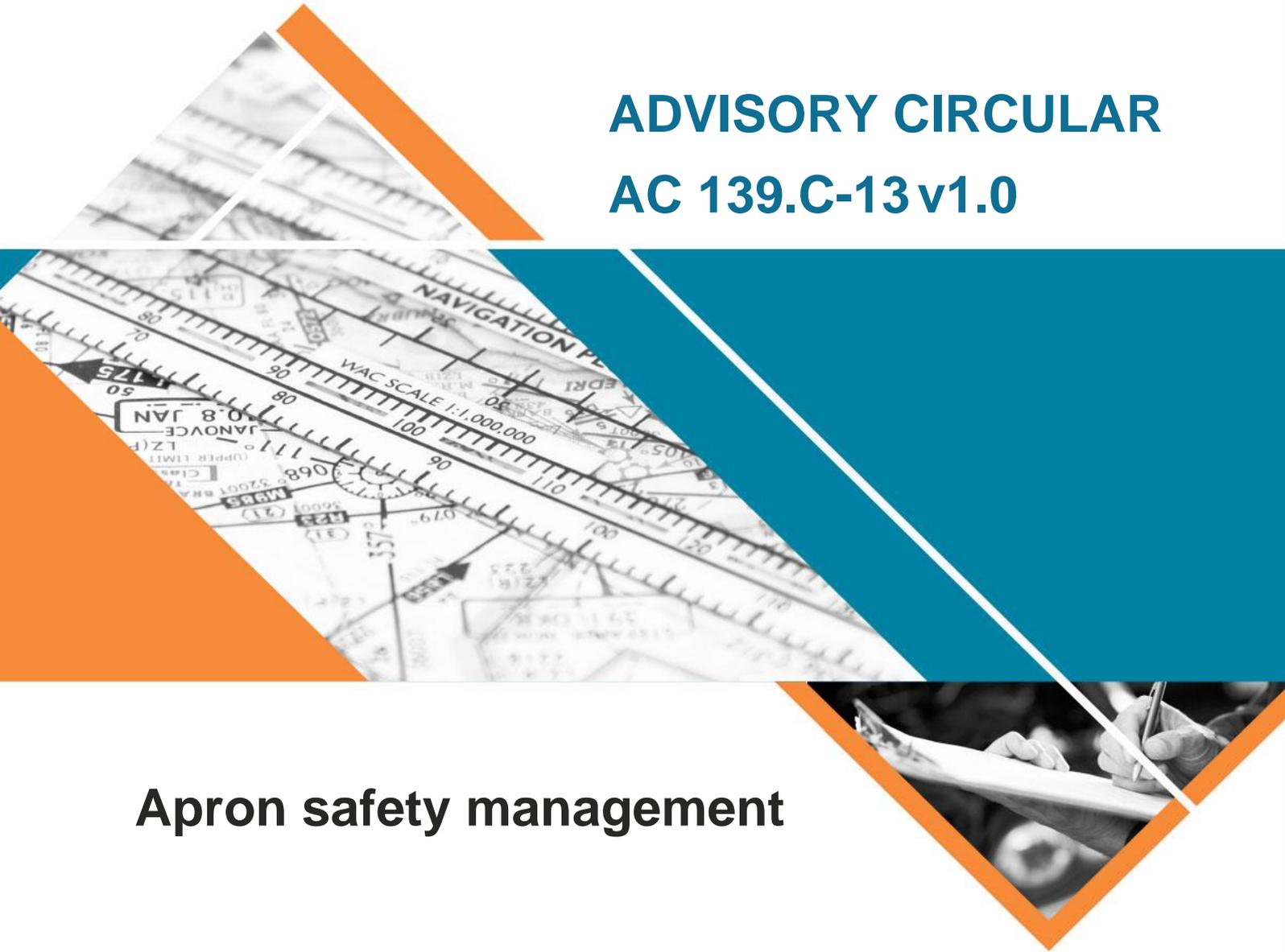




ADVISORY CIRCULAR

AC 139.C-13 v1.0



Apron safety management

Date June 2023
File ref D19/173916

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory Circulars should always be read in conjunction with the relevant regulations.

Audience

This advisory circular (AC) applies to:

- aerodrome owners/operators
- aircraft owners/operators
- air traffic service providers
- persons involved in the design, construction, and operation of aerodrome aprons
- consultants engaged to act on behalf of the aerodrome owner/operator
- the Civil Aviation Safety Authority (CASA).

Purpose

The purpose of this AC is to provide guidance to aerodrome operators in effective apron safety management. Aerodrome operators should use the guidance offered in this circular to inform their decision-making process in meeting the requirements of the Part 139 of the Civil Aviation Safety Regulation, and Part 139 Manual of Standards (MOS).

Operators should at all times consider the context of their own current and future operational environment, and the operational needs of pilots, aircraft operators and associated stakeholders, including but not limited to size and complexity.

It is important to note that this guidance does not create or permit deviations from regulatory requirements.

For further information

For further information, contact CASA's Personnel Licensing, Aerospace and Air Navigation Standards (telephone 131 757).

Unless specified otherwise, all subregulations, regulations, divisions, subparts and parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Status

This version of the AC is approved by the Manager, Flight Standards Branch.

Version	Date	Details
v1.0	June 2023	Initial AC.

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1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Acronym	Description
AC	advisory circular
AIP	Aeronautical Information Publication
ATC	Air Traffic Control
CAR	<i>Civil Aviation Regulations 1988</i>
CASA	Civil Aviation Safety Authority
CASR	<i>Civil Aviation Safety Regulations 1998</i>
FOD	Foreign Object Debris
SMS	Safety Management System
SOP	Standard Operating Procedures
RMP	Risk Management Plan
VDGS	Visual Docking Guidance System
(A)-VDGS	Advanced Visual Docking Guidance System
LVP	Low Visibility Procedure

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AC and the civil aviation legislation, the definition in the legislation prevails.

