



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

AERODROME MANUAL UPDATE AND CONTROL

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Doc 9981, Procedures for Air Navigation Services, Aerodromes, Second Edition, 2016
- ICAO Annex 14, Aerodromes, Volume 1, 7th Edition, July 2016
- ICAO Doc 9774, Manual on Certification of Aerodromes, First Edition, 2001

Note: No associated SOPs.

1.2.Purpose

This SOP describes the process for the update and control of the Aerodrome Manual for the Prince Abdulmajeed Bin Abdulaziz Airport as per the General Authority of Civil Aviation of Saudi Arabia (GACA) requirements. The SOP ensures control and integrity of the master version of the Aerodrome Manual and all assigned copies within the airport administration. It also defines the process for the upkeep and specific review of sections of the Manual, including identifying and submitting amendments for GACA acceptance and organizing subsequent updates to the Master Aerodrome Manual and all assigned copies.

1.3.Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	GACA Aviation Standards
Prince Abdulmajeed Bin Abdulaziz Airport Safety	Fuel companies
Prince Abdulmajeed Bin Abdulaziz Airport Manager	Airlines
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Ground handlers
	Maintenance Contractor

Table 1: List of relevant stakeholders

1.4. Scope

In scope: The Aerodrome Manual describes the operation procedures and the physical characteristics of the aerodrome. This document is required by regulation and is audited by the regulator for accuracy. There is one master version and exact duplicates placed within the relevant divisions of the airport operator. The Aerodrome Manual must be updated periodically, the changes must be tracked and submitted for acceptance to GACA and accepted changes must be added to the Manual and all copies.

This SOP:

- Declares the accountable division and position responsible for the Aerodrome Manual and assigned copies.
- Defines the schedule for regular Aerodrome Manual reviews to ensure accurate content.
- Identifies other operational or physical aerodrome changes that could also require updating of Aerodrome Manual.
- Outlines a process to create the amendment and submit the amendment to the Regulator for acceptance.
- Elaborates a process to track amendments and update Master Aerodrome Manual and all assigned copies.

Out of scope: This SOP does not address the management of Prince Abdulmajeed Bin Abdulaziz Airport's Safety Management System Manual or Prince Abdulmajeed Bin Abdulaziz Airport Emergency Plan.

1.5.Applicable areas within the airport operation

This SOP applies to Airport Operations Administration and staff and the accountable executive for operations. The accountable executive for this SOP shall be the Prince Abdulmajeed Bin Abdulaziz Airport Operations.

2. Process for the aerodrome manual update and control procedure

2.1. Manual update requirements:

This is the first step in the process and is applicable to Prince Abdulmajeed Bin Abdulaziz Airport Operations within that identifies a need for the aerodrome manual to be updated - either due to change or as a routine scheduled check. Steps indicated as below:

Step	Action
2.1.1	The Manual is required to be updated and controlled in terms of: a) currency; b) accuracy; and c) distribution.
2.1.2	Feedback is provided to the Manual.

2.2. Review and sign-off of sections of the manual:

This step is applicable to all accountable managers. The steps indicated in the Table below are generally sequential except 2.3.1 can apply from step 2.2.1. Step 2.3.5 follows on from the feedback provided at step 2.2.2.

Step	Action
2.2.1	Accountable managers of the concerned sections/departments are to review sections of the manual as operational or physical changes occur.
2.2.2	Accountable managers of the concerned sections/departments are to review sections of the manual as per the pre-defined schedule.
2.2.3	IF an amendment occurs THEN that section of the manual is updated and signed-off and provided to the Manual Controller.
2.2.4	IF an amendment is not required THEN feedback (with sign-off) is provided to the Manual Controller.
2.2.5	Re-distribution of the amended section occurs.

2.3.GACA advisory (GACAR 139.55)

This step is applicable to Prince Abdulmajeed Bin Abdulaziz Airport Operations in terms of ensuring that GACA Aviation Standards Sector is advised of updates to the aerodrome manual in a timely manner.

Step	Action
2.3.1	Manual Controller advises the GACA Aerodrome Inspector.

Appendix A. Glossary

A.1. Terms and definitions

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.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.

A.2. Abbreviations and acronyms

GACA	General Authority of Civil Aviation of Saudi Arabia
SOP	Standard Operating Procedure



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

**AERONAUTICAL INFORMATION SYSTEM
PROMULGATION AND UPDATE**

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Doc 9981, Procedures for Air Navigation Services, Aerodromes, Second Edition, 2016
- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016
- ICAO Annex 15, Fifteenth Edition, July 2016
- ICAO Doc 9774, Manual on Certification of Aerodromes, First Edition, 2001

Associated SOPs, OMs and O&MMs:

- SOP_OEAO ADM_01_001 Aerodrome Manual update and control
- SOP_OEAO ADM_01_008 Aerodrome signs and markings

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to define the process to ensure the timely and accurate updating and promulgation of aerodrome information to be included in the current Aeronautical Information System. Usually this occurs when there are significant changes, either by the construction or maintenance departments. This SOP describes the process for the update and control of the particulars reportable to the Aeronautical Information Management (AIM) as per the General Authority of Civil Aviation of (GACA) requirements.

1.3.Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	GACA Aviation Standards
Prince Abdulmajeed Bin Abdulaziz Airport Manager	Prince Abdulmajeed Bin Abdulaziz Airport Safety
Airlines	Fuel company
Saudi Air Navigation Services	Ground handlers

Table 1: List of relevant stakeholders

1.4.Scope

In scope: The Aeronautical Information Management is a guide for all aircraft operators intending to utilize Prince Abdulmajeed Bin Abdulaziz Airport for flight operations. The Aeronautical Information Management is maintained by the Saudi Arabian Air Navigation (SANS) and is updated regularly and published internationally. It is the responsibility of the Prince Abdulmajeed Bin Abdulaziz Airport to identify changes to the aerodrome and promulgate accurate updates to SANS for the updating of the Aeronautical Information Management after getting the approval from GAGA/Aviation Standard.

This SOP:

- Declares the accountable departments responsible for the update and promulgation of aeronautical information to the AIM.
- Identifies operational or physical aerodrome changes that would require updating of the Aeronautical Information Publication.
- Defines a procedure to ensure information is accurate, timely, relevant and complete in order to be promulgated.
- Defines a process to promulgate to SANS identified changes of information and approved by GACA/Aviation Standards regularly included in the Aeronautical Information Publication.
- Defines a process to track changes reported to the AIM and GACA's confirmation of receipt and acknowledgement of that information.
- Defines a process to promulgate accepted changes of the Aeronautical Information Publication to Prince Abdulmajeed Bin Abdulaziz Airport.

Out of scope: This SOP does not address the management of aerodrome drawings or aerodrome General Information.

1.5.Applicable areas within the airport operation

This SOP applies to Airport Operations staff and the accountable executive for operations. The accountable executive for this SOP shall be the Prince Abdulmajeed Bin Abdulaziz Airport Manager. Certain technical information needs to be published by SANS as provided by Prince Abdulmajeed Bin Abdulaziz Airport. This includes:

- Runway physical characteristics
- Taxiway characteristics
- Aircraft Parking/ Docking Chart
- Local traffic protocols for aircraft movement
- Visual aids and lighting
- Low visibility procedures
- NOTAM (Notice to Airmen)

All of this information needs to be provided to SANS for promulgation in the Aeronautical Information Publications (AIP). Some of the key information will be required to be provided by the GACA Engineering department. As and when infrastructure or operational procedures change occur, the aerodrome information may be amended accordingly. The specific applicable area is the movement area of the aerodrome.

2. Process for the aeronautical information promulgation procedure

2.1. Aeronautical information identified (Prince Abdulmajeed Bin Abdulaziz Airport Operations)

This is the first step in the process and is applicable to Prince Abdulmajeed Bin Abdulaziz Airport Operations to identify the Aeronautical Information required to be updated, maintained and promulgated – either due to change or as a routine scheduled check. Key input is expected from Prince Abdulmajeed Bin Abdulaziz Airport Maintenance (for planned project works of a permanent nature and significance) and (for temporary changes). The steps are indicated as below:

Step	Action
2.1.1	Aeronautical information is to be identified for promulgation to others. It includes: a) physical aspects (RWY, TWY); b) aircraft parking; c) aircraft movement; d) visual aids and lighting; e) LVP; and e) NOTAM.
2.1.2	Feedback provided to Prince Abdulmajeed Bin Abdulaziz Airport Operations from SANS.

2.2. Review, sign-off and release of information (Prince Abdulmajeed Bin Abdulaziz Airport Operations)

This step is applicable to Prince Abdulmajeed Bin Abdulaziz Airport Operations, although the Prince Abdulmajeed Bin Abdulaziz Airport Operation Supervisor would oversee the satisfactory completion of this work. The steps indicated as below:

Step	Action
2.2.1	Specific information required is prepared/ collated and itemized for accuracy and currency.
2.2.2	Data (Aeronautical Information) is reviewed.
2.2.3	As operational or physical changes occur then aeronautical information is updated.
2.2.4	Technical information is to be signed-off and checked by those responsible and then released by Prince Abdulmajeed Bin Abdulaziz Airport (DG) to SANS.

2.3. Publication of information (SANS Aeronautical Information Management)

This step is applicable to the SANS in terms of ensuring that current information as provided by Prince Abdulmajeed Bin Abdulaziz Airport is promulgated as appropriate in a timely manner.

Step	Action
2.3.1	Identified changes of information related to airside is sent to GACA/Aviation Standards by Prince Abdulmajeed Bin Abdulaziz Airport for Approval

Step	Action
2.3.2	Approved information is sent to SANS for promulgation within AIP
2.3.3	The aeronautical information is stored and published by SANS as part of the AIP with feedback provided to Prince Abdulmajeed Bin Abdulaziz Airport Operations.

Appendix A. Glossary

A.1. Terms and definitions

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.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Aeronautical information publication	A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation
Aeronautical information Management	A Management established within the defined area of coverage responsible for the provision of aeronautical information/data necessary for the safety, regularity and efficiency of air navigation.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Movement area	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

A.2. Abbreviations and acronyms

AIP	Aeronautical Information Publication
AIM	Aeronautical Information Management
GACA	General Authority of Civil Aviation of Saudi Arabia
SANS	Saudi Air Navigation Services
NOTAM	Notice to Airmen
RWY	Runway
SOP	Standard Operating Procedure
TWY	Taxiway



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

MAINTAINING A LOGBOOK

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016

Associated SOPs, OMs and O&MMs:

- SOP_OEAO_ADMIN_01_005 Inspection of the Movement Area
- SOP_OEAO_ADMIN_01_006 Routine maintenance and emergency maintenance.

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to describe the requirements for maintaining the results of aerodrome inspections by means of a logbook. The logbook could be implemented either by means of a simple spreadsheet or with more sophisticated fully integrated software, complete with table based checklists, automated logging of discrepancies found during an inspection and the entire follow up corrective action process. This SOP describes a basic framework of such a system but shall not be considered a software specification.

1.3.Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed bin Abdul-Aziz Airport Operations	GACA Aviation Standards
Prince Abdulmajeed bin Abdul-Aziz Airport Maintenance	Prince Abdulmajeed bin Abdul-Aziz Airport FRCC

Table 1: List of relevant stakeholders

1.4.Scope

In scope: The scope of this SOP covers the data requirements of an inspection logbook and the processes associated with logging an inspection, reporting discrepancies found during an inspection, corrective action requirements and the processes for 'closing the loop' which is an important element to a successful aerodrome inspection program.

Out of scope: Although an aerodrome inspection program would benefit from having a supporting software application, the specifications for such a system are exhaustive and are not included in the scope of this SOP.

1.5.Applicable areas within the airport operation

The applicable area for this SOP includes the entire airside and its immediate vicinity (off site obstacles and obstacle lighting).

2. Aerodrome inspections – maintaining the logbook

The Aerodrome Inspection Logbook forms part of the airport inspection program and is an integral part of SOP_OEAO_ADM_01_006, Aerodrome inspection. After each inspection, a log entry shall be made irrespective of whether there has been a finding or not. This important record is required so as to show compliance with GACA regulations for Level 1- Daily Routine Inspections and to keep track of other Level 2 and 3 Inspections which are based on airport best practices. This logbook could be in the form of spreadsheet or a fully integrated automated system. The logbook includes the Inspection Record:

Inspection Record
Inspection date
Inspection type – 1/2/3
For Inspection Type 1 – shift (Night1-Day1-Day2-Night 2)
Checklist number
Inspector's name
General remarks

Table 2: Inspection Record

If the inspection results in findings, these shall be entered as part of the record entry. The logbook includes the Inspections Findings:

Inspection Findings
Finding Number
Finding according to a categorized list
General remarks
Finding is georeferenced - Location
Work Order number
NOTAM number
Date completed

Table 3: Inspection Finding Record

2.1. Procedure for making a logbook entry

For every aerodrome inspection, there shall be an associated entry made to the logbook. In some cases, where there have been no findings, then a simple entry referred to as the Inspection Record indicating that an inspection has been completed is required. If a finding has been discovered as a result of an inspection, then the second entry referred to as an Inspection Finding Record is required.

As per SOP_OEAO_ADMIN_01_006, Aerodrome inspection if a hazard poses immediate danger to aircraft operations, then verbal notification shall be given to FRCC during the inspection. Upon completing the inspection, an entry to the logbook shall be made.

Step	Action
2.1.1	Conduct inspection using the procedures in SOP_OEAO_ADMIN_01_006, Aerodrome inspection
2.1.2	IF the inspection has resulted in no findings THEN complete the Inspection Record in the logbook – Inspection record is complete.
2.1.3	IF as a result of an inspection, the inspector has discovered one or more findings THEN complete the associated Inspection Finding Record in the logbook
2.1.4	For a finding requiring the intervention of maintenance department, the Operations Supervisor contacts Maintenance and issues a work order
2.1.5	Operations Supervisor enters the Work Order Number on the Finding Record
2.1.6	For airspace or aircraft operations findings, Operations Supervisor contacts Air Traffic Control and initiate the process for issue of a NOTAM if required
2.1.7	Operations Supervisor enters the NOTAM number on the Finding Record
2.1.8	Inspection record is complete
2.1.9	Inspection finding record is incomplete
2.1.10	File checklist

2.2. Procedures for completing an inspection findings record

Following up on an inspection finding is critical to a successful aerodrome inspection program. This is critical to ensuring that inspection findings are addressed in a timely manner. Once a work order is complete or a finding has been addressed, it is important to close the finding by entering Date Complete.

Step	Action
2.2.1	Maintenance completes the corrective action for the finding and reports completion date to Operations
2.2.2	Airport Operations complete the corrective action for the airspace or airport operations finding
2.2.3	Operations Supervisor enters the completion date of the issue on the Inspection Finding Record.
2.2.4	IF a finding has been addressed THEN Operation Supervisor initiate action to cancel NOTAM
2.2.5	Inspection finding log record is complete.

Appendix A. Glossary

A.1. Terms and definitions

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.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Fire Communication Center	A generic term meaning variously, area control center, approach control unit or aerodrome control tower
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Obstacle	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight. Note: The term obstacle is used in Annex 4 Edition 10 solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.
Runway	A defined rectangular area on a land aerodrome prepared for the landing and takeoff of aircraft.
Safety management system	A system for the management of safety at aerodromes, including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for control of safety at, and the safe use of, the aerodrome.

A.2. Abbreviations and acronyms

GACA	General Authority of Civil Aviation of Saudi Arabia
ICAO	International Civil Aviation Organisation
SANS	Saudi Air Navigation Services
NOTAM	Notice to Airmen
SOP	Standard Operating Procedure

Appendix B. Contents of the inspection record

Inspection Record (one)						
DATE	CHECKLIST	INSPECTION TYPE	D/N/SP	INSPECTOR	REMARKS	
DD-MM-YYYY	#####	1, 2 OR 3				
Inspection Findings (associated with Inspection Record) (many)						
NO	FINDING		REMARKS		LOCATION	WORK ORDER
1	STANDARDIZED LIST OF FINDINGS		FREE FORMAT REMARKS		STANDARD LIST OF LOCATIONS	####
2						####
						DD-MM-YYYY



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

FOD CONTROL

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, Standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016

Associated SOPs, OMs and O&MMs:

- SOP_OEAO_ADM_01_005 Inspection of the movement area.

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to outline the means by which Foreign Object Debris (FOD) is controlled at Prince Abdulmajeed Bin Abdulaziz Airport. This SOP establishes the procedures for preventing, detecting, removing, and observing/reporting related to FOD. The key objective of any FOD control program is to reduce the high cost of FOD damage to airline and airport assets, and the potential for injury to personnel, through the effective inspection and maintenance of airport facilities as well as coordination among airfield personnel and tenants.

1.3. Relevant stakeholders

The FOD management program at Prince Abdulmajeed Bin Abdulaziz *Airport* is applicable to the airport owner and operator, air carriers, general aviation operators, airfield and apron crews, maintenance technicians, and aircraft servicing personnel. It is also applicable to contractors working airside. The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Airlines
Prince Abdulmajeed Bin Abdulaziz Airport Safety	Ground handlers
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance Contractor	Fuel companies
	Construction Contractors

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: The presence of FOD on airport runways, taxiways, aprons and ramps poses a significant threat to safety. FOD hazards can however be reduced by an effective FOD control program. FOD control comprises four main components:

- Prevention
 - Awareness; and
 - Training and education.
- Detection
 - Inspection areas (runways, taxiways, apron, aircraft stands, cargo area, service roads, unpaved areas, construction areas);
 - Methods and techniques (automated and manual); and
 - Equipment.
- Removal
 - Mechanical (sweepers, vacuums, blowers, magnetic bars, rumble strips);
 - Manual (picking up / walking patrols); and
 - Storage systems (FOD containers).
- Observation and Reporting
 - Data collection and analysis; and
 - Continuous improvement.

Out of Scope: This SOP does not address:

- While Prince Abdulmajeed Bin Abdulaziz Airport's FOD control program is inclusive of all airside areas, the airport's maintenance contractor, service providers, and third party contractors are not addressed within this SOP; or
- FOD risk assessment practices are addressed in the airport-wide Safety Management System.

1.5. Applicable areas within the airport operation

The Prince Abdulmajeed Bin Abdulaziz Airport Operations Supervisor is the accountable staff member responsible for managing Prince Abdulmajeed Bin Abdulaziz Airport's FOD program, issues and risk assessment.

FOD comes from many sources, and each individual with access to the airside should understand their role in the prevention of FOD. These personnel include:

- Airfield operations personnel (permanent and seasonal);
- Flight and cabin crew members (airlines);
- Licensed aircraft engineers, technicians or mechanics;
- Employees of aircraft maintenance organizations;
- Airport ground handling operators (incl. baggage handlers);
- Aircraft servicing personnel (e.g. catering, cabin cleaning);
- Fuel operators;
- Waste collection and disposal contractors;
- Construction contractors; and
- Aerodrome personnel.

All stakeholders working airside are required to acknowledge the operational and safety implications of adhering to this SOP. FOD control measures are an integral part of their day-to-day operations.

Landside personnel and neighboring commercial tenants also need to understand their roles and responsibilities for FOD prevention and control, as FOD generated on landside could potentially make its way to the airside in strong weather conditions.

2. Process for FOD detection and removal

Foreign object debris (FOD) is any object located in the airport environment that could cause severe injury to persons or damage to aircraft by means of ingestion or propulsion of aircraft engines or even high velocities of wind. Like most airports, Prince Abdulmajeed Bin Abdulaziz Airport covers a very wide open area, which is susceptible to high velocities of wind. If any object is loose in this type of environment it will turn into FOD, which in turn can severely injure airport or air carrier personnel or damage equipment.

Sources of FOD:

FOD can come from many sources, which complicates efforts to maintain safe airfield operations. It can be generated from personnel, airport infrastructure, such as pavement, lights or signs, the environment, and equipment operating on the airfield. Determining the source from which FOD came from can assist airport personnel to prevent future occurrences of FOD on the maneuvering area.

FOD is not only found on maneuvering areas, but on aprons as well. Aprons can be areas that produce a lot of FOD due to many support equipment and resources to service aircraft. Objects such as baggage materials, trash, clothing, food, metals, plastics, rope, etc. are all common objects that can be detrimental to the airport environment.

On the airfield, jet blast from aircraft transitioning from runways to taxiways, can also cause loose materials, such as, dirt, rocks, chemicals, plastics, and metals to be blown onto the runway. Construction activities can cause significant amount of FOD with these loose materials. Consideration to construction areas is vital to keeping Prince Abdulmajeed Bin Abdulaziz Airport clear of FOD.

Damage and Injury caused by FOD:

In order for Prince Abdulmajeed Bin Abdulaziz Airport to maintain a safe airport environment, a decrease in occurrences of injuries from FOD should occur. FOD in the airport environment essentially becomes high velocity projectiles that not only causes damage to aircraft and airport property, but can cause injury and possibly death to airport personnel. With this in mind, the FOD program at Prince Abdulmajeed Bin Abdulaziz Airport shall keep the safety of individuals and the protection of property as its number one priority.

FOD Inspection and Removal:

A critical component of a FOD program is the inspection and detection process. Through detailed routine inspections of both maneuvering and non-movement areas of the airport for FOD can help reduce potential injury or damage occurrences. As such, FOD must be carefully monitored, detected and removed from both movement and non-movement areas. Airport personnel can attribute to the overall safety of Prince Abdulmajeed Bin Abdulaziz Airport through inspection and reporting of potential incidents.

1. **FOD detection** - The primary means of detection at Prince Abdulmajeed Bin Abdulaziz Airport is through Level 1 - Daily Routine Inspections as described in SOP_OEAO_ADM_01_005, Inspection of the Movement Area.

Proper detection determines types of FOD that are most prevalent on the airport surfaces and their sources.

Airport personnel are also a source of detection. If FOD is reported, it must be promptly removed with the same urgency that it would be had it been detected through an inspection.

2. **FOD removal** – The prompt removal of FOD can be accomplished by mechanical and non-mechanical methods, depending on the amount of FOD detected. Mechanical methods include the use of:

- Power sweepers;
- Vacuum systems;
- Jet blowers.

Non-mechanical methods include the use of:

- Friction mat sweepers;
- Magnetic bars;
- Rumble strips.

3. **FOD detection and removal record keeping**

Keeping good records of FOD detection and removal is important to the overall success of FOD prevention. The trends in the location and the nature of the types of debris found can be used to detect sources of FOD and develop mitigation methods for its prevention. A sample form used to record FOD incidents is contained in Appendix B.

2.1. FOD Detection and Removal Procedures

If FOD is detected by a stakeholder, automated device, or through a routine inspection, a determination of the quantity is conducted. Small quantities of FOD can be removed manually during an inspection. Either mechanical or non-mechanical devices must remove large quantities of FOD. Coordination of FOD removal should be done in coordination with Prince Abdulmajeed Bin Abdulaziz Airport Maintenance Contractor and FRCC. FOD shall then be placed in appropriate containers. If FOD has caused damage to property or injury to persons, it shall be treated as a serious safety incident. Safety occurrences involving FOD, shall be mandatory to report and an incident report must be filled out, as mentioned in Appendix B.

Step	Action
2.1.1	Source of FOD detected during SOP_OEAO_ADM_01_005 Inspection of the Movement Area
2.1.2	Estimate the nature and quantity of FOD and identify potential source.
2.1.3	Determine if FOD caused damage to property/equipment or injury to persons.
2.1.4	IF FOD caused damage/injury Investigate cause of damage/injury.
2.1.5	Report FOD incident and corrective action to operations as required.
2.1.6	Fill out an Incident Report found in Appendix B.
2.1.7	IF there was no damage/injury caused by FOD, THEN decide how FOD can be removed from the apron/runway/taxiway.
2.1.8	For small quantities of FOD, airport personnel can manually pick up and place FOD in FOD bucket located in Airport Operations vehicle.
2.1.9	For large quantities which is located on maneuvering area, coordinate with FRCC for closure of pavement.
2.1.10	Select and use applicable FOD removal mechanical device.
2.1.11	Dispose of FOD in appropriate "FOD Only" containers.
2.1.12	Inspect area and advise FRCC Prince Abdulmajeed Bin Abdulaziz Airport that area is free of FOD and can be re-opened.
2.1.13	Complete FOD Detection Record found in Appendix B.
2.1.14	Complete FOD Removal Record found in Appendix B.
2.1.15	FOD Control Process Complete.

Appendix A. Glossary

A.1. Terms and definitions

FOD	Any object located in any location in the airport environment that has the capacity to injure airport personnel and damage aircraft.
FOD Bucket	Small basket or box that can be stored in vehicles for collection of smaller pieces of FOD.
FOD Container	Large containers about the size of recycle bins to collect larger pieces of FOD or many quantities of FOD.
Friction Mat Sweeper	A large bristled mat towed behind a vehicle dragging debris, which is collected via hard plastic scoops under a mesh lining.
Jet Blower	Directs a stream of high velocity of air towards the pavement surface. A debris collection mechanism should be used with this device.
Magnetic Bar	The use of a strong magnet that is suspended beneath vehicles to pick up metallic material.
Power Sweeper	The sweeper removes debris from cracks and pavement joints, and is used in all areas of the Air Operations Area.
Rumble Strip	Long strips 3 to 5 meters long and are positioned on the pavement to dislodge FOD from vehicles that drive over them.
Vacuum Sweeper	The use of airflow to remove objects that can be used in conjunction with mechanical brooms.

A.2. Abbreviations and acronyms

FRCC	Fire Rescue Communication Centre
FOD	Foreign Object Damage, Foreign Object Debris
GACA	General Authority of Civil Aviation of Saudi Arabia
ICAO	International Civil Aviation Organisation
SOP	Standard Operating Procedures

Appendix B. FOD detection/removal and incident forms

B.1. FOD detection/removal record

FOD Detection/Removal Record		Prince Abdulmajeed Bin Abdulaziz Airport
Detection Record		
Date (dd-mm-yyyy):	Location:	
FOD was detected by:	Responders name:	
FOD Type:	FOD Quantity:	
Summary: Identify the type of FOD, the source of the FOD, how the FOD got to its detected location, any damage/injuries FOD created, did FOD affect KPI's for FOD Control SOP.		
Removal Record		
	Time it took to remove FOD:	
FOD was removed by/date:	Manual or Mechanical removal:	

Summary: How much FOD was generated; what is the source of the FOD; Did the FOD impact airport operations; coordination of removal with maintenance and utilities, Air Traffic Control, or stakeholders, did FOD affect KPI's for FOD Control SOP

Proposed Corrective Action	
Proposed Short-Term Corrective Action	
Long-term Corrective Actions (including an assessment of any induced hazards or risks associated to the implementation of the corrective action(s))	
Timelines for Implementation of all Corrective Actions	
Managerial acceptance Name/Signature	Date (dd-mm-yyyy)

B.2. Incident report

Incident Report		Prince Abdulmajeed Bin Abdulaziz Airport
Date (dd-mm-yyyy) and Time:	Location:	
Name of Parties:	Damage/Injury type:	
Type of FOD	FOD Source:	
<p>Summary: <i>How did FOD cause damage/injury, was person sent to hospital, were associated KPI's affected, what was the cost of the damage/injury, could it have been prevented.</i></p>		



STANDARD OPERATING PROCEDURES

Inspection of the Movement Area

Document information

General information

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Document sign off

Name	Company	Job Title	Date	Signature
Eng.Abdulwahab Bokhari	Alula International Airport	Airport Director		

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes , Version 7.0

External legal, standards and/or policy:

- ICAO Annex 14 Volume I, Ninth Edition, July 2022

Other external references:

- ACI Airside Safety Handbook (2010)
- ACI Policies Handbook (10th Edition) 2020

Associated SOPs, OMs and O&MMs:

- SOP_OEAO_ADMIN_01_003 Maintaining a logbook
- SOP_OEAO_ADMIN_01_008 Aerodrome signs & markings
- SOP_OEAO_ADMIN_01_004 FOD control
- SOP_OEAO_ADMIN_01_011 Non-compliance & corrective action reports

1.2. Purpose

This document defines Standard Operating Procedures (SOP) for Alula International Airport Operations inspections. Regular scheduled inspections are mandated by the regulation of General Authority for Civil Aviation of Saudi Arabia (GACA) and the stated commitments that are included in the approved Aerodrome Manual (AM). These procedures, which are intended to preserve the safe operation of Alula International Airport are based on 3 levels of inspection that have been designed based on Airports Council International (ACI) best practices.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Operations	GACA Aviation Standards
Alula International Airport Maintenance	Alula International Airport FRCC

Table 1: List of relevant stakeholders

1.4. Scope

In scope: Aerodrome inspections at Alula International Airport are based on a 3-level inspection program, which are based on Airports Council International best practices. These inspection procedures include:

- Level 1 - Routine Daily Inspections which are designed to provide an overview of the general condition of all airside infrastructure and facilities;
- Level 2 – Detailed Inspections which are more detailed and provide for a more comprehensive assessment of all airside infrastructure and facilities;
- Level 3 – Management Inspections and Audits which are an audit of the Level 2 Detailed Inspections so that senior operations and maintenance staff are fully involved in the overall airside inspection process.

This SOP includes:

- The accountable division and positions responsible for each inspection type;
- The details of the facilities and infrastructure to be inspected for each type of inspection;
- The frequency for each type of inspection;
- A checklist of key aerodrome facilities and infrastructure that require inspection, including obstacle limitation surfaces (OLS), water depth measurements and visual aids;
- Required communication protocols with air traffic control;
- Procedures to identify, record and report the results of each inspection on the inspection checklist;
- Procedures to ensure significant hazards are immediately addressed and communicated internally to relevant FRCC.

Out of scope: Detailed aerodrome ground lighting inspections is covered under visual aids.

1.5. Applicable areas within the Airport Operations

The applicable area for this SOP includes the inspection of airside facilities and infrastructure and any obstacles that could be present in close proximity to the perimeter fence.

2. Aerodrome inspections

2.1. Level 1 – Routine daily inspection

Routine Daily Inspections are designed to provide an overview of the general condition of all airside infrastructure and facilities. The following table describes the accountable position responsible for Level 1 routine daily inspections, the inspection sub-type, the frequency of inspections and the time of day inspections shall be conducted. Daily inspections are referred to as N1, D1, and N2 depending on the time of day they are conducted, or as SP for specialized inspections, as is illustrated in Table 2 below.

Item	Description	
Inspection Type	Level 1 – Routine Daily Inspection	
Accountable Position	Airport Duty Supervisors	
Checklist	Level 1 – Routine Daily Inspection Checklist	
Sub-type	Frequency of Inspection	Details
Runways	3 times in 24 hours or depending on operation	N1 - First-light prior to day time operations D1 - Mid-afternoon N2 - Last-light prior to night operations
Taxiways	3 times in 24 hours or depending on operations	N1 - First-light prior to day time operations D1 – Mid-afternoon N2 – Last-light prior to night operations
Aprons	3 times in 24 hours	N1 - First-light prior to day time operations D1 – Mid-afternoon N2 – Last flight prior to night operations
Obstacle lighting – on airport	1 time in 24 hours	N1 – Last flight prior to night operations
Specialized aerodrome sand areas	1 time per week	SP
Specialized obstacle lighting – off airport	1 time per week	SP

Table 2: Routine daily inspection criteria

The following table includes the elements within each system that shall be considered while performing an inspection. These include such items as surface conditions, obstructions, lighting and wildlife activity. With respect to obstructions, the aerodrome inspector shall become familiar with the general airspace at the airport and its vicinity to identify temporary structures, such as a crane being erected. It is important for the inspector to have the capability to immediately recognize its presence and refer it to GACA for evaluation and/or advise air traffic control of its presence.

INFRASTRUCTURE OR FACILITY
Runway system
Runway surface condition, including cleanliness, rubber build up and pit/drain covers
Runway friction course, particularly for cracking and loose materials
Runway signs, lights and paint markings for damage and wear
Runway shoulders, Runway strips, runway end safety areas (RESA) and clear and graded areas, including drainage
PAPI units and runway guard lights (RGL) and other runway lights and wing bars
Obstructions infringing the runway strips and its protected surfaces
All areas of work in progress on or adjacent to the runway system
Condition of windsocks for day and night operations
Runway approach lighting
Runway lighting (dusk and evening)
Taxiway system
Taxiway surface condition, including cleanliness and foreign object debris (FOD)
Taxiway signs, lights and paint markings for damage and wear
Any obstructions and excavations that may affect the taxiway strip
All areas of work in progress on or adjacent to the taxiway system
General condition of drains and covers
All taxiway lighting including centerlines, edge lights, stop bars, runway guard lights, and lead-in lights (dusk and evening)
Areas adjacent to taxiway
General condition of taxiway edges, particularly in areas of blast erosion
Excessive difference in levels at the edge of paved surfaces
Cleanliness of area with regard to FOD
All areas of work in progress
Apron areas
Apron surface condition, including cleanliness and foreign object debris (FOD)
General surface condition and pavement damage
Cleanliness particularly for fuel / oil spillages, debris and FOD
Cleanliness of all paint markings and signs
Cleanliness of areas with regard to FOD
All areas of work in progress
Aircraft Operations & Protection
Obstructions affecting protected obstacle limitation surfaces (OLS) particularly in the approach and departure areas of all runways in airside
External of FBO hanger including lighting
Bird and wildlife activity
Jet blast problems

Table 3: Level 1 - Routine daily inspection conditions

2.2. Level 1 – Routine Daily inspection procédures

The following procedures apply to routine daily inspections:

Step	Action
2.2.1	Prepare for inspection by determining the infrastructure and facilities to be inspected based on the last inspection for this day and/or the specialized inspection criteria as illustrated in Table 3
2.2.2	Obtain a checklist for inspection
2.2.3	Ensure vehicle is in good operating condition.
2.2.4	IF this inspection includes a runway inspection THEN obtain the necessary clearance from FRCC to gain access to the runway
2.2.5	Conduct inspection
2.2.6	IF a discrepancy poses an immediate hazard to aircraft operations THEN immediately contact FRCC
2.2.7	IF a new obstacle is discovered THEN it has to be reported immediately to FRCC and Operation
2.2.8	IF a discrepancy with respect to criteria in Table 4 is discovered THEN note the discrepancy on the checklist in the appropriate space provided
2.2.9	Complete the inspection
2.2.10	Complete the checklist noting infrastructure inspected, the daily shift (N1, D1, N2 or SP), the inspector name, discrepancies found and general remarks
2.2.11	File the checklist so that it is available for the next inspection on this day and complete the inspection log as per SOP_OEAO ADM_01_003, Maintaining a logbook, recording results of inspections

2.3. Level 2 – Detailed inspection

Detailed Inspections are more detailed and provide for a more comprehensive assessment of all airside infrastructure and facilities. Within this process, the movement area is divided up into a number of zones. One zone shall be inspected in detail each day depending on the amount of traffic in the area to be inspected. These types of inspections are best carried out on foot or by using a vehicle operating at a very low speed.

