumstances.

4.2 Mail handling includes physical handling of incoming and outgoing mail, handling of related documents and implementation of any security procedure agreed between the parties or required by the circumstances.

5. RAMP HANDLING

Ramp handling includes:

- a) marshalling the aircraft on the ground at arrival and departure*;
- b) assistance to aircraft parking and provision of suitable devices*;
- c) communication between the aircraft and the airside supplier of services*;
- d) the loading and unloading of the aircraft, including the provision and operation of suitable means, as well as the transport of crew and passengers, including passengers with reduced mobility, between the aircraft and the terminal, and baggage transport between the aircraft and the terminal;
- e) the provision and operation of appropriate units for engine starting;
- f) the moving of the aircraft at arrival and departure, as well as the provision and operation of suitable devices; and
- g) the transport, loading onto and unloading from the aircraft of food and beverages.

6. AIRCRAFT SERVICES

Aircraft services include:

- a) the external and internal cleaning of the aircraft, and toilet and water services;
- b) the cooling and heating of the cabin, removal of snow and ice, de-icing of the aircraft; and
- c) the rearrangement of the cabin with suitable cabin equipment and the storage of this equipment.

7. FUEL AND OIL HANDLING

Fuel and oil handling includes:

- a) the organization and execution of fuelling and defuelling operations, including the storage of fuel and the control of the quality and quantity of fuel deliveries; and
- b) the replenishing of oil and other fluids.

* Provided these services are not provided by the air traffic service.

8. AIRCRAFT MAINTENANCE

Aircraft maintenance includes:

- a) routine services performed before flight;
- b) non-routine services requested by the airport user;
- c) the provision and administration of spare parts and suitable equipment; and
- d) the request for or reservation of a suitable parking and/or hangar space.

9. FLIGHT OPERATIONS AND CREW ADMINISTRATION

Flight operations and crew administration include:

- a) preparation of the flight at the departure airport or at any other point;
- b) in-flight assistance, including re-dispatching if needed;
- c) post-flight activities; and
- d) crew administration.

10. SURFACE TRANSPORT

Surface transport includes:

- a) the organization and execution of crew, passenger, baggage, freight and mail transport between different terminals of the same airport, but excluding the same transport between the aircraft and any other point within the perimeter of the same airport; and
- b) any special transport requested by the airport user.

11. CATERING SERVICES

Catering services include:

- a) liaison with suppliers and administrative management;
- b) storage of food and beverages and of the equipment needed for their preparation;
- c) cleaning of this equipment; and
- d) preparation of equipment as well as of bar and food supplies.

Note.— This list is based on the one defined in the European Union Council Directive 96/67/EC of 15 October 1996 on access to the groundhandling market at Community airports.

Appendix C

GROUND HANDLING RISKS MAPPING

The table below illustrates, as an example, the identification of unsafe events that can be used to classify occurrences and determine where action is required at State or operator level.

Table C-1. Example of ground handling risks mapping

		<i>Ultimate consequence</i>				
<i>Typical safety impact</i>	<i>Unsafe event</i>	<i>Loss of control – in flight</i>	<i>Ground collision</i>	<i>Fire/smoke (non-impact)</i>	<i>Runway excursion</i>	<i>Injuries to passengers, crew and ground staff</i>
Critical	<i>Load and balance error (including incorrect stowage)</i>	•			•	•
	<i>Event related to aircraft de-icing and anti-icing</i>	•			•	•
	<i>Event related to line maintenance</i>	•		•	•	•
	<i>Event related to dangerous goods</i>			•		•
Important	<i>Event related to aircraft fuelling</i>	•		•		•
	<i>Event related to foreign object debris (FOD)</i>	•		•	•	•
	<i>Event related to the use of ground support equipment</i>	•	•		•	•
Sensitive	<i>Event related to aircraft marshalling and parking</i>		•			•
	<i>Event related to aircraft pushback and towing</i>		•		•	•
	<i>Premature engine startup or incorrect taxiing</i>		•			•

		Ultimate consequence				
Typical safety impact	Unsafe event	<i>Loss of control – in flight</i>	<i>Ground collision</i>	<i>Fire/smoke (non-impact)</i>	<i>Runway excursion</i>	<i>Injuries to passengers, crew and ground staff</i>
Sensitive (continued)	<i>Unwanted presence on movement area</i>		•			•
	<i>Event related to infrastructures</i>		•	•		•

Appendix D

MODELS APPLIED BY STATES FOR GROUND HANDLING SAFETY OVERSIGHT

1. DOMINICAN REPUBLIC PRACTICE

- 1.1 The Dominican Republic issued regulations providing minimum safety requirements for ground handling (*Reglamento Aeronáutico Dominicano 24 — Servicios De Asistencia en Tierra A Aeronaves*). Based on these operational and organizational provisions, the civil aviation authority (CAA), *Instituto Dominicano de Aviación Civil* (IDAC), delivers a certification required to start operations and continuously audits GHSPs.
- 1.2 Aerodrome operators are required to check that GHSPs have a valid certificate issued by IDAC to enforce ground handling regulation and to report any infringement to IDAC.
- 1.3 Air operators must ensure their GHSPs are certified by IDAC for the whole scope of requested services.

2. FRANCE PRACTICE

- 2.1 In line with European regulation, air operators are considered to be ultimately responsible for ground handling operations safety, including when these are subcontracted. Regulation and oversight are thus directly aimed at the operators. Ground handling service providers are not audited per se, but as subcontractors of air operators by the French *Direction de la Sécurité de l'Aviation Civile*, against air operations regulations and air operator procedures.
- 2.2 GHSPs are nonetheless mandated to comply with public order, apron safety and security rules developed by the State, at local or national level, and aerodrome operators. Their application is enforced by the police. In addition, administrative fines can be issued to GHSPs in case of non-compliance.
- 2.3 France has chosen to require GHSPs to get an agreement from the State to be allowed to propose ground handling services at large airports, as made possible by the European Union Council Directive 96/67/EC. The delivery of this licence is conditioned to the compliance with the various applicable rules including the ones pertaining to safety. Agreement suspension can be pronounced in case of major infringement.
- 2.4 The French CAA, *Direction Générale de l'Aviation Civile* (DGAC) also actively promotes ground handling safety through forums and working groups. All the apron actors are invited to meet and discuss areas of improvement of ground safety. Various supports are produced from this, such as best practices and risk awareness posters, videos or guides.