Term	Definition
Aerodrome	A means an area of land or water (including any buildings, installations and equipment), the use of which as an aerodrome is authorised under the regulations, being such an area intended for use wholly or partly for the arrival, departure or movement of aircraft.
aerodrome layout	the number of runways, taxiways and aprons at an aerodrome that are provided with lighting, in 1 of the following categories of aerodrome: <ol style="list-style-type: none"> basic — an aerodrome with 1 runway, with 1 taxiway to 1 apron area simple — an aerodrome with 1 runway, having more than 1 taxiway to 1 or more apron areas complex — an aerodrome with more than 1 runway, having more than 1 taxiway to 1 or more apron areas.
aerodrome traffic density	the number of aircraft movements in the mean busy hour, in 1 of the following categories: <ol style="list-style-type: none"> light — not greater than 15 movements per runway, or typically less

Term	Definition
	<p>than 20 total aerodrome movements</p> <p>b. medium — 16 to 25 movements per runway, or typically between 20 to 35 total aerodrome movements</p> <p>c. heavy — 26 or more movements per runway, or typically more than 35 aerodrome movements.</p>
aircraft parking position	<p>means an open-air designated area on an apron for parking an aircraft.</p> <p>Note 1 An aircraft parking position is also known as an aircraft stand.</p> <p>Note 2 An aircraft parking position does not include any area that is within a fully or partially enclosed aircraft hangar.</p> <p>Note 3 An area designated on an apron as being available for the parking of aircraft is considered to be an aircraft parking position.</p>
Apron	means a defined area on a land aerodrome to accommodate aircraft for the purposes of loading or unloading passengers, mail or cargo, fuelling, parking, or maintenance.
Aerodrome Operator	<p>means:</p> <p>a. for a certified aerodrome—the person who holds the aerodrome certificate for the aerodrome; or</p> <p>b. otherwise—the person who is responsible for the operation and maintenance of the aerodrome</p>
Air Traffic Control	means Air Traffic Services in its capacity as a provider of air traffic control services.
Air Traffic Service	means a service of a kind mentioned in Annex 11, Air Traffic Services, to the Chicago Convention, other than a certified air/ground radio service (within the meaning of regulation 139.390) at an aerodrome
Apron Management Unit	Refers to a designated area of an aerodrome where aircraft are parked, loaded, unloaded, fuelled, and boarded. The AMU is responsible for managing and coordinating the apron activities, including the allocation of parking stands, the provision of ground support equipment and services, and ensuring the safe and efficient movement of aircraft on the apron. The AMU liaises with air traffic control and other airport stakeholders to ensure the seamless operation of the apron.
FOD	means foreign object debris, which may result in foreign object damage to an aircraft.
Low-visibility procedure (LVP)	means a procedure applied at an aerodrome for protecting aircraft operations during conditions of reduced visibility or low cloud.
Manoeuvring area	means that part of the aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.
Marking	means a symbol or group of symbols displayed on the surface of the movement area of an aerodrome to convey surface movement, or aeronautical, information.
Movement area	means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the aprons.
NOTAM	means a notice issued by the NOTAM Office containing information or instructions concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of

Term	Definition
	which is essential to persons concerned with flight operations.
Scheduled air transport operation	means an air transport operation, other than a medical transport operation, that is conducted: <ol style="list-style-type: none"> in accordance with fixed schedules to and from fixed terminals over specific routes with or without intermediate stopping places between terminals; and in circumstances in which the accommodation in the aircraft is available for use by persons generally.
scheduled domestic air transport	operation means an air transport operation conducted in Australia in accordance with a published schedule.
scheduled international air transport operation	means an international air transport operation conducted in accordance with a published schedule.
sealed	for a surface, means that the surface is wholly, or preponderantly, sealed with a surface treatment which may include bitumen, asphalt, concrete or another suitable treatment.
SMS	means safety management system, and includes the statements and documents mentioned in Chapter 25 (of the Part 139 MOS) that describe and support the system.
Taxiway (TWY)	means a defined path on an aerodrome on land, established for the taxiing of aircraft from 1 part of an aerodrome to another. A taxiway includes a taxilane, an apron taxiway and a rapid exit taxiway.

1.3 References

Legislation

Legislation is available on the Federal Register of Legislation website <https://www.legislation.gov.au/>

Document	Title
Part 139 of CASR 1998	Aerodromes
Part 139 (Aerodromes) Manual of Standards (MOS)	Aerodromes

International Civil Aviation Organization documents

International Civil Aviation Organization (ICAO) documents are available for purchase from <http://store1.icao.int/>

Many ICAO documents are also available for reading, but not purchase or downloading, from the ICAO eLibrary (<https://elibrary.icao.int/home>).

Document	Title
International Civil Aviation Organization (ICAO) Annex 14	Aerodromes, Vol I (Aerodrome Design and Operations)
ICAO Doc 9157	Aerodrome Design Manual Part 2 — Taxiways, Aprons and Holding Bays
ICAO Doc 9981	PANS-Aerodromes

Advisory material

CASA's advisory material is available at <https://www.casa.gov.au/resources-and-education/publications-and-resources/guidance-material>.

Document	Title
AC 139.C-01	Aerodrome manual
AC 139.C-03	Serviceability inspections
AC 139.C-09	Visual aids, markings, signals and signs
AC 139.C-27	Risk management plans for aerodromes
AC 139.A-03	Application of aerodrome standards
AC 139-20	Safe planning and conduct of aerodrome works
AC 139-16	Safety management systems for aerodromes

2 Introduction

2.1 Background

- 2.1.1 An aerodrome apron is an essential facility supporting aircraft parking and operational arrangements. Aprons are designed to support aircraft of varying sizes, weights and capacities. Aprons at commercial airports are likely to accommodate multiple aircraft types in adjacent bays. An apron surface may be constructed of dirt, grass, asphalt or concrete depending on the category (based on weight and size) of aircraft for which the apron will be used. For example, a Code A or B aircraft (such as a Cessna 172) would have a maximum take-off weight (MTOW) of 1043kgs therefore this aircraft type could park on a dirt or grass apron compared to a large jet (such as a B787-900) with an MTOW of 254,000kgs which would need to park on a high strength pavement (concrete pavement).
- 2.1.2 Apron related incidents can impact the health and safety of personnel, the efficient operation of flights, the overall aerodrome performance and negatively reflect on the airlines/ground handlers/airport operator's reputation. The effective management of apron safety lends itself to a positive long-term working environment, reduces the risk of worker injuries and accidents, and contributes to commercial benefits.
- 2.1.3 The International Civil Aviation Organization (ICAO) defines apron types to include:
- Passenger terminal apron
 - Cargo terminal apron
 - Remote parking apron
 - Service and hangar aprons
 - General aviation aprons
 - Itinerant aircraft aprons
 - Base aircraft aprons or tiedowns.
- 2.1.4 An apron may be designed to facilitate one or more of the above activities simultaneously, whilst considering the capability of aircraft and its intended operations/use.
- 2.1.5 Aerodrome traffic utilising the apron concurrently can result in the apron operations developing rapidly into extremely complex situations due to, but not limited to, aircraft size mixture, Ground Service Equipment (GSE) required for the turn around and servicing of the aircraft, international, domestic or cargo operations and the required ground handling operations working near one and other. Weather conditions, staffing, scheduling including unplanned arrivals and delayed departures can add to the challenges.
- 2.1.6 In addition, other factors that will contribute to and increase the complexity of safety risks to aircraft operations includes, aircraft loading and unloading (passengers and/or cargo), refuelling/defueling operations, aircraft relocation activities, aircraft being declared unserviceable and declared emergency situations. All these factors increase the hazards and risks on the apron, especially when aircraft are being serviced on adjacent parking positions. This could include emergency events where people with no airside experience may evacuate terminal and other buildings onto the apron area.