Item	Description	
Inspection Type	Level 2 – Detailed Daily Inspection	
Accountable Position	Maintenance Site Manager	
Checklist	Type 2 – Detailed Daily Inspection	
	Frequency of Inspection	Details
Runway system	Quarterly	The entire runway system undergoes 4 detailed inspections per year
Taxiway systems	Quarterly	The entire taxiway system undergoes 4 detailed inspections per year
Apron	Quarterly	The entire apron system undergoes 4 detailed inspections per year

Table 4: Level 2 - Detailed inspection criteria

The following table includes the elements within each system that shall be considered while performing an inspection. These include such things as surface conditions, signs, markings, lights, approach lighting systems obstructions and lighting.

Runway System	
Runway Surfaces	
Frequency of Inspection	The runway system shall be inspected in detail on a <u>quarterly</u> cycle. Typically, the system can be divided up into a number of sections. Depending upon the movement area availability, a number of sections can be checked at one time.
Cracks, general breakup and any other surface failure particularly if there are signs of debris	
Particular attention shall be paid to the touchdown zones and areas that have high aircraft utilization	
Particular attention to rubber build-up that could affect runway surface friction	
Signs, markings and lights	
All signage along the runway shall be checked for general condition	
All runway markings shall be checked for visibility, particularly in the touchdown zones where rubber deposits may have blackened certain markings	
A selection of light fittings shall be checked for general safety particularly with regard to fixing nuts	
Runway strip	
All areas surrounding the runway including the runway strip, clear and graded areas (CGA) and the runway safety area (RESA) shall be checked.	
Particular attention shall be given to general bearing strength, the nature of the surface and any frangible obstructions that could cause damage to an aircraft in the event of an excursion.	
Particular attention shall be given to runway ends – overrun or undershoot areas.	
Runway approach light systems	
Frequency of Inspection	Each full approach lighting system shall be <u>checked twice a year</u> on foot.
Lights	
Cables	
Light fittings	
Masts	

Runway System	
Other support structures	
Lighting patterns for outages	
Lighting patterns for gross misalignments	
Lighting pattern, outages and gross misalignments	
Taxiway System	
Taxiway Surfaces	
Frequency of Inspection	The taxiway system shall be inspected in detail on a <u>quarterly cycle</u> . Typically, the system can be divided up into a number of sections. Depending upon the movement area availability, a number of sections can be checked at one time.
All taxiway surfaces including hard shoulders	
Cracks, general breakup and any other surface failure particularly if there are signs of debris	
Signs, markings and lights	
All signage along the taxiway shall be checked for general condition & visibility, particularly in jet blast areas	
A selection of light fittings shall be checked for general safety particularly with regard to fixing nuts	
All taxiway markings shall be checked for visibility and need for repainting	
Surrounding areas	
All areas surrounding the taxiway including the taxiway strip shall be checked for general safety.	
Particular attention shall be given to general bearing strength, the nature of the surface and any frangible obstructions that could cause damage to an aircraft in the event of a taxiway excursion.	
Aprons and Stands	
Apron Surfaces	
Frequency of Inspection	The apron shall be inspected in detail on a <u>quarterly cycle</u> . Typically, the system can be divided up into a number of sections.
All apron surfaces for cracks, general breakup and any other surface failures particularly if there are signs of debris or FOD	
All airport stands for cracks, general breakup and any other surface failures particularly if there are signs of debris or FOD	
All ground services equipment parking areas for cracks, general breakup and any other surface failures particularly if there are signs of debris or FOD	
Signs, markings and lights	
All apron signs shall be checked for general condition & visibility	
All apron lights	
All apron markings associated with aircraft maneuvering shall be checked for visibility and need for repainting	
All apron stand markings shall be checked for visibility and need for repainting	
All pedestrian crosswalks shall be checked for visibility and need for repainting	
Surrounding areas	
All service roads shall be checked for general serviceability and condition	
Areas shall be checked for general cleanliness	
Areas shall be checked for parking discipline	
Apron Operations	
Emergency telephones shall be checked for proper functioning	
Apron fire extinguishers shall be checked for visibility and accessibility	

Aprons and Stands
Fuel shut-off valves shall be checked for visibility and accessibility
Emergency exits shall be checked for visibility and accessibility
Compliance with no parking zones shall be checked
Visual warning systems shall be verified

Table 5: Level 2 - Detailed inspection conditions

2.4. Level 2 – Detailed inspection procedures

The following procedures apply to detailed inspections:

Step	Action
2.4.1	Prepare for inspection by determining area to be inspected, obtain the previous Level 2 – Detailed inspection checklists for the area being inspected and the past aerodrome inspection log book entries for the area being inspected
2.4.2	Obtain a checklist for the inspection
2.4.3	Ensure vehicle is in good operating condition
2.4.4	IF this inspection includes a runway inspection THEN obtain the necessary clearance from FRCC to gain access to the runway
2.4.5	Conduct inspection
2.4.6	IF a discrepancy poses an immediate hazard to aircraft operations THEN immediately contact FRCC and the TOCC and report the nature of the hazard
2.4.7	IF a new obstacle is discovered THEN it has to be reported immediately to FRCC
2.4.8	IF a discrepancy with respect to criteria in Table 6 is discovered THEN note the discrepancy on the checklist in the appropriate space provided
2.4.9	Complete the inspection
2.4.10	Complete the checklist noting infrastructure inspected, the date, the inspector name, discrepancies found and general remarks
2.4.11	File checklist and complete the inspection log as per SOP_OEAO ADM_01_003, Maintaining a logbook, recording results of inspections

2.5. Level 3 – Management inspections and audits

Level 3 Management Inspection is essentially an audit of the Level 2 Detailed Inspections and ensures senior Airport Operations and Engineering management staff is fully involved in the overall airside inspection process. These types of inspections are generally carried out by foot.

Item	Description
Inspection Type	Level 3 – Management inspections and audits
Accountable Position	Manager Alula Airport Director, GACA Maintenance
Checklist	Level 3 – Management inspections and audits checklist Level 3 – Management inspections of aprons, apron stands and taxiways
Frequency of Inspection	The Level 3 process shall be carried out typically two inspections per year and cover the aprons, apron stands and taxiway in such a way that each <u>area is audited/inspected on a quarterly basis</u> . Prior to a Level 3 inspection, the previous Level 2 inspection reports for the particular area shall be reviewed. This will allow senior management to audit Level 2 inspections for content and to determine if associated corrective action plans are being implemented. Level 3 – Management inspection of runways
Frequency of Inspection	The Level 3 inspection of runways shall be carried out at <u>least two times per year</u> . Senior managers shall walk the full length of all runways. This allows managers to keep an up to date working knowledge of runway surface conditions, runway signs, runway markings, runway lights, runway safety areas and approach lighting systems. Prior to a Level 3 inspection, the previous Level 2 inspection reports shall be reviewed. This will allow senior management to audit Level 2 inspections for content and to determine if associated corrective action plans are being implemented.

Table 6: Level 3 - Management inspection and audit criteria

2.6. Level 3 – Management inspections and audit procedures

The following procedures apply to management inspections and audits:

Step	Action
2.6.1	Prepare for inspection by determining area to be inspected, obtain the previous Level 2 – routine inspection checklists for the areas being inspected and the past aerodrome inspection log book entries for the areas being inspected
2.6.2	Obtain a checklist for the inspection
2.6.3	Ensure vehicle is in good operating condition
2.6.4	IF this inspection includes a runway inspection THEN obtain the necessary clearance from FRCC to gain access to the runway
2.6.5	Conduct inspection
2.6.6	IF a discrepancy poses an immediate hazard to aircraft operations THEN immediately contact FRCC
2.6.7	IF a new obstacle is discovered THEN it has to inform FRCC and Operation and take appropriate action for removal
2.6.8	IF a discrepancy with respect to criteria in Table 6 is discovered THEN note the discrepancy on the checklist in the appropriate space provided
2.6.9	Complete the inspection
2.6.10	Complete the checklist noting infrastructure inspected, the date, the inspector name, discrepancies found and general remarks
2.6.11	File checklist and complete the inspection log as per SOP_OEAO ADM_01_003, Maintaining a logbook, recording results of inspections

Appendix A. Glossary

A.1. Terms and definitions

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.
Aerodrome control tower	A unit established to provide air traffic control service to aerodrome traffic.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Airside	<p>The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.</p> <p>Authorization for an aircraft (or vehicle) to proceed under conditions specified by an air traffic control unit.</p>
Air traffic control clearance	<p>Note 1: For convenience, the term “air traffic control clearance” is frequently abbreviated to “clearance” when used in appropriate context.</p> <p>Note 2: The abbreviated term “clearance” may be prefixed by the words “taxi”, “take-off”, “departure”, “en route”, “approach” or “landing” to indicate the particular portion of flight to which the air traffic control clearance relates.</p>
Air traffic control unit	A generic term meaning variously, area control center, approach control unit or aerodrome control tower
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Clearway	A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an airplane may make a portion of its initial climb to a specified height.
Movement area	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).
Night	The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority.

	<p>Note: Civil twilight ends in the evening when the center of the sun's disc is 6 degrees below the horizon and begins in the morning when the center of the sun's disc is 6 degrees below the horizon.</p>
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Obstacle	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight. Note: The term obstacle is used in Annex 4 Edition 10 solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.
Runway	A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.
Runway end safety area RESA	An area symmetrical about the extended runway center line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an airplane undershooting or overrunning the runway.
Runway guard lights	A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.
Runway strip	A defined area including the runway and stop-way, if provided, intended: a) to reduce the risk of damage to aircraft running off a runway; and b) to protect aircraft flying over it during take-off or landing operations.
Runway-holding position	A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower. Note: In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.
Safety management system	A system for the management of safety at aerodromes, including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for control of safety at, and the safe use of, the aerodrome.
Stop-way	A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off
Taxiway	A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including: a) Aircraft stand taxi-lane. A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only. b) Apron taxiway. A portion of a taxiway system

	located on an apron and intended to provide a through taxi route across the apron. c) Rapid exit taxiway. A taxiway connected to a runway at an acute angle and designed to allow landing airplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.
Taxiway strip	An area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.
Touchdown zone	The portion of a runway, beyond the threshold, where it is intended landing airplanes first contact the runway.

A.2. Abbreviations and acronyms

ACI	Airports Council International
SANS	Saudi Air Navigation Services
FRCC	Fire Rescue Communication Centre
FOD	Foreign object damage, foreign object debris
GACA	General Authority for Civil Aviation
ICAO	International Civil Aviation Organisation
NOTAM	Notice to Airmen
OLS	Obstacle limitation surface
OM	Operations Manual
RGL	Runway guard light
RWY	Runway
SOP	Standard Operating Procedure
SP	Specialized
TOCC	Terminal Operations Control Centre
TWY	Taxiway
VDGS	Visual docking guidance system

Appendix B. Guidance

B.1. Level 1 – Routine daily checklist

Alula International Airport		AIRSIDE INSPECTION PROGRAM CHECKLIST LEVEL 1 – ROUTINE DAILY INSPECTION								
INSPECTOR								DATE		
RUNWAYS	NIGHT1	DAY1	NIGHT 2					DD-MM-YYYY		
30				N1						
12				D1						
ZONE (SEE LEGEND)				N2						
				SP						
ITEMS TO BE INSPECTED	ITEM AND/OR CONDITION		NIGHT N1	DAY D1	NIGHT N2	SPECIAL SP	REMARKS		LOCATION	LOGBOOK
PAVEMENT AREAS	PAVEMENT EDGE									
	HOLES									
	CRACKS/SPALLING/BUMPS									
	FOD GRAVEL/DEBRIS/SAND									
	RUBBER DEPOSITS									
	PONDING/EDGE DAMS									
SAFETY AREAS	RUTS/HUMPS/EROSION									
	DRAINAGE/CONSTRUCTION									
	FRANGIBLE BASES									
	UNAUTHORIZED OBJECTS									
MARKINGS & SIGNS	CLEARLY VISIBLE/STANDARD									
	RUNWAY MARKINGS									
	TAXIWAY MARKINGS									
	HOLDING POSITION MARKINGS									
	OBSCURED SIGNS									
	INOPERABLE SIGNS									
LIGHTING	DAMAGED SIGNS									
	OBSCURED/DIRTY/INOPERABLE									
	DAMAGED/MISSING									
	FAULTY AIM/ADJUSTMENT									
	RUNWAY LIGHTING									
NAVAIDS	TAXIWAY LIGHTING									
	ROTATING BEACON									
	WIND INDICATORS									
OBSTRUCTIONS	PAPI SYSTEMS									
	OBSTACLE LIGHTS INOPERABLE									
CONSTRUCTION	CRANES									
	BARRICADES/LIGHTS									
	EQUIPMENT PARKING									
	MATERIAL STOCKPILES									
WILDLIFE	CONFUSING SIGNS/MARKINGS									
	WILDLIFE PRESENT/LOCATION									
PUBLIC PROTECTION	DEAD BIRDS									
	FENCING/GATES/SIGNS									
OTHER (NOTE)	JET BLAST									

INSPECTOR	GENERAL REMARKS
ZONE LEGEND:	(Inserted by airport)

B.2. Level 2/3 – Detailed inspection checklist & management inspection and audit checklist

Alula International Airport	AIRSIDE INSPECTION PROGRAM CHECKLIST LEVEL 2 – DETAILED INSPECTION LEVEL 3 – MANAGEMENT INSPECTIONS AND AUDITS
-----------------------------	--

RUNWAYS	✓	DESCRIPTION OF AREA INSPECTED (NOTE ON AIRFIELD SKETCH)
(30)	(12)	
ZONE (SEE LEGEND)		
OTHER		

DATE
DD-MM-YYYY

ITEMS TO BE INSPECTED	ITEM AND/OR CONDITIONS	REMARKS	LOCATION	LOGBOOK
PAVEMENT AREAS	PAVEMENT EDGE			
	HOLES			
	CRACKS/SPALLING/BUMPS			
	FOD GRAVEL/DEBRIS/SAND			
	RUBBER DEPOSITS			
	PONDING/EDGE DAMS			
SAFETY AREAS	RUTS/HUMPS/EROSION			
	DRAINAGE/CONSTRUCTION			
	FRANGIBLE BASES			
	UNAUTHORIZED OBJECTS			
MARKINGS & SIGNS	CLEARLY VISIBLE/STANDARD			
	RUNWAY MARKINGS			
	TAXIWAY MARKINGS			
	HOLDING POSITION MARKINGS			
	OBSCURED SIGNS			
	INOPERABLE SIGNS			
LIGHTING	DAMAGED SIGNS			
	OBSCURED/DIRTY/INOPERABLE			
	DAMAGED/MISSING			
	FAULTY AIM/ADJUSTMENT			
	RUNWAY LIGHTING			
NAVAIDS	TAXIWAY LIGHTING			
	ROTATING BEACON			
	WIND INDICATORS			
OBSTRUCTIONS	PAPI SYSTEMS			
	OBSTACLE LIGHTS INOPERABLE			
CONSTRUCTION	CRANES			
	BARRICADES/LIGHTS			
	EQUIPMENT PARKING			
	MATERIAL STOCKPILES			
WILDLIFE	CONFUSING SIGNS/MARKINGS			
	WILDLIFE PRESENT/LOCATION			
PUBLIC PROTECTION	DEAD BIRDS			
	FENCING/GATES/SIGNS			
OTHER (NOTE)	JET BLAST			

INSPECTOR	GENERAL REMARKS
ZONE LEGEND:	(Inserted by airport)



STANDARD **O**PERATING **P**ROCEDURES

ROUTINE MAINTENANCE AND EMERGENCY MAINTENANCE

Document information

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes , Version 6.0

External legal, standards and/or policy:

- ICAO Doc 9981, Procedures for Air Navigation Services, Aerodromes, Second edition, 2016
- ICAO Annex 14, Aerodromes, Volume 1,SeventhEdition , July 2016
- ICAO Doc 9137, Airport Services Manual, Part-XI ,First Edition 1984.

Associated SOPs, OM s and O&MMs:

- OM_OEAO ADM_01_001 Aerodrome Manual, Section 5.7 Maintenance of the Movement Area
- SOP_OEAO _ADM_01_005 Inspection of the Movement Area
- SOP_OEAO _ADM_01_003 Maintaining a logbook

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to describe the process for carrying out routine maintenance and emergency maintenance during or outside of normal operating hours of Prince Abdulmajeed Bin Abdulaziz Airport.

1.3. Relevant stakeholders

The stakeholders who must directly use this SOP together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	GACA – Aviation Standards
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance Inspector and Contractors	GACA – Maintenance
Prince Abdulmajeed Bin Abdulaziz Airport Fire & Rescue Services	Aircraft operators at Prince Abdulmajeed Bin Abdulaziz Airport
Prince Abdulmajeed Bin Abdulaziz Airport Safety	Ground handlers
Fire commination Center (FRCC)	

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: This SOP includes the following:

- Description of responsible parties to implement the preventative maintenance program
- Description of responsible parties to conduct emergency maintenance
- Description of the communication protocols to be followed to commence, conduct and conclude scheduled or unscheduled maintenance
- Process to follow up on regular maintenance findings arising from inspections
- Process to follow up on emergency maintenance arising from inspections
- Process to communicate with the Operations any information requiring immediate dissemination in the event of emergency maintenance to address significant hazards to aircraft operations and the resolution

Out of Scope: Development of a preventive maintenance program.

1.5. Applicable areas within the airport operation

All of the facilities and infrastructures at the airport.

2. Routine and emergency maintenance

2.1. Routine Maintenance and Emergency Repairs

ICAO Safety Management System guidance describes the aerodrome as a system. The system description of an aerodrome should include facilities, equipment, personnel, processes and procedures necessary for the operation of the aerodrome. The Prince Abdulmajeed Bin Abdulaziz Airport SMS is the overarching system that applies risk management principles to ensuring that facilities and equipment meet GACA regulations and that these principles are applied to ensuring that all aspects of airside operations are conducted in such a way to meet GACA regulations. As shown in Figure 3 below:



Figure: The airport system

Aerodrome inspections and their follow up form an integral part of the airport's safety management system. SOP_OEAO ADM_01_005, Inspection of the movement area and SOP_OEAO ADM_01_003, Maintaining a logbook describe the overall processes by which to ensure that airfield infrastructure and facilities are in good working order. The program is based on inspection program as detailed in SOP_OEAO ADM_01_005, Inspection of the Movement Area. These inspection procedures include:

- Routine Daily Inspections which are designed to provide an overview of the general condition of all airside infrastructure and facilities;
- Detailed Inspections which are more detailed and provide for a more comprehensive assessment of all airside infrastructure and facilities;
- Management Inspections and Audits, which are an audit of the Detailed Inspections so that senior operations and engineering staff are fully involved in the overall airside inspection process.

The need for repairs and emergency repairs could be identified during any one of these types of inspections or during the course of regular maintenance.

The criticality of the facility or infrastructure will determine whether a repair must be effected immediately or whether it can follow the normal course of a general repair. The airport's maintenance management system should be designed to differentiate between these types of repairs.

For this SOP, work is categorized according to this urgency:

- Emergency repairs – a deficiency is identified, and due to its criticality, the repair work must be done immediately;
- Repairs – a deficiency is identified, but due to the lack of criticality, the repair work can follow the general maintenance repair procedures, as contained in the airport's maintenance management program.

Step	Action
2.1.1	IF during an inspection, a discrepancy with respect to criteria identified in SOP_OEAO ADM_01_005, Inspection of the movement area, is discovered THEN notify the Operations and report the nature of the hazard.
2.1.2	A Finding Record is entered in the Logbook as per SOP_OEAO ADM_01_003, Maintaining a logbook
2.1.3	For emergency work, Operations immediately contacts Maintenance and issues an emergency repair work order and enters the Work Order Number on the Finding Record as per SOP_OEAO ADM_01_003, Maintaining a logbook
2.1.4	For non-emergency work, Operations identifies a need for repair and issues a repair work order and enters the Work Order Number on the Finding Record as per SOP_OEAO ADM_01_003, Maintaining a logbook
2.1.5	The work is completed and the emergency repair or repair work order is completed by the Maintenance Contractor
2.1.6	Maintenance reports to Operations that the work is complete
2.1.7	Operations enters the Date Complete on the Inspection Finding Record

Appendix A. Glossary

A.1. Terms and definitions

Emergency Repair	Work of an urgent nature due to the criticality of a system, facility or infrastructure
Repair	Work that is not of an urgent nature but is required to maintain the integrity of a system, facility or infrastructure

A.2. Abbreviations and acronyms

FRCC	Fire Rescue Commination Center
GACA	General Authority of Civil Aviation of Saudi Arabia
O&MM	Operating & Maintenance Manual
OM	Operations Manual
SMS	Safety Management System
SOP	Standard Operating Procedure



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General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

MARKING OF UNSERVICEABLE AREAS

Document information

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016

Associated SOPs, OMIs and O&MMs:

- SOP_OEAO_ADMIN_01_002Aeronautical Information System promulgation & update
- SOP_OEAO_ADMIN_01_008 Aerodrome signs & markings.

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to outline the means by which temporarily unserviceable areas are marked and lit at Prince Abdulmajeed Bin Abdulaziz Airport.

The key objective of markings and markers used on unserviceable areas of runways, taxiways, aprons and holding bays is to prominently define the unserviceable area boundaries and prevent inadvertent or accidental entry of vehicles or aircraft into unserviceable areas.

1.3.Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Fire Communication Center
Prince Abdulmajeed Bin Abdulaziz Airport Safety	Maintenance contractors
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Construction contractors
	Airlines Operating at Prince Abdulmajeed Bin Abdulaziz Airport
	Ground handlers

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: Unserviceability markers and lights are displayed wherever any portion of a taxiway, apron or holding bay is unfit for the movement of aircraft, but it is still possible for aircraft to bypass the area safely. Unserviceability markers and lights are used for such purposes as warning pilots of a hole in a taxiway or apron pavement, or outlining a portion of a pavement, for example on an apron that is under repair.

The marking of unserviceability areas includes:

- Isolation of the work area / location (the placing of the markers at intervals sufficiently close so as to delineate the unserviceable area)
- Characteristics of unserviceability markers (e.g., flags, cones or marker boards) and unserviceability lights

Out of Scope: This SOP does not address:

- The closure of a runway or taxiway SOP_OEAO ADM_01_016, Restricting aircraft operations during a closure.
- Promulgation of aeronautical information (through Aeronautical Information Publication (AIP) or Notices to Airmen (NOTAM) SOP_OEAO ADM_01_002, Aeronautical Information System promulgation & update.
- Reporting of dangerous unserviceability discovered during runway inspections SOP_OEAO ADM_01_005, Inspection of the Movement Area.

1.5.Applicable areas within the airport operation

Airport Operations staff are responsible for the marking of unserviceable areas.

Each individual involved in the planning or marking of these areas, or those individuals working within unserviceable areas should understand their roles and responsibilities in maintaining safety. These personnel include:

- Airfield operations personnel (permanent and seasonal);
- Maintenance and utilities personnel
- Airport duty Supervisor;
- Air traffic controllers;
- Maintenance contractors; and
- Construction contractors.

All stakeholders working airside are required to acknowledge the operational and safety implications of adhering to this SOP.

2. Unserviceable areas

2.1. Process for marking unserviceable areas

A critical step in the development of the PCO and the execution of work is to locate the project work site and its access, identify operating constraints and mark the areas that are unsuitable for aircraft and vehicle operations. Delineating work areas is achieved by placing markers at intervals sufficiently close so as to identify the area that is unsuitable for aircraft and vehicles movement. Markers and their configuration used to mark unserviceable areas.

Criteria	Description
Unserviceability lights	
1. A minimum of 4 fixed red lights should be used, except where the area is triangular; in this case 3 lights may be used. The intensity of the lights should be sufficient to ensure conspicuity considering the intensity of the general level of illumination in the area and of adjacent lights. In no case shall the intensity be less than 10cd of red light.	 

Criteria	Description
<p>2. The number of lights should be increased when the area large or of unusual configuration. At least one light should be installed for each 7.5 m or peripheral distance</p>	
<p>3. If lights are directional, they should be oriented so that as far as possible their beams are aligned in the direction from which an aircraft or vehicle will approach. Where aircraft or vehicles approach from several directions, adding extra lights or using omnidirectional lights to show the area from these directions should be used</p>	

Criteria	Description
<p>4. The height of lights should be low so as to preserve clearance for propellers or for aircraft engines</p>	
<p>Unserviceability cones</p> <p>5. An unserviceability cone should be at least 0.5m in height and red, orange or yellow or any one of these colors in combination with white.</p>	

Unserviceability flags

6. An unserviceability flag should be at least 0.5m square and red, orange or yellow or any one of these colors in combination with white



Unserviceability marker boards	
<p>7. An unserviceability marker board should be at least 0.5m in height and 0.9m in length, with alternate red and white or orange and white vertical stripes.</p>	

Table 2: Lights and markers used to identify unserviceable areas

2.2. Marking of Unserviceable areas

Step	Action
2.2.1	Identify signage and markers needed to clearly delineate unserviceable areas and any markers needed to ensure vehicles and equipment do not penetrate critical navigational facilities.
2.2.2	Install all lights and markers prior to construction start or as required.
2.2.3	Inspect all lights and markers prior to sunset.
2.2.4	On project termination remove all lights and markers.

Appendix A. Glossary

A.1. Terms and definitions

Plan of Construction Operations (PCO)	A plan which is intended to provide a prescriptive approach to working airside on a project in conformance with GACA SARPs while minimizing disruption to normal operations including disruptions to navigational aids.
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
GACARs	GACA SARPS (Standards and Recommended Practices) for Annex 14 for aerodrome works.

A.2. Abbreviations and acronyms

GACA	General Authority of Civil Aviation of Saudi Arabia
GACAR	GACA Standards and Recommended Practices
ICAO	International Civil Aviation Organisation
PCO	Plan of Construction Operations
SOP	Standard Operating Procedure



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General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

AERODROME SIGNS AND MARKINGS

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards.

- GACAR Part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016

Associated SOPs, OM&Ms and O&MMs:

- OM_OEAO ADM_01_001 Aerodrome Manual
- SOP_OEAO ADM_01_005 Inspection of the Movement Area.
- SOP_OEAO ADM_01_003 Maintaining a logbook.
- SOP_OEAO ADM_01_016 Restricting aircraft operations during closures.
- SOP_OEAO ADM_01_010 Secondary power supplies & total system failure.
- SOP_OEAO ADM_01_017 Protection of sites for radar & navigation aids.
- SOP_OEAO ADM_01_007 Marking of unserviceable areas.
- SOP_OEAO ADM_01_011 Non-compliance & corrective action reports.

1.2. Purpose

This SOP details the various signs and markings and their maintenance required on the movement area of Prince Abdulmajeed Bin Abdulaziz Airport in keeping with the provisions of GACAR 139.

1.3.Relevant stakeholders

The stakeholders who must directly use this SOP together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	SANS (FRCC – Engineers – etc)
Prince Abdulmajeed Bin Abdulaziz Airport Safety	Airlines
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Ground handlers
	Fuel companies
	Contractors
	RSAF
	FRS

Table 1: List of relevant stakeholders

1.4.Scope

In Scope: The signs to be installed provide mandatory instructions, information, and directional guidance on specified locations on the airfield at Prince Abdulmajeed Bin Abdulaziz Airport. In addition, the markings as mentioned below are also provided on the Runway and taxiway. The signs bearing the following characteristics are installed on the Aerodrome:

■ **Mandatory Signs**

- Runway designation sign
- Runway holding position sign
- No entry signs - prohibition of vehicular access
- Road holding position signs

■ **Information Signs**

- Taxiway intersection information sign
- Runway exit sign
- Taxiway designator sign

- **Markings**

- Runway
 - Runway centerline marking
 - Threshold marking
 - Runway designation marking
 - Aiming point marking
 - Touchdown zone marking
 - Runway side stripe marking
- Taxiway
 - Taxiway centerline marking
 - Runway holding position marking

Out of Scope: Signage intended for traffic control and security are not included on apron areas.

2. Aerodrome signage specifications audit

The achievement of safe and efficient aircraft taxiing and ground movement requires the provision of a system of signs for the use of pilots and vehicle drivers on the movement areas. By relating signage data to ground map information in the cockpit or vehicle, pilots and vehicle drivers can ensure they are on their assigned route and can report their position to FRCC. To meet the operational requirements of a complex system of runways and taxiways, signs must be readily seen and the inscription of their face must be easy to read GACAR 139.

Signs are classified as:

- 1) **Mandatory:** a mandatory sign identifies a location where a vehicle or taxing aircraft must not proceed without authorization from FRCC. Mandatory signs are red and white and shall always be located on each side of the taxiway or runway. Mandatory signs could include a variety of the following types:
 - a) Runway designation
 - b) Runway-holding position
 - c) Road-holding position
 - d) No entry

2) **Information:** an information sign provides information related to a specific location, directional routing or destination information or other information relevant to the safe and efficient movement of aircraft or vehicles. Information signs are yellow and black. Information signs include a variety of the following types:

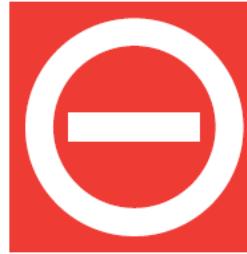
- a) Direction
- b) Location
- c) Destination
- d) Runway exit
- e) Runway vacated
- f) Intersection takeoff

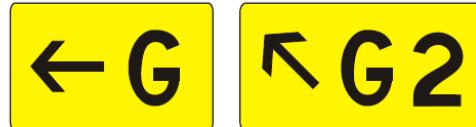
Signage specifications are contained in GACAR 139. When purchasing airfield signage, it is important to receive confirmation from the signs that meet GACAR 139 specifications.

For example, **Compliance Standards:**

Signs	Left Side Example	Right Side Example
1. Location (information) and runway designation (mandatory) - aircraft or vehicle is on Taxiway B facing Runway 25-07	 LOCATION/RUNWAY DESIGNATION	 RUNWAY DESIGNATION/LOCATION

Signs	Left Side Example	Right Side Example
2. Location (information) and runway designation (mandatory) - aircraft or vehicle is on Taxiway A at Runway 25, runway extremity	 LOCATION/RUNWAY DESIGNATION	 RUNWAY DESIGNATION/LOCATION
3. Runway holding position must be established on a taxiway if the location or alignment of the taxiway is such that taxing aircraft or vehicle can infringe an obstacle limitation surface or interfere with navigational aids. Aircraft or vehicle is on Taxiway B but must hold between aircraft operations so as to not interfere with the OLS or navigational aid signals. Where it is necessary to provide intermediate holding positions on a taxiway at locations other than a runway/taxiway intersection, the location signs shall consist of the taxiway designator supplemented by a number.	 RUNWAY-HOLDING POSITION	 RUNWAY-HOLDING POSITION

Signs	Left Side Example	Right Side Example
4. Supplemental runway holding position sign for precision approach	 RUNWAY DESIGNATION/ CATEGORY II HOLDING POSITION	 RUNWAY DESIGNATION/ CATEGORY II HOLDING POSITION
5. No entry sign when entry to an area is prohibited	 NO ENTRY	 NO ENTRY
6. Road holding sign where a road enters a runway – “STOP proceed only on FRCC clearance” in a language that is comprehensible by all road users at the airport.		

Signs	Examples of Signage
7. Directional – aircraft or vehicle on Taxiway B facing Taxiway C	<p style="text-align: center;">LEFT SIDE RIGHT SIDE</p>  <p style="text-align: center;">DIRECTION/LOCATION/DIRECTION</p>
8. Location – aircraft or vehicle on Taxiway A	 <p style="text-align: center;">LOCATION</p>
9. Destination	 <p style="text-align: center;">DESTINATION</p>
10. Runway exit sign	 <p style="text-align: center;">RUNWAY EXIT</p>

Signs	Left Side Example	Right Side Example
11. Runway vacated	Left	Right
	 LOCATION/RUNWAY VACATED	 RUNWAY VACATED/LOCATION
12. Intersection takeoff		

Table 2: Examples of signage inscriptions

2.1.Aerodrome signage audit

SOP_OEAO_ADM_01_005, Inspection of the Movement Area describes the procedures for three types of inspection:

- Routine Daily Inspections which are designed to provide an overview of the general condition of all airside infrastructure and facilities
- Detailed Inspections which are more detailed and provide for a more comprehensive assessment of all airside infrastructure and facilities
- Management Inspections and Audits which are an audit of the Detailed Inspections so that senior operations staff are fully involved in the overall airside inspection process

An audit of the entire airfield shall be conducted periodically using the methods described in Detailed Inspections. An inspection of this type is detailed and provides for a more comprehensive assessment. These types of inspections are best carried out on foot or by using a vehicle operating at a very low speed.

For a signage audit, signage shall be audited following the guidance found in GACAR 139:

- Conspicuity – color and luminance
- Comprehensibility, particularly for complex sign arrays and/or after alterations to the airfield configuration
- Sign height – taking into consideration new large aircraft
- Sign location.

Any discrepancies discovered shall become part of a corrective action plan, as described in SOP_OEAO ADM_01_011, Non-compliance & corrective action reports, and communicated to GACA, if required.

Step	Action
2.1.1	Develop signage audit work plan – areas, types of signage to be verified (Mandatory vs. Information)
2.1.2	Conduct Detailed Inspection - audit type inspection
2.1.3	Document audit findings, log entry in Inspection Log as per SOP_OEAO ADM_01_003, Maintaining a logbook, conduct a risk assessment and develop a corrective action plan (CAP)
2.1.4	IF it is determined that GACA shall be advised, THEN develop corrective action plan (CAP) using the CAP form contained in SOP_OEAO ADM_01_011, Non-compliance & corrective action reports
2.1.5	Send CAP to GACA for acceptance
2.1.6	IF acceptance is received THEN proceed with the implementation of the CAP
2.1.7	IF acceptance is not received THEN rework and resubmit
2.1.8	Implement the CAP and close Logbook entry as per SOP_OEAO ADM_01_003, Maintaining a logbook
2.1.9	IF applicable advise GACA that CAP is complete
2.1.10	GACA follows up, completes corrective action form and closes the non-compliance finding

3. Aerodrome signage maintenance

These inspection protocols apply to airfield signage. For Routine Daily Inspections, the following signage elements shall be verified and addressed:

- Signage lighting and the replacement of burnt-out lamps
- Inscriptions for legibility and absence of obstructions and the removal of obstructions that could obscure the sign faces.