Reference: [Ground Handling and Flight Safety — Basics, best practices and awareness-raising](#), DGAC December 2015.

3. SINGAPORE PRACTICE

Under the CAA's aerodrome certification framework, the aerodrome operator is responsible for the safety of aerodrome operations. It is thus required to set and enforce procedures for specific ground operations. To this end, the aerodrome operator has been empowered by by-laws to discharge its responsibilities. It licenses GHSPs to operate at the airports and enters into ground handling service agreements with them, which include safety performance indicators (SPIs) and targets (SPTs). The aerodrome operator is also responsible to provide the necessary infrastructure, facilities and services for GHSPs to operate safely.

4. SPAIN PRACTICE

4.1 In accordance with European regulation, air operators shall ensure that GHSPs comply with the applicable requirements as a contracted service (Commission Regulation (EU) No 965/2012) and aerodrome operators shall ensure that GHSPs have safety procedures in place to comply with the applicable requirements (Commission Regulation (EU) No 139/2014). Therefore, GHSPs should be audited by air operators and aerodrome operators.

4.2 However, the Aviation Safety and Security Agency of Spain, *Agencia Estatal de Seguridad Aérea* (AESA), has detected the need to carry out its own inspections taking into account the audits performed by air operators and aerodrome operators. In this respect, GHSPs are considered by Spanish law as independent stakeholders.

4.3 Consequently, the AESA regularly carries out inspections at stations and headquarters on the basis of two technical instructions:

- a) ground handling operations, which includes specific ground handling operational provisions partly based on IATA material; and
- b) safety management for ground handling services, which, depending on parameters related to the volume and the type of activities of the provider, defines the criteria for the scalability of the GHSP's SMS implementation.

References: [Gestión de Seguridad Operacional para la Asistencia en Tierra \(APTO-15-ITC-105\)](#), AESA, October 2015.
[Operaciones de Asistencia en Tierra \(APTO-15-ITC-104\)](#), AESA, September 2015.

5. SWITZERLAND PRACTICE

5.1 The Federal Office of Civil Aviation (Switzerland) (FOCA) conducts its surveillance of ground handling service providers on the basis of applicable laws and best practices of ICAO, the European Union Aviation Safety Agency (EASA), Commission Regulation (EU) No 965/2012, and directives of the European Parliament, as well as recommendations from the European Plan for Aviation Safety 2016-2020. However, these regulations and best practices do not promote a direct oversight of GHSPs by the FOCA. Applicable regulations consider air and aerodrome operators as ultimately responsible for the safety of ground handling operations.

5.2 The oversight of these contracted services is conducted by the FOCA by means of overseeing air operators' and aerodrome's SMS and oversight practices. Air and aerodrome operators are required to ensure the safety of contracted services based on EASA requirements. This process is audited and inspected by the FOCA.

5.3 The following audits and inspections are held:

- a) ground handling audits, including verification of ground handling instructions for contracted services of air and aerodrome operators (part of the SMS audit of operators);

- b) turnaround inspections; and
- c) witness inspections of air operators own ground handling safety audits.

5.4 Nonetheless, in case of possible safety issues discovered through the mandatory and voluntary reporting system of the FOCA, the FOCA has the possibility to directly audit and/or inspect GHSPs on Swiss aerodromes.

6. UNITED ARAB EMIRATES PRACTICE

6.1 Within the United Arab Emirates, an aerodrome operator is issued with an aerodrome certificate in accordance with the provisions of the General Civil Aviation Authority (GCAA) Civil Aviation Regulation (CAR) Part IX, Aerodromes. This incorporates the physical layout of the aerodrome and a variety of other elements that can affect aircraft safety and subsequently ensure that the ground handling organizations and ground service providers operate safely during all ramp operations. In order to achieve this, the aerodrome operator is required to develop partnerships with ground handling agents through standard contract clauses that require ground handling agents to comply with all relevant legislation and standards.

6.2 The following requirements relating to the oversight of third party organizations providing services at the aerodrome are contained in GCAA CAR, Part IX, Chapter 4, Obligations of the Aerodrome Operator:

“4.1.1 The Aerodrome Operator shall require all the users of the aerodrome... to comply with the requirements laid down by the Aerodrome Operator with regard to safety and order at the aerodromes, and shall monitor such compliance.

4.1.2 Aerodrome Operators shall ensure that they:

- a) maintain their safety responsibilities over safety related activities conducted by those third party organisations...;
- b) have the power to access and inspect any third party organisations providing a service... to the aircraft operations operating from the aerodrome including its facilities and records to determine continued compliance with the relevant requirements through safety audits or inspections. The power to access and inspect shall be included in the contractual arrangement; and
- c) are able to impose operating restrictions in the event on non-compliance with the applicable safety requirements or unresolved safety deficiencies or concerns.

4.7.9 The Aerodrome Operator shall require all the users of the aerodrome to fully support the programme to promote safety at the aerodrome by attending and contributing to the aerodrome’s various safety committees, immediately informing the Aerodrome Operator of the accidents, incidents, defects and faults which have the potential to effect safety.”

6.3 Aerodrome operators are therefore required to provide oversight and monitor the compliance of any third party organization and, as part of their SMS, ensure that third party organizations (such as ground handlers) are actively involved in the aerodrome operator’s SMS. This oversight of the ground handling organization may be achieved through the aerodrome operator conducting turnaround audits, carrying out apron safety-risk assessments, investigating any accidents or incidents, and ensuring the implementation of any mitigation or corrective actions resulting from those investigations.

7. UNITED KINGDOM

Ground Safety

7.1 Annex II of the Authority Requirements for Air Operations (ARO) of Commission Regulation (EU) No 965/2012 (EASA Air Ops), specifies the requirements for the administration and management system to be fulfilled by the agency and each Member State, for the implementation and enforcement of Regulation (EC) No 216/2008 and its implementing rules regarding civil aviation air operations.