- 2.1.7 Where Air Traffic Services (ATS) are available, the volume of movements and activities on one or more aprons could result in an increase to the perceived and actual hazards. Peak period traffic movement, even if just for short time spans, may place additional demands on airlines and ground handlers adding to the intensity and likelihood of accidents/incidents occurring. It is therefore critical for aerodrome operators to gauge the level of operational intensity each apron may experience, and appropriately analyse potential sources of hazards and risks and how to safely manage them.
- 2.1.8 At aerodromes with scheduled international air transport services the level of operational requirements may increase in volume and complexity therefore the hazards and risks may increase proportionately. A busy aerodrome with complex apron operations can be a hazardous place, requiring careful, appropriate, and effective operational and safety management processes and procedures to be in place to ensure the apron(s) environment remain as safe as reasonably practical. Hazards and risks can impact both aviation safety and worker health and safety equally. This AC focuses on aviation safety.
- 2.1.9 With a focus on aviation safety, the aerodrome operator should, through their Safety Management System (SMS) or Risk Management Plan (RMP), consider the risk to aerodrome operations, consequential risk to aircraft operations and the risks to those working on the apron, to ensure safety management processes are appropriately scaled and suitable to the nature of the risk. Applying the SMS/RMP will assist in reducing risks without introducing additional unintended consequences, and ensure risk tolerance is carefully considered, mitigation is appropriately apportioned, and suitably implemented.
- 2.1.10 Some fundamental aspects of apron management are covered in Chapter 11 of the Part 139 MOS, which are likely to be appropriate for smaller, less busy, aerodrome aprons. For larger, more complex aerodrome apron environments, this advisory circular intends to provide additional guidance and information for aerodrome operators to consider on how to setup apron management suitable for their site-specific operation.
- 2.1.11 Apron management services and procedures should:
- prevent or reduce the risk of collisions between aircraft, vehicles, and/or obstacles
 - facilitate safe and efficient entry and egress of aircraft on the apron in cooperation with Air Traffic Control (ATC) where provided, or otherwise published in the Aeronautical Information Publication (AIP), or in accordance with local procedures
 - ensure safe appropriate staging and usage of vehicles and equipment on aprons, apron edge taxiways, taxi lanes and apron service roads.

2.2 Apron safety

- 2.2.1 Aerodrome operators hold the prime responsibility for apron safety however, apron safety is the joint responsibility of all parties present on the apron and, in the case of ATC, assisting safe operations through pushback and taxi clearances. All stakeholders should prepare and follow appropriate safety management processes. The development, implementation, and maintenance of an apron safety framework to support day-to-day operations should be developed using inputs from all apron users, and other stakeholders. Apron Operating Procedures (AOP's) and safety

instructions/information should be provided by the aerodrome operator to all stakeholders with apron access.

- 2.2.2 The Part 139 (Aerodromes) Manual of Standards 2019 (the Part 139 MOS) requires aerodrome operators to ensure that the apron safety management procedures are followed by any organisation that conducts apron operational activities (refer 11.15(3) of the MOS). Where operations on an apron are controlled by third parties, such as airline operators, ground handling agents or other parties, the responsibility of apron safety remains with the aerodrome operator. Information regarding the responsibilities of third parties should be included in the aerodrome manual as outlined in AC 139.C-01 - Aerodrome manual.

3 Apron management

The aerodrome operator should set out and clearly define the permitted activities that can safely take place on the apron in conjunction with ATC (where present) and all apron users and stakeholders.

The monitoring and management of permitted activities on the apron is the responsibility of the aerodrome operator.

At controlled aerodromes, if air traffic control services do not engage in apron management services, processes should be established with the responsible stakeholders to enable all aircraft and vehicles that enter, egress and manoeuvre around the apron area are appropriately risk assessed.

3.1 Aircraft parking control

- 3.1.1 Aircraft parking control is the process of allocating suitable parking positions to arriving aircraft within the movement area. Aircraft parking position allocation is primarily based on aircraft arrival sequencing, parking position design, operational procedures, information markings on the ground and aerodrome signage.
- 3.1.2 The organisation or business unit responsible for aircraft parking control may vary between aerodromes, or the various aprons at the same aerodrome.
- 3.1.3 When provided, ATC directs aircraft to the parking position allocated by the aircraft or aerodrome operator, or other appropriate authority. However, an alternative organisation or business unit (usually the airline or a ground handler) may be allocated responsibility for apron management and allocating aircraft parking positions.
- 3.1.4 As per Section 11.15 of the Part 139 MOS, aerodrome operators with scheduled international air transport operations must establish aircraft parking control procedures.
- 3.1.5 Other Aerodromes that do not support scheduled international air transport operations may also establish such procedures where apron congestion creates a hazard to aircraft operations, or as part of their risk mitigation program.
- 3.1.6 Where established, aircraft parking control procedures must include procedures as prescribed in Section 11.15 (2) of the Part 139 MOS. This includes:
 - a. liaison between ATC and the individuals or positions responsible for apron management
 - b. procedures for allocating aircraft parking positions
 - c. initiating engine start and ensuring clearances for aircraft pushback
 - d. identifying and using the aerodrome Visual Docking Guidance Systems (VDGSs), including any Advanced Visual Docking Guidance Systems (A-VDGSs)
 - e. marshalling services
 - f. leader (“van”) service or follow-me service
 - g. identifying:
 - i. the names and roles of the individuals responsible for planning and implementing aircraft parking control

- ii. the telephone numbers for contacting the relevant individuals during and after normal working hours.