Detailed Inspection provide for a more detailed inspection. It is during these types of inspections that a detailed assessment of signage shall be done. At least, annually, the following signage elements shall be verified and addressed:

- Sign mounting and repair
- Light mounting and repair
- Sign structure and its paint; clean, repair or replace
- Signage lighting and repair

As well after severe winds or sandstorms, signs shall also be verified for damage. Tumbled signs shall be re-positioned and repaired as needed.

3.1.Aerodrome signage routine inspection and maintenance

Step	Action
3.1.1	Conduct Routine Daily Inspection or Detailed Inspections using the procedures in SOP_OEAO ADM_01_005, Inspection of the Movement Area
3.1.2	IF sign damage is discovered THEN follow procedures in SOP_OEAO ADM_01_005, Inspection of the Movement Area, and SOP_OEAO ADM_01_003, Maintaining a logbook.

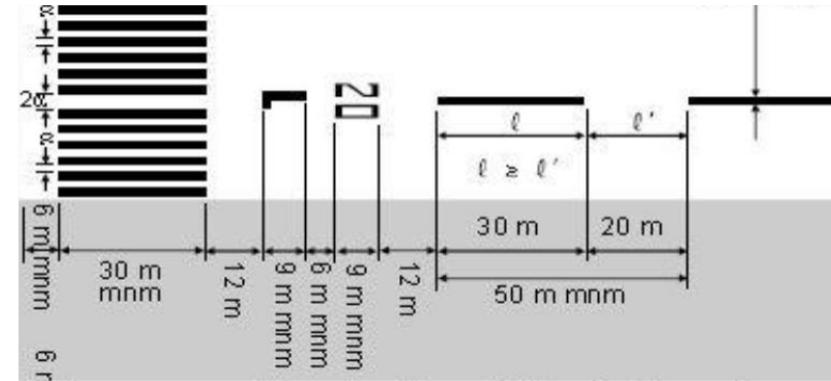
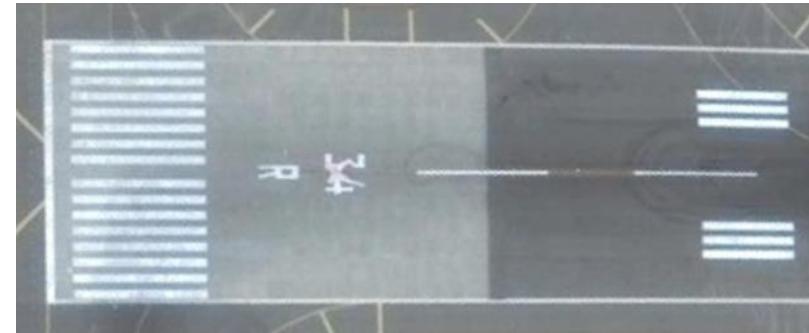
4. Aerodrome surface markings

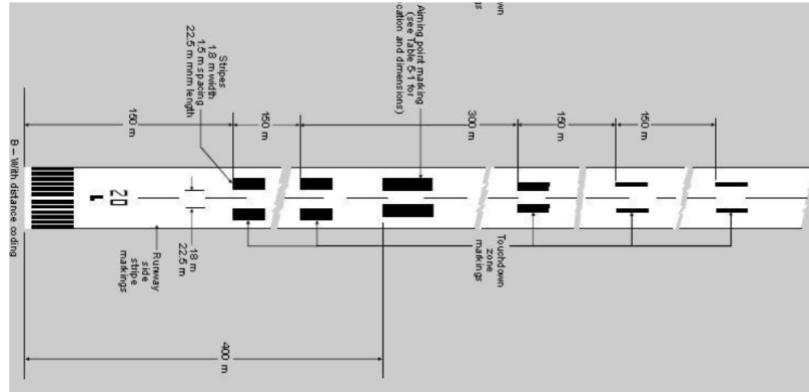
The achievement of safe and efficient aircraft taxiing and ground movement requires the provision of a system of signs and surface markings for the use of pilots and vehicle drivers on the movement areas. Surface markings consists of:

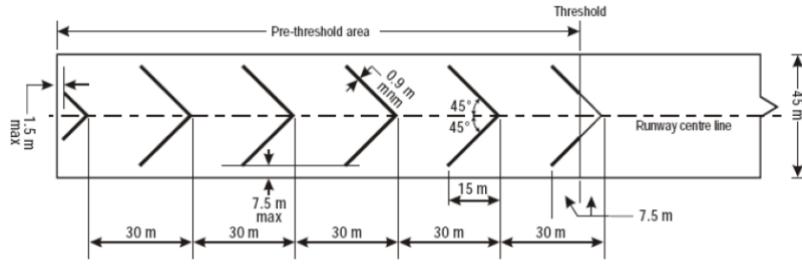
- Runway markings – runway markings are White.
- Taxiway markings – taxiway markings are Yellow.

Markings may consist of solid areas or a series of longitudinal stripes providing the effect equivalent to solid areas.

For example; specification for runway markings:

Runway Markings	Specifications and examples of markings
1. Runway threshold, runway designation and centerline	 <p>The diagram illustrates the specifications for runway markings. It shows a cross-section of a runway with various markings. On the left, there is a series of thick black horizontal bars representing the centerline markings. To the right of these are two sets of vertical bars: one set of three bars and another set of two bars. The distance between the start of the centerline markings and the first set of vertical bars is labeled as 30 m mm. The distance between the first and second sets of vertical bars is 12 m. The width of each set of vertical bars is 6 m mm. The distance between the second set of vertical bars and the end of the markings is 12 m. The total length of the markings is 50 m mm. The distance from the end of the markings to the threshold is 20 m. The diagram also shows a shaded area representing the runway surface.</p>
2. Typical example – threshold, runway designation and centerline markings.	 <p>A photograph of a runway at night or in low light conditions. The runway surface is dark. On the left, there is a white rectangular marking with horizontal stripes, representing the threshold. In the center, the letters 'R' and '34' are painted in white, identifying the runway number. A white centerline marking extends from the 'R' towards the right. On the right side, there are two sets of vertical white bars, similar to those shown in the diagram.</p>

Runway Markings	Specifications and examples of markings
3. Touchdown zone marking, aiming point marking	 <p>The diagram illustrates the layout of runway markings. It shows a runway with a length of 400 m. At the start, there is a 'Runway side stripe marking' consisting of three parallel white lines. Further down the runway, there is an 'Aiming point marking' indicated by a vertical line with a horizontal bar. The 'Touchdown zone marking' is shown as a series of alternating black and white rectangular blocks. Labels provide dimensions: 18 m for the distance between the start of the runway and the aiming point; 22.5 m for the length of the aiming point marking; 1.8 m for the width of the stripes; and 1.8 m for the spacing between the stripes. The diagram also shows a 'Runway marking' consisting of vertical bars at the end of the runway.</p>
4. Typical example, touchdown zone marking, aiming point and runway side stripe marking.	 <p>A photograph of a runway at night or in low light conditions. The runway surface is dark, and various markings are visible. On the left, there is a 'Runway side stripe marking' with three parallel white lines. Further down the runway, there is an 'Aiming point marking' with a vertical line and a horizontal bar. The 'Touchdown zone marking' is visible as a series of alternating black and white rectangular blocks. The overall scene is dimly lit, with the markings reflecting some light.</p>

Runway Markings	Specifications and examples of markings
<p>5. Pre-threshold areas – when the surface before a threshold is paved and exceeds 60m in length and is not suitable for normal use by aircraft, the entire length before the threshold shall be marked with a chevron marking. It shall be conspicuous and contrast the runway markings color, preferably in yellow.</p>	 <p>The diagram illustrates the markings for a pre-threshold area. It features a horizontal dashed line representing the runway centerline. Above this line is a 'Pre-threshold area' containing four chevron markings. Below the centerline is a 'Threshold' marked by a dashed line. The total width of the area is 15 m, indicated by arrows on both sides. The height of the markings is 15 m. The distance from the centerline to the start of the chevrons is 7.5 m max. The distance between the centers of the chevrons is 30 m. The angle of the chevrons is 45°, with a minimum value of 0.9 m min. The distance from the end of the chevrons to the threshold is 15 m.</p>

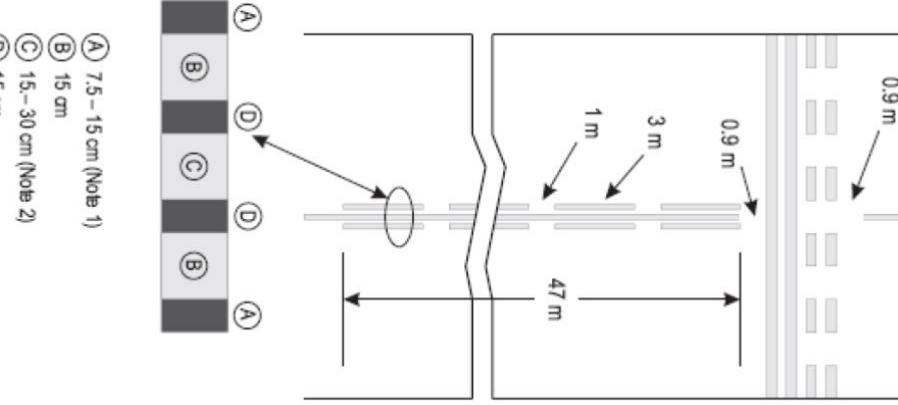
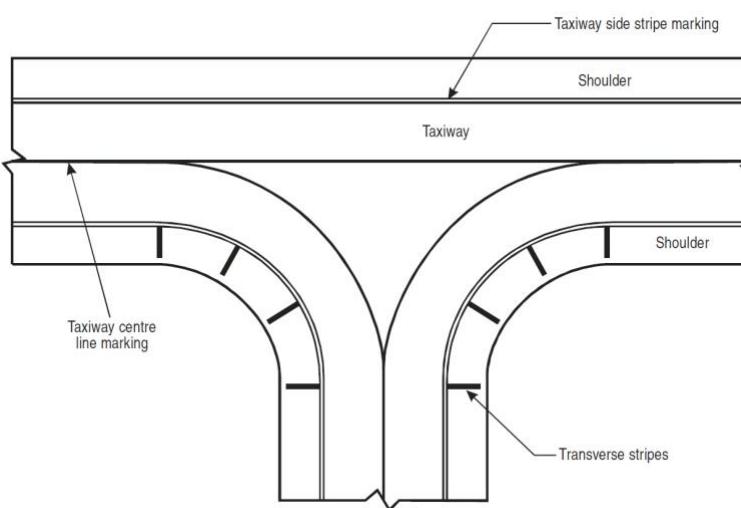
Taxiway Markings	Specifications and examples of markings
<p>6. Taxiway centerline markings must be provided on a paved taxiway. Where it is necessary to denote the proximity of a runway hold position, enhanced taxiway centerline markings shall be provided.</p> <p>Note 1: Black background for contrast on light-coloured pavements. Note 2: Continuous yellow centre line.</p>	
<p>7. Aprons and taxiways that are provided with shoulder stabilization, which has the appearance of pavement but is not intended to support aircraft must be marked. For straight taxiway sections, the taxiway side stripes are recognizable. At intersections of taxiways and other areas, due to turning, the possibility of confusion between the side stripe markings and centerlines may exist. In these cases the addition of transverse stripes on the non-load bearing surface has been found to be effective.</p>	

Table 3: Examples of surface markings

4.1.Aerodrome markings audit and maintenance

SOP_OEAO ADM_01_005, Inspection of the Movement Area describes the procedures for Inspection:

- Routine Daily Inspections which are designed to provide an overview of the general condition of all airside infrastructure and facilities
- Detailed Inspections which are more detailed and provide for more comprehensive assessment of all airside infrastructure and facilities
- Management Inspections and Audits which are an audit of the Detailed Inspections so that senior operations staff are fully involved in the overall airside inspection process.

An audit of the entire airfield shall be conducted periodically using the methods described in Detailed Inspections. An inspection of this type is detailed and provides for a more comprehensive assessment. These types of inspections are best carried out on foot or by using a vehicle operating at a very low speed.

For a markings audit, markings shall be audited for dimensions, patterns, location and conspicuity. Markings shall be inspected at least semi-annually. Markings, which are faded or discolored by soil, shall be repainted. When rubber deposits have been removed from the pavement, all defaced markings shall be restored as soon as possible.

Any discrepancies discovered shall become part of a correction action plan, as described in SOP_OEAO ADM_01_011, Non-compliance & corrective action reports and communicated to GACA if required.

Step	Action
4.1.1	Develop surface markings audit work plan – areas, markings to verified.
4.1.2	Conduct Detailed Inspection - audit type inspection
4.1.3	Document audit findings, log entry in Inspection Log as per SOP_OEAO ADM_01_003, Maintaining a logbook, and then conduct a risk assessment, and develop corrective action plan (CAP)
4.1.4	IF it is determined that GACA shall be advised, THEN develop corrective action plan (CAP) using the CAP form contained in SOP_OEAO ADM_01_011, Non-compliance & corrective action reports.
4.1.5	Send CAP to GACA for acceptance.
4.1.6	IF acceptance is received THEN proceed with the implementation of the CAP.
4.1.7	IF acceptance is not received THEN rework and resubmit.
4.1.8	Implement the CAP and close Logbook entry as per SOP_OEAO ADM_01_003, Maintaining a logbook.
4.1.9	IF applicable advise GACA that CAP is complete
4.1.10	GACA follows up, completes corrective action form and closes the non-compliance finding

Appendix A. Glossary

A.1. Terms and definitions

Aerodrome certificate	A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Corrective action plan	A formal plan to correct a non-compliance finding.
Non-compliance	Not meeting a GACA standard or recommended practice.
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
GACARs	General Authority of Civil Aviation Regulations

A.2. Abbreviations and acronyms

CAP	Corrective Action Plan
GACA	General Authority of Civil Aviation
GACARs	General Authority of Civil Aviation Regulation
ICAO	International of Civil Aviation Organisation
O&MM	Operating & Maintenance Manual
OM	Operations Manual
PCO	Plan of Construction Operations
SOP	Standard Operating Procedure
SANS	Saudi Air Navigation Services
RSAF	Royal Saudi Air Force
FRS	Fire and Rescue Services



STANDARD OPERATING PROCEDURES

CLEANING AND SWEEPING OF THE APRON

Document information

General information

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01	29/10/2020	Alula International Airport Operations	Majed K. Hefni	Eng.Abdulwahab Bokhari	Issue
01.1	02/08/2021	Alula International Airport Operations	Majed K. Hefni	Eng.Abdulwahab Bokhari	Change SOP name From (Prince Abdulmajeed Bin Abdulaziz Airport) To: (AIUla International Airport)
1.2	30/09/2022	Alula International Airport Operations	Rami Alhazmi	Eng.Abdulwahab Bokhari	Update to include FBO hanger

Document sign off

Name	Company	Job Title	Date	Signature
Eng.Abdulwahab Bokhari	Alula International Airport.	Airport Director		

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 7.0

External legal, regulatory standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Ninth Edition, July 2022

Associated SOPs, OM&Ms and O&MMs:

- SOP_OEAO_ADMIN_01_006 Routine maintenance and emergency maintenance
- SOP_OEAO_ADMIN_01_007 Marking of unserviceable areas

1.2. Purpose

This document defines Standard Operating Procedure (SOP) for the initiation of apron cleaning and sweeping, operational measures on the apron during cleaning and sweeping and release of the apron or its part back to the operation when cleaning and sweeping have been completed. The purpose of this SOP is to facilitate the process of the apron cleaning and sweeping in order to minimize the safety risks related to apron contamination.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in

Table 1.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Operations	SANS
Alula International Airport Maintenance	Airlines
	Handling agents

Table 1: List of relevant stakeholders

Alula International Airport maintenance are responsible for the organisation of apron cleaning and sweeping. Other stakeholders need to be aware of this in order to initiate the process.

1.4. Scope

In scope: The scope of this SOP covers cleaning and sweeping of all aprons under Alula International Airport operation. The SOP shall be used whenever the need for the cleaning and sweeping is triggered by:

- Adverse weather conditions
- Works in progress on the apron
- Emergency or contingency situation
- Handling agent, airline or FBO hangar operator
- Airside Operations.

The SOP also covers particulars of the procedures for management of the apron cleaning and sweeping including the following:

- Coordination arrangements with all stakeholders including arrangements for communicating with Tower Control Unit (TWR) during the progress of cleaning and sweeping;
- Verification of the quality of cleaning and sweeping;
- Closing and reopening working areas;
- The names, telephone numbers and roles of the persons and organizations responsible for planning and carrying out the work, and arrangements for contacting those persons and organizations at all times.

The names and telephone numbers, during and after working hours, of the aerodrome fixed-base operators, ground handling agents and aircraft operators who are to be notified of the work.

1.4.1. Conditions of use and assumptions

WARNING 1

A number of conditions and assumptions were made during the creation of this document. The authors recommend that this SOP is not used until an inspection of the area has been completed and validated. The Airfield Operation Officers shall inspect the area before clearing it for aircraft operations.

1.4.1.1. Conditions of use of this SOP

This document does not supersede any national or international regulatory documentation. This document does not constitute an Aeronautical Information Publication (AIP). Assumptions related to this SOP

- The equipment will be installed and perform in line with the high level specification
- Suitable training and competency will be achieved and maintained by those completing the apron cleaning
- The existing AIP is accurate
- The Alula International Airport Operations department will have the facility to issue NOTAMs

1.5. Applicable areas within the airport operation

The applicable area for this SOP within the airfield.

2. Description of process apron cleaning and sweeping

2.1. General consideration

2.1.1. Risks relate to contaminated pavements

For safety reasons the surface of aprons and stands have to be clean of sand, debris and other loose objects, otherwise known as Foreign Object Debris (FOD). Engines of aircraft can easily ingest loose objects or materials and thus cause damage to the engine compressor blades or propellers. Sharp debris may also damage tires of taxing aircraft or vehicles on the apron.

There is also a risk that the loose debris blown by engine jet blast can also harm people or cause damage on other aircraft, equipment or building.

Besides the contaminants that could cause damages to the aircraft there, also other contaminants that deteriorate physical characteristics of the pavement surfaces that cause slipperiness and adversely affect breaking actions and manoeuvrability of aircraft and vehicles.

2.1.2. Types of contamination

Aprons are more likely to become contaminated than other aircraft movement areas on the airport due to the greater number of users of this area, traffic concentration and the loading process going on there. Objects found on aprons may include stones, bottles, cans, stoppers, bottle caps, lost hand tools, personal belongings, nails, screws, bolts, paper, rubber, wire, plastic material, wooden, textile, synthetic and metal parts of all sizes from boxes, cases, pallets, containers and other packing devices. Contamination is worst in freight handling areas and, of course, near construction areas. Another kind of contamination to the pavement surface is by hydraulic oils, fuel and lubricants. There may also be contamination from fluids used within the FBO hanger to clean aircraft.

2.1.3. Sources of contamination

Objects found on taxiways and aprons may stem for instance from the following sources:

- Debris from damaged pavement;
- Debris from joint sealing;
- Rubber debris from aircraft tires;
- Metal or plastic parts from aircraft;
- Sand and soil from heavy storms, heavy rains or engine blast of aircraft;
- Debris from aircraft or cargo handling activities;
- Debris from maintenance or construction activities;
- Debris from emergency situation; and
- Dead birds or other small animals hit by aircraft.

2.1.4. Personnel responsibility

Even with regular sweeping Alula International Airport Operations cannot fully guarantee the absence of contamination in the areas where work is continually being carried out. Regular apron safety training for all apron personnel on apron risks and the benefit of discipline necessary to minimize careless attitudes of personnel. Cleaning and sweeping can only keep the foreign object damage low when the whole staff takes notice of the problem and keeps the movement area as clean as possible. Refer to SOP_OEAO ADM_01_004 FOD control.

2.1.5. Apron surface monitoring

In order to early identify presence of debris, loose objects or other contamination and thus minimize risks related to the apron contamination it is necessary to establish system for monitoring of apron surfaces. Reporting of apron contamination

Besides regular and irregular safety inspections on aprons performed by Alula International Airport Airside Operations all personnel having access to the apron shall be aware of their responsibility to clean the FOD from apron. When the amount or nature of contamination exceeds personal abilities, every person shall report the identified hazards to the Alula International Airport Airside Operations department.

2.2. Detailed description of tasking of apron cleaning and sweeping

Step	Action		
Upon receipt of information about apron contamination Alula International Airport Operations performs Apron safety inspection and verifies extension of the contamination.	<p>The need for apron cleaning or sweeping may be triggered by the following circumstances:</p> <ul style="list-style-type: none"> ■ Works in progress on the apron. ■ Adverse weather ■ Contingency or emergency situation on the apron ■ Report from the handling agent, airline or FBO operator. 		
2.3.1	Note 1		
If the identified problems are major and require stand or apron restrictions or closure, then Airfield Operations Officer informs Lead Airfield Officer and Alula International Airport Operations department about identified problems with proposal for necessary actions.	<p>2.3.2</p>		
Alula International Airport Operations department then:	<p>2.3.3</p> <ul style="list-style-type: none"> ■ update the daily stand plan in FIDS / AODB; ■ Adapt procedures to avoid restricted or closed stands / aprons. 		
If there is an indication that the problem will persist longer than 24 hours and the nature of the problems require to publish necessary aeronautical information, then Alula International Airport Operations department publishes a Notification to Airman (NOTAM).	<p>2.3.4</p> <p>Note 2</p> <p>The NOTAM shall be issued for presence or removal of, or significant changes in, hazardous conditions due to radioactive material, toxic chemicals, volcanic ash deposition, sand contamination or water on the movement area.</p>		
Alula International Airport Operations informs Airport SGS:	<p>2.3.5</p> <ul style="list-style-type: none"> ■ Scale and nature of the apron/stand contamination; ■ Required priority and timescale for stand / apron recovery; 		
Operation Supervisor informs maintenance contractor to perform cleaning.	<p>2.3.6</p>		
Alula International Airport maintenance manages cleaning or sweeping of the apron.	<p>2.3.7</p> <p>Note 3</p> <p>If contamination includes hydraulic oils, fuel, lubricants, radioactive material or toxic chemicals Airport maintenance cooperates with Airport Fire & Rescue Services.</p>		

Step	Action
2.3.8	When cleaning or sweeping of stands / aprons is finished fully or partially Airport maintenance informs Alula International Airport Operations.
2.3.9	Upon receipt of the information that cleaning / sweeping has been finished Operations Officer performs follow-up inspection to verify that the stands / aprons are suitable for operation.
2.3.10	If during the follow-up inspection Airfield Operations Officer identifies a persisting contamination, then the Airfield operation officers again contact the maintenance contractor to do a repetitive cleaning / sweeping action. The process needs to be repeated until the stand / apron is suitable for aircraft operation.
2.3.11	When Airfield Operations Officer assures that the contamination has been removed and does not constitute any safety or operational concern, then he informs Lead Airfield Officer and Airport operations.
2.3.12	If the NOTAM issued by Airport Operations department, they shall cancel the NOTAM.
2.3.13	Airport Operations Supervisor then: <ul style="list-style-type: none"> ■ cancel the restrictions and update the daily stand plan in Flight Information Data System (FIDS) / Aerodrome Operational Database (AODB); ■ Return to the normal operation.

Appendix A. Glossary

A.1. Terms and definitions

Aircraft Accident	An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which: a) a person is fatally or seriously injured as a result of: <ul style="list-style-type: none">■ being in the aircraft, or■ direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or■ direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or b) the aircraft sustains damage or structural failure which: <ul style="list-style-type: none">■ adversely affects the structural strength, performance or flight characteristics of the aircraft, and■ would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or c) the aircraft is missing or is completely inaccessible. Note 1: For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO. Note 2: An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.
Airport	The entire development area, including all Landside and Airside Areas
Airside	All external areas that are contained by the airport perimeter fence, all internal areas after the security checkpoint
Apron	The apron is an area consisting of the Aircraft Stands and Taxi-lanes
Area of Responsibility	The defined area where a controller holds responsibility
FRCC Clearance	A specific instruction given to aircraft clearing them to depart from the stand

Contact Stand	An aircraft stand that uses an air bridge to disembark passengers
Follow Me	A service provided to guide vehicles or aircraft that are unfamiliar with the aerodrome. A follow me shall also be provided to Vehicles and drivers that are ill equipped or not qualified to operate independently on the movement area.
Ground Movement Control	The FRCC service that provides instructions to aircraft on the maneuvering area
Heavy Rain	Qualitative definition: when rainfall splashes off surfaces and quickly forms standing water puddles on the ground and/or restricts visibility. Quantitative definition: when rain intensity reaches or exceeds 50 mm per hour
Incident	An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
Investigation	A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations.
Landside	All internal areas
Maneuvering Area	The maneuvering area consisting of the Runway(s), and Taxi-lanes at an aerodrome.
MARS	An aircraft stand that can park either 1 large (Code D-F) or two small (Code C) aircraft.
Movement Area	The movement area is defined as areas covered by Aprons or the Maneuvering Area
Off Block Times	The time at which the chocks are removed before an aircraft departs a stand
On Block Times	The time at which an aircraft arrives on stand and the chocks are placed in position
Remote Stand	An aircraft stand that does not use an air bridge to disembark passengers
Safety Occurrence	Any safety-related event which endangers or which, if not corrected or addressed, could endanger an aircraft, its occupants or any other person and includes in particular an accident or serious incident
Safety Performance	A State or a service provider's safety achievement as defined by its safety performance targets and safety performance indicators.

Safety Performance Indicator	A databased parameter used for monitoring and assessing safety performance.
Serious Incident	An incident involving circumstances indicating that an accident nearly occurred. The difference between an accident and a serious incident is providence.
Stand Box	A defined area, delineated on the ground, that defines the aircraft stand area
Swing Gates	Gates where the terminal configuration can be altered to process passengers for domestic or international flights
Taxilane	Areas used for aircraft to maneuver on the Aprons so they can move from the aircraft stand to the maneuvering area
Taxiway	Areas used for aircraft to maneuver from the Aprons to the runway(s)
Terminal	Designated building(s) that are in place to process passengers or cargo

A.2. Abbreviations and acronyms

ACAMS	Airport Control and Monitoring System
ACI	Airports Council International
ACN	Aircraft Classification Number
AGL	Airfield Ground Lighting
AHM	Airport Handling Manual
AIB	Aviation Investigation Bureau
AIP	Aeronautical Information Publication
AMO	Aircraft Maintenance Organizations
ANS	Air Navigation Service
ANSP	Air Navigation Service Provider
AOC	Airside Operations Centre
AODB	Airport Operational Database
AOM	Apron Operations Manual
AoR	Area of Responsibility
APU	Auxiliary Power Unit
A-SMGCS	Advanced-Surface Movement Guidance and Control System
BHS	Baggage Handling System
BSIS	Baggage Source Info Service
CAT	Category

CB	Call Button
EBS	Early Bag Store
EFPS	Electronic Flight Progress Strip
EOC	Emergency Operations Centre
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FRCC	Fire Rescue Communication Center
FBO	Fixed Base Operation
FIDS	Flight Information Display System
FIR	Flight Information Region
FOD	Foreign Object Debris/Damage
FPS	Flight Progress Strip
FRS	Fire and Rescue Service
GA	General Aviation
GACA	General Authority of Civil Aviation
GACAR	General Authority of Civil Aviation Regulation
GHA	Ground Handling Agent
GIDS	General Information Display System
GOM	Ground Operational Manual
GPU	Ground Power Unit
GSE	Ground Service Equipment

HMI	Human Machine Interface
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IHP	Intermediate Holding Points
KPI	Key Performance Indicator
LoA	Letter of Agreement
LVP	Low Visibility Procedure
M&U	Maintenance and Utilities
MACS	Manual of Apron Control Services
MARS	Multiple Aircraft Receiving Stands
MOR	Mandatory Occurrence Report
MWO	Meteorological Watch Office
NOTAM	Notice to Airmen
O&MM	Operations and Maintenance Manual
OIP	Organizationally Important Person
OM	Operating Manual
OOG	Out-Of-Gauge
OTP	On Time Performance
PBB	Passenger Boarding Bridge
PCA	Pre-Conditioned Air
PCN	Pavement Classification Number

PPE	Personal Protective Equipment
PRM	Passenger with Reduced Mobility
PTB	Passenger Terminal Building
QFE	Altimeter Setting
QNH	Altimeter setting
RSAF	Royal Saudi Air Force
RTC	Road Traffic Collision
RTF	Radiotelephone
RVR	Runway Visual Range
SAF	Safety
SAR	Search and Rescue
SGS	Saudi Ground Services
SIGMET	Significant Meteorological Event
SLA	Service Level Agreement
SMS	Safety Management System
SOOG	Super Out-Of-Gauge
SOP	Standard Operating Procedure
TOCC	Terminal Operations Control Center
TWR	Tower
ULD	Universal Loading Devices
VCCS	Voice Communication and Control Services

VCS Voice Communication System

VIP Very Important Person

VIS Visibility

Appendix B. Contact list

Alula International Airport

Unit or Name	Function	Telephone number during working hours	Telephone numbers after working hours	R/T contact
Majed K. Hefni	Airport Operations	0562854845		
Abdulraof Jaber	Airport Maintenance	0568892626		

SANS

Unit or Name	Function	Telephone number during working hours	Telephone numbers after working hours	R/T contact
TWR -				
TWR Supervisor	SANS supervisor at Alula International Airport.			

Saudi Ground Services (SGS)

Unit or Name	Function	Telephone number during working hours	Telephone numbers after working hours	R/T contact
SGS Supervisor	Vehicle control			

Contractors for cleaning and sweeping

Unit or Name	Function	Telephone number during working hours	Telephone numbers after working hours	R/T contact
Maintenance Contractor	Cleaning and sweeping	0506599403	0506599403	



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

SECONDARY POWER SUPPLIES AND TOTAL SYSTEM FAILURE

Document information

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Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition (July 2016)

Associated SOPs, OMIs and O&MMs:

- OM_OEAO ADM_01_001 Aerodrome Manual, Part 5.6 Visual Aids and Aerodrome Electrical Systems
- SOP_OEAO ADM_01_005 Inspection of the Movement Area
- SOP_OEAO ADM_01_016 Restricting aircraft operations during closures
- SOP_OEAO ADM_01_006 Routine maintenance and emergency maintenance

1.1. Purpose

The purpose of this Standard Operating Procedure (SOP) is to provide an overview of Prince Abdulmajeed Bin Abdulaziz Airport airfield electrical power system and the redundancy capability designed to prevent partial or complete system failure. In the event of a total or partial electrical power system failure, this SOP will specify the appropriate communication protocol and those agencies responsible to restore system electrical power with immediacy.

1.2. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Air Traffic Control
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Airlines
	Ground handlers
	Utility companies

Table 1: List of relevant stakeholders

1.3. Scope

In Scope: Prince Abdulmajeed Bin Abdulaziz Airport relies on the primary airfield electrical power supply from the electrical power utility company. In addition, Prince Abdulmajeed Bin Abdulaziz Airport also has a significant system of backup power generation intended to protect the airport from total power failure. In accordance with GACAR 139 standards, Prince Abdulmajeed Bin Abdulaziz Airport has a system designed to meet General Authority of Civil Aviation (GACA) regulations.

In the event of a partial or total system failure, a specific process must be followed to ensure regulatory compliance and the continued safe operation of Airport. Timely and coordinated communication with affected agencies and stakeholders is essential.

This SOP includes:

- Description of primary and secondary airfield electrical power supply system
- Description of potential partial and complete electrical power system failures
- Description of affected agencies and stakeholders in the event of any type of power system failure
- Identification of the responsible parties to respond and repair any type of failure
- Details of a communication protocol to be followed in the event of a partial or complete power system failure
- Details of a communication protocol to be followed upon resumption of normal power

Out of Scope: This SOP does not address back-up sources provided by any individual entities on the airport premises.

1.4. Applicable areas within the airport operation

Through the effective management and maintenance of the secondary power supply system, there should be no secondary power supply failures.

In the unlikely event that there is a secondary power supply failure, it should be addressed immediately.

Restoration of secondary power will be provided by a manual start with a response time of less than one hour.

This SOP primarily applies to Prince Abdulmajeed Bin Abdulaziz Airport Maintenance.

2. Secondary power supplies and total system failure process

2.1. Testing, notification and total failure protocols

Functional Testing

Functional testing of power supply systems must include:

- A simulated primary power supply failure testing (every 6 months), including prior notification to relevant aerodrome personnel;
- A predefined period (e.g. 30 minutes to 1 hour) test run of the secondary power supply to ensure correct functioning of automatic start, change over and shut down functions; and
- Observations that are recorded and confirm that the secondary power supply system functions normally, including prior notification to relevant personnel that change-over to the secondary power supply will occur.

Performance Testing

The secondary power plant should be regularly performance tested every 6 months to ensure conformance to design function. This would include tests in accordance with the manufacturer's recommended testing and schedule such as:

- Automatic start, change-over, load acceptance; and
- A plant test run to full operating temperature; e.g. 4 – 6 hours.

Records

A log of all initial acceptance testing, functional testing and performance testing is to be maintained.

2.2. Notification of Secondary Power Supply Operations to Relevant Personnel

There is a need to ensure that certain aerodrome operational functional areas and personnel are advised of any secondary power supply operation. Notification should be manual (through the Airport Operations) and include the following:

- Fire Communication Center;
- SANS (navigation aids)
- Prince Abdulmajeed Bin Abdulaziz Airport Fire and Rescue Services;
- Other airport operating facilities and systems classified as essential for continued operations of the airport;
- Maintenance Engineering - electrical systems, surveillance, communications; and
- Appropriate personnel associated with other aerodrome facilities or buildings provided with automatic secondary power supply; e.g. terminal buildings, public areas, operations buildings.

A return to normal operations is also to be communicated to the same affected parties.

Procedures during Failure of a Secondary Power Supply

Competent electrical staff of Prince Abdulmajeed Bin Abdulaziz Airport Maintenance must be on duty at all times and in the event of a secondary power supply failure, must conduct a manual start. The response time for manual starting must be less than 1 hour.

In more adverse times for aerodrome operations (e.g. low visibility, thunderstorm activity, times when power supply failures are likely to occur), the secondary power supply must be manually activated by electrical maintenance personnel to operate as the primary power supply, with the primary power source used as the secondary source.