7.2 Therefore, every United Kingdom air operator certificate (AOC) holder is subject to an audit and inspection programme, which varies in scope dependent on the complexity and performance of the organization. Ramp inspections will focus on the activities delegated under contract to the GHSPs and self-handling operations. Headquarters' audits include topics such as management structure/responsibilities, compliance monitoring, occurrence reporting and safety/risk management; the scope of which will capture sub-contracted activities, as all associated standards remain the responsibility of the air operator. The CAA has no direct regulatory oversight of the GHSPs but the aforementioned audit and inspection methods ensure that the air operator fulfils the terms of the AOC.

Dangerous Goods

7.3 Annex 18 — *The Safe Transport of Dangerous Goods by Air*, Chapter 11, Section 11.1 requires that each Contracting State shall establish inspection, surveillance (and enforcement procedures) for all entities performing any function prescribed in its regulations for air transport of dangerous goods with a view to achieving compliance with those regulations. The requirements of Doc 9284 — *Technical Instructions for the Safe Transport of Dangerous Goods by Air* are enacted in the United Kingdom's legislation through the Air Navigation (Dangerous Goods) Regulations. The requirements of the Technical Instructions for dangerous goods acceptance, handling and loading, passenger handling, etc., and for personnel to receive dangerous goods training apply to GHSPs. Accordingly, performance-based oversight is scheduled and conducted on all relevant GHSPs within the United Kingdom.

Mandatory occurrence reporting

7.4 Both ground safety and dangerous goods inspectors are executors of related mandatory occurrence reports in accordance with Commission Regulation (EU) No 376/2014 and are tasked with reviewing the outcomes of investigations to ensure an appropriate standard has been achieved. Elements such as level of detail, identification of causal/contributing factors, corrective actions and application of just culture are reviewed before the inspector closes the report in the European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS). This enables direct communication and engagement with the GHSPs.

Ground Handling Operations Safety Team (GHOST)

7.5 While GHOST is not part of any formal regulatory oversight framework, this CAA-led ground safety forum provides an additional level of collaboration and influencing. The resultant safety conversations and initiatives are supported by the 200 members that represent the various aviation communities (air operators, aerodrome operators, ground service providers, regulatory authorities, etc.).

Appendix E

EXAMPLES OF RISK ASSESSMENTS

1. OCCURRENCE LIKELIHOOD

The following table can be used to determine the likelihood of an occurrence (extracted from Doc 9859).

Table E-1. Safety risk probability

<i>Likelihood</i>	<i>Meaning</i>	<i>Value</i>
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

2. OCCURRENCE SEVERITY

The following table can be used to assess the severity of an occurrence (extracted from Doc 9859).

Table E-2. Example safety risk severity table

<i>Severity</i>	<i>Meaning</i>	<i>Value</i>
Catastrophic	<ul style="list-style-type: none">• Aircraft / equipment destroyed• Multiple deaths	A
Hazardous	<ul style="list-style-type: none">• A large reduction in safety margins, physical distress or a workload such that operational personnel cannot be relied upon to perform their tasks accurately or completely• Serious injury• Major equipment damage	B

<i>Severity</i>	<i>Meaning</i>	<i>Value</i>
Major	<ul style="list-style-type: none"> • A significant reduction in safety margins, a reduction in the ability of operational personnel to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency • Serious incident • Injury to persons 	C
Minor	<ul style="list-style-type: none"> • Nuisance • Operating limitations • Use of emergency procedures • Minor incident 	D
Negligible	<ul style="list-style-type: none"> • Few consequences 	E

3. GROUND HANDLING OCCURRENCES THAT SHOULD BE SUBJECT TO A RISK ASSESSMENT

The non-exhaustive table below provides examples of various occurrences which may take place during or subsequent to ground handling activities. These occurrences should be considered during a risk assessment process by the GHSP.

Table E-3. Ground handling occurrences that should be subject to a risk assessment according to their severity

<i>Severity</i>	<i>Ground handling occurrences that should be subject to a risk assessment</i>
Catastrophic	<ul style="list-style-type: none"> • Improper tie-down, resulting in cargo movement, centre of gravity shift and aircraft crash • Undetected damage prior to departure, leading to loss of control and crash • Misfuelling of an aircraft causing its crash • Improper or incomplete de-icing of aircraft causing its crash • Ground support staff ingested by an aircraft engine • Ground support staff falling from or being hit by equipment resulting in death • Personnel falling from unprotected aircraft door after stair removal resulting in death • Fire causing aircraft destruction or death • Undeclared dangerous goods leading to inflight fire and crash
Hazardous	<ul style="list-style-type: none"> • Staff falling from equipment resulting in serious injuries • Staff being crushed between equipment • GSE puncturing aircraft skin • Aircraft damage that would require major repair and flight cancellation, for example wingtip or fuselage collision with infrastructure while being marshalled or towed • Aircraft collision as a result of improper chocking • Incorrect aircraft loading leading to reduced aircraft manoeuvrability • Misuse of the equipment restraint area resulting in aircraft damage or engine ingestion

<i>Severity</i>	<i>Ground handling occurrences that should be subject to a risk assessment</i>
Major	<ul style="list-style-type: none"> • Equipment to equipment, equipment to infrastructure collision • Personnel injured or vehicles/equipment damaged as result of jet blast • Aircraft damage resulting in delay due to required maintenance • Extensive fuel spillages on stand • Aircraft braking rapidly as a result of vehicle crossing in front, leading to cabin crew injury • People being hit and injured by air bridges, tugs, tow bars or other moving equipment • Strong winds resulting in movement of aircraft or equipment (unit load devices, stairs, etc.) • Work in extreme adverse weather conditions resulting in hypothermia, heat stroke or injury
Minor	<ul style="list-style-type: none"> • Aircraft braking rapidly as a result of vehicle crossing in front • Minor aircraft damage not resulting in significant delay or maintenance • Undetected damage found on arrival, not affecting the aircraft operation • Minor damage to airport infrastructure • Injury not requiring medical attention • Tow bar shear pin breaking resulting in operational delay • Hydraulic fluid or lavatory spillage • Loading or weight and balance error noticed and corrected before departure • Communication issues resulting from multilingual and multicultural staff • Confusion resulting from conflicting/different standard operating procedures
Negligible	<ul style="list-style-type: none"> • Failure to follow procedures not leading to any of the above • Inadequate resources leading to poor service delivery • Poorly maintained equipment stuck on the aircraft stand

4. RISK ASSESSMENT PROCESS

4.1 A risk assessment is a combination of likelihood and severity. Table E-4 presents an example safety risk matrix (extracted from Doc 9859).