- 3.1.7 The fundamental principles in aircraft parking control should be:
- a. ensuring sufficient clearance between an aircraft and objects such as other aircraft, buildings, equipment, vehicles and other structures
 - b. assigning aircraft parking positions that are appropriate for the size, weight and operation of the aircraft
 - c. providing staging areas and unobstructed access for GSE and operations to facilitate safe aircraft loading and unloading, including areas for refuelling vehicles and equipment.
- 3.1.8 Chapter 6 of the Part 139 MOS provides specifications for the minimum separation distances between aircraft and objects on the apron. To provide the required separation distance around an aircraft, the aerodrome operator must consider the aircraft code letter or aircraft code letters, and any unique aircraft parking position characteristic (i.e., multiple passenger door locations requiring multiple aerobridges to operate simultaneously, for example an A380 or alternative door arrangements) when allocating suitable or airline preferred parking positions.
- 3.1.9 Special consideration should be given by aerodrome and aircraft operators for aerodromes that will service aircraft with folding wings, such as the Boeing 777X. With its wingtips extended the aircraft is a Code F but with the wingtips folded it is a Code E as with other Boeing 777 models. Therefore, apron and taxiway separation distances need to be carefully considered for all operations on the movement area and the areas where wingtips will be extended or folded should be clearly identified on aerodrome and apron charts.
- 3.1.10 The pavement strength of an aircraft parking position may vary taking into consideration various factors such as surface and/or sub-surface materials used in construction, and ongoing maintenance requirements for the pavement from when it was first commissioned. The aerodrome operator should consider which aircraft exceed the design characteristics of the apron's pavement to avoid the risk of damage to aircraft and/or the apron surface.
- 3.1.11 The aerodrome operator should ensure that appropriate parking positions are available for all aircraft types that intend to use the apron and accommodating for the different aircraft dimensions and weights. Additionally, any contingency planning for non-regular, non-routine (itinerate) or oversize aircraft operations that may infrequently use the aerodrome should be considered. For instance, arrangements for power in/power out operations for aircraft that may use the aerodrome as an alternate, where no tow bar or pushback arrangements are available, should be considered.
- 3.1.12 Aircraft parking position classifications and designations should be included in an apron plan for the aerodrome. Information about aircraft parking position classification and designations should be accurately maintained to ensure that the most current information is available and supplied to aircraft and ground service operators. This information should be made available by the aerodrome operator in a timely manner.
- 3.1.13 Apron configuration may be designed with flexibility to accommodate additional/various aircraft types like the MARS (multi-aircraft ramp system) parking positions. The apron

plan should identify such positions distinctly and include the combination of aircraft types and variants permitted to operate safely within the apron configuration.

- 3.1.14 When an apron includes power-in, power-out parking positions, minimum separation distances may be increased to take account of wing tip clearance and jet blast or propeller wash. The apron plan should precisely identify parking positions that allow power-in/power-out operations. The types and variants of aircraft that power in/power out parking positions can accommodate should also be included.
- 3.1.15 Access, egress and staging positions for GSE, refuelling equipment and other vehicles at aircraft parking positions should also be considered as part of aircraft parking position design and allocation process. This will ensure a faster turnaround for ground handling services and minimise the movement of vehicle traffic across the apron.
- 3.1.16 Where rotorcraft are permitted to use the same apron as fixed wing aircraft, the aerodrome operator should consider the impact and risks associated with downwash/outwash, other than those rotor craft using wheels to traverse the apron.

3.2 Marshalling arrangements

- 3.2.1 Marshalling services offer guidance to aircraft moving into aircraft parking positions when other automated precision parking services such as VDGS/A-VDGS (see below for more information) are unavailable, when there is a need to manoeuvre around temporary apron constraints, and/or it is requested by the pilot.
- 3.2.2 Marshalling services should be provided where guidance is required to ensure safe parking or dispatch of aircraft, particularly when the aircraft moves under its own power into an aircraft parking position, to avoid apron obstacles.
- 3.2.3 For parking positions where a marshalling service is provided, marshaller stop lines must be provided as described in Section 8.63(1) of the Part 139 MOS.
- 3.2.4 Arrangements to provide marshalling services can vary by aerodrome. An aircraft operator may:
 - a. use their own personnel
 - b. contract with a ground service provider, or
 - c. engage with the aerodrome operator to provide marshalling services.
- 3.2.5 An aerodrome operator should recommend the organisation offering marshalling services demonstrate a comprehensive Standard Operating Procedure (SOP) that ensures the services will be in accordance with international best practices (see ICAO Annex 2 - Rules of the Air (Appendix 1, Section 5)), and as required by Section 11.15(3) of the Part 139 MOS.
- 3.2.6 The standard operating procedure should, as a minimum, cover the following criteria:
 - a. Usage of marshalling signals for fixed-wing aircraft and helicopters as described in [Marshalling Signals, 5.1 From a signalman to an aircraft, as contained in Appendix 1 of ICAO Annex 2, Rules of the Air](#).
 - b. Appropriate training for persons conducting aircraft marshalling is available in Australia as unit of competency (UoC) AVIF3016 - Marshal aircraft, through

<https://training.gov.au>. UoC AVIF3016 includes information on competency checks and refresher training at appropriate intervals.

- c. Appropriate marshalling equipment and clothing to be worn while performing marshalling services, which is visually distinct from other service providers operating on the apron, is to be determined by the operator providing the service. Each service provider is responsible for ensuring persons are appropriately equipped to perform their functions on the apron in the range of operating conditions, including weather events when aircraft may need to be marshalled.
- d. Assessing and identifying circumstances where wing walkers may be required to monitor wing-tip clearance and positioning during marshalling operations is a responsibility of the airline, aircraft operator, pilot, and ground handling agent. However, the marshaller is responsible for ensuring an obstruction-free environment while conducting marshalling services prior to an aircraft being guided to the parking position.
- e. Actions to be initiated when an aircraft:
 - i. is incorrectly marshalled, or
 - ii. a push-back operation is interrupted, or is forced to change direction during operations, including notifying:
 - A. ATC, the airline, aerodrome operator, and/or
 - B. internally within the organisation, following established incident reporting processes.

Note: Incident notification or reporting should be carried out by the organisation responsible for performing the providing marshalling or push-back activities.
- f. Arrangements for the communication and the management of reportable incidents that occur during the provision of a marshalling service, and any reporting of identified hazards to the responsible personnel should be through documented processes and procedures and applied by each organisation involved in the activity.

3.2.7 An aerodrome operator may, in association with marshalling service providers, devise and promulgate a procedure to request and offer marshalling services or decline to offer marshalling arrangements. The aerodrome operator may publish aircraft marshalling arrangements in the AIP.