The secondary power supply, when automatically operating as the primary power source must not be reverted back to a secondary source until a stable primary source has been achieved for at least 30 minutes.

Completion Communication Protocol

Electrical maintenance personnel must initiate corrective action and notify all affected parties in the event of a partial or complete power supply failure. The notification function may also be undertaken by remote monitoring of power supply systems.

The process steps for secondary power supplies and total electrical power system failure are as follows. Steps 2.1.1 to 2.1.4 refer to the respective testing protocols. Notification to all operationally affected parties is to occur before any testing regime, together with a return to normal operations.

Step	Action
2.1.1	Secondary power plant shall be subject to regular functional testing to ensure continuity of power supply in the event of primary failure. Functional testing must be conducted at weekly intervals. The functional testing should be planned to have a minimal impact on operations and potential consumers.
2.1.2	The secondary power plant shall be regularly performance tested every 6 months to ensure conformance to design function. This would include: automatic start, change-over, load acceptance and a plant test run to full operating temperature.
2.1.3	Notification of secondary power supply operations is to be made to key operationally affected parties (through the Airport Operations Supervisor and Prince Abdulmajeed Bin Abdulaziz Airport Duty Supervisor as included under paragraph 2.2 of this SOP).
2.1.4	Competent electrical staff of Airport Maintenance shall be on duty at all times and in the event of a secondary power supply failure, shall conduct a manual start.
2.1.5	IF power supply failures are likely to occur, the secondary power supply shall be manually activated to operate as the primary power supply, with the primary power source used as the secondary source.
2.1.6	The secondary power supply, when automatically operating as the primary power source shall not be reverted back to a secondary source until a stable primary source has been achieved for at least 30 minutes.
2.1.7	Electrical maintenance personnel shall log all information and initiate corrective action. They will also notify all affected parties in the event of a partial or complete power supply failure. A return to normal operations is also to be communicated to the affected parties.

3. Power supply systems, failures and switch-over times

3.1. Description of power supply systems

The Prince Abdulmajeed Bin Abdulaziz Airport electrical systems involve primary mains supply system provided by the power supply authority grid. This is backed up by various secondary supply sources in the form of engine-generator sets, which can be automatically connected, to the aerodrome facilities and equipment requiring secondary power.

Secondary power is provided for systems such as aerodrome lighting, air traffic services, radio navigation aids, terminal buildings and other facilities deemed as essential services.

A partial power systems failure occurs when there is a loss of primary and/or secondary power supply to a limited number of aerodrome facilities or equipment.

A complete power systems failure occurs when there is a complete loss of primary and secondary power supply to all aerodrome facilities and equipment.

3.2. Description of partial and complete electrical power system failures

In the event of a partial power systems failure or complete power systems failure, power supply maintenance staff shall be required to restore all power supplies within the standards as specified in Para 3.3.

In the event of a primary power supply system failure, the secondary power supply system automatically ensures continuity of supply within a defined period of time. Switchover times as specified in Para 3.3.

Uninterruptible Power Supply (UPS) systems must be in place to enable continued operation by inbuilt reserves capable of continuous operation for at least one hour to enable maintenance staff to restore primary or secondary power to the UPS system, Airfield lighting system and other installations.

3.3. Maximum switch-over time

The time interval between failure of the primary source of power and the complete restoration of the services for visual aids associated with non-precision, precision approach or takeoff runway shall not exceed 15 seconds.

Appendix A. Glossary

A.1. Terms and definitions

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.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Maneuvering Area	That part of an aerodrome to be used for the takeoff, landing and taxiing of aircraft, excluding aprons.

A.2. Abbreviations and acronyms

AOA	Airport Operations Area
GACA	General Authority of Civil Aviation
FRCC	Fire Rescue Communication Center
ICAO	International Civil Aviation Organization
O&MM	Operating & Maintenance Manual
OM	Operations Manual
RWY	Runway
SMS	Safety Management System
SOP	Standard Operating Procedure
TWY	Taxiway
SANS	Saudi Air Navigation Services



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

NON-COMPLIANCE AND CORRECTIVE ACTION REPORTS

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Eng.Abdulwahab Bokhari	Prince Abdulmajeed Bin Abdulaziz Airport	Airport Director	29/10/2020	

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Doc 9774, Manual on Certification of Aerodromes, First Edition (2001)
- ICAO Doc 9859, Safety Management Manual (SMM), Third Edition (2013)

Associated SOPs, OMIs and O&MMs:

- SOP_OEAO_ADMIN_01_005 Inspection of the Movement Area.
- SOP_OEAO_ADMIN_01_016 Restricting aircraft operations during closures.
- SOP_OEAO_ADMIN_01_017 Protection of sites for radar & navigation aids.
- SOP_OEAO_ADMIN_01_007 Marking of unserviceable areas.

1.2.Purpose

This Standard Operating Procedure (SOP) details the procedure to be implemented by Prince Abdulmajeed Bin Abdulaziz Airport in the event of a discovery of non-compliance with General Authority Civil Aviation of Saudi Arabia (GACA) regulatory provisions and the subsequent requirement for the submission of corrective action thereof. This SOP further outlines the process and sequence to be followed in developing the corrective action to address the issue of non-compliance, in view of the established regulatory requirements to the GACA

1.3.Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Safety	GACA Aerodrome Standards
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Fire Communication Center (FRCC)
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Contractors hired by Prince Abdulmajeed Bin Abdulaziz Airport or airport tenants to perform services on the airport
Western Airports Security Affairs	Aircraft operators at Prince Abdulmajeed Bin Abdulaziz Airport
	Ground handlers
	Catering crews
	Tenants

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: This SOP includes the following:

- Establishing a working group drawn from concerned departments of Prince Abdulmajeed Bin Abdulaziz Airport to examine the cause and reason for non-compliance
- Identify the root cause of non-compliance via three categories; human factors, resources and procedures
- Develop a solution for contributing factors
- Procedure to allocate responsibility for corrective action to the accountable division

- Identify the time line for submission of the corrective action report
- Procedure for final review of corrective action by senior executive before submission to the GACA

Out of Scope: This SOP does not include any non-compliance outside the purview of GACA regulations e.g. criminal activity.

1.5.Applicable areas within the airport operation

This SOP covers all areas of the Aerodrome.

2. Non-compliance and corrective action plans

ICAO's Safety Management System guidance describes the aerodrome as a system. The system description of an aerodrome should include facilities, equipment, personnel, processes and procedures necessary for the operation of the aerodrome. Prince Abdulmajeed Bin Abdulaziz Airport's SMS is the overarching system that applies risk management principles to ensuring that facilities and equipment meet GACA regulations and that these same principles are applied to ensuring all aspects of airside operations are conducted in such a way to meet GACA regulations. Pictorially, this can be presented as shown in Figure below:

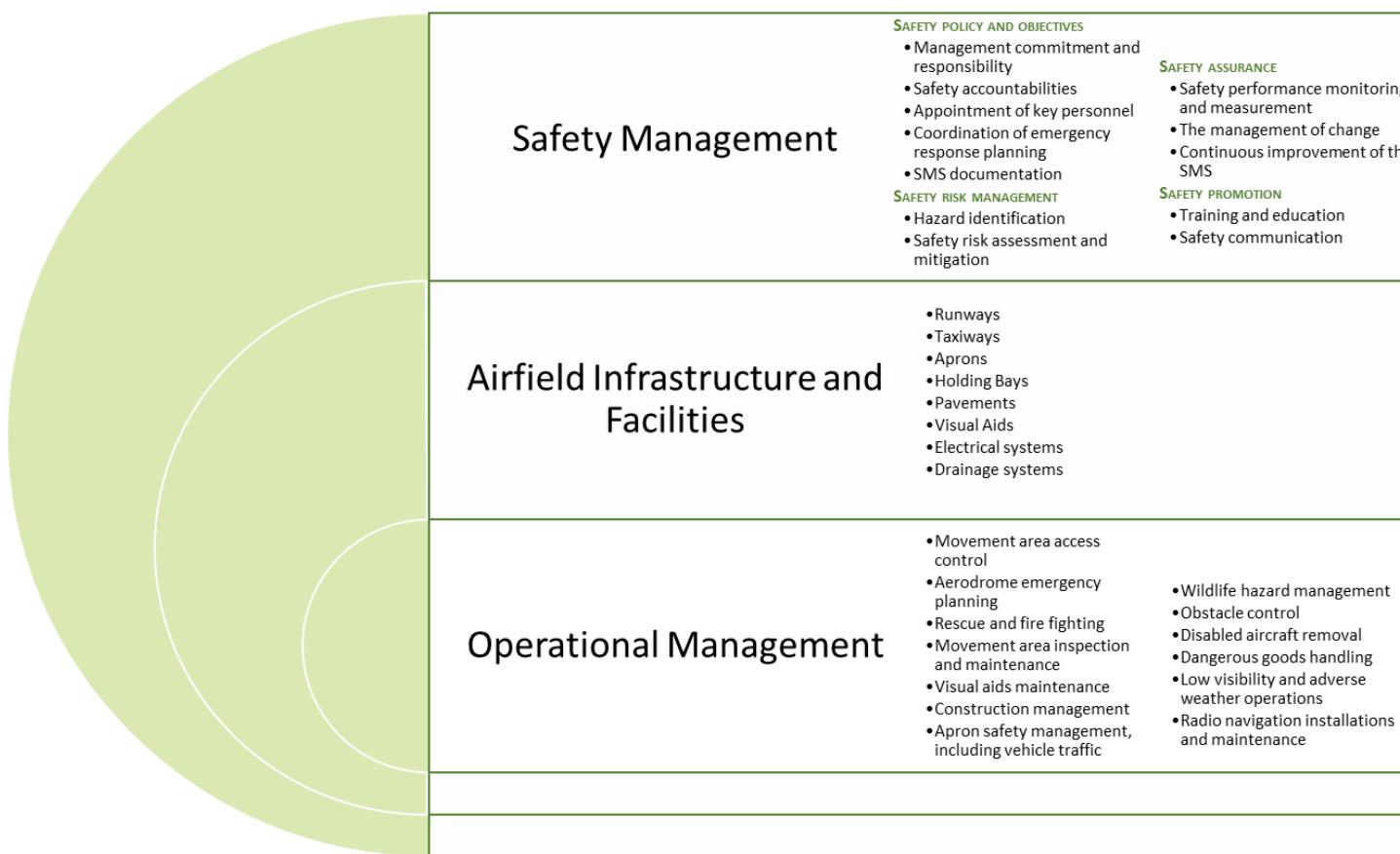


Figure 1: The airport system

Within the context of SMS, Prince Abdulmajeed Bin Abdulaziz Airport has many SOPs that directly address the identification of hazards, their assessment and their mitigation. For those that require follow up action, a corrective action plan (CAP), to correct a deficiency or operating procedure might need to be developed. In addition to the SMS standard operating procedures, many airside SOP could lead to the identification of hazards and the development of mitigation strategies to reduce their risk. These mitigation strategies would be documented in a CAP. Corrective action plans could be simple or complex. For example, if during an inspection FOD is discovered on a runway surface, the immediate response would be to remove it. This very simple corrective plan would simply be logged as part of the inspection process, and likely no further action would be required. However, under SMS and the collection of safety data, it could be discovered that FOD in the same particular area of the airfield is a trend. This trend could lead to the discovery of a problem at large, where the source of FOD would need to be investigated and a plan to correct its source would need to be developed and implemented.

For airfield and infrastructure items, non-compliance might take the form of not meeting the GACA SARP. For example, as a result of a Level 2/3 Inspection - SOP_ OEAO _ADM_01_005, Inspection of the Movement Area and OLS, it is discovered that some airfield signs are not properly located or are too high. This larger issue would require a corrective action plan, which might include an operational assessment, re-engineering and re-construction.

For each specialized SOP, there could be elements of non-compliance and the need for a corrective action plans. There could be many sources of non-compliance within the aerodrome system; facilities, equipment, personnel, processes and procedures.

This SOP identifies the overall process by which a corrective action plan is developed and communicated to GACA if required.

2.1. Non-compliance and corrective action plans

Step	Action
2.1.1	Non-compliance finding is identified through SMS procedures or specialized ADM and AEP procedures.
2.1.2	Conduct risk assessment as per Safety Management Manual
2.1.3	IF the Committee for safety assessment considers further mitigation of the risk, it must seek advice from GACA
2.1.4	Develop corrective action plan (CAP)
2.1.5	Complete Corrective Action Form (Appendix B1)
2.1.6	IF the Committee determined that GACA should be advised THEN send CAP to GACA for acceptance
2.1.7	IF acceptance is received THEN proceed with the implementation of the CAP
2.1.8	IF acceptance is not received THEN rework and resubmit
2.1.9	Implement the CAP
2.1.10	IF applicable advise GACA that CAP is complete
2.1.11	GACA follows up, completes corrective action form and closes the non-compliance finding
2.1.12	File completed CAP in Risk Register

Appendix A. Glossary

A.1. Terms and definitions

Aerodrome Certificate	A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.
Aerodrome Manual	Contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including Safety Management System) and is a fundamental requirement of the certification process; it demonstrates the aerodrome conforms to the certification standards and practices, and there are no apparent shortcomings that would adversely affect the safety of aircraft operations.
Corrective Action Plan	A formal plan to correct a non-compliance finding
GACARs	GACA SARPS (Standards and Recommended Practices) for Annex 14 for aerodrome works.
Non-compliance	Not meeting a GACA standard or recommended practice
NOTAM	Notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

A.2. Abbreviations and acronyms

ADM	Aerodrome Manual
AEP	Airport Emergency Plan
CAP	Corrective Action Plan
FOD	Foreign Objective Debris
GACA	General Authority of Civil Aviation of Saudi Arabia
GACAR	GACA Standards and Recommended Practices
ICAO	International Civil Aviation Organisation
OLS	Obstacle Limitation Surface
PCO	Plan of Construction Operations
SOP	Standard Operating Procedure

Appendix B. Corrective action plan

Corrective Action Form		Prince Abdulmajeed Bin Abdulaziz Airport
Location	Date (dd-mm-yyyy)	
Factual Review of Non-compliance Finding Identify what happened, how widespread it is, where it occurred and what type of problem it is.		
Root cause analysis Identify the type of analysis used, how it was used to derive root cause(s) and what root causes resulted from the analysis		

Proposed Corrective Action	Prince Abdulmajeed Bin Abdulaziz Airport
Proposed Short-Term Corrective Action	
Long-term Corrective Actions (including an assessment of any induced hazards or risks associated to the implementation of the corrective action(s))	
Timelines for Implementation of all Corrective Actions	
Managerial acceptance Name/Signature	Date (dd-mm-yyyy)

GACA Aerodrome Standards Department		
<input type="checkbox"/> CAP Accepted		
Proposed Follow-up: <input type="radio"/> On-Site OR <input type="radio"/> Administrative	Proposed Follow-up Date (dd-mm-yyyy)	
<input type="checkbox"/> CAP Rejected	New CAP Target Date (dd-mm-yyyy)	
Notes		
GACA Inspector's Signature		Date (dd-mm-yyyy)
Non-compliance Finding closed: Reason(s)/Follow-Up/ Comments		
Follow-up Completed: <input type="radio"/> On-Site OR <input type="radio"/> Administrative		Date Completed (dd-mm-yyyy)
Date of Closure (dd-mm-yyyy)	Finding Closed By	



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

FRICTION TESTING

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition (July 2016)

Associated SOPs, OM&Ms and O&MMs:

- OM_OEAO ADM_01_001 Aerodrome Manual, Part 5.7 Maintenance of the Movement Area
- SOP_OEAO _ADM_01_013 Rubber removal prevention program.

1.2. Purpose

The International Civil Aviation Organization (ICAO) and Kingdom of Saudi Arabia General Authority of Civil Aviation (GACA) have regulations regarding runway surface conditions and the periodic measurement of runway friction characteristics. Adequate runway friction characteristics are needed for two distinct purposes:

- Deceleration of the aircraft after landing or after a rejected take-off;
- Maintaining directional control during the ground roll or take-off or landing, in particular in the presence of cross-winds, asymmetric engine power or technical malfunctions, and

Given climatic conditions at Prince Abdulmajeed Bin Abdulaziz Airport runway surface friction / speed, characteristics should be determined for the following circumstances:

- Dry runway, where only infrequent measurement may be needed in order to assess surface texture, wear and restoration requirements;
- Wet runway, where only periodical measurements of the runway friction characteristics are required to determine that they are above a maintenance planning level and/ or minimum acceptable level; and
- The presence of a significant depth of water on the runway, in which case the need for determination of the aquaplaning tendency must be recognized

The runway friction assessment program is based on GACAR 139.

1.3. Relevant stakeholders

The stakeholders who must directly use this SOP together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Airlines
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Fire Rescue communication Center (FRCC)
Prince Abdulmajeed Bin Abdulaziz Airport Safety	GACA Aviation Standards

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: The scope of this SOP includes the procedures associated with a systematized runway friction assessment program. This SOP includes:

- The Prince Abdulmajeed Bin Abdulaziz Airport Maintenance contractor is responsible for friction testing and reporting
- Record keeping
- Minimum friction levels as required by GACA
- Friction testing frequency
- Minimum rubber removal frequency

Out of Scope: This SOP does not address friction testing on other parts of the maneuvering area.

2. Friction testing process

2.1. Criteria for friction testing

One of two series of events can trigger the requirement for friction testing:

- Friction testing must be conducted (as a minimum) in accordance with the Schedule provided in the Table-2 given below. The friction testing is performed or coordinated (through a competent contractor) by Prince Abdulmajeed Bin Abdulaziz Airport Maintenance; or
- Testing may be initiated as a result of reports of poor braking action, visible signs of runway surface wear or excessive rubber deposit and/ or any significant maintenance activity on the runway.

Prince Abdulmajeed Bin Abdulaziz Airport Operations and FRCC are to be informed of planned friction testing together with the results of that testing:

“Areas showing friction test results below a Mu rating of 0.52 (at a test speed of 65 km/hr.), with a Mu Meter Trailer, require maintenance planning leading to rubber removal” (GACAR 139).

Friction testing activation should also be based on the number of aircraft landings per runway as tabled below:

Criteria	Minimum Friction Testing Frequency
Daily turbo-jet aircraft landings per runway end:	
Less than 15	Once per year
16-30	Once every 6 month
31-90	Once every 3 month
91-150	Once every month
151-210	Once every 2 week
Greater than 210	Once every week

Table 2: Friction testing frequency based on aircraft landings

Additionally, the following friction testing parameters (GACAR 139) are to apply depending on the type of test equipment used:

Test Equipment	Test Speed (km/hr)	Maintenance Planning Level	Minimum Friction Level
Mu Meter Trailer	65	0.52	0.42
Mu Meter Trailer	95	0.38	0.26
Skiddometer Trailer	65	0.60	0.50
Skiddometer Trailer	95	0.47	0.34
Surface Friction Tester Vehicle	65	0.60	0.50
Surface Friction Tester Vehicle	95	0.47	0.34
Runway Friction Tester Vehicle	65	0.60	0.50
Runway Friction Tester Vehicle	95	0.54	0.41
TATRA Friction Tester Vehicle	65	0.57	0.48
TATRA Friction Tester Vehicle	95	0.52	0.42
RUNAR Trailer	65	0.52	0.45
RUNAR Trailer	95	0.42	0.32
Grip Tester Trailer	65	0.53	0.43
Grip Tester Trailer	95	0.36	0.24

Table 3: Runway surface conditions levels

The process steps for friction testing are as follows. Step 2.1.1 **or** Step 2.1.2 can be the trigger to initiate action.

Step	Action
2.1.1	Prince Abdulmajeed Bin Abdulaziz Airport Maintenance initiates scheduled friction testing based on aircraft landings data per runway end (Table 3).
2.1.2	Prince Abdulmajeed Bin Abdulaziz Airport Maintenance initiates action as a result of reports of poor braking action, visible signs of runway surface wear or excessive rubber deposit and/ or any significant maintenance activity on the runway This step is independent of step 2.1.1.
2.1.3	Prince Abdulmajeed Bin Abdulaziz Airport Operations and FRCC are informed of planned friction testing. Coordination is required to ensure minimal disruption to aircraft operations and also to ensure that the task can be performed safely in accordance with Prince Abdulmajeed Bin Abdulaziz Airport's Safety Management System (SMS).
2.1.4	Prince Abdulmajeed Bin Abdulaziz Airport Maintenance ensures that the works party is competent and trained to undertake the friction testing techniques in accordance with section 3.2 of this SOP.
2.1.5	Pre-testing is to be completed as per section 3.1 of this SOP. [Note: Post testing is also required on the same defined test strip].
2.1.6	Friction testing methodology and speed of choice is made (i.e. 65 or 95 km/hr) by Prince Abdulmajeed Bin Abdulaziz Airport Maintenance.
2.1.7	Friction testing is conducted and results are obtained. Depending on the results there may be 3 courses of action a) No remedial action; b) Maintenance planning is required for rubber removal; and c) Results do not meet minimal friction level and more immediate action is required.
2.1.8	Completion of task and results are communicated to Prince Abdulmajeed Bin Abdulaziz Airport Operations and FRCC.
2.1.9	IF minimal friction level is not met, NOTAM is issued to advise that the runway is slippery when wet.
2.1.10	IF maintenance is required then rubber removal is to be performed in accordance with SOP_OEAO ADM_01_013, Rubber removal prevention program.
2.1.11	Records of friction testing are to be logged with the details as described in section 3.3 of this SOP.

3. Friction testing pre-testing, techniques and records

3.1. Pre-testing

Prior to and after undertaking the runway friction tests, the Continuous Friction Measurement Equipment (CFME) must be checked on a defined test strip of pavement that is not used for aircraft operations. Comparison of the sample readings with previous results must be used to verify the calibration of the CFME equipment.

3.2. Techniques

All personnel undertaking runway friction tests must comply with the requirements for runway and movement area access.

The friction tests should only be carried out when the runway surface is dry, free from precipitation, and has no wet patches.

Friction readings for the survey run must be collected by the CFME along the entire pavement length. Multiple runs must be made along the runway parallel to the centerline, offset on either side and in both landing directions.

Testing must be conducted at both 3 and 6 meters from the runway centerline, to determine the worst-case condition associated with the most trafficked wheel paths. If, due to the undercarriage widths of certain aircraft operating, measurements at 5 and 7 meters can be used. If the worst-case condition is found to be consistently limited to one track, future surveys may be limited to this track, subject to periodically undertaking a full multiple-track check to account for any future and/ or seasonal changes in aircraft mix.

Two friction measurement runs must be performed at each chosen offset. Results of the four measured runs are to be averaged to determine the "100 Meter Section Average Friction" values along the length of the runway and the overall "Runway Average Friction" value. The use of discrete values can be applied if the software is available.

A normal procedure is to divide the runway into zones 100 meters in length with an average friction value determined every 10 meters along a run, enabling a 100-meter rolling average to be calculated. An alternative acceptable method is to use discrete averaging for interpretation immediately after the testing. The friction test runs should be carried out along the entire pavement length at a constant speed, starting with the run closest to the runway edge. The runs should preferably be performed at two speeds, 65 km/h and 95 km/h, although if operationally constrained, runs may be conducted only at 65km/h.

3.3. Records

Records must be kept of all runway surface friction tests.

The following items must be included in the standard test report:

- Date and time of assessment;
- Type of CFME used;
- Name of operator;
- Runway number and runway direction;
- Distance from the centerline and which side of the centerline the run was performed;
- Distance from the threshold where the run was performed;
- Constant run speed (km/h) for each run;
- Runway length;
- Amount of water film used;
- Surface condition (dry/ damp/ wet);
- Weather conditions and ambient temperature;
- Friction levels for each portion of the pavement. This can include average friction levels for each third of the runway at each offset, direction and speed;
- Overall friction level for the full length of the runway and the 10 meter friction averages in the touchdown zones;
- A comparison of the results with any previous surveys conducted, providing the same CFME has been used;
- Evaluation of friction levels between the reference non-trafficked test strip and the trafficked runway during the current survey;
- Any evaluations of the reference non-trafficked test strip between successive surveys;
- Any additional comments.

A suggested report that includes these elements is outlined in Appendix B.

Appendix A. Glossary

A.1. Terms and definitions

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.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Mu	Coefficient of friction
Maneuvering Area	That part of an aerodrome to be used for the takeoff, landing and taxiing of aircraft, excluding aprons.

A.2. Abbreviations and acronyms

AOA	Airport Operations Area
CFME	Continuous Friction Measuring Equipment
GACA	General Authority of Civil Aviation of Saudi Arabia
FRCC	Fire Rescue Communication center
ICAO	International Civil Aviation Organization
Mu	Mu value
O&MM	Operating & Maintenance Manual
OM	Operations Manual
RWY	Runway
SMS	Safety Management System
SOP	Standard Operating Procedure

Appendix B. Runway friction test report

Runway Friction Test Record		Prince Abdulmajeed Bin Abdulaziz Airport			
Date and time of assessment (dd-mm-yyyy):	Type of CFME:				
Name of Operator:	Runway Number and Direction: Runway Length:				
Distance from the centerline and which side of centerline:	3m from Centerline:	6m from Centerline:			
Distance from threshold:	Run One:	Run Two:			
Constant run speed (65km/h or 95 km/h) for each run:	Run One:	Run Two:			
Amount of water film used:					
Surface condition:	Dry <input type="checkbox"/>	Damp <input type="checkbox"/>	Wet <input type="checkbox"/>		
Friction levels:	First 1/3:	Second 1/3:	Last 1/3:	Total:	
Did you compare results with previous survey with same CFME used?	Yes <input type="checkbox"/>			No <input type="checkbox"/>	
Reference any difference between test strip and successive surveys:	Test Strip:			Successive Survey:	
Comments:					



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

RUBBER REMOVAL PREVENTION PROGRAM

Document information

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Name	Company	Job Title	Date	Signature
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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition (July 2016)

Associated SOPs, OMs and O&MMs:

- OM_OEAO ADM_01_001 Aerodrome Manual, Part 5.7 Maintenance of the Movement Area
- SOP_OEAO ADM_01_012 Friction testing

1.2. Purpose

The International Civil Aviation Organization (ICAO) and Kingdom of Saudi Arabia General Authority of Civil Aviation (GACA) have regulations regarding runway surface conditions and the periodic measurement of runway friction characteristics.

Rubber deposited in the touchdown zone by tires of landing aircraft can obliterate runway markings and, when wet, can create an extremely slick surface. These rubber deposits can affect runway friction characteristics and should be removed periodically.

1.3. Relevant stakeholders

The stakeholders who must directly use this Standard Operating Procedure (SOP) together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Airlines
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Prince Abdulmajeed Bin Abdulaziz Airport Safety
FRCC	

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: This SOP includes the procedures associated with a systematized runway friction assessment program and its associated rubber removal requirements. This SOP addresses:

- Using the results of runway surface friction tests and determining areas where rubber removal is required
- Rubber removal frequency
- Rubber removal techniques
- Rubber removal equipment
- Record keeping
- Training requirements

Out of Scope: This SOP does not address rubber removal on other parts of the maneuvering area.

1.5. Applicable areas within the airport operation

This SOP applies to Prince Abdulmajeed Bin Abdulaziz Airport Maintenance and Prince Abdulmajeed Bin Abdulaziz Airport Operations and FRCC.
This SOP is applicable to the runway at the airport.

2. Rubber removal process

2.1. Criteria for rubber removal action

One of two events can trigger the requirement for rubber removal.

- Rubber removal must be conducted (as a minimum) in accordance with the Schedules provided in Tables 2 and 3, or otherwise as determined by runway friction tests. The rubber removal process is performed by Prince Abdulmajeed Bin Abdulaziz Airport Maintenance;
- Runway friction tests must be conducted in accordance with SOP_OEAO_ADM_01_012, Friction testing. The friction testing is performed or coordinated (through a competent contractor) by Prince Abdulmajeed Bin Abdulaziz Airport Maintenance.

Prince Abdulmajeed Bin Abdulaziz Airport Operations and FRCC are to be informed of planned rubber removal (i.e. post friction testing or part of the routine schedule as indicated in Table 4).

Areas showing friction test results below a Mu rating of 0.52 (at a test speed of 65km/hr.) require **maintenance planning** leading to rubber removal.

Additionally, the following frequency of action for rubber removal is required post friction testing:

Mu Rating	Frequency of Action
0.40 to 0.49	Within 120 days
0.30 to 0.39	Within 90 days
0.20 to 0.29	Within 60 days
<0.19	Within 30 days

Table 2: Rubber removal activation based on friction testing

Rubber removal activation should also be based on the number of aircraft landings per runway end as tabled below:

Criteria	Minimum Rubber Removal Frequency
Daily turbo-jet aircraft landings per runway end:	
Less than 15	Once every 2 years
16-30	Once every year
31-90	Once every 6 months
91-150	Once every 4 months
151-210	Once every 3 months
Greater than 210 Whenever friction measurements are less than 0.52Mu	Once every 2 months

Table 3: Rubber removal activation based on aircraft landings

The process steps for rubber removal are as follows. Step 2.1.1 or Step 2.1.2 can be the trigger to initiate action.

Step	Action
2.1.1	SOP_OEAO_ADMIN_01_012 Friction testing initiates requirement for rubber removal. Rubber removal is dependent on the results of the friction testing coordinated by Prince Abdulmajeed Bin Abdulaziz Airport Maintenance at that time. Prince Abdulmajeed Bin Abdulaziz Airport Maintenance who then advises Prince Abdulmajeed Bin Abdulaziz Airport Operations Supervisor to issue NOTAM.
2.1.2	Scheduled rubber removal is planned based on aircraft landings data per runway end. This is managed directly by Prince Abdulmajeed Bin Abdulaziz Airport Operations. This step is independent of step 2.1.1.
2.1.3	Prince Abdulmajeed Bin Abdulaziz Airport FRCC are informed of planned rubber removal. Coordination is required to ensure minimal disruption to aircraft operations and also to ensure that the task can be performed safely in accordance with Prince Abdulmajeed Bin Abdulaziz Airport's Safety Management System (SMS).
2.1.4	Prince Abdulmajeed Bin Abdulaziz Airport Maintenance ensures works party is competent and trained to undertake the rubber removal activity in accordance with section 3.4 of this SOP.
2.1.5	The choice of Rubber removal technique is made and consulted with Prince Abdulmajeed Bin Abdulaziz Airport Maintenance (Engineers) to ensure that the integrity of the pavement surface is not unduly impacted.
2.1.6	Rubber removal equipment familiarization is required together with the mobilization of such equipment in the field.
2.1.7	Rubber removal is conducted.
2.1.8	Prince Abdulmajeed Bin Abdulaziz Airport Operations and FRCC are informed of completion of rubber removal task.

Step	Action
2.1.9	Records of rubber removal are to be logged with the details as described in section 3.3 of this SOP.

3. Rubber removal techniques, equipment, records and training

3.1. Techniques

There are four primary rubber removal techniques available for consideration:

- High pressure water, comprising either ultra-high pressure or high pressure water without the use of chemical additives;
- Chemical solvents;
- High velocity abrasion (shot blasting);
- Mechanical abrasion – a range of techniques from wire brushing and sandblasting to milling of 3mm to 5mm of the runway surface. A typical operation has productivity around 1,000 square meters/ hour and might involve a runway closure for up to 10 hours.

Combinations of the above (e.g. chemical/ shot blasting or high pressure water/ chemical) may also be used.

3.2. Equipment

Water blasting typically involves a water pressure head truck with recovery, and a broom sweeper, involving a crew of 3-4. Productivity of this method is around 1,100 square meters/ hour which allows completion of one runway end during a 6-7-hour runway closure period. Ultra-high pressure water blasting uses smaller water cutting equipment that can be easily removed and thus avoid extended closure of a runway. Typically, 6 machines are used for a single runway end, with two-crew per machine.

The chemical removal process uses chemical spray trucks, mechanical brooms, a vacuum truck and a tanker truck, with an average crew of four. Expected productivity is around 1,500 square meters /hour typically involving a 5-8-hour runway closure for removal on one end.

Shot blasting uses a special purpose-built machine, plus vacuum device to remove residue, and has a 3,000-3,700 square meter/ hour productivity.

3.3. Record keeping

All rubber removal activities must be logged with the following parameters recorded for every application:

- Friction levels produced by the last friction test;
- Areas subject to rubber removal;
- Technique used;
- Post-removal runway surface inspection;
- Results of next friction test over the treated area;
- Next proposed planned test.

Reports must be submitted to the Prince Abdulmajeed Bin Abdulaziz Airport Head of Airfield Maintenance. A suggested report that includes these elements is included at Appendix B.

3.4. Training

All personnel working on rubber removal crews (whether contractor Prince Abdulmajeed Bin Abdulaziz Airport staff) must have received formal training on the rubber removal methodology, including environmental management training by the rubber removal contractor.

All personnel working on rubber removal crews must be trained by the rubber removal contractor, and must comply with the requirements of this SOP and maneuvering area (specifically runway) access. Training should include:

- Familiarization with this SOP;
- Situational awareness (operating on the runway);
- Radio communications;
- Utilization of equipment (operational use, safety procedures, maintenance).

Appendix A. Glossary

A.1. Terms and definitions

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.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Mu	Coefficient of friction
Maneuvering Area	That part of an aerodrome to be used for the takeoff, landing and taxiing of aircraft, excluding aprons.