Table E-4. Example safety risk matrix

Safety Risk		Severity				
Probability		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

Note.— In determining the safety risk tolerability, the quality and reliability of the data used for the hazard identification and safety risk probability should be taken into consideration.

4.2 The tables below are synthetic examples of risk assessments provided to illustrate the methodology commonly used. When conducting risk assessments, expertise and knowledge of local operations should be used.

Table E-5A. Sample risk assessment A

Hazard:	Aircraft movement			
Risk:	Ground support staff ingested by engine			
Pre-mitigation	Risk likelihood rating:	3 (remote), based on available data and known accident reports	→ Pre-mitigation safety risk:	3A: need for mitigation
	Risk severity rating:	A (catastrophic)		
Possible mitigation:	Documenting and implementing turnaround SOPs, training, supervision, monitoring		→ Post-mitigation safety risk:	1A

Table E-5B. Sample risk assessment B

Hazard:	Equipment use			
Risk:	Staff being crushed between equipment			
Pre-mitigation	Risk likelihood rating:	4 (occasional), based on available data and known accident reports	→ Pre-mitigation safety risk:	4B: need for mitigation
	Risk severity rating:	B (hazardous)		
Possible mitigation:	Documenting and implementing SOPs, training, supervision, monitoring, use of PPE		→ Post-mitigation safety risk:	2B

Table E-5C. Sample risk assessment C

Hazard:	Equipment use			
Risk:	Belt-loader collision causing aircraft damage resulting in delay due to required maintenance			
Pre-mitigation	Risk likelihood rating:	5 (frequent), based on available data and known accident reports	→ Pre-mitigation safety risk:	5D: need for mitigation
	Risk severity rating:	D (minor)		
Possible mitigation:	Retrofitting proximity sensors to GSE, updated SOPs, increased maintenance inspections, training, supervision, monitoring		→ Post-mitigation safety risk:	1D

5. EXAMPLE OF A DETAILED RISK ASSESSMENT

Table E-6. Risk management in a risk assessment plan

<i>Risk management</i>
<i>Causes of risk management activation: Serious incident</i>
<p><u>Methodology</u></p> <p>This risk assessment evaluates the incidents related to GSE fire next to the aircraft. A multidisciplinary expert team, along with the Safety Manager, identifies the causes or latent conditions (in general, hazards) that can potentially lead to an incident of GSE fire next to or on the aircraft. Additionally, the possible final risks, or consequences, are defined and assessed. The risk assessment must take into account the different hazards and their consequences, allocate values of severity, probability, and, therefore, risk tolerability. It must be pointed out that quantitative references are initially used but the final decision is taken with the expert team's qualitative opinion.</p> <p>Finally, measures to mitigate risks are set out to reduce risks in terms of probability and severity. These measures are not only focused on reducing the severity of final risks, but also on reducing hazards and their causes as part of the different strategies to reduce risks. Expert opinion is essential for the materialization and validation of the mitigation measures or actions.</p> <p><u>Scenario / background</u></p> <p>The activation of the Risk Management System is due to an incident that occurred at the airport of [city] in [date]. The description of the incident is as follows: a belt loader caught fire due to a fuel spillage when it was being used to unload luggage from the cargo door of a [operator A] flight (Boeing 767-300). Although this incident took place in another State, it can also happen in Spain; therefore it is convenient to carry out a risk assessment to mitigate the likelihood of this incident's occurrence and the severity of its consequences.</p> <p><u>GSE in the scope of this risk assessment</u></p> <p>Belt loaders, container loaders, transporters, GPU, tractors, pushback tugs and tractors, passenger boarding steps/stairs, buses, etc.</p> <p><u>Occurrence Status Records</u></p> <p>Source: Occurrence database (ECCAIRS) and Spanish GHSP's databases or other available Spanish aerodrome operators' databases. Taking into account all incidents that occurred during the period from January 2015 to June 2017 (source: ECCAIRS; scope: Spain), there has not been any damage to aircraft, people or equipment, other than the damages to the equipment that caught fire.</p> <p><u>Operation Status Records</u></p> <p>Source: Spanish aerodrome operator's data.</p>

<i>Risk management</i>		
<i>Causes of risk management activation: Serious incident</i>		
Existing defences	Manuals and procedures	<ul style="list-style-type: none"> • Ground handling training • General operating procedures and technical instructions • GSE manufacturer manuals and procedures for maintenance • General management procedures (communications, accident/incident, monitoring and measurement, etc.) • Manuals of assisted airlines and other documentation • Airport regulations • Specific training for crew, airline maintenance staff and GHSP staff
	Implementation of specific requirements	<ul style="list-style-type: none"> • Ground Operation Manual Equipment Management: Maintenance Programme and equipment operability • Ground Operation Manual Fire protection and prevention Procedures • Ground Operation Manual Spillage Procedures • International references for ground handling (ISAGO) <p>GSE parking:</p> <ul style="list-style-type: none"> • Not to block access to firemen vehicles or to emergency controls of fuel hydrant pits • Motorized or electric GSE when positioned at or near the aircraft: emergency controls and not left unattended <p>GSE positioning:</p> <ul style="list-style-type: none"> • Not to obstruct the evacuation of people from the aircraft or the movement of a fuelling vehicle away from the aircraft