3.3 Follow-me service (leader vehicle)

3.3.1 Follow-me services may be available to both aircraft and other vehicles, upon request and when various other circumstances occur (see 3.3.2 below). Generally, follow-me services are provided by the aerodrome operator.

3.3.2 The follow-me service provider should have a SOPs for follow-me services at the aerodrome. Such procedures may include:

- a. Conditions when such services may be provided, such as:
 - i. low-visibility conditions

- ii. complex taxi-routing and when required by local operating procedures
 - iii. unfamiliar operating crew
 - iv. stranded aircraft or vehicles seeking assistance
 - v. temporary change to airside configuration
 - vi. for vehicles that do not regularly operate in the aerodrome, or do not have authority to operate without an escort (e.g. ambulance)
 - vii. VIP movements.
- b. Follow-me vehicle operating procedures should include and clearly state:
- i. speed limits on different airside locations (apron, TWY/RWY, service road, etc)
 - ii. separation distances to be maintained from the aircraft and other vehicles following
 - iii. suitability of surface when offering the services
 - iv. following guidance lights, signboards, markings, and monitoring obstructions
 - v. priority and right of way for other aircraft and vehicle movements (e.g., taxiing aircraft)
 - vi. consideration for the physical characteristics of the aircraft or vehicle being provided with the follow-me service
 - vii. where ATC is present and as per local procedures, vehicle operators performing follow-me requirements to adhere to instructions from ATC
 - viii. the procedures should ensure the aircrew are informed where follow-me services begin/end.
- c. Trained and qualified airside personnel performing follow-me services should:
- i. be sufficiently trained on follow-me procedures
 - ii. be trained on low-visibility conditions and operating procedures
 - iii. be well versed in aerodrome topography
 - iv. be radio-telephony qualified and proficient in communication procedures including receipt and read-back clearances
 - v. be prepared for emergency responses
 - vi. have additional skills and knowledge as required by the prevailing operating environment within an aerodrome.
- d. A Follow-Me vehicle should:
- i. have distinct and clear identification markings along with lights/beacons in compliance with Section 14.05 of the Part 139 MOS and, where provided, illuminated message boards/ signage to be unambiguously recognised by the following aircraft or vehicle
 - ii. be equipped with two-way radio-telephony instruments to communicate with ATC or the pilot
 - iii. equipped with appropriate emergency and safety equipment
 - iv. contain a detailed airside map for the vehicle operator to refer to when needed.

3.3.3 Consideration should be given to the importance of follow-me services' roles during emergency operations both on, and in the surrounding vicinity of an aerodrome.

Vehicles, safety equipment and personnel should accordingly be made available and rostered to provide a follow-me service during aerodrome operating hours.

3.4 Apron cleanliness

- 3.4.1 Paved apron surfaces must be maintained clean and free from Foreign Object Debris (FOD) to prevent damage to aircraft, as prescribed in Chapter 18 of the Part 139 MOS.
- 3.4.2 There are two significant elements to managing apron cleanliness - the management of waste and spillage and the removal of FOD.
- 3.4.3 Apron cleanliness is the responsibility of all operators using the apron. Every person working in an airside environment, irrespective of role, has a responsibility to report or remove FOD.
- 3.4.4 Periodic apron cleaning:
- a. An aerodrome operator should have a scheduled apron cleaning plan as well as an ad-hoc/response cleaning plan in place appropriate for the level of apron operations on sealed aprons. The apron cleaning plan should be reviewed periodically based on operations, occurrences relating to FOD identification, reporting and airside inspection feedback.
 - b. The apron cleaning plan must provide special consideration for areas adjacent to construction sites where the potential for waste generation is high and could create significant FOD hazards to apron operations.
 - c. For a large apron area with multiple movements, dedicated sweeping machines may be considered for apron cleaning. Consideration may be given to installing magnetic bars to collect metallic objects, amongst other features.
 - d. Specific procedures should be developed to handle fuel, oil and hydraulic spillages. Such procedures should include reporting spillage, spill kit availability, chemical agents/solutions available for cleaning (including how to use these safely), machinery to be deployed, and emergency services contact details etc.
 - e. Apron cleaning services may be provided by the aerodrome operator or through third-party contractors. Apron cleaning personnel should operate according to standard operating procedures for standard and exceptional (hazardous) operations.
 - f. The apron drainage configuration must ensure that spills and hazardous materials should not leave the apron area or accumulate near the terminal building as described in Section 6.60 (6) & (7) of the Part 139 MOS.
- 3.4.5 Foreign Object Debris management:
- a. FOD presents multiple hazards to apron operations. It can be generated from various sources both on the apron and from the surrounding area. Due to the unpredictable nature of FOD contaminating an apron, monitoring and management is the responsibility of every person accessing an airside environment.
 - b. All personnel with access to the apron should be trained in FOD practices, educated on the risks posed by FOD, and made aware of local procedures as a first step in FOD management. Training material and documentation should be

available from the aerodrome operator or organisation responsible for any person required to perform FOD management.

- c. Other measures that substantially add value to FOD management are:
 - i. placing FOD bins at strategic (visible) locations across the apron
 - ii. communicating the presence and purpose of FOD bins
 - iii. not allowing FOD bins to be filled beyond capacity
 - iv. periodic emptying and cleaning of FOD bins.
- 3.4.6 Airport operator, airline and ground service staff on the apron should examine aircraft parking positions and adjacent areas for FOD and remove all FOD items, prior to arrival, whilst the aircraft parked and after departure of an aircraft.
- 3.4.7 Unattended tools and equipment may be a high-risk FOD source. Organisations operating on the apron should develop a tool management programme to reduce the risk of unattended tools becoming a FOD risk.
- 3.4.8 All tools and equipment should be clearly marked in a manner that makes them easy to see and identify the owner.
- 3.4.9 Aerodrome operators may also have in place the following for an effective FOD management process:
 - a. regular joint FOD inspections involving all stakeholders to identify and raise awareness of FOD sources
 - b. locating traps or fencing in open areas or around construction sites to capture wind-blown debris
 - c. FOD campaigns, periodic briefings and sharing of safety statistics (FOD reports) to keep personnel aware of on-going FOD management
 - d. identifying regular causes of FOD and communicating to all relevant stakeholders through airside management briefings (Safety Committee meetings).
- 3.4.10 Section 12.03 of the Part 139 MOS stipulates recording requirements for objects found during serviceability inspections. Significant objects that cannot be removed immediately may need to be reported to the NOTAM Office. Information to be reported to the NOTAM office is outlined in Section 12.04 of the Part 139 MOS. Refer to <https://www.airservicesaustralia.com/wp-content/uploads/NOTAM-Data-Quality-Requirements-for-Aerodrome-Operators.pdf> for further information.
- 3.4.11 Details of any aircraft parts which may have fallen from an aircraft or the remains of wildlife which may have been struck by an aircraft may require additional reporting to the ATSB. Refer to <https://www.atsb.gov.au/form/occurrence-notification-aviation>.
- 3.4.12 In locations where FOD increases the risk of damage to an aircraft, additional serviceability inspections may be required to reduce the likelihood of FOD damage.