A.2. Abbreviations and acronyms

AOA	Airport Operations Area
GACA	General Authority of Civil Aviation of Saudi Arabia
FRCC	Fire Rescue Communication Center
O&MM	Operating & Maintenance Manual
OM	Operations Manual
RWY	Runway
SMS	Safety Management System
SOP	Standard Operating Procedure

Appendix B. Rubber removal report

Rubber Removal Report	Prince Abdulmajeed Bin Abdulaziz Airport			
Date (dd-mm-yyyy):	Affected Runway:			
Last recorded Friction Mu Value:	Technique used (<i>high pressure water, chemical solvents, high velocity abrasion, or mechanical abrasion</i>):			
Was a post-removal runway surface inspection conducted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
What were the results of the post removal friction test?	Below 0.52 Mu Value? <input type="checkbox"/>		Above 0.52 Mu Value? <input type="checkbox"/>	
When was last rubber removal conducted for this runway?	Within 120 Days <input type="checkbox"/>	Within 90 Days <input type="checkbox"/>	Within 60 Days <input type="checkbox"/>	Within 30 Days <input type="checkbox"/>
Summary: (<i>if Mu value was still below .52 was same removal technique conducted, if not, what technique was used?, how long did the removal process take with selected technique, any issues addressed, any maintenance issues with equipment, etc.</i>)				
Date of next proposed planned test:				



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

AIRCRAFT ENGINE GROUND RUNNING

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Name	Company	Job Title	Date	Signature
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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016
- ICAO Annex 16, Volume 1, Environmental Protection - Aircraft Noise, Eighth Edition (July 2017)

Other external references:

- ACI Policies and Recommended Practices (7th Edition) 2009

Associated SOPs, OMIs and O&MMs:

- OM_OEAO_ADM_01_001 Aerodrome Manual

1.2. Purpose

This Standard Operating Procedure (SOP) provides the method in which aircraft ground running is conducted at Prince Abdulmajeed Bin Abdulaziz Airport.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	GACA Aviation Standards
Prince Abdulmajeed Bin Abdulaziz Airport Safety	
FRCC	
Airlines	
Fire and Rescue Services	
Ground handlers	

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: This SOP shall:

- Define the designated area of the airfield where ground engine running is permitted.
- Define the times and days that engine running is permitted.
- Define the division of Prince Abdulmajeed Bin Abdulaziz Airport accountable for the management and oversight of engine running.
- Define procedures to address deviations/breaches of engine running procedures.
- Define a procedure to ensure noise compliance certification of aircraft operators.
- Define an inspection procedure of the designated engine run area to ensure that FOD from asphalt deterioration is identified and subsequently removed or repaired.
- Logging of all engine running activities.
- Monitoring of public complaints as related to engine running activities.

Out of Scope:

- Aircraft engine running as part of regular operations or in airline maintenance areas
- Define safe areas for movement of personnel during engine running (this is the responsibility of the aircraft operator).
- Define the personal protective equipment required during engine running (this is the responsibility of the aircraft operator).
- Ensure that light aircraft/equipment/personnel remain beyond a distance of 250 meters of the engine running (this is the responsibility of the aircraft operator).

1.5.Applicable areas within the airport operation

This SOP covers designated engine run-up area on the **taxiway** of the airport.

Note : The part of the airport indicating the directions, for the engine run-up area, need to be mentioned in the above blank.

2. Aircraft Engine run-up permission

Aircraft engines are complex mechanical systems that require regular maintenance to meet the rigors of operational service. To maintain a high level of safety, maintenance standards require aircraft operators to test engines and their components before the aircraft is put back into service. These tests are referred to as aircraft “engine run-ups”.

The duration and engine power setting during a run-up are dependent on the systems being checked. Because run-ups cause fuel burn and wear on engine components, the duration of a run-up is kept to a minimum.

As a rule, aircraft maintenance is done at night because, in general, aircraft operate during daytime hours. As operators prepare to place the aircraft back into service for the following morning, some run-ups occur during the night-time and early morning hours.

To manage noise from run-up operations, a structured approach on how, where and when run-ups are permitted is required. In order to manage this operation, operators must call Prince Abdulmajeed Bin Abdulaziz Airport Operations to request acceptance for an engine run-up. If an acceptance is granted, the operator is assigned a specific location on the airfield and a heading for the run-up. This is intended to ensure the run-up is conducted safely and to minimize noise disturbances to those living in the immediate vicinity of the airport. During the night-time hours, the number of accepted run-up locations is further reduced to have aircraft positioned away from populated areas as much as possible.

Table 2 identifies the location of where on the airfield engine run-ups are permitted and the time of day at which they are permitted.

Engine Run-Up Permissions	
Airfield location	Hours permitted
Taxiway	

Table 2: Engine run-up permissions

2.1. Aircraft engine run-up permission

Step	Action
2.1.1	Aircraft operator contacts operations to request permission to do an engine run-up. The time at which the run-up will occur is required.
2.1.2	operations determines optimum location and heading for the aircraft for the run-up and grants permission to operator
2.1.3	operations logs the request in the Occurrence Logbook; AIRCRAFT OPERATOR, DATE/TIME REQUESTED, LOCATION AND HEADING assigned and advises Airport Operations
2.1.4	Aircraft operator proceeds to location and proceeds with the engine run-up
2.1.5	Aircraft operator completes run-up and contacts the operations to indicate that the run-up is complete
2.1.6	Airport Operations completes and logs DATE AND TIME in Occurrence Logbook
2.1.7	Airport Operations proceeds to the location to determine if the run-up has generated FOD and cleans up if necessary
2.1.8	Airport Operations examine is FOD free and that the occurrence can be closed
2.1.9	Airport Operations logs the DATE AND TIME COMPLETE, DATE AND TIME CLOSED and closes the occurrence log

3. Aircraft engine run-up infractions

In order to control illegal aircraft engine run-ups, the Prince Abdulmajeed Bin Abdulaziz Airport will impose a fine to aircraft operators that do not respect the procedures with respect to requesting permission to execute an aircraft engine and to follow the directives as to the permitted location and heading. This system of fines is described in Table 3.

Engine Run-Up Fines	
	Fine
1 st offense	Warning letter
2 nd offense in calendar year	Prince Abdulmajeed Bin Abdulaziz Airport to determine
3 rd offense in calendar year	Prince Abdulmajeed Bin Abdulaziz Airport to determine
4 th offense in calendar year	Prince Abdulmajeed Bin Abdulaziz Airport to determine

Table 3: Engine run-up fines

3.1. Aircraft engine run-up fines

Step	Action
3.1.1	The Prince Abdulmajeed Bin Abdulaziz Airport is made aware that an aircraft engine run-up is proceeding without permission
3.1.2	Airport Operations logs this occurrence in the occurrence log: AIRCRAFT OPERATOR, DATE AND TIME
3.1.4	Airport Operations proceeds to location and advises aircraft operator that permission has not been granted
3.1.5	Airport Operations notes the name of the AIRCRAFT OPERATOR, THE AIRCRAFT MECHANIC, THE LOCATION, THE TIME AND PHOTOGRAPHS the occurrence
3.1.6	Airport Operations updates the occurrence log
3.1.7	The Airport Operations investigates occurrence to determine the level of infraction (first, second, third or fourth) and sends information to Finance Affairs
3.1.8	Using the template in Appendix B, Finance Affairs issues Aircraft Engine Run-up Letter of Infraction

4. Logging of public complaints

A noise complaint phone line and/or e-mail address could be used as a means of allowing the public to report noise complaints. At times, noise complaints could be received. These should be investigated in order to determine if they are as a result of an engine run-up.

Prince Abdulmajeed Bin Abdulaziz Airport will need to confirm if these are in place or if there is any intent of doing so – assuming so, then.

4.1. Logging of public complaints

Step	Action
4.1.1	Airport Safety Officer receives noise complaint
4.1.2	Airport Safety Officer advises the Airport Operations
4.1.3	Airport Operations investigates aircraft engine run-up Occurrence Logbook to determine if this was due to an accepted run-up
4.1.4	IF the complaint is due to an accepted run-up THEN this is noted against the run-up the Occurrence Log record
4.1.5	IF NOT then complaint is logged in the Occurrence Log
4.1.6	Airport Operations advises Airport Safety Officer
4.1.7	Airport Safety Officer updates noise complaint register

Appendix A. Glossary

A.1. Terms and definitions

Aircraft engine run-up	Aircraft engine run-ups are performed by aircraft mechanics at a specified location on the aerodrome to test engines and diagnose engine problems. The duration and engine power setting during a run-up are dependent on the systems being checked.
------------------------	--

A.2. Abbreviations and acronyms

GACA	General Authority of Civil Aviation of Saudi Arabia
SMS	Safety Management System
SOP	Standard Operating Procedure

Appendix B. Sample template wording for letter of infraction

Date

Aircraft Operator Name

Address

Subject: Aircraft Engine Run-Up

Prince Abdulmajeed Bin Abdulaziz Airport has strict procedures regarding aircraft engine run-ups. Before proceeding with an aircraft engine run-up, you are required to contact the Airport Operations in order to request permission. At this time, you must provide the estimated time of the procedure. The Airport Operations then grants acceptance and identifies the appropriate location and heading of the aircraft. This procedure is in place in order to minimize aircraft engine noise in adjacent communities and to allow our operations staff to verify the site conditions once the procedure has terminated.

Your company executed an aircraft engine run-up on (DATE) at (TIME) without permission.

- (1) This letter serves as a warning OR
- (2) Given that this is your 2nd/3rd/4th fine in this calendar year, the Prince Abdulmajeed Bin Abdulaziz Airport is levying a fine for this occurrence

The table below illustrates the Prince Abdulmajeed Bin Abdulaziz Airport's system of fines for proceeding with an aircraft engine run-up without permission.

Engine Run-Up Fines	
	Fine
1st offense	Warning letter
2nd offense in calendar year	Prince Abdulmajeed Bin Abdulaziz Airport to determine
3 rd offense in calendar year	Prince Abdulmajeed Bin Abdulaziz Airport to determine
4 th offense in calendar year	Prince Abdulmajeed Bin Abdulaziz Airport to determine



STANDARD **O**PERATING **P**ROCEDURES

AIRCRAFT MARSHALLING

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01.1	02/08/2021	Alula International Airport Operations	Majed K. Hefni	Eng.Abdulwahab Bokhari	Change SOP name From (Prince Abdulmajeed Bin Abdulaziz Airport) To: (AIUla International Airport)
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Document sign off

Name	Company	Job Title	Date	Signature
Eng.Abdulwahab Bokhari	Alula International Airport.	Airport Director		

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1. Introduction

1.1. Regulation and reference documents

External legal, regulatory standards and/or policy:

- ICAO Annex 2 Rules of the Air;
- ICAO Annex 2, Appendix 1;

Other external references:

- IATA Airport Handling Manual 43rd Edition;
- UK CAP637 Visual Aids Handbook.

1.2. Purpose

This document facilitates positioning of the aircraft and describes Standard Operating Procedure (SOP) for the marshalling service to the aircraft in the following cases:

- For stands not installed with VDGS;
- Non-standard parking.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Operations	SANS
Handling agents	Airlines
FRCC	
FBO Hangar Operator	

Table 1: List of relevant stakeholders

1.4. Scope

In scope: The scope of this SOP covers marshalling on aircraft stands 1-7.

This procedure describes an information flow among organizational units and stakeholders in order to enable continuous flow of aircraft on the aprons and reduce or eliminate any delays. The SOP also contains actual instructions for Marshallers as it how to align the aircraft to a desired position including the aspects to be considered when positioning aircraft on non-standard stands or aircraft for which marked parking position does not exist on the desired stand (for instance the need to accommodate an A-330).

Note: For the purpose of this document **Non-standard stand** means a stand that was not originally designed for the aircraft and the stand code letter is lower than the actual aircraft code letter. It also includes parking within the FBO hangar.

This procedure also sets the training requirements on personnel performing marshalling.

1.5. Applicable areas within the airport operation

This SOP is applicable to all activities around aircraft at Alula International Airport.

2. High level overview of the marshalling process

2.1. Overview of sections

The following sections detail the necessary pre-requisites and processes that must be followed by all stakeholders when marshalling aircraft on Alula International Airport.

A brief summary of each section is given below:

- Section 3 details the requirements on Marshaller training that have to be completed before Marshaller is assigned the task;
- Section 4 describes the signals used by Marshaller to control aircraft movement and signals of wing walkers to Marshaller to ensure the obstacle clearance;
- Section 5 details the processes of Marshaller tasking in different situations.

2.2. General requirements

No person shall guide an aircraft unless trained, qualified and approved by Alula International Airport Operations or the Handling Agent to carry out the functions of a Marshaller in compliance with Section 3 of this SOP. Once approved the Marshaller is responsible for providing standard marshalling signals in a clear and precise manner to arriving and departing aircraft in accordance with Section 4.

The Marshaller shall use “Dayglo” wands, bats or gloves when signalling. Illuminated wands shall be used at night or in low visibility conditions.

Marshallers must be familiar with the aircraft stand constraints.

3. Training requirements

Training requirements defined in this chapter are mandatory for any entity authorized to conduct marshalling at Alula International Airport.

3.1. Training scheme

Training scheme for Marshallers is a combination of theoretical and practical activities to ensure the trainees understanding of, and ability to complete, the marshalling task. It consists of the following elements as needed:

- Basic training;
- On the job training;
- Skill assessment;
- Re-training; and
- Recurrent training.

Table 2 describes different elements of the training scheme for Marshallers:

Name	Description
Basic training	Theoretical training focused on gaining elementary knowledge and understanding of marshalling service, operational aspects and limitations as well as hazards.
On the job training	Part of training when a trainee performs marshalling under supervision.
Skill assessment	Knowledge and skill verification is required to ensure that the trainee achieved a required level of competency. Upon successful completion of the skill assessment, trainee can be considered as qualified to fulfil marshalling tasks.
Re-training	Set of additional training sessions to ensure the minimum required level of competency or to verify understanding of the marshalling procedures.
Recurrent training	Recurrent training is recommended by IATA to be repeated within 3 years.

Table 2: Description of training program elements for Marshallers

3.2. Training requirements

3.2.1. Basic training

Each person who has never been involved in the marshalling service and whose working position requires marshalling of aircraft shall pass basic theoretical training in accordance with training requirements defined under Section 4. Basic theoretical training shall be conducted by the qualified and approved Marshaller with at least 3 years of experience.

Basic training shall as a minimum cover the following:

- National, international and industrial regulations related to marshalling services;
- Familiarization with airside SOPs;
- Marshalling signals in accordance with Section 4;
- Aircraft ground movement characteristics;
- Airside marking and signage;
- General hazards related to aircraft marshalling;
- Hazards related to aircraft marshalling under different weather conditions;
- Human factors (motivation / attitude, human behaviour, communication skills, stress, fatigue, time pressure, team work, situational awareness).

3.2.2. On the job training

On the job training shall be conducted under supervision of the qualified and approved Marshaller with at least 3 years of experience who has an eligibility to be assigned as an instructor. The length of the on-job training depends on the trainee's performance but shall cover as a minimum marshalling of 50 aircraft on all applicable aprons. In order to properly assess the trainee's progress through the on-job training period the training should be conducted by a single instructor.

3.2.3. Skill assessment

At the end of the basic and on-job training each trainee shall pass skill test to demonstrate that he achieved required level of competence. The skills shall be assessed by qualified and approved Marshaller with 5-year experience assigned to perform the test. The assessment shall not be done by the Marshaller who was involved into on-job training of the examined trainee.

Skill test shall as a minimum cover the following:

- Oral part when trainee demonstrates his theoretical knowledge of the process and safety prerequisites;
- Marshalling of 3 aircraft including marshalling with wing walker assistance.

Completion of the skill test is recorded in the personal file of the Marshaller and recorded in the Alula International Airport Operations.

3.2.4. Re-training

Re-training element is usually initiated following procedural failure, accident/incident, significant safety shortcomings, negative safety trends, near miss or prolonged absence of more than 6 months from the marshalling activities.

Re-training may be required by Alula International Airport Safety and by the individual entity providing marshalling service that defines required scope of the re-training.

3.2.5. Recurrent training

Recurrent training is provided in a 3-year period mainly with the focus on changes in the procedure, safety prerequisites and new types of aircraft if applicable. This can be achieved by observing during Aircraft turnaround audits. If there is any safety concern identified, then Alula International Airport Safety may require re-training.

3.3. Training records

All marshalling training, assessments and competencies shall be documented in a timely and consistent manner by Alula International Airport Operations within a Training register and the personal files of the employees.

The training record shall identify the content and the date when the particular training element has been delivered to the trainee. The trainee and the trainer shall sign the training record.

Training content and records shall be made available for review by GACA, Alula International Airport Safety and airline representatives.

4. Marshalling signals

4.1. Signals used by Marshaller

The following chapter describes signals between Marshaller and the pilot and between Marshaller and the wing walkers. These standard signals shall be used all the time when marshalling or push back procedure is taking place.

Marshalling hand signals shall be given from a position forward of the aircraft while facing and within view of the pilot.

The Marshaller shall keep constant visual contact with the flight crew and wing walkers throughout the manoeuvre. If visual contact is lost, the operation must stop and not re-commence until visual contact is re-established.

Illuminated wands shall be used to improve the visibility of the hand signals in the following situations:

- Insufficient apron lighting;
- Poor visibility; and
- Night conditions.

The aircraft engines are numbered in relation to the signalman facing the aircraft, from right to left (i.e. No. 1 engine being the port outer engine).

Note	Signals 16 to 21 are dedicated to helicopter operation only.
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1. Wing walker/guide

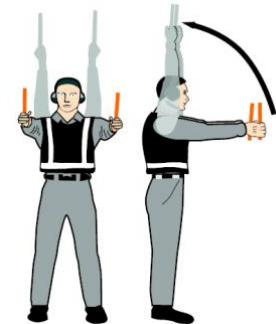
Raise right hand above head level with wand pointing up; move left-hand wand pointing down toward body.

Note: This signal provides an indication by a person positioned at the aircraft wing tip, to the pilot/ Marshaller/push-back operator, that the aircraft movement on/off a parking position would be unobstructed.



2. Identify stand

Raise fully extended arms straight above head with wands pointing up.



3. Proceed to next signalman or as directed by tower/ground / apron control

Point both arms upward; move and extend arms outward to sides of body and point with wands to direction of next signalman or taxi area.



4. Straight ahead

Bend extended arms at elbows and move wands up and down from chest height to head.



5 a). Turn left (from pilot's point of view)

With right arm and wand extended at a 90-degree angle to body, make "come ahead" signal with left hand. The rate of signal motion indicates to pilot the rate of aircraft turn.



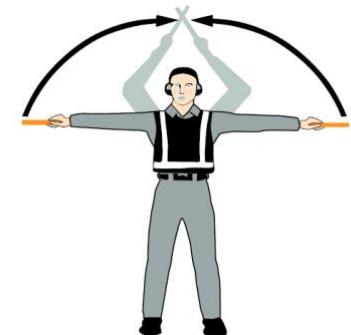
5 b). Turn right (from pilot's point of view)

With left arm and wand extended at a 90-degree angle to body, make "come ahead" signal with right hand. The rate of signal motion indicates to pilot the rate of aircraft turn.



6 a). Normal stop

Fully extend arms and wands at a 90-degree angle to sides and slowly move to above head until wands cross.



6 b). Emergency stop

Abruptly extend arms and wands to top of head, crossing wands.



7a). Set brakes

Raise hand just above shoulder height with open palm. Ensuring eye contact with flight crew, close hand into a fist. **Do not** move until receipt of "thumbs up" acknowledgement from flight crew.



7 b). Release brakes

Raise hand just above shoulder height with hand closed in a fist. Ensuring eye contact with flight crew, open palm. **Do not** move until receipt of "thumbs up" acknowledgement from flight crew.



8 a). Chocks inserted

With arms and wands fully extended above head, move wands inward in a “jabbing” motion until wands touch. **Ensure** acknowledgement is received from flight crew.



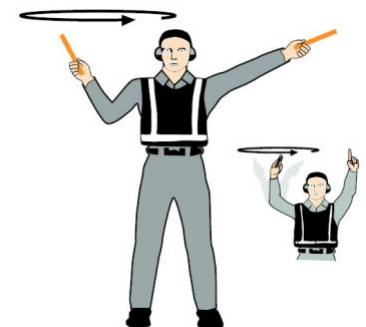
8 b). Chocks removed

With arms and wands fully extended above head, move wands outward in a “jabbing” motion. **Do not** remove chocks until authorized by flight crew.



9. Start engine(s)

Raise right arm to head level with wand pointing up and start a circular motion with hand; at the same time, with left arm raised above head level, point to engine to be started.



10. Cut engines

Extend arm with wand forward of body at shoulder level; move hand and wand to top of left shoulder and draw wand to top of right shoulder in a slicing motion across throat.



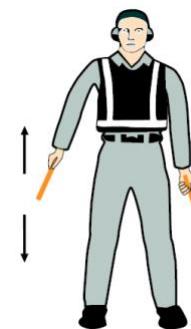
11. Slow down

Move extended arms downwards in a “patting” gesture, moving wands up and down from waist to knees.



12. Slow down engine(s) on indicated side

With arms down and wands toward ground, wave either *right* or *left* wand up and down indicating engine(s) on *left* or *right* side respectively should be slowed down.



13. Move back

With arms in front of body at waist height, rotate arms in a forward motion. To stop rearward movement, use signal 6 a) or 6 b).



14 a). Turns while backing (for tail to starboard)

Point left arm with wand down and bring right arm from overhead vertical position to horizontal forward position, repeating right-arm movement.



14 b). Turns while backing (for tail to port)

Point right arm with wand down and bring left arm from overhead vertical position to horizontal forward position, repeating left-arm movement.



15. Affirmative/all clear

Raise right arm to head level with wand pointing up or display hand with "thumbs up"; left arm remains at side by knee.

Note: This signal is also used as a technical/ servicing communication signal.



HELICOPTER SIGNALS

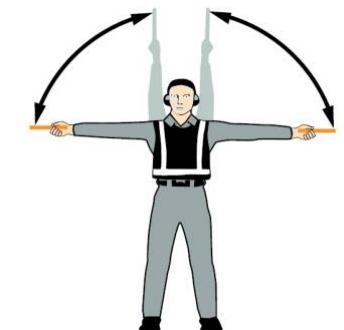
16. Hover

Fully extend arms and wands at a 90-degree angle to sides.



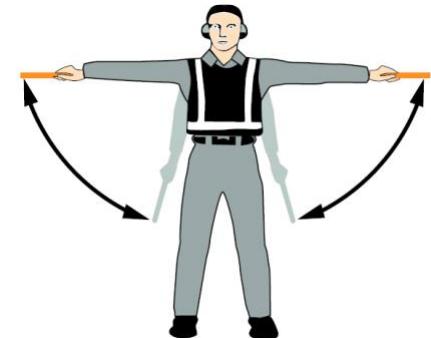
17. Move upwards

Fully extend arms and wands at a 90-degree angle to sides and, with palms turned up, move hands upwards. Speed of movement indicates rate of ascent.



18. Move downwards

Fully extend arms and wands at a 90-degree angle to sides and, with palms turned down, move hands downwards. Speed of movement indicates rate of descent.



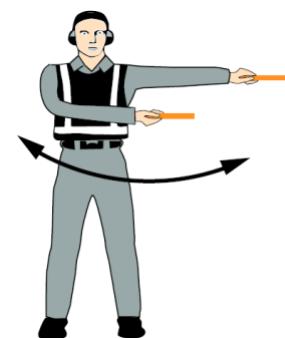
19 a). Move horizontally left (from pilot's point of view)

Extend arm horizontally at a 90-degree angle to right side of body. Move other arm in same direction in a sweeping motion.



19 b). Move horizontally right (from pilot's point of view)

Extend arm horizontally at a 90-degree angle to left side of body. Move other arm in same direction in a sweeping motion.



20. Land

Cross arms with wands downwards and in front of body.



21. Hold position/stand by

Fully extend arms and wands downwards at a 45-degree angle to sides. Hold position until aircraft is clear for next manoeuvre.



ALL AIRCRAFT

22. Dispatch aircraft

Perform a standard salute with right hand and/or wand to dispatch the aircraft. Maintain eye contact with flight crew until aircraft has begun to taxi.



23. Fire

Move right-hand in a “fanning” motion from shoulder to knee, while at the same time pointing with left hand to area of fire.

Night — same with wands.



4.2. Signals used by technicians or ground handling personnel

Signals no. 24 to 29 shall be used for communication with pilot by ground personnel when providing ground services to an aircraft and are established to standardize the use of hand signals used to communicate to flight crews during the aircraft movement process that relate to servicing or handling functions.

Manual signals shall only be used when verbal communication is not possible with respect to technical/servicing communication signals. Signalmen (Marshaller or handling personnel) shall ensure that an acknowledgement is received from the flight crew with respect to technical/servicing communication signals.

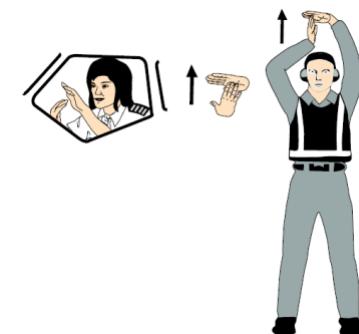
24. Do not touch controls (technical/servicing communication signal)

Extend right arm fully above head and close fist or hold wand in horizontal position; left arm remains at side by knee.



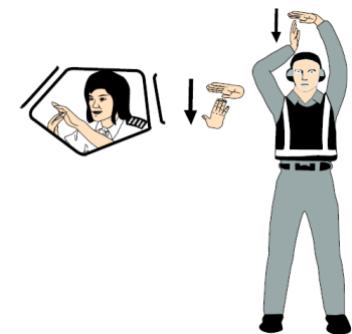
25. Connect ground power (technical/servicing communication signal)

Hold arms fully extended above head; open left hand horizontally and move finger tips of right hand into and touch open palm of left hand (forming a "T"). At night, illuminated wands can also be used to form the "T" above head.



26. Disconnect power (technical/servicing communication signal)

Hold arms fully extended above head with finger tips of right hand touching open horizontal palm of left hand (forming a "T"); then move right hand away from the left. **Do not** disconnect power until authorized by flight crew. At night, illuminated wands can also be used to form the "T" above head.



27. Negative (technical/servicing communication signal)

Hold right arm straight out at 90 degrees from shoulder and point wand down to ground or display hand with "thumbs down"; left hand remains at side by knee.



28. Establish communication via interphone (technical/servicing communication signal)

Extend both arms at 90 degrees from body and move hands to cup both ears.



29. Open/close stairs (technical/servicing communication signal)

With right arm at side and left arm raised above head at a 45-degree angle, move right arm in a sweeping motion towards top of left shoulder.

Note: This signal is intended mainly for aircraft with the set of integral stairs at the front.



4.3. Signals used by pilot to Marshaller or ground handling personnel

To maintain visual communication between Marshaller and pilot, the Marshaller shall understand also signals used by pilots to inform Marshaller about required or performed activities. These signals are designed for use by a pilot in the cockpit with hands plainly visible to the signalman, and illuminated as necessary to facilitate observation by the Marshaller.

30. Brakes engaged

Raise arm and hand with fingers extended horizontally in front of face, then clenched fist.

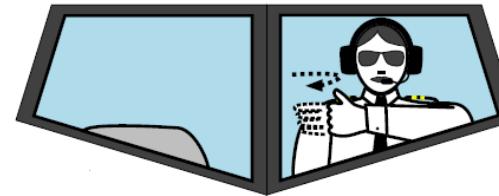
The moment the fist is clenched indicates the moment of brake engagement.



31. Brakes released

Raise arm, with fist clenched, horizontally in front of face, then extend fingers.

The moment the fingers are extended indicates the moment of brake release.



32. Insert chocks

Arms extended palms facing outwards, move hands inwards to cross in front of face.



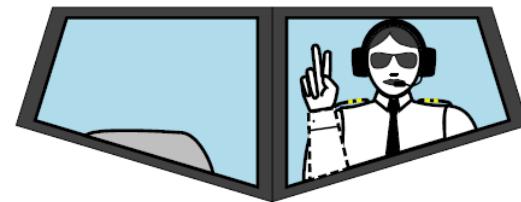
33. Remove chocks

Hands crossed in front of face, palms facing outwards, move arms outwards.



34. Ready to start engine indicated

Raise the number of fingers on one hand indicating the number of the engine to be started. For this purpose the aircraft engines shall be numbered as follows, No. 1 engine shall be the port outer engine, No. 2, the port inner engine, No. 3, the starboard inner engine and No. 4, the starboard outer engine.



35. Connect ground power

Hold arms fully extended above head; open left hand horizontally and move finger tips of right hand into and touch open palm of left hand (forming a "T"). At night, illuminated wands can also be used to form the "T" above head.



36. Disconnect power

Hold arms fully extended above head with finger tips of right hand touching open horizontal palm of left hand (forming a "T"); then move right hand away from the left. **Do not** disconnect power until authorized by flight crew. At night, illuminated wands can also be used to form the "T" above head.



5. Process of aircraft marshalling

5.1. General consideration / Staff planning

Sufficient number of Marshallers shall be available to provide marshalling service for all aircraft planned to be parked on the stands without VDGS. The Marshallers shall be planned based on seasonal plans to allow seamless/continuous apron operation.

Alula International Airport operations shall ensure that sufficient number of Marshallers are planned for the expected operation on the following day and prepares allocation of resources for marshalling (Marshallers and vehicles).

At the beginning of each shift Alula International Airport operations issues daily plan for marshalling with allocation of flights to each Marshaller.

At the beginning of the shift each Marshaller shall check completeness and correct functions of the all necessary equipment:

- Function of wands; and
- Radios

During the shift Marshallers shall monitor FIDS/AODB for changes in the daily plan. If any conflict of duties, that could cause a delay of an aircraft, occurs the Marshaller shall inform Alula International Airport Operations and act according to provided instructions.

Note	Communication means with Alula International Airport Operations: <ul style="list-style-type: none">■ Telephone■ Hand held radio■ Other methods may be employed which will be agreed with the Marshallers and Alula International Airport Operations at a future date
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5.2. Dispatch Marshaller for standard marshalling

Handling Agent is required to provide marshalling for all aircraft stands:-

WARNING 1 	If Marshaller spots any hazard of potential collision use the “ Emergency stop ” signal to prevent from any damage or harm.
WARNING 2 	This process involves approaching an aircraft with running engines. This process should only be completed by suitably trained and experienced staff. Under no circumstance may a vehicle or pedestrian approach an aircraft until after the anti-collision lights have been switched off.

The following steps should be performed but their sequence is not mandatory.

Step	Action
5.2.1	If there is no change in ETA of an aircraft, then the Marshaller at ETA-15 minutes checks in FIDS/AODB allocated stand or position within the FBO hanger and departs for the stand. If there is a change in the ETA, Alula International Airport Operations informs Marshaller usually not later than ETA – 15 minutes about the changes.
5.2.2	After arrival to the stand the Marshaller shall: <ul style="list-style-type: none"> ■ Perform FOD check and remove all debris ■ Make sure that the stand surface condition is sufficient to safe aircraft movement. ■ Make sure that all ground handling equipment is positioned behind the safety line / outside the equipment restraint area ■ Make sure that the stand area is free of objects and obstacles which the aircraft may strike or endanger others due to jet blast effects ■ If parking within the FBO hanger ensure that the identified parking position is large enough for the aircraft and the positioning of the centre of the aircraft and stop point allows for access to the hanger, avoids other aircraft and allows for positioning of tugs for backing out of the aircraft.
5.2.3	As aircraft approaches the stand the Marshaller points to the stand lead-in line on the apron to be followed by the aircraft by standing at the top of the stand lead-in line and giving the “ IDENTIFY STAND ” signal.
5.2.4	While the aircraft taxies along the guide-in line, the Marshaller gives the “ Straight ahead ” signal with marshalling wands.
5.2.5	The nose wheel should follow the lead-in line all the way to the appropriate stop point. Use the “ Turn Left ” or “ Turn Right ” signals to correct the track of the aircraft as required. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Note Use other signals defined in the Chapter 4 as needed. </div>
5.2.6	As the aircraft approaches the stop position, use the “ Slow Down ” signal if required. As the nose wheel reaches the stop point slowly cross the wands in the “ Stop ” signal.
5.2.7	When the aircraft stops in the required/desired position, use the “ Set brakes ” signal. Wait for the signal from pilot confirming “ Brakes engaged ”.
5.2.8	Once the aircraft has come to a complete stop and all conditions for chocking are met, the aircraft is chocked. Use the “ Chocks inserted ” signal to inform pilot that the aircraft is safely choked.
5.2.9	Once aircraft choked, the marshalling task is finished.

5.3. Dispatch Marshaller to aircraft for non-standard aircraft

Alula International Airport Marshaller is required in case that there is a need to park non-standard aircraft.

Note 1	For the purpose of this SOP the “non-standard” aircraft is an aircraft for which marked parking position does not exist on the desired apron (for example the need to accommodate an B-777 or similarly large aircraft).
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Step	Action
5.3.1	Handling agents, airlines or any other airport user submit their request for non-standard aircraft parking at least 24 hours before planned aircraft arrival to Alula International Airport.
5.3.2	<p>After receiving request for marshalling Alula International Airport Operations checks availability of experienced Marshallers (wing walkers if needed) for the expected period taking into consideration following:</p> <ul style="list-style-type: none">■ Planned tasks; and■ Available vehicles. <p>CAUTION Experienced Marshaller is a qualified and approved Marshaller with at least 3 years experience.</p>
5.3.3	Alula International Airport Operations and Handling Agent nominate experienced Marshaller and reserves wing walkers (in case they are needed) and informs nominated Marshaller about the task providing following information: <ul style="list-style-type: none">■ Aircraft type;■ Required apron; and■ Date and ETA.