Table E-7. Risk assessment in a risk assessment plan

<i>Risk assessment</i>							
<i>Hazards</i>	<i>Potential risk</i>	<i>Final risk</i>	<i>Probability</i>	<i>Severity</i>	<i>Risk evaluation (see Annex I)</i>		<i>Technical justification</i>
Fuel spillage GSE operating during fuel spillage Inappropriate operation of equipment that causes the equipment to become warm Inappropriate maintenance of equipment Equipment operation in hot zones	GSE fire next to the aircraft	a) aircraft destroyed	1	A	1A	MODERATE RISK	Operation data in Spain (≈ 1 M per year) do not allow probability estimates below an order of magnitude of 10^{-6} . However, a probability value of “improbable” has been established due to the approximated number of operations around the world of 85 M during the period from January 2015 to June 2017 (source: ATAG). No aircraft has been found to have been entirely destroyed by GSE fire. On the basis of experience and data, the expert team agrees to allocate a probability value of “highly improbable” (1). The severity value A comes from the severity chart (aircraft destroyed).
		b) damage to aircraft	3	B	3B	MODERATE RISK	

Risk assessment						
Hazards	Potential risk	Final risk	Probability	Severity	Risk evaluation (see Annex I)	Technical justification
Fuel spillage	GSE fire next to the aircraft	c) deaths	1	A	1A MODERATE RISK	There is no available information (source: ECCAIRS, aerodrome operators, handling agents) about any death caused by GSE fire. On the basis of experience and data, the expert team agrees to allocate the same probability value as for “aircraft destroyed”: “highly improbable” (1). The severity value A comes from the severity chart (deaths).
GSE operating during fuel spillage	(continued)	d) injuries	2	C	2C MODERATE RISK	In the description of the incident that generates this risk management, it is explained that there were people injured during the evacuation of the aircraft (severity: “important”). Analysing all incidents that occurred (source: ECCAIRS, scope: Spain), no record of injury was found. Therefore, taking into account that the order of magnitude of the operations in Spain (source: AENA) is approximately 10^{-6} , the expert team agrees to allocate a probability value of “improbable” (2). The severity value C comes from the severity chart (injury to people).
Inappropriate operation of equipment that causes the equipment to become warm		e) damage to other equipment	3	B	3B MODERATE RISK	Operation data in Spain during the period from January 2015 to June 2017 (≈ 5 M) do not allow probability estimates below an order of magnitude of 10^{-6} . Taking into account the same criteria as in “damage to aircraft”, on the basis of experience and data, the expert team agrees to allocate a probability value of “remote” (3). The severity value B comes from the severity chart (damage to equipment).
Inappropriate maintenance of equipment						
Equipment operation in hot zones						
(continued)						

Risk assessment							
Hazards	Potential risk	Final risk	Probability	Severity	Risk evaluation (see Annex I)		Technical justification
	GSE fire next to the aircraft <i>(continued)</i>	f) other equipment destroyed	1	A	1A	MODERATE RISK	There is no available information (source: ECCAIRS, aerodrome operator, ground handling provider) about any equipment destroyed by GSE fire. Therefore, the probability is the same as for "aircraft destroyed": "improbable" (1). The severity value A comes from the severity chart (equipment destroyed).
Conclusion	Due to all final risks being assessed as "Moderate Risks", it is necessary to establish mitigation actions to avoid the materialization of the analysed potential risk (GSE fire) and, if the incident occurs, to reduce as much as possible the severity and consequences of the occurrence.						

Table E-8. Mitigation actions in a risk assessment plan

<i>Mitigation actions</i>					
<i>Action</i>	<i>Deadline</i>	<i>Responsible</i>	<i>Result and evidence</i>		
Amendment of procedures to establish that the operation must stop (GSE stops) when a fuel spillage occurs next to the equipment that is being used. Communication of this amendment to staff.	3 months	Human Resources Department	Amendment of the procedure and records of communication of changes (read and sign)		
Refresh GSE operation training to staff who attended this training course more than two years ago.	6 months	Human Resources Department	Training records		
Monitoring of equipment maintenance, taking special care on those items related to oil change and refrigerated systems.	6 months	Safety Manager	Equipment maintenance records		
Read and sign for staff, warning to take full precautions, and not to operate equipment if there are any hot zones (landing gear, spark, works with fire...) in close proximity.	1 month	Safety Manager	Read and sign		
Design and implementation of fire prevention initial training for ground handling staff.	6 months	Human Resources Department	Training records		
Design and implementation of passenger management, in case of evacuation, training for ground handling staff.	6 months	Human Resources Department	Training records		
Specific monitoring (during turnaround checks) of the equipment operation procedures that could generate GSE fire (mentioned in the first section of the risk management).	During 12 months in scheduled checks	Safety Manager	Turnaround checks		
Comments	The effectiveness of these measures will be monitored after 6 months of their implementation.				
Signatures	Safety Manager	Expert 1	Expert 2	Expert 3	Expert 4

ANNEX I. Matrix to evaluate the risk tolerability

The quantitative value, included in Table E-9 below, has been established from a reference value of “one catastrophic accident for each 10^{-8} operations”. This is the desirable target level of safety (TLS).

Table E-9. Probability of incident

<i>Probability</i>			
<i>Definition</i>	<i>Qualitative criteria</i>	<i>Value</i>	<i>Reference</i>
Frequent	It is likely to happen many times (it has happened frequently).	5	$> 10^{-3}$ per operation
Occasional	It is likely to happen sometimes (it has happened occasionally).	4	$> 10^{-5}$ and $< 10^{-3}$ per operation
Remote	Improbable, but it is possible to happen (it has occurred rarely).	3	$> 10^{-6}$ and $< 10^{-5}$ per operation
Improbable	It is very improbable (it is unknown to have happened).	2	$> 10^{-8}$ and $< 10^{-6}$ per operation
Highly improbable	It is nearly inconceivable that it happens.	1	$< 10^{-8}$ per operation