3.5 Operation of aerobridges

- 3.5.1 Aerobridges also known as air bridges, passenger loading bridges, passenger boarding bridges, or Jetways are provided at aircraft parking positions to facilitate safe, secure, and fast movement of passengers to and from an aircraft via the terminal building. Parking positions that have these facilities are sometimes referred as contact stands.

- 3.5.2 Aerobridges are extended structures from terminal buildings with the ability to move in a controlled manner across the apron before contacting with an aircraft. Aerobridge operators should exercise caution during operation. The design, functions and limitations of aerobridges may vary according to manufacturers, airport environment and the aircraft types they serve.
- 3.5.3 Due to the nature of aerobridge operations, its structure, proximity to aircraft and frequent usage during day-to-day operations, aerobridge operations require standard operating procedures to be followed and continuous monitoring to achieve best practice.
- 3.5.4 Although an aerobridge facility is owned by the aerodrome operator, its day-to-day operation may be performed by in-house staff, airline staff or contracted to a third-party. However, the overall responsibility for aerobridge operations is with the aerodrome operator.
- 3.5.5 An aerobridge SOP should be developed by the aerodrome operator in consultation with all stakeholders and factor in all identified and potential hazards. The SOP should cover, as a minimum, the following topics:
- a. Aerobridge operator training, retraining and qualification requirements.
 - b. Aerodrome operators should provide suitable training and supervision for aerobridge operation techniques, how to monitor the surrounding apron environment, positioning of the aerobridge near an aircraft, establishing and maintaining communication with ground services and any relevant emergency procedures.
 - c. Aerobridge training should cover theoretical as well as practical knowledge.
 - d. The training must be followed by comprehensive assessments before authorising individuals to operate an aerobridge.
 - e. An authorisation card or aerobridge operator license may be issued by the organisation responsible for aerobridge operations.
 - f. Periodic refresher training may be conducted highlighting potential hazards and mitigation measures and any changes to the aerobridge operations/programming.
 - g. Procedures for manning aerobridges when docked with an aircraft, stopping and parking positions, and general operations techniques.
 - h. Regular maintenance checks, pre-use inspections and visual inspections to be conducted after each and every aircraft movement.
- Note:** The aerodrome operator should provide a checklist of items to be pre-use inspections and visually inspected for each type or brand of aerodrome in use at the aerodrome.
- i. Audible warnings and visual alerts to indicate aerobridge movements.
 - j. Ground markings to identify the aerobridge manoeuvring zone and associated procedures to keep the zone free from obstructions.
 - k. Information on safety equipment such as emergency stop buttons and instructions on how to use them.
 - l. Emergency procedures to be followed during abnormal operations encountered within and around an aerobridge.
 - m. Processes for communicating between the ground and the aerobridge.

- n. Procedures for reporting faults and/or maintenance issues

3.6 VDGS operations

- 3.6.1 A VDGS or an A-VDGS must be provided at an apron aircraft parking position equipped with an aerobridge, which requires precise positioning of an aircraft as per:
 - a. Section 9.117 of the Part 139 MOS - Visual docking guidance systems
 - b. Section 9.118 of the Part 139 MOS - Characteristics of visual docking guidance systems
 - c. Section 9.123 of the Part 139 MOS - Advanced visual docking guidance systems
 - d. Section 9.124 of the Part 139 MOS - Characteristics of advanced visual docking guidance systems.
- 3.6.2 Section 9.117 of the Part 139 MOS recommends the use of A-VDGS with aircraft parking positions at international aerodromes used for air transport operations and which are equipped with passenger loading bridges.
- 3.6.3 Most VDGS or A-VDGS systems are owned and may be operated by the aerodrome operator, airline personnel or ground handling agents and provide the pilot in charge with visual aids such as guidance and stopping position indicators.
- 3.6.4 A VDGS or A-VDGS system can be controlled from an aerobridge or other location based on the system design for a specific aerodrome.
- 3.6.5 The organisation responsible for VDGS or A-VDGS system operations should ensure that personnel who use the system are suitably trained on its functions and risk factors.
- 3.6.6 Accurate and timely information for the next arriving aircraft should always be provided to VDGS or A-VDGS operators. Personnel responsible for VDGS or A-VDGS operations must correctly pre-set the system for the next arriving aircraft type as per the aircraft information provided.
- 3.6.7 Procedures should be in place for reporting safety issues, system faults and initiating emergency responses.
- 3.6.8 Periodic inspections should be conducted to validate the accuracy the VDGS or A-VDGS equipment based on the manufacturers recommended specifications, or more frequently if there are additional risk factors such as extreme environmental conditions. In the event of a failure in the system an inspection should take place, following the repair of the system, before the next aircraft is permitted to use the system on the apron.
- 3.6.9 Inspections should be performed by personnel trained in the inspection methodology for that model of equipment. The outcome of inspections should be recorded and retained by the operator.
- 3.6.10 When the VDGS/A-VDGS system is declared unserviceable, standard operating procedures should be developed to provide contingency arrangements, such as the provision of marshalling services as per local arrangements.
- 3.6.11 Information on VDGS/A-VDGS availability is to be published as required by Chapter 5 of the Part 139 MOS and Part 175 Data Quality Requirements - [Aeronautical Data Originators as published by Airservices](#).

- 3.6.12 VDGS may be provided for primary, secondary or both primary and secondary aircraft parking positions. Guidance may be provided by a single VDGS unit, or multiple VDGS units. Where multiple units are used to guide aircraft on overlapping (primary/secondary) aircraft parking positions, controls should be introduced to interlock the operation of VDGS on those overlapping parking positions.