Step	Action
5.3.4	<p>The nominated Marshaller prepares in due time plan considering the following:</p> <ul style="list-style-type: none"> ■ Aircraft characteristics (wing span, wheel span, turning radius, etc); ■ Regulatory requirements (wing tip clearance, outer wheel clearance); ■ Compatibility of an aircraft ACN with apron PCN; ■ Potential obstructions; ■ Need for wing walkers; and ■ Jet blast effect. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note Aircraft characteristics should be taken from official aircraft manufacturer sources or any other credible sources (software for stand design with operational characteristics of the particular A/C)</p> <p>Note Computer simulation of the taxing aircraft may be used to identify potential conflict with ground infrastructure (masts, ground installations, pavements with not sufficient load-bearing, etc.).</p> </div>
5.3.5	<p>If any potential obstruction identified Marshaller requests the assignment of wing walkers.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note On-site check of the taxi router and the apron may be needed in advance to ensure that there is no unexpected obstruction that could cause any conflict.</p> </div>
5.3.6	<p>If the stand lead-in line won't be used for aircraft alignment and there is an obstruction identified the Marshaller may use temporary auxiliary marking on the apron to safely navigate an aircraft to desired position and to delineate safety lines / the equipment restraint area.</p> <p>.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note Chalk or reflective removable tapes may be used to provide temporary auxiliary marking.</p> </div>
5.3.7	<p>If there is no change in ETA of an aircraft reported then the Marshaller at ETA-20 minutes checks in FIDS/AODB allocated stand, briefs wing walkers (if needed) and departs for the stand.</p>
5.3.8	<p>After arrival to the parking area the Marshaller shall:</p> <ul style="list-style-type: none"> ■ Perform FOD check and remove all debris ■ Make sure that the parking area surface condition is sufficient to safe aircraft movement. ■ Make sure that all ground handling equipment is positioned not creating obstruction ■ Make sure that the parking area is free of objects and obstacles which the aircraft may strike into or endanger other apron users due to jet blast effects.
5.3.9	<p>As aircraft approaches the parking area the Marshaller points to the parking area on the apron to be followed by the aircraft by standing at the top of the desired position and giving the "IDENTIFY STAND" signal.</p>

Step	Action
5.3.10	<p>Marshaller gives signals defined in Chapter 4 as needed to manoeuvre the aircraft to the desired position.</p> <div style="border: 2px solid orange; padding: 5px; margin-bottom: 10px;"> CAUTION Monitor signals of the wing walkers to assure a safe distance is maintained from any obstacles / obstructions </div> <div style="border: 2px solid red; padding: 5px;"> WARNING  If Marshaller spots any hazard of potential collision use the “Emergency stop” signal to prevent from any damage or harm. </div>
5.3.11	<p>If Marshaller uses temporary auxiliary marking the nose wheel should follow the marking all the way to the appropriate stop point. Use the “Turn Left” or “Turn Right” signals to correct the track of the aircraft as required.</p>
5.3.12	<p>As the aircraft approaches the stop position, use the “Slow Down” signal if required. As the nose wheel reaches the stop point slowly cross the wands in the “Stop” signal.</p>
5.3.13	<p>When the aircraft stops in the required/desired position, use the “Set brakes” signal. Wait for the signal from pilot confirming “Brakes engaged”.</p>
5.3.14	<p>Once the aircraft has come to a complete stop and all conditions for chocking are met, the aircraft is chocked. Use the “Chocks inserted” signal to inform pilot that the aircraft is safely choked.</p>
5.3.15	<p>Once aircraft chocked, the marshalling task is finished.</p> <div style="border: 2px solid red; padding: 5px;"> WARNING  When the aircraft leaves the parking area the temporary auxiliary marking shall be completely removed. </div>

5.4. Dispatch Marshaller to aircraft for non-standard parking

Handling Agent Marshaller is required in case that there is a need to park an aircraft in a non-standard position on the apron or on other parking area.

Note 1	For the purpose of this SOP the “non-standard” position means a stand that was not originally designed for the aircraft and the stand code letter is lower than the actual aircraft code letter or the aircraft is required to park out of standard stand. This also includes parking of aircraft within the FBO hanger
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Step	Action
5.4.1	Handling agents, airlines or any other airport user submit their request for non-standard position parking at least 2 hours before planned aircraft arrival to Alula International Airport.
5.4.2	After receiving request for marshalling Handling agents checks availability of experienced Marshallers (wing walkers if needed) for the expected period taking into consideration following: <ul style="list-style-type: none">■ Planned tasks; and■ Available vehicles. <div style="border: 2px solid orange; padding: 5px; margin-top: 10px;">CAUTION Experienced Marshaller is a qualified and approved Marshaller with at least 3 year experience.</div>
5.4.3	Alula International Airport Operations and handling agent nominate experienced Marshaller and reserves wing walkers (in case they are needed) and informs nominated Marshaller about the task providing following information: <ul style="list-style-type: none">■ Aircraft type;■ Required apron and / or stand; and■ Date and ETA.

Step	Action				
5.4.4	<p>The nominated Marshaller prepares in due time plan considering the following:</p> <ul style="list-style-type: none"> ■ Aircraft characteristics (wing span, wheel span, turning radius, etc); ■ Regulatory requirements (wing tip clearance, outer wheel clearance); ■ Potential obstructions; ■ Need for wing walkers; and ■ Jet blast effect. <table border="1" data-bbox="361 414 2061 552"> <tr> <td data-bbox="361 414 579 477">Note</td><td data-bbox="579 414 2061 477">Aircraft characteristics should be taken from official aircraft manufacturer sources or any other credible sources (software for stand design with operational characteristics of the particular A/C)</td></tr> <tr> <td data-bbox="361 477 579 552">Note</td><td data-bbox="579 477 2061 552">Computer simulation of the taxing aircraft may be used to identify potential conflict with ground infrastructure (masts, ground installations, pavements with not sufficient load-bearing, etc.).</td></tr> </table>	Note	Aircraft characteristics should be taken from official aircraft manufacturer sources or any other credible sources (software for stand design with operational characteristics of the particular A/C)	Note	Computer simulation of the taxing aircraft may be used to identify potential conflict with ground infrastructure (masts, ground installations, pavements with not sufficient load-bearing, etc.).
Note	Aircraft characteristics should be taken from official aircraft manufacturer sources or any other credible sources (software for stand design with operational characteristics of the particular A/C)				
Note	Computer simulation of the taxing aircraft may be used to identify potential conflict with ground infrastructure (masts, ground installations, pavements with not sufficient load-bearing, etc.).				
5.4.5	<p>If any potential obstruction identified Marshaller requests the assignment of wing walkers.</p> <table border="1" data-bbox="361 647 2061 716"> <tr> <td data-bbox="361 647 579 716">Note</td><td data-bbox="579 647 2061 716">On-site check of the taxi router and the apron may be needed in advance to ensure that there is no unexpected obstruction that could cause any conflict.</td></tr> </table>	Note	On-site check of the taxi router and the apron may be needed in advance to ensure that there is no unexpected obstruction that could cause any conflict.		
Note	On-site check of the taxi router and the apron may be needed in advance to ensure that there is no unexpected obstruction that could cause any conflict.				
5.4.6	<p>If the stand lead-in line won't be used for aircraft alignment and there is an obstruction identified the Marshaller may use temporary auxiliary marking on the apron to safely navigate an aircraft to desired position and to delineate safety lines / the equipment restraint area.</p> <p>.</p> <table border="1" data-bbox="361 843 2061 890"> <tr> <td data-bbox="361 843 579 890">Note</td><td data-bbox="579 843 2061 890">Chalk or reflective removable tapes may be used to provide temporary auxiliary marking.</td></tr> </table>	Note	Chalk or reflective removable tapes may be used to provide temporary auxiliary marking.		
Note	Chalk or reflective removable tapes may be used to provide temporary auxiliary marking.				
5.4.7	<p>If there is no change in ETA of an aircraft reported then the Marshaller at ETA-20 minutes checks in FIDS / AODB allocated stand, briefs wing walkers (if needed) and departs for the stand.</p>				
5.4.8	<p>After arrival to the parking area the Marshaller shall:</p> <ul style="list-style-type: none"> ■ Perform FOD check and remove all debris ■ Make sure that the parking area surface condition is sufficient to safe aircraft movement. ■ Make sure that all ground handling equipment is positioned not creating obstruction ■ Make sure that the parking area is free of objects and obstacles which the aircraft may strike into or endanger other apron users due to jet blast effects. 				
5.4.9	<p>As aircraft approaches the parking area the Marshaller points to the parking area on the apron to be followed by the aircraft by standing at the top of the desired position and giving the "IDENTIFY STAND" signal.</p>				

Step	Action
5.4.10	<p>Marshaller gives signals defined in Chapter 4 as needed to manoeuvre the aircraft to the desired position.</p> <div style="border: 2px solid orange; padding: 5px; margin-bottom: 10px;"> CAUTION Monitor signals of the wing walkers to assure a safe distance is maintained from any obstacles / obstructions </div> <div style="border: 2px solid red; padding: 5px;"> WARNING  If Marshaller spots any hazard of potential collision use the "Emergency stop" signal to prevent from any damage or harm. </div>
5.4.11	<p>If Marshaller uses temporary auxiliary marking the nose wheel should follow the marking all the way to the appropriate stop point. Use the "Turn Left" or "Turn Right" signals to correct the track of the aircraft as required.</p>
5.4.12	<p>As the aircraft approaches the stop position, use the "Slow Down" signal if required. As the nose wheel reaches the stop point slowly cross the wands in the "Stop" signal.</p>
5.4.13	<p>When the aircraft stops in the required/desired position, use the "Set brakes" signal. Wait for the signal from pilot confirming "Brakes engaged".</p>
5.4.14	<p>Once the aircraft has come to a complete stop and all conditions for chocking are met, the aircraft is chocked. Use the "Chocks inserted" signal to inform pilot that the aircraft is safely choked.</p>
5.4.15	<p>Once aircraft choked, the marshalling task is finished.</p> <div style="border: 2px solid red; padding: 5px;"> WARNING  When the aircraft leaves the parking area the temporary auxiliary marking shall be completely removed. </div>

5.5. Dispatch Marshaller to an aircraft at the work in progress location

Handling agent Marshaller is required in case that there is a need to park an aircraft in the location where work in progress take place and there is a legitimate / well founded concern that safety of the aircraft might be compromised due to running works.

When work in progress is planned Alula International Airport Operations makes decision about safety measures including closure of movement areas (see SOP_OEAO_ADM_01_007 Marking of unserviceable areas). In case there is a need to maintain stands open for aircraft parking and handling even though there were safety hazards identified the marshalling to the stands influenced by the works shall be provided by Handling agent Marshallers.

First Day of Works - Alula International Airport operations ensure that sufficient number of Marshallers and wing walkers are planned for the expected operation on the following day and prepares allocation of resources for marshalling (Marshallers, wing walkers and vehicles) including marshalling at the work in progress locations.

Step	Action
5.5.1	If there is no change in ETA of an aircraft then the Marshaller at ETA-15 minutes checks in FIDS /AODB allocated stand, brief wing walker and departs with wing walkers for the stand. If there is a change in the ETA Alula International Airport Operations informs Marshaller usually not later than ETA – 15 minutes about the changes.
5.5.2	After arrival to the stand the Marshaller shall: <ul style="list-style-type: none">■ Perform FOD check and remove all debris■ Make sure that the stand surface condition is sufficient to safe aircraft movement.■ Make sure that all ground handling equipment and construction equipment is positioned behind the safety line / outside the equipment restraint area■ Make sure that the stand area is free of objects, obstacles and personnel which the aircraft may strike into or endanger due to jet blast effects.
5.5.3	As aircraft approaches the stand the Marshaller and wing walkers shall be positioned. Ma points to the stand lead-in line on the apron to be followed by the aircraft by standing at the top of the stand lead-in line and giving the " IDENTIFY STAND " signal.
5.5.4	The nose wheel should follow the lead-in line all the way to the appropriate stop point. Use the " Turn Left " or " Turn Right " signals to correct the track of the aircraft as required.

Step	Action
5.5.5	<p>Marshaller gives signals defined in Chapter 4 as needed to manoeuvre the aircraft to the desired position.</p> <div style="border: 2px solid orange; padding: 5px; margin-bottom: 10px;"> CAUTION Monitor signals of the wing walkers to assure a safe distance is maintained from any obstacles / obstructions. </div> <div style="border: 2px solid red; padding: 5px;"> WARNING  If Marshaller spots any hazard of potential collision use the “Emergency stop” signal to prevent from any damage or harm. </div>
5.5.6	As the aircraft approaches the stop position, use the “Slow Down” signal if required. As the nose wheel reaches the stop point slowly cross the wands in the “Stop” signal.
5.5.7	When the aircraft stops in the required/desired position, use the “Set brakes” signal. Wait for the signal from pilot confirming “Brakes engaged”.
5.5.8	Once the aircraft has come to a complete stop and all conditions for chocking are met, the aircraft is chocked. Use the “Chocks inserted” signal to inform pilot that the aircraft is safely choked.
5.5.9	Once aircraft choked, the marshalling task is finished.

5.6. Marshalling in adverse weather and under low visibility conditions

If there was an adverse weather warning issued the Marshaller shall through the duration of the adverse weather increase vigilance and pay attention to additional safety measures.

Generally, for all adverse weather conditions Marshaller and wing walkers shall consider:

- Extra time for transportation between the base office and the stand;
- Extra time for all ramp activities;
- Pedestrian hazards and difficulties to move on open areas; and
- Lower speed for aircraft movement.

5.6.1. Sand storm

Through the sand storm the visibility is very low and may complicate visual contact between the Marshaller and the pilot and thus Marshaller shall always use the lighted wands for signalling.

Drifting sand particles may harm Marshaller's sight during the marshalling and therefore Marshaller and wing walkers shall wear additional PPE that protects their eyes (safety glasses).

5.6.2. Low visibility conditions

Similarly, as through the sand storm the visual contact between the pilot and the Marshaller may be impaired and therefore Marshaller shall through the low visibility conditions always use the lighted wands for signalling.

Before aircraft approaches a stand the Marshaller shall ensure that the pilot taxing on taxilane will be able to clearly recognize the Marshaller's signals.

5.6.3. Thunder storm

Any operation during lightning at the airport is very dangerous and the operation shall be stopped. In case there is a need for mar to finish the marshalling task the Marshaller and wing walkers (when needed) shall minimize their exposure time on the open areas and, near buildings and masts (poles).

5.6.4. Heavy rain / flood

Similarly, as through the sand storm and low visibility conditions the visual contact between the pilot and the Marshaller may be impaired and therefore Marshaller shall through the heavy rain always use the lighted wands for signalling.

5.6.5. Strong wind

Through the strong wind period Marshaller shall ensure that:

- All the ground handling and apron equipment adjacent to the stand is properly secured (parking brakes are used on all parked GSE, before aircraft arrives; and
- Additional chokes are used to secure the aircraft.

Appendix A. Glossary

A.1. Terms and definitions

Aircraft Accident	<p>An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:</p> <p>a) a person is fatally or seriously injured as a result of:</p> <ul style="list-style-type: none">■ being in the aircraft, or■ direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or■ direct exposure to jet blast, <p>except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or</p> <p>b) the aircraft sustains damage or structural failure which:</p> <ul style="list-style-type: none">■ adversely affects the structural strength, performance or flight characteristics of the aircraft, and■ would normally require major repair or replacement of the affected component, <p>except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or</p> <p>c) the aircraft is missing or is completely inaccessible.</p> <p>Note 1: For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.</p> <p>Note 2: An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.</p>
Airport	The entire development area, including all Landside and Airside Areas
Airside	All external areas that are contained by the airport perimeter fence, all internal areas after the security checkpoint
Apron	The apron is an area consisting of the Aircraft Stands and Taxi-lanes
Apron Control Management	The management personnel of the Apron Control Unit

Apron Control Service	A service that shall provide instructions to aircraft on Aprons and Taxi-lanes that shall guide them from the maneuvering area to an appropriate parking stand and from an appropriate parking stand to the maneuvering area.
Apron Control Shift Leader	The certified person that is in charge of any Apron Control Room
Apron Control Unit	The organization that shall provide the Apron Control Service
Apron Controller	Certified personnel that shall give instructions to aircraft maneuvering on the Aprons and Taxi-lanes
Area of Responsibility	The defined area where a controller holds responsibility
ATC Clearance	A specific instruction given to aircraft clearing them to depart from the stand
Contact Stand	An aircraft stand that uses an air bridge to disembark passengers
Follow Me	A service provided to guide vehicles or aircraft that are unfamiliar with the aerodrome. A follow me shall also be provided to Vehicles and drivers that are ill equipped or not qualified to operate independently on the movement area.
Ground Movement Control	The ATC service that provides instructions to aircraft on the maneuvering area
Heavy Rain	Qualitative definition: when rainfall splashes off surfaces and quickly forms standing water puddles on the ground and/or restricts visibility. Quantitative definition: when rain intensity reaches or exceeds 50 mm per hour
Incident	An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
Investigation	A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations.
Landside	All internal areas
Maneuvering Area	The maneuvering area consisting of the Runway(s), and Taxi-lanes at an aerodrome.
MARS	An aircraft stand that can park either 1 large (Code D-F) or two small (Code C) aircraft.

Movement Area	The movement area is defined as areas covered by Aprons or the Maneuvering Area
Off Block Times	The time at which the chocks are removed before an aircraft departs a stand
On Block Times	The time at which an aircraft arrives on stand and the chocks are placed in position
Remote Stand	An aircraft stand that does not use an air bridge to disembark passengers
Safety Occurrence	Any safety-related event which endangers or which, if not corrected or addressed, could endanger an aircraft, its occupants or any other person and includes in particular an accident or serious incident
Safety Performance	A State or a service provider's safety achievement as defined by its safety performance targets and safety performance indicators.
Safety Performance Indicator	A data-based parameter used for monitoring and assessing safety performance.
Serious Incident	An incident involving circumstances indicating that an accident nearly occurred. The difference between an accident and a serious incident is providence.
Stand Box	A defined area, delineated on the ground, that defines the aircraft stand area
Swing Gates	Gates where the terminal configuration can be altered to process passengers for domestic or international flights
Taxi-lane	Areas used for aircraft to maneuver on the Aprons so they can move from the aircraft stand to the maneuvering area
Taxiway	Areas used for aircraft to maneuver from the Aprons to the runway(s)
Terminal	Designated building(s) that are in place to process passengers or cargo

A.2. Abbreviations and acronyms

ACAMS	Airport Control and Monitoring System
ACI	Airports Council International
ACN	Aircraft Classification Number
ACU	Apron Control Unit
AGL	Airfield Ground Lighting
AHM	Airport Handling Manual
AIB	Aviation Investigation Bureau
AIP	Aeronautical Information Publication
AMO	Aircraft Maintenance Organizations
ANS	Air Navigation Service
ANSP	Air Navigation Service Provider
AODB	Airport Operational Database
AOM	Apron Operations Manual
AoR	Area of Responsibility
APU	Auxiliary Power Unit
A-SMGCS	Advanced-Surface Movement Guidance and Control System
ATC	Air Traffic Control
BHS	Baggage Handling System

BSIS	Baggage Source Info Service
CAT	Category
CB	Call Button
EBS	Early Bag Store
EFPS	Electronic Flight Progress Strip
EOC	Emergency Operations Centre
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FBO	Fixed Base Operation
FIDS	Flight Information Display System
FIR	Flight Information Region
FOD	Foreign Object Debris/Damage
FPS	Flight Progress Strip
FRS	Fire and Rescue Service
GA	General Aviation
GACA	General Authority of Civil Aviation
GACAR	General Authority of Civil Aviation Regulation
GHA	Ground Handling Agent
GIDS	General Information Display System
GOM	Ground Operational Manual

GPU	Ground Power Unit
GSE	Ground Service Equipment
HMI	Human Machine Interface
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IHP	Intermediate Holding Points
AOC	(airport name) Airside Operations Centre
KPI	Key Performance Indicator
LoA	Letter of Agreement
LVP	Low Visibility Procedure
M&U	Maintenance and Utilities
MACS	Manual of Apron Control Services
MARS	Multiple Aircraft Receiving Stands
MOR	Mandatory Occurrence Report
MWO	Meteorological Watch Office
NOTAM	Notice to Airmen
O&MM	Operations and Maintenance Manual
OIP	Organizationally Important Person
OM	Operating Manual
OOG	Out-Of-Gauge

OTP	On Time Performance
PBB	Passenger Boarding Bridge
PCA	Pre-Conditioned Air
PCN	Pavement Classification Number
PPE	Personal Protective Equipment
PRM	Passenger with Reduced Mobility
PTB	Passenger Terminal Building
QFE	Altimeter Setting
QNH	Altimeter setting
RSAF	Royal Saudi Air Force
RTC	Road Traffic Collision
RTF	Radiotelephone
SAF	Safety
SAR	Search and Rescue
SGS	Saudi Ground Services
SIGMET	Significant Meteorological Event
SLA	Service Level Agreement
SMS	Safety Management System
SOOG	Super Out-Of-Gauge
SOP	Standard Operating Procedure

TWR	Tower
ULD	Universal Loading Devices
VCCS	Voice Communication and Control Services
VCS	Voice Communication System
VIP	Very Important Person
VIS	Visibility



STANDARD **O**PERATING **P**ROCEDURES

**RESTRICTING AIRCRAFT OPERATIONS
DURING CLOSURES**

Document information

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition, July 2016

Associated SOPs, OMIs and O&MMs:

- SOP_OEAO_ADMIN_01_006 Routine maintenance and emergency maintenance.
- SOP_OEAO_ADMIN_01_017 Protection of sites for radar & navigation aids.
- SOP_OEAOA_ADMIN_01_007 Marking of unserviceable areas.

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to describe the procedures to be followed to restrict aircraft operations at Prince Abdulmajeed Bin Abdulaziz Airport during altered aerodrome conditions including runway and taxiway closures.

1.3.Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	FRCC
Prince Abdulmajeed Bin Abdulaziz Airport Safety	Airlines Operating at Prince Abdulmajeed Bin Abdulaziz Airport
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Ground handlers
Contractors working within the airside areas	
Consultants working within the airside areas	

Table 1: List of relevant stakeholders

1.4. Scope

Periodically conditions of the Prince Abdulmajeed Bin Abdulaziz Airport will require that normal aircraft operations are restricted. The airport certificate holder is responsible to ensure safe aircraft operations and identify any deviations that could impact normal operations.

This SOP will describe the processes to identify, create, communicate and remove restrictions to aircraft operations.

In Scope:

- Description of alterations to the aerodrome that would create unsafe aircraft maneuvering and therefore require restriction to aircraft operations, including runway and taxiway closures.
- Definition of the process to create a restriction to aircraft operations.
- Definition of the process to communicate the restrictions to aircraft operations to Prince Abdulmajeed Bin Abdulaziz Airport Operations, SANS and aircraft operators.
- Details of a communication protocol to be followed to remove the aircraft operating restrictions and resume normal aircraft operations.

Out of Scope:

- Marking of unserviceable areas which is contained in SOP_OEAO_ADM_01_007, Marking of unserviceable areas.

1.5.Applicable areas within the airport operation

Airport Operations staff are responsible for the marking of unserviceable areas. SOP_OEAO_ADM_01_007, Marking of unserviceable areas contains procedures as to how to clearly mark and light these areas. In addition to this, the airport certificate holder has the responsibility of informing FRCC and air operators of their location, their lighting and marking characteristics and alternate routings.

Each individual involved in the planning or marking of these areas or those individuals working within unserviceable areas within the airside areas shall understand their roles and responsibilities in maintaining safety. These personnel include:

- Airfield operations personnel (permanent and seasonal);
- Maintenance personnel working within the airside areas;
- Airport duty managers;
- Air traffic controllers;
- Maintenance contractors working within the airside areas; and
- Construction contractors working within the airside areas.

All stakeholders working airside are required to acknowledge the operational and safety implications of adhering to this SOP.

2. Requirements for restricting aircraft operations during closures

A Plan of Construction Operations is intended to provide a prescriptive approach to executing an aerodrome construction or maintenance project in conformance with aerodrome standards and recommended practices while minimizing disruptions to normal operations including disruptions to navigational aids.

A critical step in the development of the Plan of Construction Operation and the execution of work is to locate the project work site and its access, identify operating constraints and mark the areas that are unsuitable for aircraft and vehicle operations and to establish a communications system by which aircraft and vehicle operators are made aware of these operating restrictions.

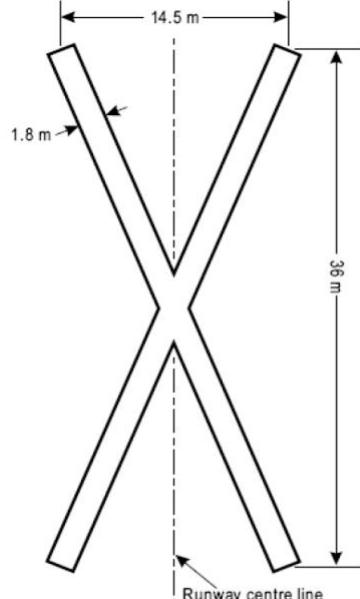
Airfield construction activity can disrupt normal taxi routes, cause pilot confusion, provide hazardous situations and increase the potential for an accident. It can also impact emergency response routes and water supplies, therefore it is important the Fire and Rescue Services be made aware this construction activity well in advance.

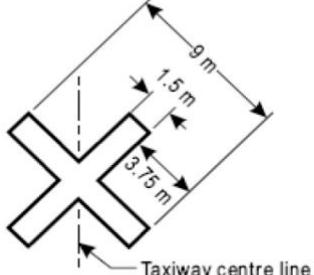
Closures of aircraft maneuvering surfaces may consist of:

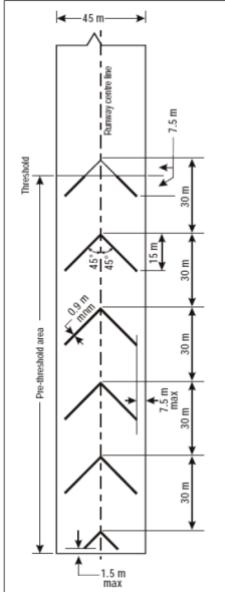
- 1) Complete runway closure
- 2) Partial runway closure causing a relocated threshold
- 3) Complete taxiway closure
- 4) Taxiway by-pass

2.1. Processes for restricting aircraft operations during closure

In addition to lighting and marking unserviceable areas as described in SOP_OEAO ADM_01_007, Marking of unserviceable areas, the following procedures shall be implemented for runway and taxiway closures and displaced thresholds.

Runway Closure	Examples of Signage
<ol style="list-style-type: none">1. A closed marking shall be displayed on a temporarily closed runway, or portion thereof, except that such marking may be omitted when the closing is of a short duration and adequate warning by air traffic services is provided.2. On a runway a closed marking shall be placed at the end of each runway, or portion thereof, declared closed and additional marking shall be so placed that the minimum interval between markings does not exceed 300m.3. Lighting on a closed runway or portion thereof shall not be operated, except as required for maintenance purposes.4. Lighted closure signs are very effective during low visibility conditions and at night when the runway lights must be illuminated for maintenance.	 <p>Illustration a) Closed runway marking</p>   

Taxiway Closure	Examples of Signage
<p>5. A closed marking shall be displayed on a temporarily closed taxiway, or portion thereof, except that such marking may be omitted when the closing is of a short duration and adequate warning by air traffic services is provided.</p> <p>6. On a taxiway a closed marking shall be placed at least at each end of the taxiway or portion thereof.</p> <p>7. Good practice – temporarily paint over or remove taxiway centerlines leading in to closed taxiways and runways.</p>	 <p>Illustration b) Closed taxiway marking</p>
<p>8. In addition to closed markings, when a runway or taxiway or portion thereof is intercepted by a usable runway or taxiway which is used at night, unserviceability lights shall be placed across the entrance not exceeding 3m.</p> <p>9. If taxiway center line lights lead into closed area, light fixtures shall be covered or turned off.</p>	

Relocated Thresholds	Examples of Signage
<p>10. When the surface before a threshold is paved and exceeds 60m in length and is not suitable for normal use by aircraft, the entire length before the threshold shall be marked with a chevron marking.</p>	
<p>11. Where the pavement prior to the threshold is used for taxiing, a temporary threshold and chevron may be installed along the sides of the runway using staked plywood.</p> <p>12. When a runway threshold is temporarily moved for construction, the runway distance remaining signs in the opposite direction must be covered as they no longer provide accurate information</p>	 

Relocated Thresholds	Examples of Signage	
<p>13. When the runway threshold is temporarily moved for construction and the runway is open at night, the caution zone lights marking the last 600m (2000') of runway will need to be adjusted. If runway center lights are present, they will need to be placed out of service</p> <p>14. When the runway threshold is temporarily moved for constructions, NAVAIDS will need to be place out of service</p>		

2.2. Restricting aircraft operations during closures

Step	Action
2.2.1	Determine the impact on aircraft operating surfaces and the need for runway or taxiway closures or for relocating threshold
2.2.2	IF threshold relocation THEN calculate new declared distances
2.2.3	Develop drawing of closed surfaces and provide to FRCC, Fire and Rescue, Operations, airfield maintenance and contractor
2.2.4	GACA determines impact to aircraft operations
2.2.5	Fire and Rescue determines impact to emergency routes
2.2.6	Operations advises airlines and issues NOTAM
2.2.7	Airfield maintenance turns off closed surfaces lighting
2.2.8	FRCC turns off closed surfaces navigational aids
2.2.9	Install signs and markers and cover signs that could cause pilot confusion
2.2.10	Inspect all related equipment and materials prior to sunset
2.2.11	On project termination re-instate all appurtenances
2.2.12	Operations Advise airlines and remove NOTAM

Appendix A. Glossary

A.1. Terms and definitions

Aerodrome certificate	A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.
GACARs	GACA SARPS (Standards and Recommended Practices) for Annex 14 for aerodrome works.
NAVAIDS	Any sort of marker which aids the traveler in navigation; the term is most commonly used to refer to nautical or aviation travel. Common types of such aids include lighthouses, buoys, fog signals, and day beacons.
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Plan of Construction Operations (PCO)	A plan which is intended to provide a prescriptive approach to working airside on a project in conformance with GACA SARPs while minimizing disruption to normal operations including disruptions to navigational aids.
Runway Threshold	A point at the physical beginning or end of the runway, marking the area used for takeoffs or landings.

A.2. Abbreviations and acronyms

FRCC	Fire Rescue Communication Center
GACA	General Authority of Civil Aviation of Saudi Arabia
GACAR	GACA Standards and Recommended Practices
ICAO	International Civil Aviation Organisation
SANS	Saudi Air Navigation Services
NOTAM	Notice To Airman
PCO	Plan of Construction Operations
SOP	Standard Operating Procedure



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

PROTECTION OF SITES FOR RADAR AND NAVIGATION AIDS

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Doc 9774, Manual on Certification of Aerodromes, First Edition (2001)

Associated SOPs, OMs and O&Ms:

- OM_OEAO ADM_01_001 Aerodrome Manual, Part 5.17 Protection of sites for radar and navigation aids
- SOP_OEAO ADM_01_006 Routine maintenance and emergency maintenance
- SOP_OEAOL ADM_01_011 Non-compliance and corrective action reports

1.2. Purpose

This Standard Operating Procedure (SOP) applies to the protection of areas encompassing the navigational aids at Prince Abdulmajeed Bin Abdulaziz Airport as per the regulations set for by the General Authority of Civil Aviation of Saudi Arabia (GACA). To ensure the accurate functionality of the navigational aids for the safe operation of the airport, a specific protocol must be followed to allow access only to individuals with the right and need to enter these areas.

1.3.Relevant stakeholders

The stakeholders who must directly use this SOP together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Prince Abdulmajeed Bin Abdulaziz Airport Fire and Rescue Services
FIRE FIGHTING SERVICES	FRCC
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Western Airport Security Affairs
RSAF	Prince Abdulmajeed Bin Abdulaziz Airport Safety

Table 1: List of relevant stakeholders

1.4.Scope

In scope: Navigational aids are sensitive to any movement or obstruction within a specified area. This SOP includes:

- Consideration of the protection of the Instrument Landing System (ILS) critical area both in terms of infrastructure and procedural warning signs for drivers of vehicles and physical buffers
- Consideration of the restriction of access to airside operations personnel, Fire and Rescue Services personnel, and technical personnel from the engineering department
- Consideration of designating airfield operations personnel to provide escorts to others having a need to access protected areas via vehicles
- Consideration of the restriction of electronic devices to be used at certain thresholds of critically protected areas
- Consideration of conducting briefings for work crews assigned to conduct tasks around protected sites
- Consideration of periodic re-certification for persons having a need to access protected areas, including airfield operations personnel
- Consideration of implementing a preventive maintenance program to safeguard against any random request for access to a protected area

Out of Scope: Visual navigational aids.

1.5.Applicable areas within the airport operation

This SOP covers all radar and navigational aids at Prince Abdulmajeed Bin Abdulaziz Airport.

2. Process for the protection of sites for Navigational aids

2.1. Planning and developments (SANS Maintenance)

The first step is applicable to Maintenance to ensure any development is assessed which may affect the protection of navigational aids. The information will be referred to Air Navigation Services through Prince Abdulmajeed Bin Abdulaziz Airport Operations. A further review of designs/ developments may be required. The steps are sequentially indicated in the Table below.

Step	Action
2.1.1	SANS Maintenance design determines that a new development could potentially impact on the protection of sites for Navigational aids. Further clarification is undertaken initially through Prince Abdulmajeed Bin Abdulaziz Airport Operations.
2.1.2	Prince Abdulmajeed Bin Abdulaziz Airport Operations initially assesses the potential impact of the development/ works and refers all available information to SANS.
2.1.3	SANS assesses the proposed development and associated works to determine the potential impact.
2.1.4	IF there is no effect on operations, the development and planned works may progress.
2.1.5	IF there is a potential effect on operations, the matter is referred back to SANS Maintenance for a development and design review.

2.2. Assessment and monitoring (Prince Abdulmajeed Bin Abdulaziz Airport Operations)

This step is applicable to Prince Abdulmajeed Bin Abdulaziz Airport Operations. The steps indicated in the Table below are sequential however, steps 2.2.2 and 2.2.3 may be conducted concurrently.

Step	Action
2.2.1	Prince Abdulmajeed Bin Abdulaziz Airport Operations assesses the potential impact of the development/ works. These works may include routine maintenance in the vicinity of the potentially affected sites. Any hazards reported to Prince Abdulmajeed Bin Abdulaziz Airport Safety are to be managed according to pre-existing protocols within the Prince Abdulmajeed Bin Abdulaziz Airport Safety Management System (SMS).
2.2.2	The area of works activity is to be regularly monitored and must be under control. Clear restriction boundaries need to be set.
2.2.3	The status of signage is to be routinely monitored to ensure that its visibility and condition provides sufficient warning to those nearby.
2.2.4	All Non-compliances are to be reported, recorded and action taken. The Manager of the works is to be contacted immediately and works ceased if there is a possibility of interference with the navigational aids or a danger to workers.

2.3. Maintenance activity at Prince Abdulmajeed Bin Abdulaziz Airport

This step is applicable to works parties undertaking works in the vicinity of sites for navigational aids. The steps indicated in the Table below are independent events but both require a significant safety focus in accordance with the *Prince Abdulmajeed Bin Abdulaziz Airport* Safety Management System (SMS).

Step	Action
2.3.1	The works party undertakes maintenance in the vicinity of the navigational aids. Site safety inspections are required to ensure that works, vehicles and other equipment do not impede the installations.
2.3.2	Hazards (within the site vicinity in particular) are to be immediately reported to the Prince Abdulmajeed Bin Abdulaziz Airport Airfield Operations Coordinator and/ or the Operations.

2.4. Independent checks (RSAF)

This step is applicable to in terms of ensuring authorized access only to the aerodrome and compliance with restricted area signage and vehicle movements. This is a critical overseeing role to ensure that the principles of the Prince Abdulmajeed Bin Abdulaziz Airport Security Manual are adopted in practice.

Step	Action
2.4.1	Monitor the airport perimeter and critical assets and report operational breaches to the Prince Abdulmajeed Bin Abdulaziz Airport Airfield Operations Coordinator. People may also be putting themselves at undue risk. Non-compliances are reported to the Prince Abdulmajeed Bin Abdulaziz Airport Airfield Operations Coordinator.