Table E-10. Severity of incident

<i>Severity</i>		
<i>Definition</i>	<i>Criteria</i>	<i>Value</i>
Catastrophic	Collision: fuselage lost; equipment destruction; total loss of control; multiple deaths; crew members gravely injured or disabled.	A
Hazardous	Large reduction in safety margins or aircraft airworthiness: serious injuries, with gravely injured people; important damages to the equipment; heavy workload, in a way that it is not possible to ensure tasks are properly performed by the crew.	B
Important	Important reduction of the safety margin or aircraft airworthiness, injuries in passengers and crew; significant workload increase with the consequent reduction in the capacity of response to adverse operational conditions.	C
Minor	Minor reduction of the safety margin or aircraft airworthiness: interferences; operational limitations; use of emergency procedures; etc.; minor workload increase.	D
Insignificant	Without effect.	E

Table E-11. Tolerability matrix

		<i>TOLERABILITY</i>				
		<i>Catastrophic</i>	<i>Hazardous</i>	<i>Important</i>	<i>Minor</i>	<i>Insignificant</i>
		A	B	C	D	E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Highly improbable	1	1A	1B	1C	1D	1E
<i>RISK</i>	<i>ACTION</i>					
HIGH	Cease or cut back operation promptly if necessary. Perform priority risk mitigation to ensure that additional or enhanced preventive controls are put in place to bring down the risk to the moderate or low range.					
MODERATE	Schedule performance of a safety assessment to bring down the risk index to the lower range if viable.					
LOW	Acceptable as is. No further risk mitigation required.					

6. EXAMPLE OF A RISK REGISTER**Table E-12. Sample risk register table**

Hazard / risk	Pre-mitigation risk	Reason	Mitigation strategy	Post-mitigation risk	Mitigation review process	Final assessment
<i>Description of the hazard and related risk.</i>	<i>Risk level before any mitigation.</i>	<i>How was the risk identified?</i>	<i>Which are the identified control measures to reduce the risk to an acceptable level?</i>	<i>Risk level after mitigation</i>	<i>Is the mitigation strategy working? Is there any unintended effect?</i>	<i>Is the risk finally acceptable? When should it be reassessed?</i>
Aircraft movement / ground support staff ingested by engine	3A	Hazard identification workshop	Documenting and implementing turnaround SOPs, training, supervision, monitoring	1A	...	...

Hazard / risk <i>Description of the hazard and related risk.</i>	Pre-mitigation risk <i>Risk level before any mitigation.</i>	Reason <i>How was the risk identified?</i>	Mitigation strategy <i>Which are the identified control measures to reduce the risk to an acceptable level?</i>	Post-mitigation risk <i>Risk level after mitigation</i>	Mitigation review process <i>Is the mitigation strategy working? Is there any unintended effect?</i>	Final assessment <i>Is the risk finally acceptable? When should it be reassessed?</i>
Equipment use / Staff being crushed between equipment	4B	Available data and known accident reports	Documenting and implementing SOPs, training, supervision, monitoring, use of PPE	2B	...	...
Equipment use / belt-loader collision causing aircraft damage	5D	Acquisition of new equipment	Retrofitting proximity sensors to GSE, updated SOPs, increased maintenance inspections, training, supervision, monitoring	1D	...	...
Equipment use / GPU fire	3A	Incident having occurred at another location	Improved maintenance schedule, improved daily inspections, improved drivers' training	2A	...	...
...other...	...	...	...	...	...	...



Appendix F

SAFETY PERFORMANCE INDICATORS FOR GROUND HANDLING

The table below includes examples of leading and lagging indicators, as well as precursor events that can be used for ground handling.

Table F-1. Examples of safety performance indicators for ground handling

<i>SAFETY PERFORMANCE INDICATORS</i>	
LEADING INDICATORS	<ul style="list-style-type: none"> • Number of peer observations against target • Percentage of staff that completed recurrent training on time • Percentage of up-to-date risk assessments • Number of out-of-date procedures • Compliance with vehicle maintenance inspections • Percentage of overtime over prescribed period • Percentage of staff attending safety promotion events • Percentage of nominated key safety personnel attending safety committees • Number of safety-related complaints from air operators or aerodrome operators • Number of emergency response plan (ERP) drills
LAGGING INDICATORS	<ul style="list-style-type: none"> • Apron accidents/incidents: <ul style="list-style-type: none"> o aircraft parked o aircraft arriving to stand o aircraft departing the stand o without aircraft involved • Number of repeat findings • Number of employee injuries • Number of infringements to apron safety regulation notified to each provider by the aerodrome operator • Number of unreported damages found before ground support equipment (GSE) approach and number of damages to the aircraft (presumably originated before last flight)
PRECURSOR EVENT	<ul style="list-style-type: none"> • Number of reported near-misses • Number of foreign object debris (FOD) detected • Cases of missing or incorrect use of personal protective equipment (PPE) • Number of non-compliances and number of supervised items (turnaround supervision)

Appendix G

HUMAN FACTORS: THE “DIRTY DOZEN”

Element 1: Lack of communication

1.1 Poor communication is often the top contributing and causal factor in accident reports, making it one of the most critical human factor elements. Communication refers to the transmitter and the receiver, as well as the method of transmission. Transmitted instructions may be unclear or inaccessible. The receiver may make assumptions about the meaning of these instructions, and the transmitter may assume the message has been received and understood. With verbal communication it is common that only 30 per cent of a message is received and understood.

1.2 Detailed information must be passed before, during and after any task, and especially across the handover of shifts. Therefore, when messages are complex they should be written down and organizations should encourage full use of logbooks, worksheets, checklists, etc. Verbal messages should be kept short, with the most critical elements emphasized at the beginning and repeated at the end. Consideration should be given to the use of read-backs for critical information. Assumptions should be avoided and opportunities for asking questions both given and taken. Adherence to standard operating procedures (SOPs) is vital and where changes from the norm are expected, the correct communication of the change is important. In the apron environment where hearing protection is used, communication may rely heavily on written guidance or hand signals.

Element 2: Distraction

2.1 Distraction can be anything that draws a person’s attention away from the task on which they are employed. Some distractions in the workplace are unavoidable, such as loud noises, requests for assistance or advice, and day-to-day safety problems that require immediate solving. Other distractions can be avoided or delayed until more appropriate times, such as messages from home, management decisions concerning non-immediate work, etc.