3.7 Hazards due to blast and wash from aircraft propulsion systems - safeguarding measures

- 3.7.1 Jet blast, propeller wash and downwash from aircraft propulsion systems can cause damage to vehicles, buildings, equipment, other aircraft, and/or cause injury to persons.
- 3.7.2 Aerodrome operators must design the movement area including the apron taking into considering the jet blast or propeller wash velocities as prescribed in Sections 6.63 and 6.64 of the Part 139 MOS.
- 3.7.3 To ensure the safety of all apron users, aerodrome operators should ensure awareness among all users about the hazards arising from aircraft propulsion systems and the necessary precautions to be followed. This may be provided during induction programs, included in role specific training and education programs, included in regular safety committee meetings, safety briefings and/or a mixture of all of these.
- 3.7.4 Some of the precautions that can be implemented are:
- a. Ground vehicles and wheeled equipment should be secured (brakes applied) to minimise the risk of equipment movement when subjected to jet blast.
 - b. Aircraft on adjacent aircraft parking positions should be chocked to prevent jet blast impacts.
 - c. Ensure the apron is free from FOD, as debris moved by jet blast can potentially become more hazardous and cause additional and/or more significant damage.
 - d. Assigning and using dedicated parking positions that reduce the exposure of ground vehicles and equipment to jet blast or propeller wash.
 - e. Installation of blast fences where appropriate or identified necessary as per the local aerodrome hazard identification process.
 - f. Periodic awareness programs and workshops to emphasise risks and safety precautions around jet blast and propeller wash.
- 3.7.5 Where passengers are required to walk on the apron to embark or disembark an aircraft, care should be taken to prevent jet blasts caused by adjacent aircraft operations. The responsibility for passenger safety rests with aircraft operator or its ground handling agent.
- 3.7.6 Where possible, scheduling of aircraft movements should include consideration of passenger movements on an apron or on adjacent aircraft parking positions when aircraft arrival or departure is concurrent.
- 3.7.7 Where aircraft parking positions rely on power in - power out operations, additional consideration may be required to ensure persons and equipment on adjacent parking positions are not subject to adverse blast or wash velocities.

- 3.7.8 Procedures to ensure safe passenger movements should be established in line with aerodrome safety requirements and be monitored and reviewed.
- 3.7.9 Maximum permitted blast and wash velocity is outlined in Section 6.64 of the Part 139 MOS. Prevailing wind conditions, physical infrastructure and aircraft specific characteristics should be considered when designing aircraft parking position arrangements, developing apron arrival and departure schedules, and when changes to apron infrastructure are being proposed.

3.8 Aircraft pushbacks

- 3.8.1 An aircraft pushback is the movement of an aircraft from a nose-in parking position using the power of an external source such as a specialised ground vehicle attached to the aircraft to push the aircraft in a backwards movement. Aircraft pushback is a required procedure at the commencement of the departure phase of a flight, unless the parking position is designed and approved for power-in, power-out operations or power-back operations.
- 3.8.2 As aircraft pushback operations involve complex manoeuvring on the apron, they may increase the risk of damage to aircraft, buildings and/or other structures or injuries to persons on the apron.
- 3.8.3 To mitigate the risks of pushback operations, standardised procedures should be developed and promulgated among stakeholders based on the safety risk assessments conducted by the aerodrome operator, aircraft operator and ground handling organisations.
- 3.8.4 An aerodrome operator may establish procedures for pushback operations at the aerodrome. However, this may also be developed by the aircraft operator or the ground handling organisation or in conjunction with all parties.
- 3.8.5 When developed by the aircraft operator or ground handler, the aerodrome operator should ensure the procedures adequately address identified risks and take into account proposed mitigations at the aerodrome. The aerodrome operator should perform ongoing reviews to ensure continued compliance with such procedures.
- 3.8.6 The pushback procedures should at a minimum, consider the following aspects:
- Ensure that ground vehicles or equipment attached to the aircraft are removed and that there are no obstacles around and behind the aircraft or aircraft engines.
 - Ensure that no conflicts exist with other aircraft pushbacks in progress, aircraft ready to taxi, and other traffic on the apron. At controlled aerodromes this is a joint responsibility with ATC.
 - Ensure capability is available to maintain a continuous watch around the aircraft during pushback operations.
 - After pushback, ensure the aircraft is positioned in such a way as to avoid concentrating break-away blast at buildings, parked or taxiing aircraft, vehicles and/or persons on the apron.
- 3.8.7 Where the safety risk assessment has highlighted risks and recommended precautionary measures, additional wing-walkers may be positioned to ensure wingtip clearance and prevent collisions.

- 3.8.8 The role of a head-set operator, who is normally in communication with the flight deck throughout pushback, should be established. Where there is a possibility that a head-set operator or verbal communication with the flight deck is not available, the ground crew should be trained to use internationally agreed hand signals.
- 3.8.9 The aircraft operator and their ground handling agent should establish appropriate communication methods between the head-set operator and the pushback equipment operator.
- 3.8.10 Where arrangements are made, procedures may be established for pushback equipment operators to monitor the ATC frequency and execute the pushback instruction provided. They should be prepared to challenge a pilot if they consider a pushback operation is unsafe.
- 3.8.11 The aerodrome operator designs and provides guidance markings that a pushback operator needs to follow. Pushback guidance markings include:
- a. aircraft push-back lines
 - b. towbar disconnect points.
- 3.8.12 Pushback markings are primarily based on the nose wheel of the most critical, that is, the most demanding criteria of a design aircraft, which may consist of dimensions of more than one aircraft.
- 3.8.13 Where the aerodrome operator has determined a need for pushback markings to be based on main track wheels, the aerodrome operator should ensure:
- a. aircraft clearance to object requirements in Chapter 6 are maintained
 - b. pushback arrangements using main track wheels present no hazard to aircraft operations
 - c. relevant aircraft operators are consulted, and agree in writing, with evidence of acceptance to be retained by the aerodrome operator and the agreement recorded in the aerodrome manual (note: acceptance by airline ground handling agents may need further support from their customer airline operator)
 - d. the push-back design methodology, and associated push-back safety procedures, are:
 - i. communicated to the relevant aircraft operators and associated ground handling organisations
 - ii. documented in the aerodrome manual.
- 3.8.14 Training and competence assurance of pushback equipment operators, head-set operators and wing-walkers on the procedures and their individual responsibilities is the responsibility of the aircraft operator or ground handling agent.
- 3.8.15 In some instances, aerodrome operators may allow power-back operations from certain aircraft parking positions. Aircraft power-back operation is the movement of an aircraft from a nose-in parking position using its own power.
- 3.8.16 Given the hazards created by power-back operations, aerodrome operators should conduct safety risk assessments taking into consideration the apron characteristics, aircraft characteristics, surrounding clearances, and gradients on apron and adjacent taxiways or taxi lanes.