Appendix A. Glossary

A.1. Terms and definitions

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.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System, Airport Security Manual) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Maneuvering Area	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

A.2. Abbreviations and acronyms

SANS	Saudi Air Navigation Services
GACA	General Authority of Civil Aviation of Saudi Arabia
ICAO	International Civil Aviation Organization
KPI	Key Performance Indicators
O&MM	Operating & Maintenance Manual
OM	Operations Manual
SMS	Safety Management System
SOP	Standard Operating Procedure
RSAF	Royal Saudi Air Force



الهيئة العامة للطيران المدني
General Authority of Civil Aviation

STANDARD **O**PERATING **P**ROCEDURES

DRAINAGE SYSTEM MAINTENANCE AND ADEQUACY

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards

- GACAR part 139, Certification & Operations, Aerodromes, Version 6.0

External legal, standards and/or policy:

- ICAO Annex 14, Aerodromes, Volume 1, Seventh Edition (July 2016)

Associated SOPs, OM&Ms and O&MMs:

- OM_OEAO ADM_01_001 Aerodrome Manual, Section 5.6.1.2
- SOP_OEAO ADM_01_005 Inspection of the movement area.
- SOP_OEAO ADM_01_003 Maintaining a logbook.
- SOP_OEAO ADM_01_006 Routine maintenance and emergency maintenance.
- SOP_OEAO ADM_01_012 Friction testing.

1.2. Purpose

The purpose of this Standard Operating Procedure (SOP) is to define the requirements at Prince Abdulmajeed Bin Abdulaziz Airport for the maintenance of the airside drainage system and ensure it is adequate in meeting the operational demands of preventing ‘standing water’ on the Airfield. The airfield drainage system is an essential feature of the airport that ensures adequate water removal to preserve the strength of the soil and prevent erosion. The system of airfield drainage is required to service the entire maneuvering and movement areas by ensuring it is free of standing water or ponding.

1.3 Relevant stakeholders

The stakeholders who must directly use this SOP together with those who must be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Prince Abdulmajeed Bin Abdulaziz Airport Maintenance	Prince Abdulmajeed Bin Abdulaziz Airport Fire and Rescue Services
Prince Abdulmajeed Bin Abdulaziz Airport Operations	Airlines
Prince Abdulmajeed Bin Abdulaziz Airport Safety	

Table 1: List of relevant stakeholder

1.4. Scope

In Scope: This SOP includes the provisions associated with ensuring the drainage system maintenance and adequacy. It includes:

- Identification of the Prince Abdulmajeed Bin Abdulaziz Airport maintenance contractor who is responsible for the maintenance of the airfield drainage system
- Weekly checks with a checklist.
- Conduct of inspection after storms, including sand storms
- Environmental requirements regarding materials allowed into the airport's storm water drainage system

Out of Scope: Drainage systems outside of the airside (external stakeholder process).

1.5 Applicable areas within the airport operation

This SOP covers all movement areas of the Prince Abdulmajeed Bin Abdulaziz Airport. This includes:

- Runways
- Taxiways
- Aprons
- Adjoining areas of Runway, Taxiway and Apron

2. Process for testing and maintaining the airport drainage system

An adequate drainage system to remove surface and subsurface water is vital for the safety of aircraft and for the long service life of Prince Abdulmajeed Bin Abdulaziz Airport pavements. Improper drainage can result in ponding on the pavement surface that can present hazards to aircraft taking off and/or landing. Poor drainage can also cause pavement to deteriorate, reducing the life of the pavement. Thus, the type of soil and moisture content can affect the rate of infiltration of water overall affecting the amount of runoff.

Types of Drainage Systems:

At Prince Abdulmajeed Bin Abdulaziz Airport there are three types of drainage systems; pavement surface, general surface, and subsurface drainage. Pavement surface drainage prevents the buildup of water that will lead to hydroplaning. General surface drainage is needed to direct the flow of water away from pavements and to remove it from the airfield altogether. Subsurface drainage requires the removal of water from beneath the pavement. If these drainage systems fail, accidents can arise when aircraft lose steering and braking control due to ponding and erosion.

Environmental Issues:

Careful consideration to prevent the introduction of materials into the drainage system that could be detrimental to the environment is critical. Materials that are prohibited from entering the storm water drainage system are such things as fuel, HAZMAT, oils, and numerous other chemicals. If these materials are found to be entering Prince Abdulmajeed Bin Abdulaziz Airport `s drainage systems, it must be treated immediately by using the protocols in SOP_OEAO ADM_01_006, Routine maintenance and emergency maintenance.

Pavement Condition Inspection and Reporting:

Inspecting the pavement condition and predicting future conditions can indicate whether pavement distress is environmental or traffic load related. Routine inspections of the drainage systems will be conducted per SOP_OEAO ADM_01_005, Inspection of the movement area. Reporting and record keeping of pavement inspections along with checklists to perform such tasks will be conducted as per SOP_OEAO ADM_01_003, Maintaining a logbook.

Remedial Action for Ineffective Drains:

Prince Abdulmajeed Bin Abdulaziz Airport drainage systems are paved, with some non-standard drains improved with lining. These drains are cleaned twice a year, usually during the months of December and June. The drains shall still be routinely checked with scheduled maintenance for repairs as well as emergency maintenance if drains do not remove water efficiently, especially during inclement weather as per SOP_OEAO ADM_01_006, Routine maintenance and emergency maintenance. The Roads and Ground Engineering Manager at the maintenance contractor is responsible for the routine repair and maintenance of the Prince Abdulmajeed Bin Abdulaziz Airport pavements and drainage system. This also includes attending to immediate civil works relating to reported problems.

It is important for Prince Abdulmajeed Bin Abdulaziz Airport that the pavement surfaces be kept in optimal conditions in order to maintain continuous and safe aircraft operations.

2.1. Testing and maintaining the airport drainage system

If during a routine inspection or FRCC reports ponding on the pavement surface or drainage erosion, the Drainage System Checklist (see Appendix B) will be utilized to determine the severity of ponding or erosion. Prince Abdulmajeed Bin Abdulaziz Airport's Maintenance Inspector will be called for all reports of drainage system issues. Prince Abdulmajeed Bin Abdulaziz Airport Maintenance will determine remedial course of action for repair of the drainage system. Any Hazmat that enters the drainage system must be reported to Prince Abdulmajeed Bin Abdulaziz Airport's Maintenance Inspector and emergency maintenance shall be conducted per SOP_OEAO ADM_01_006, Routine maintenance and emergency maintenance.

Step	Action
2.1.1	Conduct Daily Routine Inspection for Pavement and Drainage Conditions as per SOP_OEAO ADM_01_005, Inspection of the movement area or as reported by FRCC (assuming air carriers or FRCC see ponding or severe erosion).
2.1.2	IF ponding or erosion is seen on the Airport Movement Area THEN determine safest route to not impede aircraft operations AND obtain clearance from FRCC.
2.1.3	Use Drainage System Checklist in Appendix B to determine severity of ponding or erosion.
2.1.4	Report ponding and drainage erosion conditions to the Prince Abdulmajeed Bin Abdulaziz Airport Maintenance Inspector.
2.1.5	Prince Abdulmajeed Bin Abdulaziz Airport's Maintenance Inspector will determine remedial action dependent on the severity of ponding and erosion conditions.
2.1.6	IF ponding or drainage erosion is severe, Prince Abdulmajeed Bin Abdulaziz Airport Operations will immediately report to the FRCC for closure of the affected Airport Movement Area.
2.1.7	THEN coordinate the maintenance of affected drains with Prince Abdulmajeed Bin Abdulaziz Airport Maintenance as per SOP_OEAO ADM_01_006, Routine maintenance and emergency maintenance.
2.1.8	IF affected drain cannot be repaired immediately, issue NOTAM for affected area of pavement on the Airport Movement Area.
2.1.9	Once ponding has receded and drainage erosion repaired, inspect area to determine if it is safe to reopen the affected Airport Movement Area.
2.1.10	Inform FRCC that area is free of ponding and erosion, and can be re-opened.
2.1.11	Continue Daily Routine Inspection.
2.1.12	IF ponding or erosion is sighted again, start from Step 2.1.2
2.1.13	Complete Drainage condition checklist in Appendix B
2.1.14	Complete Storm Drainage Maintenance Form in Appendix C
2.1.15	Drainage System Maintenance and Adequacy is complete.

Appendix A - Glossary

A.1. Terms and definitions

GACARs	GACA Regulations
HAZMAT	Hazardous Materials – a system of classifying chemicals and fire modes.
NOTAM	A notice containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Ponding	The collection of water into a pond or large puddle.
Runoff	The draining away of water (or substances carried in it) from the surface of an area of land, a building or structure, etc.
Subsurface	Natural materials (such as rock) that is not exposed to the surface of the ground.

A.2. Abbreviations and acronyms

FRCC	Fire Rescue Communication Center
GACA	General Authority of Civil Aviation
GACAR	General Authority of Civil Aviation Regulations
HAZMAT	Hazardous Materials
ICAO	International Civil Aviation Organization
NOTAM	Notice to Air Men
O&MM	Operating & Maintenance Manual
OM	Operations Manual
SOP	Standard Operating Procedure

Appendix B. Pavement and drainage checklist

Pavement and Drainage Condition Checklist	Prince Abdulmajeed Bin Abdulaziz Airport
1. Ponding or standing water present on pavement surface?	
2. Is standing water unsafe for aircraft and vehicle movement on the surface?	
3. Has the depth of water been determined?	
4. Is the water runoff rate substantial?	
5. Are drains functioning?	
6. If drains are not functioning, is it due to clogging?	
7. Has Prince Abdulmajeed Bin Abdulaziz Airport Road and Grounds Engineering Manager been notified?	
8. Has any hazardous materials entered storm drains?	
9. If Hazmat entered drainage system, has the quantity and type been determined?	
10. Was the affected area inspected before ponding/erosion event?	

Appendix C. Storm drainage and maintenance forms

Storm Drainage Form		Prince Abdulmajeed Bin Abdulaziz Airport
Date (dd-mm-yyyy):	Location:	
Responders name:	Type of problem (<i>ponding, erosion</i>):	
Depth of Standing Water:	Runoff Rate:	
Summary: <i>Did ponding or erosion affect aircraft operations, was any pavement closed, did any Hazmat enter the drains, what caused the standing water (storms, leaking pipes, etc.).</i>		

Drainage Maintenance Form		Prince Abdulmajeed Bin Abdulaziz Airport
Date (dd-mm-yyyy):	Location:	
Maintenance Work Order #:	Length of Repair:	
<i>Summary: Describe how the drainage system was repaired, how long was standing water or erosion present on the surface, were aircraft operations affected.</i>		



STANDARD **O**PERATING **P**ROCEDURES

VERY LARGE AIRCRAFT OPERATIONS

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1. Introduction

1.1. Regulation and reference documents

External legal, regulatory standards and/or policy:

- GACAR part 139, Certification & Operations, Aerodromes , Version 7.0
- ICAO Annex 14, Aerodromes, Volume 1, Ninth edition , July 2022
- ICAO Cir 305 on operation of New Larger Aeroplanes at existing Airport, June 2004

Associated SOPs, OM&Ms and O&MMs:

- SOP_OEAO ADM01_005 Inspection of the movement area.
- SOP_OEAO ADM01_016 Restricting aircraft operations during closures.
- SOP_OEAO ADM01_008 Aerodrome signs & markings.
- SOP_OEAO ADM01_014 Aircraft engine ground running.
- SOP_OEAO ADM01_015 Aircraft Marshalling

1.2. Purpose

This Standard Operating Procedure (SOP) details the provisions associated with the operations of very large aircraft at Alula International Airport. This includes aircraft with a wingspan extending 65 meters and above. Large aircraft are predominantly used for long haul flights and convey large number of passengers and heavy payloads of cargo. Accordingly, pressure is brought to bear on the resources of the airfield facility, and as such, special measures are developed to assure the safe operations of these aircraft types at Alula International Airport . Currently, the airfield infrastructure at Alula International Airport meets the International Civil Aviation Organization (ICAO) code for large aircraft operations.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Operations	Ground handlers
Alula International Airport Safety	Fuel companies
Air Traffic Control	
Airlines	

Table 1: List of relevant stakeholders

1.4. Scope

In Scope: This SOP includes the provisions associated with the operations of very large aircraft. It includes:

- Consideration for a process by which large aircraft operators, prior to the commencement of operations at OEAO submit their various plans to Alula International Airport, including their aircraft recovery plan.
- The development of a procedure to ensure the mandatory inspection of the maneuvering surface prior and after the operations of a very large aircraft.
- Establish procedure to restrict engine ground run-ups in designated areas at certain times
- Procedure for maintaining and keeping current, the contact information for officers of entities with very large aircraft at Alula International Airport.
- Verification and notification that Alula International Airport Fire and Rescue Services (FRS) meets the required operational category during operations of very large aircraft.

Out of Scope: This SOP does not address:

- All aircraft operating at Alula International Airport below 65 meters wingspan

1.5. Applicable areas within the airport operation

This SOP covers all maneuvering areas of the Alula International Airport. This includes:

- Runways
- Taxiways
- Aprons

2. Very large aircraft operations

For operation of very large aircraft, physical characteristics have been specified in Part 139. These codes are based on aircraft wingspan and aircraft outer main gear span. Alula International Airport can accommodate the largest Aerodrome Reference Code of F. Code F aircraft are any aircraft that have larger than 65 meters wingspan and greater than 14 meters outer main gear span, they may be referred to as Very Large Aircraft (VLA). The Boeing 747-8 and the Airbus A380-800 are examples of Code F aircraft that can both operate at Alula International Airport.

The dimensions of Code F aircraft may increase the likelihood that such aircraft might leave the runway in a manner that might obstruct or collide with another aircraft on an adjacent parallel taxiway. Therefore, all Code F aircraft arrival/departure routes at the aerodrome should be evaluated for adherence to Code F restrictions.

These operational restrictions are in place to minimize impact on the aerodrome:

- Runway to Taxiway Separation 182.5 / 190 meters
- Taxiway to Taxiway Separation 76/91 meters
- Taxiway to Fixed or Moveable Object 43.5/51 meters

These considerations must also be addressed:

1. Jet Exhaust Blast – VLA operating on the aerodrome maneuvering areas, should not cause greater jet blast issues than those currently created by aircraft lower than Code F aircraft. Those areas require action to minimize excessive jet blast exposures need to be identified and reported to Alula International Airport Operations and FRCC. SOP_OEAO ADM01_014, Aircraft engine ground running outlines the limits and locations for engine ground running of VLA. Airport operations must be aware of any signs or markings that affect VLA routes on the aerodrome and their exposure to jet blast. Damaged signs and chipped markings are consequences to jet blast of VLA and are made aware in SOP_OEAO ADM_01_009, Aerodrome signs & markings.

2. Load Bearing Capacity – All Alula International Airport runway and taxiway pavements can accommodate the load bearing capacity of a Code F aircraft. Due to the immense weight of Code F aircraft, Alula International Airport Technical Services should provide periodic evaluation of all pavement concerns. Additionally, Alula International Airport Operations provides daily pavement observations as outlined in SOP_OEAO ADM01_005, Inspection of the movement area. If abnormalities in pavement condition are a cause of concern then affected areas should be closed. Closures can cause more burdensome restrictions on VLA, which could restrict their operations per SOP_OEAO ADM01_016, Restricting aircraft operations during closures.

3. Fire and Rescue Services – Alula International Airport is a Category 10 aerodrome with equipment able to accommodate Code F aircraft. Category 10 requires three vehicles with 32,300 liters of water and 450 kg of extinguishing agents with a total discharge capacity of 11,200 liters/min. Alula International Airport Fire and Rescue Services are required to be familiar with access and evacuation points of VLA, and must meet Category 10 standards at all times as per the Airport Emergency Plan (AEP). In the event FRS equipment becomes unavailable, the category may drop to the next lower level (Category 9), and services to accommodate Code F must be restored promptly.

2.1 Procedures for very large aircraft operations

When Very Large Aircraft (VLA) operators plan to operate at Alula International Airport, they must submit their operating plan to the Alula International Airport Operations Manager, including disabled aircraft recovery plan, prior to commencement of operations. The Alula International Airport Operations Manager shall advise the Alula International Airport Operations Manager when a new or existing operator intends to introduce Code F aircraft. The Alula International Airport Operations Manager will then ensure the operator is made aware of the restrictions relating to Code F aircraft operations and confirm that the aircraft operator has access to the Alula International Airport Manual (AOM). Aircraft with special parking requirements must gain prior acceptance from the Alula International Airport Operations Manager to ensure any request do not reduce capacity for already identified parking areas. Airport operations must maintain contact information of all VLA operators.

To ensure that Code F operating restrictions are adhered to, Airport Operations must complete a mandatory inspection of the maneuvering surface before and after very large aircraft operations. The inspection covers the VLA routes on the Aerodrome. Signs and markings need to be a primary focus during these inspections and should adhere to SOP_OEAO_ADM01_008, Aerodrome signs & markings. This also includes restricting engine ground run-ups in designated areas at certain times, by monitoring and recording run-ups via SOP_OEAO_ADM_01_017, Aircraft engine ground running. The engine ground run-ups will be recorded in the Very Large Aircraft Engine Ground Running Log, found in Appendix B. A NOTAM must be issued if an operating surface must be closed due to load bearing capacity issues, thus special attention to those affected areas under SOP_OEAO_ADM01_016, Restricting aircraft operations during closures.

Alula International Airport FRS will be familiar with access and evacuation points of all VLA that operate on the aerodrome. They will adhere to the Airport Emergency Plan during any VLA emergency. Alula International Airport Fire Rescue Services will notify Alula International Airport Operations if and when their equipment cannot sustain Category 10 requirements and Alula International Airport Operations will issue a NOTAM in the event of a drop below required category. Alula International Airport Operations will also report number of times Alula International Airport FRS falls below required Category 10 with the Category 10 Sustainability Report, found in Appendix B.

Step	Action
2.1.1	When Very Large Aircraft (VLA) operators plan to operate at Alula International Airport, they must submit their operating plans to the Alula International Airport operations Manager, including their aircraft recovery plan, prior to commencement of operations.
2.1.2	The Alula International Airport Operations Manager will then ensure the operator is made aware of the restrictions relating to Code F aircraft operations and confirm that the aircraft operator has access to the Alula International Airport Manual.
2.1.3	Aircraft with special parking requirements must gain prior acceptance from the Alula International Airport operations Manager to ensure any request does not reduce capacity for already identified parking areas.
2.1.5	Airport Operations must maintain contact information of all VLA operators.
2.1.6	After acceptance of VLA operator and upon arrival of a VLA, Alula International Airport Operations conducts inspection of Aerodrome Movement Area.
2.1.7	Airport Operations will determine safest route on to the Aerodrome Movement Area and obtain clearance from FRCC.
2.1.8	Inspection of Signs and Markings on the VLA route is conducted with SOP_OEAO ADM01_008, Aerodrome signs & markings.
2.1.9	IF after inspection, discrepancies are found on the movement area Alula International Airport Operations will issue a NOTAM and close affected area with FRCC.
2.1.10	THEN aircraft operations on the aerodrome movement area will be restricted via SOP_OEAO ADM01_016, Restricting aircraft operations during closures.
2.1.11	After Step 2.1.5 does the VLA operator requests an aircraft engine ground run-up?
2.1.12	IF Step 2.1.12 is true, Alula International Airport Operations will monitor aircraft engine ground run-ups in accordance with SOP_OEAO ADM01_014, Aircraft engine ground running.
2.1.13	THEN , Alula International Airport Operations will record aircraft engine ground run-up in the Very Large Aircraft Engine Ground Running Log.
2.1.14	After Step 2.1.5 is the VLA involved in an emergency situation?
2.1.15	IF Step 2.1.14 is true, Alula International Airport Fire Rescue Services will adhere to the Airport Emergency Response Plan (ERP).
2.1.16	THEN , Alula International Airport Fire Rescue Services will notify Alula International Airport Operations if they are unable to maintain Category 10 capabilities.
2.1.17	Alula International Airport Operations will issue a NOTAM due to the drop in below required Category 10 capabilities.
2.1.18	THEN , Alula International Airport Operations will record the drop in below Category 10 with the Category 10 Sustainability Report.
2.1.19	VLA Operations procedure is complete.

Appendix A - Glossary

A.1. Terms and definitions

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.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Category 10	Under ICAO's categorical system for Rescue Fire Fighting Services, Category 10 is the highest with capabilities for fire fighters to tend to aircraft with length over 65 meters.
Code F	Code F aircraft are aircraft that have wingspan larger than 65 meters and have larger than 14 meters outer main gear span.
GACARs	GACA SARPS (Standards and Recommended Practices) for Annex 14 for aerodrome works.
Jet Blast	Extreme movement of air produced from the exhaust of jet engines.
Load Bearing Capacity	Maximum amount of pressure that can be supported without failure.
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Very Large Aircraft (VLA)	Those aircraft categorized as Code F aircraft in the International Civil Aviation Organization's Aerodrome Reference Code.

A.2. Abbreviations and acronyms

AEP	Airport Emergency Plan
FRCC	Fire Rescue Communication Center
FRS	Fire Rescue Services
GACA	General Authority of Civil Aviation of Saudi Arabia
GACAR	General Authority of Civil Aviation Regulations
ICAO	International Civil Aviation Organization
NOTAM	Notice to Air Men
O&MM	Operating & Maintenance Manual
OM	Operations Manual
SOP	Standard Operating Procedure
VLA	Very Large Aircraft

Appendix B. Engine ground running log and category 10 forms

Very Large Aircraft Engine Ground Running Log		Alula International Airport
Date (dd-mm-yyyy):	Location on movement area:	
Name of VLA Operator:	Length of Engine Ground Running:	
<i>Summary: Have appropriate restrictions on the aerodrome movement area been made, how long will the aircraft engine ground running affect aircraft operations, have all important parties been notified of restrictions and potential delays, are KPI's being met in regards to the safety and reporting of VLA engine ground running.</i>		

Category 10 Sustainability Form		Alula International Airport
Date of Drop in Category (dd-mm-yyyy):	Number of Fire Rescue Equipment out of Service:	
Type of Fire Rescue Equipment out of Service:	Length Fire Rescue Equipment out of Service:	
<p><i>Summary: What kind of emergency caused Drop in Category, Was a NOTAM sent out, Is aerodrome in compliance with lower level category, timeline for prompt recovery of Category 10, have all important parties been notified, which VLA operator caused out of compliance for Alula International Airport Fire Rescue Services, have all KPI's been met in regards to sustaining Category 10 requirements.</i></p>		



STANDARD **O**PERATING **P**ROCEDURES

FBO Hanger Operation

Document information

General information

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Eng.Abdulwahab Bokhari	Alula International Airport	Airport Director		

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes , Version 7.0

External legal, standards and/or policy:

- ICAO Annex 14 Volume I, Ninth Edition, July 2022

Other external references:

- ACI Airside Safety Handbook (2010)
- ACI Policies Handbook (10th Edition) 2020

Associated SOPs, OMs and O&MMs:

- SOP_OEAO ADM_01_004 – FOD Control
- SOP_OEAO ADM_01_005 – Inspection of the Movement Area
- SOP_OEAO ADM_01_006 - Routine Maintenance and Emergency Maintenance
- SOP_OEAO ADM_01_008 – Aerodrome Signs and Markings
- SOP_OEAO ADM_01_009 – Cleaning and Sweeping of the Apron
- SOP_OEAO ADM_01_014 – Aircraft Engine Ground Running
- SOP_OEAO ADM_01_015 - Aircraft Marshalling
- SOP_OEAO ADM_01_016 - Restricting Aircraft Operations During Closures

1.2. Purpose

This document defines Standard Operating Procedures (SOP) for Alula International Airport Operations use of the FBO hangers.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Operations	GACA Aviation Standards
Handlers	Alula International Airport FRCC
Airlines	
FBO Operator	

Table 1: List of relevant stakeholders

1.4. Scope

In scope: This document only covers the FBO and hangers at Al Ula airport and though it overlaps with other operations at the airport is not meant to supersede procedures already agreed e.g. ramp operations. It therefore covers the following procedures for the hanger and FBO operation

- Arrival procedures
- Turnaround activities
- Departure procedures
- Access and egress of aircraft to the hangers including towing
- Cleaning of aircraft
- Cleaning of the hangers
- Equipment needs
- Health and Safety

Out of scope: Operations external from the FBO hangers.

1.5. Applicable areas within the Airport Operations

The applicable area for this SOP includes the FBO hangers.

2. Permitted Use of an FBO hanger

2.1. Permitted operation

The following is allowed within the FBO hangers:

- Storage of active aircraft;
- Construction of amateur-built or kit-built aircraft provided that activities are conducted safely;
- Storage of aircraft handling equipment, e.g., tow bar, glider tow equipment, workbenches, and tools and materials used to turn around an aircraft; items related to ancillary or incidental uses that do not affect the hangars' primary use;
- Minor maintenance of aircraft to ensure their safety before dispatch;
- Storage of materials related to an aeronautical activity, e.g. balloon and skydiving equipment, office equipment, teaching tools, and materials related to ancillary or incidental uses that do not affect the hangars' primary use;
- Storage of non-aeronautical items that do not interfere with the primary aeronautical purpose of the hangar (for example, televisions, furniture);
- A vehicle parked at the hangar while the aircraft usually stored in that hangar is flying, subject to local airport rules and regulations;
- Cleaning of the internal and external of aircraft;
- Operation of an aeronautical business related to the permitted use of the hanger e.g. offices for the FBO operator, handlers and airlines.

2.1. Non permitted operation

The following is not allowed within the FBO hangers:

- Use as a residence;
- Operation of a non-aeronautical business, e.g., limo service, car and motorcycle storage, storage of inventory, non-aeronautical business office;
- Activities which impede the movement of the aircraft in and out of the hangar or other aeronautical contents of the hangar;
- Activities which displace the aeronautical contents of the hangar or impede access to aircraft or other aeronautical contents of the hangar;
- Storage of household items that could be stored in commercial storage facilities;

- Long-term storage of derelict aircraft and parts;
- Storage of items or activities prohibited by local or state law;
- Storage or of fuel, and other dangerous and Hazmat materials;
- Storage of inventory or equipment supporting a municipal agency function unrelated to the aeronautical use;
- Shelter for maintenance, repair, or refurbishment of aircraft and the indefinite storage of non-operational aircraft;
- Servicing, maintenance, major repairs or outfit of aircraft;
- Construction of amateur-built or kit-built aircraft.

3. Facility use

3.1. Maintenance and facility design

The operator must ensure that any facilities used have been assessed for any safety concerns and that they are maintained, cleaned and upgraded with the health and safety of staff, passengers, crew and equipment in mind.

Fire protection must be sufficient for the operation, regularly inspected and drills periodically performed. Exit signs must be in place and not obstructed.

The operator must comply with all operational, maintenance and safety SOPs related to operation of a facility as issued by Alula International airport or the RFFS. This includes the SOPs mentioned in section 1.1 above as well as procedures described within the Alula Aerodrome Manual.

The following should be observed

- Perimeter floor marking should be in place that delineate the limits of aircraft placement near hangar walls.
- Floor/ramp markings should be in place to delineate best aircraft positions for entry or exit from hangars.
- Hangar doors should have fully open securing methods to prevent inadvertent closure due to jet blast or high winds.
- Overhead doors systems should have a periodic inspection process.
- Designated areas for equipment should be created to minimize danger to aircraft. Outlines can be drawn on the floor to help ensure compliance.
- Fire Protection systems, water storage and pumping, and the fire detection and alarm system, that will be connected to the RFFS (Rescue and Fire Fighting Service) of ULH airport.

3.2. Hazard assessment

Risk and hazard analysis should be completed for:

- Aircraft movement in hangar areas related to unique situations.
- Aircraft towing
- New processes or procedures.
- Potential weather related events.
- Use of fuel and other hazardous chemicals including cleaning solutions.
- Any incident or near miss that occurs.

3.3. General rules regarding safety

1. Equipment should only be stored in its intended location.
2. Adequate lighting should be maintained.
3. There should be appropriate fire extinguishers in place that should always be easily accessible.

4. Fire alarms should be tested regularly and emergency drills performed.
5. Air hoses should be kept on reels or hangers in a designated area on the wall.
6. Unattended ladders should never be left next to an airplane.
7. If paint is kept in the hangar it should be kept in a properly designated paint cabinet.
8. Oxygen cylinders should be kept separate from flammables and greases and chained to the wall.
9. Fuel or other spill kits should be available for use and staff trained in their use. If there has been a fuel leak, the hangar should be given time to air out, to dissipate flammable fumes. Some fluids, such as certain hydraulic fluids for example, can be highly corrosive, burning skin or damaging the floor. When spills occur, wash hands and clean floors and equipment immediately.

3.4. Cleaning

All areas inside the hangar should be kept clean including the floor which should be mopped.

When cleaning or doing maintenance in aircraft overshoes and gloves should be worn and every precaution should be taken to avoid spillages or marking internal fixtures and fittings

If cleaning includes in depth internal cleaning or to the exterior of the hangar then

- Only agreed chemicals should be used.
- Run off should be managed to ensure that it is at a minimum.
- Run off should only go into airport drainage for it to be disposed of and treated properly.
- Following cleaning there should be an inspection of the hangar area to ensure no chemicals or excess water is present and if so the area should be cleaned up.

4. Aircraft Arrivals

Arrival procedures for arrival at the hanger are described in SOP_OEAO_ADM_01_015 - Aircraft Marshalling. Aircraft will park in the hanger under their own power. Particular attention must be taken in the following areas:

Step	Action
4.1	Suggested hangar parking diagrams should be provided as visual aids to Aula Airport Operations by the FBO operator.
4.2	The FBO operator or airline must have previously informed Alula Airport Operations of the aircraft type and any special equipment or handling required.
4.3	When required the Executive fleet vehicles should be at the hanger prior to the arrival of the flight. If not then appropriate coach transport will be provided. These will initially be parked in agreed areas away from the parking area and so they do not obstruct the arrival of the aircraft.
4.4	Marshallers and wing walkers will be dispatched with appropriate equipment to the hanger in preparation.
4.5	After arrival to the hanger the Marshaller shall: <ul style="list-style-type: none">■ Perform FOD check and remove all debris■ Make sure that the stand surface condition is sufficient to safe aircraft movement.■ Make sure that all ground handling equipment is positioned behind the safety line / outside the equipment restraint area■ Make sure that the stand area is free of objects and obstacles which the aircraft may strike or endanger others due to jet blast effects■ Ensure that the identified parking position is large enough for the aircraft and the positioning of the centre of the aircraft and stop point allows for access to the hanger, avoids other aircraft and allows for positioning of tugs for backing out of the aircraft.
4.6	Aircraft will either be stopped outside the hanger and towed in or use their own power to enter the hanger. If the former then steps 4.7 to 4.13 should be followed if using their own power then steps 4.14 to 4.18 should be followed. After either method will continue to follow the steps from 4.19.
4.7	As aircraft approaches the Hanger the Marshaller indicates the line to be followed by the aircraft by standing at the stop line and gives the " IDENTIFY STAND " signal.
4.8	As the aircraft approached the Marshaller will provide the correct hand signals to stop the aircraft at the appropriate place.
4.9	The nose wheel should be positioned at appropriate stop point. Use the " Turn Left " or " Turn Right " signals to correct the track of the aircraft as required.
4.10	As the aircraft approaches the stop position, use the " Slow Down " signal if required. As the nose wheel reaches the stop point slowly cross the wands in the " Stop " signal.
4.11	When the aircraft stops in the required/desired position, use the " Set brakes " signal. Wait for the signal from pilot confirming " Brakes engaged ".
4.12	A tug with appropriate tow bar is then attached to the aircraft and the pilot will be signalled using the " Release-brakes " sign. After receiving the " Brakes Released " signal the aircraft towing will then start.
4.13	The tug operator will then tow the aircraft to the designated parking spot in the hanger following any instructions from Wing walkers if used
4.14	As aircraft approaches the Hanger the Marshaller indicates the line to be followed by the aircraft by standing at the stop line inside the hanger and gives the " IDENTIFY STAND " signal. If the line cannot easily be seen from outside the hanger then Marshallers will first align the aircraft with it outside the hanger stop the aircraft and then position themselves inside to complete the movement.
4.15	As the aircraft approached the Marshaller will provide the correct hand signals to stop the aircraft at the appropriate place.

Step	Action
4.16	The nose wheel should be positioned at appropriate stop point. Use the “ Turn Left ” or “ Turn Right ” signals to correct the track of the aircraft as required.
4.17	As the aircraft approaches the stop position, use the “ Slow Down ” signal if required. As the nose wheel reaches the stop point slowly cross the wands in the “ Stop ” signal.
4.18	When the aircraft stops in the required/desired position, use the “ Set brakes ” signal. Wait for the signal from pilot confirming “ Brakes engaged ”.
4.19	Once the aircraft has come to a complete stop and all conditions for chocking are met, the aircraft is chocked. Use the “ Chocks inserted ” signal to inform pilot that the aircraft is safely choked. Note that if the aircraft is planned for overnight parking then triple chocks should be placed at main and nose gear .
4.20	Once aircraft choked, the marshalling task is finished.
4.21	The Executive fleet vehicles or coach will then be driven to the aircraft side once the aircraft door has been opened and a clear signal is given by the Ground Handler for them to move forward. . At all times the vehicle drivers will be alert for any dangers on the site and for other ground handling vehicles or aircraft that may be at the stand or its vicinity.
4.22	Once the passengers have disembarked the Executive fleet vehicle or coach will take them to the terminal for arrivals processing as agreed with the airport operator, security, customs and immigration services. Provision must also be in place to take crew from the aircraft for processing if required i.e. they are not staying with the aircraft until departure.
4.23	Any luggage should be removed from the aircraft and taken with the passenger to the terminal for processing.

5. Aircraft Turnaround

The following activities can be performed whilst the aircraft is within the hanger in preparation for its departure.

- Cleaning of the internal of the aircraft;
- Removal of waste to be disposed of appropriately;
- Addition of potable water;
- Removal of toilet waste;
- Addition of blue water;
- Connection of GPU and PCA if available;
- Loading of catering; and
- Washing of the exterior of the aircraft.