2.2 Distraction is considered the number one cause of forgetting things, hence the need to avoid becoming distracted and to avoid distracting others. When returning to a task following a distraction, people have a tendency to think they are further ahead than they are, consequently, it is a good idea to commence at least three steps back, so that the personnel can retrace some steps before picking up the task again.

2.3 Management have a role to play in reducing the distractions placed on their employees. This may involve good workspace design, management of the environment and procedures that create “safety zones”, “circles of safety” or “do not disturb areas” around workers engaged in critical tasks.

Element 3: Lack of resources

3.1 If all the correct or appropriate equipment is not available to complete a turnaround then there may be pressure on ground staff to complete the task using inappropriate equipment. The ground handling resources include personnel, time, data, equipment, skill, experience, knowledge, etc. A lack of any of these resources can interfere with a GHSP’s ability to complete a task.

3.2 When the proper resources are available, there is a greater chance that staff will complete a task more effectively, correctly and efficiently. Therefore, forward planning to make available and positioned correctly in advance of the aircraft arrival is essential.

Element 4: Stress

4.1 There are many types of stress. Typically in the aviation environment there are two distinct types — acute and chronic. Acute stress arises from real-time demands placed on a person's senses, such as dealing with an emergency or working under time pressure with inadequate resources. Chronic stress is accumulated and results from long-term demands placed on the physiology by life's demands. When people suffer stress from these persistent and long-term life events, it can mean the threshold of reaction to demands and pressure at work can be lowered.

4.2 Managers and supervisors should be aware of signs of stress, which may include changes in personality and moods, errors of judgment, lack of concentration and poor memory. Individuals may notice difficulty in sleeping and an increase in fatigue, as well as digestive problems. Longer-term signs of stress include susceptibility to infections, increased use of stimulants and self-medication, absence from work, illness and depression. GHSPs should consider employee assistance (or well-being) policies that include stress reduction programmes.

Element 5: Complacency

5.1 Complacency can be described as a feeling of self-satisfaction accompanied by a loss of awareness of potential dangers. Such a feeling often arises when conducting routine activities that have become habitual and which may be considered as easy and safe. A general relaxation of vigilance results and important signals will be missed, with the individual only seeing what they expect to see. Complacency can also occur following a highly intense activity such as recovering from a possible disaster; the relief felt at the time can result in physical relaxation, and reduced mental vigilance and awareness.

5.2 While too much pressure and demand causes over-stress and reduces human performance, too little results in under-stress, boredom, complacency and reduced human performance. It is therefore important, when conducting simple, routine and habitual tasks, and when fatigued, to maintain an adequate, or optimum, level of stress through different stimulation. The use of SOPs for aircraft turnaround and adhering to those procedures, will increase vigilance and provide suitable stimulus. Working from memory, relying on assumptions and unchecked work should be avoided.

Element 6: Lack of teamwork

6.1 In ground handling, many tasks and operations are a team effort; no single person (or organization) can be responsible for the safe outcomes of all tasks. However, if someone is not contributing to the team effort, this can lead to unsafe outcomes. This means workers must rely on colleagues and other outside agencies to provide their support. Some of the key teamwork skills include: leadership; followership; effective communication; trust building; motivation of self and others; and praise-giving. To create an effective team it is necessary that the following issues are discussed, clarified, agreed and understood by all team members, as appropriate:

- a) clearly defined and maintained aim or goal(s);
- b) each team member's role and responsibilities;
- c) communication messages and methods;
- d) limitations and boundaries;

- e) emergency procedures;
- f) individual expectations and concerns;
- g) what defines a successful outcome;
- h) debriefing arrangements;
- i) team dismissal arrangements; and
- j) opportunities for questions and clarification.

6.2 A team’s effectiveness can also be improved through the selection of team members to reflect a broad range of experience and skill sets, and also through training, practice and rehearsal.

Element 7: Pressure

Pressure is to be expected when working in a ground handling environment. However, when the pressure to meet a deadline interferes with the ability to complete tasks safely and correctly, it has become too great to handle. In ground handling, staff should never knowingly reduce the quality of their work to meet time bound targets. Ground handling staff will come under direct, or indirect, pressure from their own company, clients, colleagues and themselves. Staff will often take on more work than they can handle. Assertiveness skills will allow a worker to say “no”, “stop” or “slow down”, and communicate these concerns with colleagues, customers and the company. These skills are essential and when deadlines are critical, then extra resources and help should always be obtained to ensure the task is completed to the required level of quality.

Element 8: Lack of awareness

Working in isolation and only considering an individual’s responsibilities can lead to tunnel vision; a partial view and a lack of awareness of the affect actions can have on others and the wider task. Such lack of awareness may also result from other human factors, such as stress, fatigue, pressure and distraction. A useful attribute involves constant questioning and watching for potential hazards. Vigilance is closely related to situational awareness and workplace procedures, such as scanning, two-way communication and use of checklists will help to maintain vigilance.

Element 9: Lack of knowledge

9.1 The regulatory requirements for training and qualification vary considerably globally. However, lack of on-the-job experience and specific knowledge is known to lead workers into misjudging situations and making unsafe decisions. The nature of aircraft turnaround, and the equipment and vehicles used is complex and adequate technical training, experience and competence are vital. Furthermore, systems and procedures can change substantially and employees’ knowledge can quickly become out-of-date indicating the need for recurrent training.

9.2 It is important for employees to undertake continuing professional development and for the most experienced workers to share their knowledge with colleagues. Part of this learning process should include the latest knowledge on human error and performance. It should not be taken as a sign of weakness to ask someone for help or for information; in fact this should be encouraged. Checklists and publications should always be referred to and followed. Personnel should never make assumptions or work from memory.