- 3.8.17 The safety assessment should include the following factors, at a minimum:
- a. Jet blast, propeller wash or downwash from the aircraft propulsion system
 - b. surface conditions
 - c. noise levels
 - d. manoeuvring space (considering that the power-back operations may be less accurate than forward movement or even pushback operations)
 - e. the potential for conflict with other traffic
 - f. effect on the surrounding structures and buildings.
- 3.8.18 Standardised procedures should be developed based on the outcomes of safety risk assessments. These procedures may be developed by the aerodrome operator or the aircraft operator or the ground handling organisation.
- 3.8.19 Power-back operational procedures may include:
- a. procedures to ensure clearance around the aircraft
 - b. procedures to continuously monitor the aircraft position during power-back operation
 - c. procedures to initiate corrective actions if the aircraft movement is inappropriate
 - d. positioning of ground staff such as marshals and wing-walkers
 - e. communication between the ground crew and use of internationally agreed hand signals to communicate with flight deck
 - f. ground crew training.
- 3.8.20 The aerodrome operator should ensure the availability of these procedures and monitor their continued compliance.
- 3.8.21 When pushback operations enter the manoeuvring area during periods of declared low visibility, the aerodrome operator's low visibility procedures may incorporate requirements for pushback operators to follow procedures, based on local requirements and agreements with the air traffic service.

3.9 Ground vehicle movements

- 3.9.1 An aerodrome operator, when establishing procedures to control ground vehicle operations on or near the movement area, must include or link the procedures to the aerodrome manual as prescribed in Section 11.14 of the Part 139 MOS and as outlined in the advisory circular CASA AC139.C-01 - Aerodrome manual.
- 3.9.2 The following aspects should be included in such procedures:
- a. traffic movement (including speed limits), driver/operator error and enforcing traffic rules
 - b. establishing a method of instructing and testing drivers in relation to traffic rules, including retesting every two years (or sooner).
- 3.9.3 AC 139-C-14 - Airside vehicle control provides more comprehensive guidance material that explains the steps involved in managing risks associated with ground vehicle operations in an airside environment, including aprons, airside roads and the movement area.

- 3.9.4 Aerodrome operators should ensure that procedures are established, documented and communicated to ensure airside ground vehicles give way to emergency vehicles, taxiing aircraft, aircraft about to taxi, being pushed back or towed in accordance with ICAO Annex 14 – Aerodromes paragraph 9.5.6 a. These procedures should be documented in the aerodrome manual.

3.10 Apron discipline

- 3.10.1 Generally, aerodrome operators will monitor airport airside activities. However, this responsibility may be delegated to a different agency, who would inform the aerodrome operator about any observed issues with apron discipline.
- 3.10.2 As part of the aerodrome's safety management system - safety assurance functions, or risk management plan, aerodrome operators or the delegated organisation should monitor airside activities and ensure compliance with established procedures.
- 3.10.3 Aerodrome operators may also develop enforcement procedures that enable them to manage non-compliance and enhance wider compliance with established standards.
- 3.10.4 Aerodromes that don't require a safety management system or risk management plan, may establish a system to monitor and manage airside operations and compliance. The procedures developed may be included or linked to the aerodrome manual.
- 3.10.5 At aerodromes that are not subject to ongoing monitoring of apron activities, a reporting process may be considered to enable aerodrome users, fixed based operators, maintenance organisations and any other permanent presence at the aerodrome an opportunity to notify the aerodrome operator of observed issues with apron discipline.

3.11 Dissemination of information

- 3.11.1 Information about aerodrome infrastructure that is required to be published by the aerodrome operator in the integrated aeronautical information package (IAIP) is outlined in Chapter 5 of the Part 139 MOS and Part 175 Data Quality Requirements - [Aeronautical Data Originators as published by Airservices](#).
- 3.11.2 Changes or limitations within the movement area can arise at short notice. Aerodrome operators should establish procedures to maintain safe aircraft operations under these conditions.
- 3.11.3 Changes or limitations within the movement area should be distributed to all relevant stakeholders operating at the aerodrome in a timely manner. This provides the opportunity for those working at the aerodrome, and the pilots, to understand the change in conditions to the environment they operate in.
- 3.11.4 Information regarding changes or limitations that are likely to affect the safe movement of aircraft may, where appropriate, be distributed through Airservices Australia's Aeronautical Information Service (AIS) by promulgation of NOTAMs and other publications for wider stakeholder attention.
- 3.11.5 Activities that may impact an apron, or aircraft parking position are not normally provided through NOTAM. Refer to Airservices' [NOTAM Data Quality Requirements for Aerodrome Operators](#) for further information.

- 3.11.6 There are alternative and more expedient methods of disseminating information rather than waiting for a publication such as a NOTAM to be issued. Different communication methods and channels may be established at the aerodrome level, depending on the size and complexity of operational environment, to distribute information about movement area changes or limitations.
- 3.11.7 Aerodrome operators may consider introducing a communications network, safety briefing, intranet, or channel where information can be provided to apron users and other interested groups.
- 3.11.8 Apron and other interested groups may include:
- a. fixed based operators
 - b. ground handling agents
 - c. airline representatives
 - d. aviation rescue and firefighting services (where present)
 - e. air traffic services (where present)
 - f. refuelling organisations (where present)
 - g. any other organisation that has a business presence, operational impact to apron activities or could impact the aerodrome or aircraft operations.
- 3.11.9 Information that could be provided to apron users may include:
- a. the type of operational changes or limitations
 - b. the duration of the operational changes or limitations, if known
 - c. mitigation measures to be applied
 - d. availability of aircraft parking stands
 - e. restrictions on aircraft parking stands including unserviceable VDGS/A-VDGS
 - f. availability of fixed installations at aircraft parking stands
 - g. special parking procedures, if any
 - h. temporary change of driving routes
 - i. work in progress
 - j. any other information that has operational significance to the apron users.
- 3.11.10 When developing procedures to report changes or limitations, due consideration should be accorded to those who will be impacted by them and what actions are to be followed at the aerodrome. Initial notification may be passed to ATC, where available, if the change was first observed by a pilot. Reporting channels may vary when ATC is not available.
- 3.11.11 The aerodrome operator should consider establishing a notification process where matters are reported to the responsible AIP person or their delegate, when the matter is identified by ground personnel.