Element 10: Fatigue

10.1 Fatigue is a natural physiological reaction to prolonged physical and/or mental stress. The ground handling operations are at many airports 24 hour operations with shift patterns that involve unsocial hours. Fatigue will occur following long periods of work and periods of hard work. As personnel become more fatigued their ability to concentrate, remember and make decisions will decline, they can become distracted and lose situational awareness. Fatigue will also affect a person's mood, often making them more withdrawn and sometimes more irrational and angry.

10.2 When fatigue becomes a chronic condition it may require medical attention. Supervisory personnel should be aware of their team members and watch for signs of fatigue in others and themselves. It is human nature to underestimate the level of fatigue and overestimate the ability of an individual to cope with it.

10.3 Work of a critical and complex nature should not be programmed during the low point on the body's circadian rhythm (usually from 0300 to 0500 hours). When fatigued, good practice is to cross-check work or actions undertaken by the team. This time period does coincide with many airports preparing for the first wave of morning departures and early arrivals, therefore GHSPs should pay particular attention to the capabilities of their teams during this time.

Element 11: Lack of assertiveness

11.1 An individual being unable to express concerns and not allowing others to express their concerns creates ineffective communications and damages teamwork. Unassertive team members can be forced to go with a majority decision, even when they believe it is wrong and dangerous to do so.

11.2 Assertiveness is a communication and behavioural style that allows us to express feelings, opinions, concerns, beliefs and needs in a positive and productive manner. Speaking one's mind assertively is about communicating directly and honestly giving respect to the opinions and needs of others, but not compromising one's own standards.

11.3 Assertiveness techniques can be learnt and they focus on keeping calm, being rational, using specific examples rather than generalizations and inviting feedback. Most importantly, any criticisms should be directed at actions and their consequences rather than people and their personalities; this allows others to maintain their dignity and a productive conclusion to be reached.

Element 12: Norms

12.1 Workplace practices develop over time through experience and often under the influence of a specific workplace culture. These practices are referred to as "the way we do things around here" and become norms; they can be good and bad, safe and unsafe. Such practices follow unwritten rules or behaviours, which deviate from the required rules, procedures and instructions. These norms can then be enforced through peer pressure and force of habit. Most norms have not been designed to meet all circumstances, therefore they are not adequately tested against potential threats.

12.2 Where personnel feel pressure to deviate from a procedure or work around it, this information should be fed back so that the procedure can be reviewed and amended, if necessary. Developing assertiveness can allow personnel to express their concerns about unsafe norms, despite peer pressure.

Appendix H

TURNAROUND PLAN

The examples below illustrate turnaround plans for single-aisle and wide-body aircraft. Any references to timings are simple indications to provide an overall view of a turnaround plan. Each operator and GHSP should establish their own requirements based on agreed turnaround times.

Table H-1. Example of a linear turnaround plan for a single-aisle aircraft

<i>Activity</i>	<i>Target time from scheduled time of arrival</i>	<i>Target time from scheduled time of departure</i>
Ground crew on stand	-5	
Pre-arrival ramp check completed	-2	
Equipment pre-positioned	-2	
Ground power connected	+3	
Chocks and cones positioned	+4	
Jet bridge or stairs positioned	+4	
Doors opened	+5	
Baggage belt or high loader positioned	+5	
Baggage / unit load device (ULD) offload commenced	+6	
Fuelling vehicle position and fuelling started		-25
Baggage / ULD loading started		-25
Aircraft waste / potable water management started		-20
Catering vehicle positioned and catering started		-20
Aircraft cleaning started		-17
Fuel sheet passed to flight crew		-10
Pushback tractor in position		-8
Dispatcher on flight deck with load sheet for final check		-7
Doors closed		-6
Chocks and cones removed		-5
Ground power disconnected		-5
Pushback tractor connected		-5
Walkaround completed		-3
Pushback and departure		-1

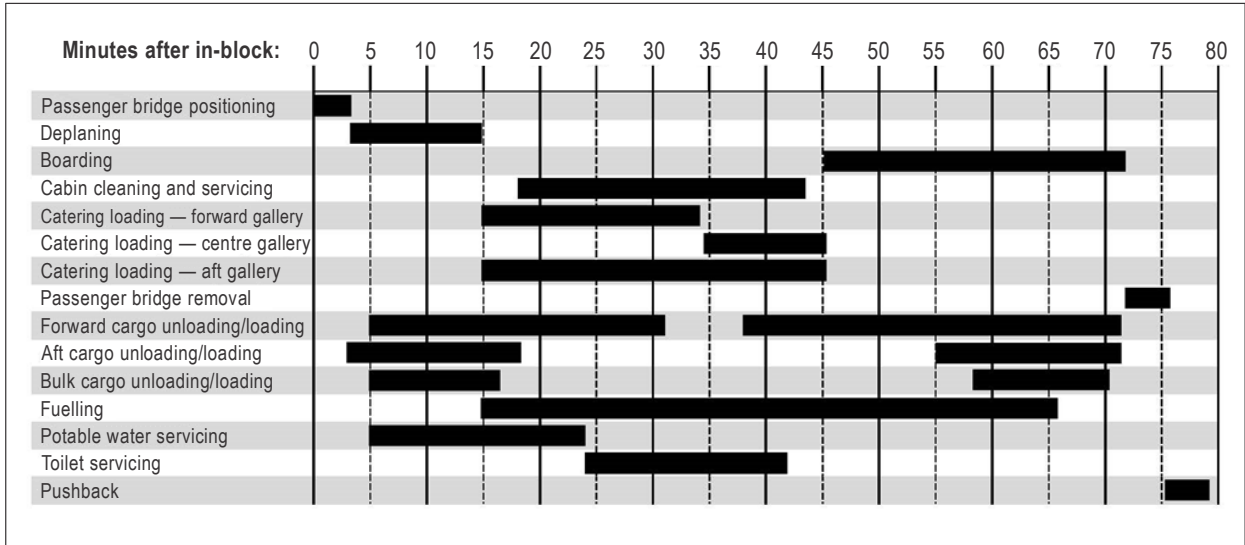


Figure H-1. Example of Gantt chart type turnaround plan for a wide-body aircraft

— END —

ISBN 978-92-9258-821-2



9

789292

588212