Actual procedures will depend on agreements with the aircraft operator or airline and must follow the following:

- Operation of any equipment must be done by personnel trained and familiar with the equipment including any supplied by the aircraft operator or airline if specialist equipment or tools are needed;
- Fueling and defueling is not allowed within the hanger;
- Overshoes may be required in order to maintain the cleanliness of cabins;
- Ground power units should not be positioned under tail sections and must be chocked and special precautions should be followed to insure the removal of GPU plugs before the unit is moved;
- Removal of blue water will be done using suitable equipment and trained staff and disposed of as per the airport operating procedures ensuring that it does not pollute any areas of the airport or externally;
- Tugs and other types of GSE such as golf carts should be shut-off, parking brakes set, and chocked when left unattended;
- All mobile equipment should be positioned to not face aircraft.

If cleaning includes the exterior of the aircraft then

- Only agreed chemicals should be used;
- Run off should be managed to ensure that it is at a minimum;
- Run off should only go into airport drainage for it to be disposed of and treated properly;
- Following cleaning there should be an inspection of the hanger and ramp area to ensure no chemicals or excess water is present and if so the area should be cleaned up.

All aircraft fueling must be performed on the ramp and not in hangers. All safety processes as directed by the airport operator, fueling company and fire service must be followed including that Fuel Trucks should be chocked when servicing aircraft.

Potable water will be delivered as per airport operating processes. These should include:

- Safe handling including attaching and detaching hoses
- Cleanliness

- Verification of source purity
- Verification of purity within Ground Handling equipment

6. Aircraft Departure

Aircraft will need to be pushed back from the hangers onto the ramp for departure.

6.1. Towing and pushback

The following rules apply to towing and pushback from the FBO hanger:

Step	Action
6.1.1	The type of tow vehicle and tow bar must be appropriate and certified for the aircraft type.
6.1.2	There must be verification that the aircraft brakes are off before the tow or push is initiated
6.1.3	Employees who move aircraft must have received appropriate training on equipment and procedures.
6.1.4	Aircraft should only be towed at a safe walking speed.
6.1.5	All tugs must have clearly marked towing safety rules present.
6.1.6	Large/heavy aircraft must have a person acting as a brake monitor during movement in the cockpit in direct communication with the tug.
6.1.7	Wing walkers must be used in confined areas or areas where marshalling person cannot see all positions of the aircraft.
6.1.8	If a wing walker is being used and the tow operator loses sight of them then an immediate stop should occur.
6.1.9	If there is any doubt as to having adequate space or clearance, an immediate stop should occur.
6.1.10	A complete area risk assessment briefing should be performed before moving aircraft.
6.1.11	At least 2 wing walkers should be used while moving aircraft from or into hangars along with the tug operator.
6.1.12	Hanger doors should be fully opened and secured.
6.1.13	Towing equipment should be visually inspected, the brakes checked and the correct tow bar verified.
6.1.14	A visual inspection of the aircraft should be completed before any tow initiates.
6.1.15	All sides of the aircraft perimeter should be visually inspected for hazards.
6.1.16	Aircraft wings should not overlap other aircraft due to settling hazard.
6.1.17	Aircraft should not be moved through propeller arcs.
6.1.18	Employees who move aircraft should have received training on company procedures and the equipment they will use.
6.1.19	A post tow inspection should be completed of aircraft.
6.1.20	For aircraft pushes, the rear area must be inspected before movement.
6.1.21	Large/heavy aircraft must have a person acting as a brake monitor during movement in the cockpit in direct communication with the tug.

6.2. Departure Processes

Departure procedures from the hanger are that aircraft will be pushed back from the hanger into the apron area:

Step	Action
6.2.1	The FBO operator or airline must have previously informed Alula Airport Operations of the aircraft type and any special equipment or handling required
6.2.2	Marshallers and wing walkers will be dispatched with appropriate equipment to the hanger in preparation.
6.2.3	All required ground handling and marshalling staff should be in place as required for the departure e.g. baggage loading, passenger services etc.
6.2.4	Passengers will be brought to the aircraft by the Executive Fleet or coach only once it has been agreed that the aircraft is ready for them to board. Passengers must also have cleared any security and emigration checks as required.
6.2.5	All baggage must have been cleared by airport security and customs, if appropriate, before being brought to the aircraft.
6.2.6	Push back can then be performed following the rules in 6.1 above and SOP_OEAO ADM_01_015
6.2.7	Once clear of the hanger and the push back tug is away from the aircraft. Only after agreement with air traffic control, the ground handler and the pilot the aircraft can depart.

Appendix A. Glossary

A.1. Terms and definitions

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.
Aerodrome control tower	A unit established to provide air traffic control service to aerodrome traffic.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Airside	<p>The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.</p> <p>Authorization for an aircraft (or vehicle) to proceed under conditions specified by an air traffic control unit.</p>
Air traffic control clearance	<p>Note 1: For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate context.</p> <p>Note 2: The abbreviated term "clearance" may be prefixed by the words "taxi", "take-off", "departure", "en route", "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates.</p>
Air traffic control unit	A generic term meaning variously, area control center, approach control unit or aerodrome control tower
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Clearway	A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an airplane may make a portion of its initial climb to a specified height.
Fixed Base Operation	A fixed-base operator (FBO) is an organization granted the right by an airport to operate at the airport and provide aeronautical services such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, flight instruction, and similar services. An FBO is the primary provider of support services to general aviation operators at a public-use airport and is on land leased from the airport, or, in rare cases, adjacent property as a "through the fence operation".

Movement area	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).
Night	The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority. Note: Civil twilight ends in the evening when the center of the sun's disc is 6 degrees below the horizon and begins in the morning when the center of the sun's disc is 6 degrees below the horizon.
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Obstacle	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight. Note: The term obstacle is used in Annex 4 Edition 10 solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.
Runway	A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.
Runway end safety area RESA	An area symmetrical about the extended runway center line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an airplane undershooting or overrunning the runway.
Runway guard lights	A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.
Runway strip	A defined area including the runway and stop-way, if provided, intended: a) to reduce the risk of damage to aircraft running off a runway; and b) to protect aircraft flying over it during take-off or landing operations.
Runway-holding position	A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower. Note: In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.
Safety management system	A system for the management of safety at aerodromes, including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for control of safety at, and the safe use of, the aerodrome.

Stop-way	A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off
Taxiway	A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including: a) Aircraft stand taxi-lane. A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only. b) Apron taxiway. A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron. c) Rapid exit taxiway. A taxiway connected to a runway at an acute angle and designed to allow landing airplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.
Taxiway strip	An area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.
Touchdown zone	The portion of a runway, beyond the threshold, where it is intended landing airplanes first contact the runway.

A.2. Abbreviations and acronyms

ACI	Airports Council International
SANS	Saudi Air Navigation Services
FBO	Fixed Base Operation
FRCC	Fire Rescue Communication Centre
FOD	Foreign object damage, foreign object debris
GACA	General Authority for Civil Aviation
ICAO	International Civil Aviation Organisation
NOTAM	Notice to Airmen
OLS	Obstacle limitation surface
OM	Operations Manual
RGL	Runway guard light
RWY	Runway
SOP	Standard Operating Procedure
SP	Specialized
TOCC	Terminal Operations Control Centre
TWY	Taxiway
VDGS	Visual docking guidance system



Standard Operating Procedures

Global Reporting Format (GRF)

Authorization

	Name	Position	Date & Signature
Prepared by:			
Operational Check by:			

GRF-RCR SOP Record and Amendments

Revision Numbers	Revision Date	Name and Position	Brief of Change
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1. ABBREVIATIONS

OEAO	Alula International Airport
SANS	Saudi Air Navigation Services
ATM	Air Traffic Management
ATS	Air Traffic Services
AIM	Aeronautical Information Management
ATC	Air Traffic Control
TWR	Air Traffic Tower
NOF	SANS Notification Office
GRF	Global Reporting Format
GACA	General Authority of Civil Aviation
GACARs	General Authority of Civil Aviation Regulations
SOP	Standard Operating Procedures
PANS	Procedures for Air Navigation Services
MET	Meteorology
QA	Quality Assurance
RCR	Runway Condition Report
RCAM	Runway Condition Assessment Matrix
RWYCC	Runway Condition Code
SNOWTAM	Special series notifying the presence or removal of hazardous condition due to snow, ice slush or standing water associated with snow, slush and ice on the movement area by means of a specific format
NOTAM	Notification to Airmen
RWY	Runway
ATIS	Automatic Terminal Information Services
VHF	Very High Frequency
RST	Runway Safety Team

2. Introduction

The ICAO Global Reporting Format (GRF) is a globally harmonized methodology for runway surface condition assessment and reporting that it is intended to be the only such reporting format for international aviation, with the objective of reducing runway excursions, thus improving the safety of airport operations. The aim of this SOP is to assist airport personnel to implement the new Runway Condition reporting requirements as outlined in ICAO Circular 355 (Assessment, Measurement and Reporting of Runway Surface Conditions).

a. External legal, regulatory standards and/or policy:

- GACAR 139 Version 7.0- Appendix E-3.
- ICAO PANS Doc.9981 Third Edition 2020 – Part-II, Chapter 2.
- ICAO Circular 355 Assessment, Measurement and Reporting of Runway Surface Conditions.
- ICAO Doc.10066 Aeronautical Information Management First Edition 2018 - Appendix 4.

b. Associated SOPs:

- SOP 01.005 Inspection of the Movement Area

2.1 Purpose

The GRF was developed by the International Civil Aviation Organization (ICAO) to help mitigate the risk of runway excursions. The aim is to provide a common understanding of the surface friction characteristics that contribute to controlling an aircraft via critical tier-to-ground contact area.

The GRF is established to

a. Standardization: Establish a common language between all related parties in airports with one system (Aerodrome Operator, RST, Safety, Aircraft Operators, Pilots, ATS, AIM, MET, etc.)

- b. Improved Safety: Better understanding of runway conditions and fewer runway excursions.
- c. Improved Efficiency: Flight crews can better correlate reported runway surface conditions to contaminated landing and take-off performance data and airport operators have an objective method of reporting runway surface conditions to flight crews.

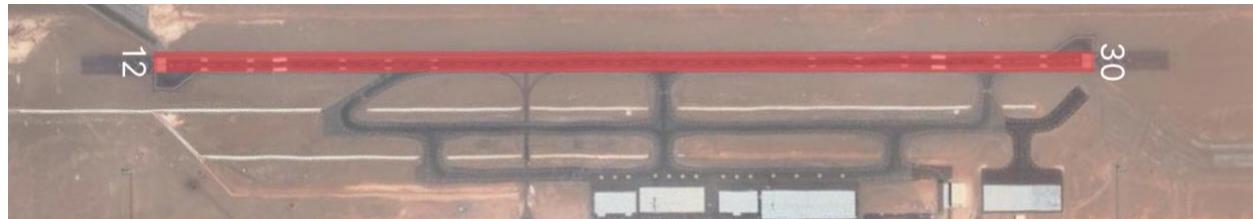
2.2 Relevant Stakeholder

Direct Use	Aware of
<ul style="list-style-type: none"> • Aerodrome Operations • Aeronautical Information Management • Air Traffic Services • Meteorology 	<ul style="list-style-type: none"> • Aerodrome Safety • Aerodrome Maintenance • Aircraft Operators

2.3 Scope

This standard operating procedure is associated to all direct users from OEAO Aerodrome Operations, SANS Aeronautical Information Management, and SANS Air Traffic Services.

2.4 Applicable areas within the airfield (outlined in red)



3. Performance means

Performance	Description	Main Drivers	Reporting	When
Reporting Runway Surface Condition using Runway Condition Report (RCR) Format	The RCR shall be established when a significant change in runway surface condition occurs due to water, snow, ice, or frost until the runway condition is not reported.		Aerodrome RST/Operations/Safety to report RCR to SANS	Report shall be sent immediately from the inspection completion
Reporting Runway Surface Condition using Ground Controller Frequency			Aerodrome RST/Operations/Safety shall contact the ATC controller on frequency (118.775)	Reporting shall be completed after vacating the in-use runway immediately
Issuance of SNOWTAM	<p>SNOWTAM shall be issued and published whenever one or more of the defined thirds on the in use RWY found:</p> <ul style="list-style-type: none"> 1- Covered by more than 25% of contaminant (i.e. water) and. 2- The depth of contaminant is more than 3mm. 	Reducing the risk probability of runway excursion	<p>Aerodrome Operations Supervisor to coordinate with NOF and issue SNOWTAM accordingly.</p> <p>nof@sans.com.sa</p>	SNOWTAM shall be initiated and communicated to NOTAM office (NOF) immediately from the inspection completion.

4. Stakeholder Responsibilities

4.1 Aerodrome Operations

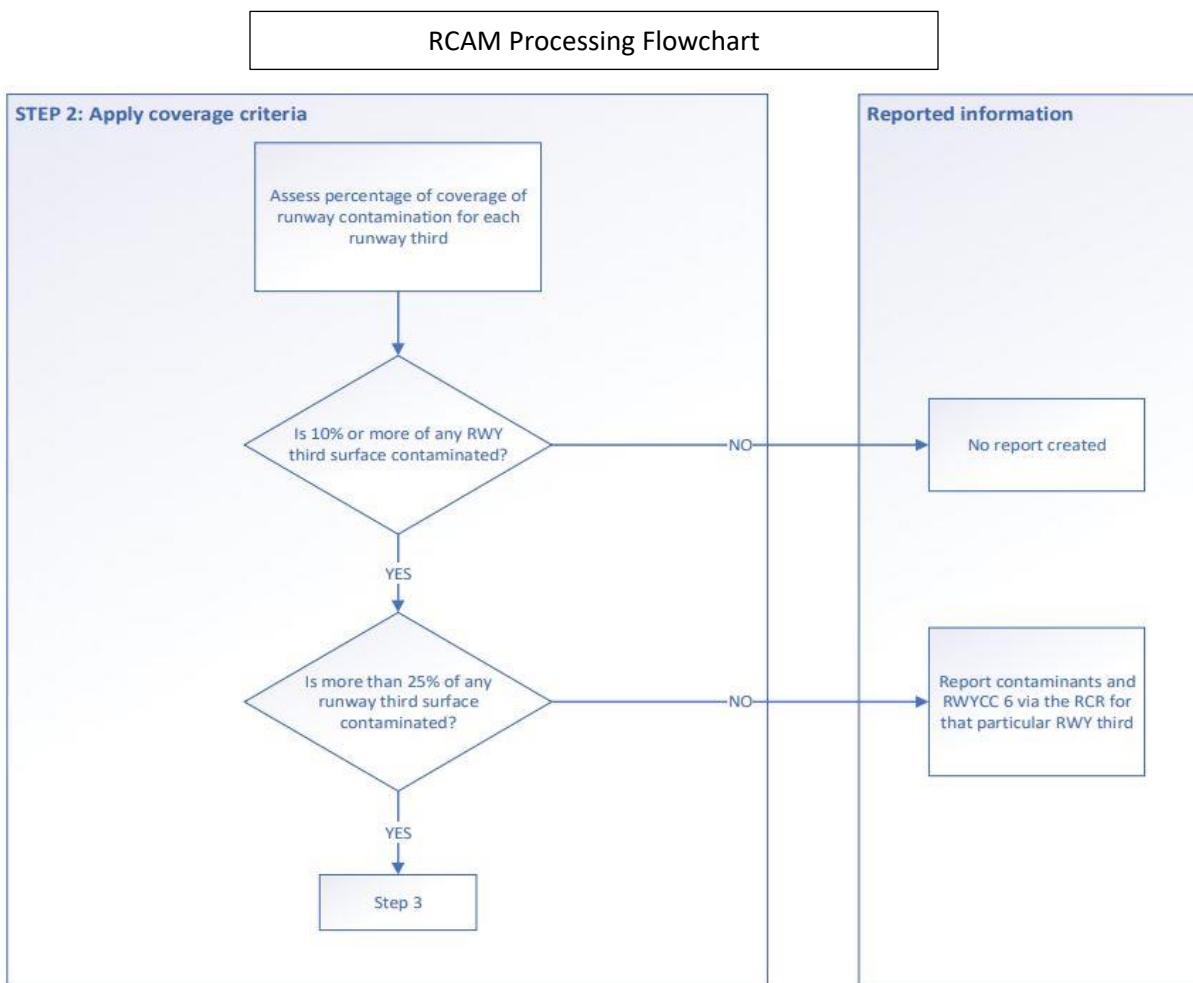
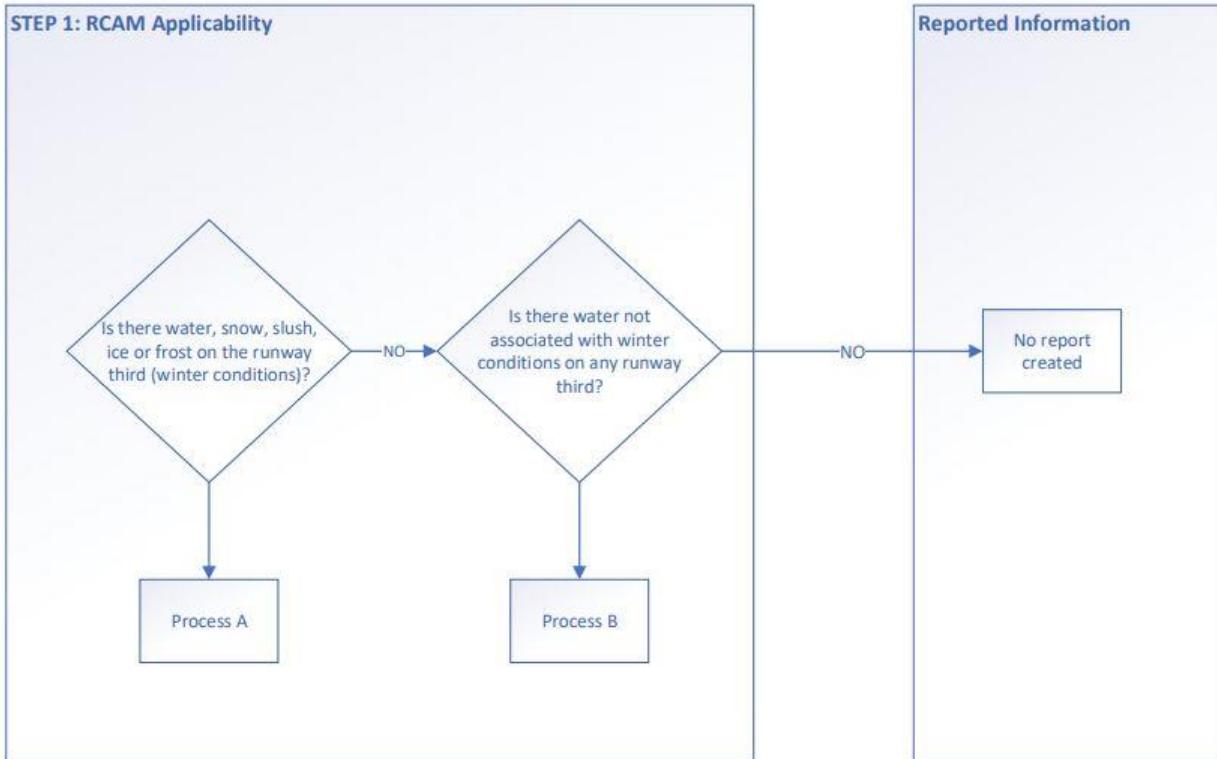
A. Assessing the runway surface conditions

- i. The Aerodrome RST/Operations/Safety team assesses the runway surface conditions whenever water, snow, slush, ice, or frost are present on an operational runway, using runway condition assessment matrix (RCAM) see appendix 1.
- ii. A runway condition code (RWYCC) see appendix 2, assessment will be assessed based on a description of the runway surface and it can be used by the flight crew for aircraft performance calculations.
- iii. The report, based on the type, depth, and coverage of contaminants, to be assessed based on the runway surface condition by the aerodrome operations team.
- iv. All other pertinent information may be taken into consideration.
- v. Upgrading or downgrading RWYCC using the defined procedures in this document using the runway condition assessment matrix RCAM.

B. Assess the runway surface conditions, including contaminants, for each third of the runway length, and to be reported by means of a uniform RWY condition report (RCR) as follows:

- i. Upon the receipt of weather report from meteorology office MET whenever water, snow, slush, ice, or frost are present or forecasted on OEAO/ULA (30/12 runway), the Aerodrome RST/Operations/Safety Officer / Inspector will immediately respond and proceed to the in-use RWY in coordination with SANS (ATC TWR, Permission shall be obtained ahead to enter the active runway)
- ii. The Aerodrome RST/Operations/Safety Officer / Inspector will inspect the in-use RWY defining percentages of the runway contamination coverage over the runway thirds as shown in appendix.2 (i.e., water coverage)
- iii. If one or more of the defined thirds on the in-use runway found covered by more than 25% of contaminant (i.e., Water) and the depth of the contaminant is less than or equal to three (3) mm (using Vernier Caliper or a ruler as a measurement tool), then the

- Aerodrome RST/Operations/Safety Officer / Inspector shall immediately report the runway condition report RCR to the ATC TWR controller via Ground Frequency (118.775) Hz.
- iv. the Aerodrome RST/Operations/Safety Officer / Inspector shall repeat the runway condition assessment as follows:
 - a) The inspection and assessment will be repeated, whenever change is observed until the case is terminated.
 - b) Whenever a change in weather is observed either by air traffic control ATC, meteorology office MET or by the aerodrome operations officer / inspector.
 - c) If needed, any other information (e.g., a pilot report of runway braking action - AIREPs).
 - v. the Aerodrome RST/Operations/Safety shall report runway surface condition using Runway Condition Assessment Worksheet format, see appendix 5, via e-mail to SANS ATC operations.
 - vi. When the case is terminated, the Aerodrome RST/Operations/Safety Officer / Inspector will terminate the case whenever the weather condition is improved so, the Aerodrome RST/Operations/Safety Officer / Inspector will report the case is closed to the ATC TWR controllers via VHF radio (Ground Frequency) however, hard copy/Scanned copy by email of the RCR will be handed over to the ATC TWR as soon as possible.
 - vii. SNOWTAM Issuance: If one or more of the defined thirds on the in-use runway RWY found covered by more than 25% of contaminant (i.e. Water) and the depth of the contaminant is more than three (3) mm (a ruler as a measurement tool), then the Aerodrome RST/Operations/Safety shall issue a SNOWTAM in coordination with ATC TWR; then, to share the SNOWTAM form “signed” to SANS AIM/Operations via e-mail Aim@SANS.COM.SA for publication purposes, taking into the considerations that the mandatory fields have been completed from A to G. (see appendix 4)



STEP 3: Apply assessment criteria

Assessment criteria

Contaminant type and depth
Temperature considerations
Corresponding RWYCC for each runway third
RWYCC identified by reviewing all runway surface description categories

From Step 2

Assess and determine the type and depth of contaminants present for each third and assign RWYCC

YES

Is RWYCC downgrade or upgrade action required?

NO

Step 4

Reported information

Report contaminants and RWYCC via the RCR

STEP 4: Apply downgrade/upgrade criteria

Examples of pertinent information

Prevailing weather conditions
Observations and measurements
AIREPs
Experience (local knowledge)
Results from friction measurements
Vehicle deceleration or directional control
All other available information

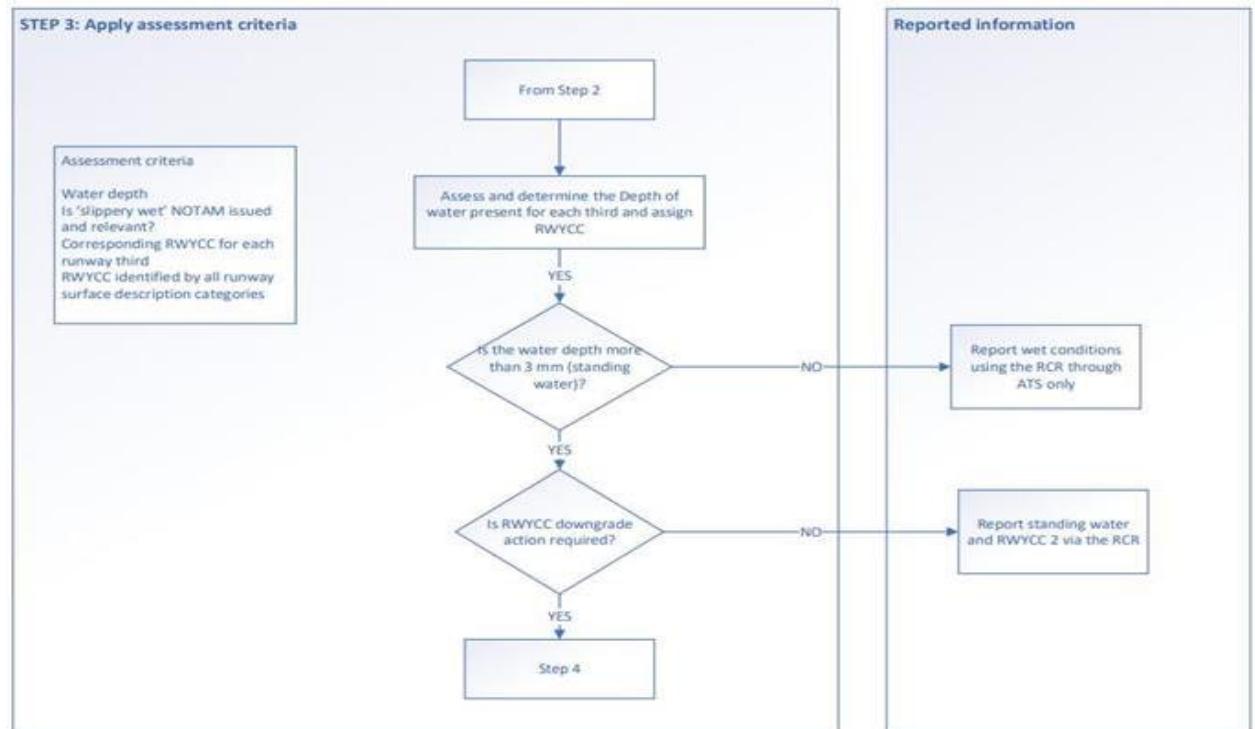
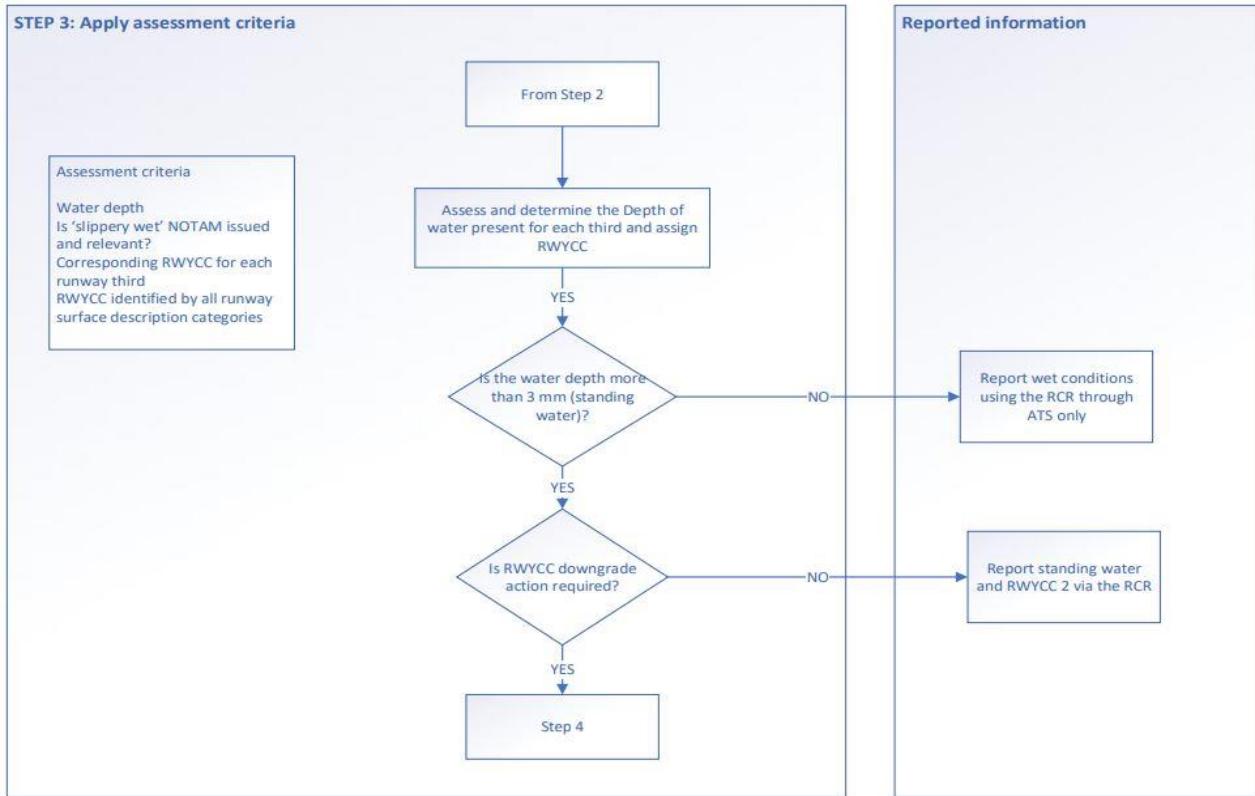
From Step 3

Determine downgrade or upgrade using all pertinent information available

Reported information

Report contaminants and RWYCC via the RCR

RCAM Processing Flowchart A



Global Reporting Format (GRF)

STEP 4: Apply downgrade/upgrade criteria

Examples of pertinent information

Prevailing weather conditions
Observations and measurements
AIREPs
Experience (local knowledge)
Results from friction measurements
Vehicle deceleration or directional control
All other available information (e.g. ponding)

From Step 3

Determine downgrade or upgrade using all pertinent information available

Reported information

Report Standing water and RWYCC via the RCR

- viii. Vehicle's Radio Failure: In case the Aerodrome RST/Operations/Safety Officer / Inspector experiences a radio failure, the vehicle's operator shall vacate the runway immediately to the nearest safety area and shall contact ATC controllers through landline (0148847104) and Aerodrome Operations Control Center by other means to identify the new position and actions.
- ix. Aerodrome Operations staff Training: Prior the implementation of the GRF, the Aerodrome RST/Operations/Safety Officer / Inspector shall be trained on the GRF and RCR implementation and a refresh training should be provided for each inspector (at least once a year). Moreover, all newly recruited Aerodrome Operations Officer / Inspector shall be trained on the GRF implementation procedures prior commencing their duties.

4.2

[**OEAO Metrology Office \(National Center of Metrology\)**](#)

- a. MET office shall monitor the weather condition changes continually and comply with requirements of GACAR 179.
- b. MET office at OEAO is responsible for passing weather forecasts information including Weather-warning reports in timely manner to OEAO Aerodrome Operations department via email.
- c. MET office update OEAO mentioned departments and will update them for any change in the weather condition via email.
- d. MET office will provide any supportive data related to the weather condition via the defined Telephones whenever requested by OEAO mentioned departments.

4.3

[**Air Traffic Control**](#)

- a. ATC Controller will facilitate/support the Aerodrome RST/Operations/Safety Inspector movement and access to the maneuvering area depend on the traffic.
- b. Upon the receipt of the RCR from Aerodrome Operations, the ATC Controller will update the ATIS; accordingly, or
- c. Will convey the RCR to the Airmen (upon Airmen request) via VHF Radio (Ground or Local Frequencies).

- d. ATC Controllers should notify on duty Aerodrome Operations of any observed changes in weather conditions.

4.4

[**SANS Aeronautical Information Management \(AIM\)**](#)

- a. Upon the receipt of the SNOWTAM message form by email, AIM officer will review the SOWTAM then he will publish it as per the agreed format.
 - b. Aerodrome maintenance shall update the aerodrome operations for any change in the friction coefficient, and / or upon request.

Appendix 1

Runway Condition Assessment Matrix (RCAM)

RUNWAY CONDITION ASSESSMENT MATRIX

Assessment Criteria		Downgrade deceleration or directional control observation	
Runway condition code	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action
6	• Dry	---	---
5	<ul style="list-style-type: none"> • Frost • Wet (The runway surface is covered by any visible dampness or water up to and including 3mm depth) <p>Up to and including 3mm depth:</p> <ul style="list-style-type: none"> • Slush • Dry snow • Wet snow 	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
4	<ul style="list-style-type: none"> -15°C and lower outside air temperature: • Compacted snow 	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
3	<ul style="list-style-type: none"> • Wet ("slippery wet" runway) • Dry snow or Wet snow (any depth) On top of compacted snow <p>More than 3mm depth:</p> <ul style="list-style-type: none"> • Dry snow • Wet snow <p>Higher than -15°C outside air temperature:</p> <ul style="list-style-type: none"> • Compacted snow 	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
2	<ul style="list-style-type: none"> More than 3mm depth of water or slush: • Standing water • Slush 	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
1	• ICE	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
0	<ul style="list-style-type: none"> • Wet ice • Water on top of compacted snow • Dry snow or wet snow on top of ice 	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Less than Poor

Appendix 2

Assigning Runway Condition Code (RWYCC)

<i>Runway condition description</i>	<i>Runway condition code (RWYCC)</i>
DRY	6
FROST WET (the runway surface is covered by any visible dampness or water up to and including 3 mm deep) SLUSH (up to and including 3 mm depth) DRY SNOW (up to and including 3 mm depth) WET SNOW (up to and including 3 mm depth)	5
COMPACTED SNOW (Outside air temperature minus 15 degrees Celsius and below)	4
WET ("Slippery wet" runway) DRY SNOW (more than 3 mm depth) WET SNOW (more than 3 mm depth) DRY SNOW ON TOP OF COMPACTED SNOW (any depth) WET SNOW ON TOP OF COMPACTED SNOW (any depth) COMPACTED SNOW (outside air temperature above minus 15 degrees Celsius)	3
STANDING WATER (more than 3 mm depth) SLUSH (more than 3 mm depth)	2
ICE	1
WET ICE	0
WATER ON TOP OF COMPACTED SNOW	
DRY SNOW OR WET SNOW ON TOP OF ICE	

Appendix 3

Correlation of Runway Condition Code and Pilot Report of Runway Braking Action

<i>Pilot report of runway braking action</i>	<i>Description</i>	<i>Runway condition code (RWYCC)</i>
N/A		6
GOOD	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal	5
GOOD TO MEDIUM	Braking deceleration OR directional control is between good and medium	4
MEDIUM	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced	3
MEDIUM TO POOR	Braking deceleration OR directional control is between medium and poor	2
POOR	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced	1
LESS THAN POOR	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain	0

Appendix 4

SNOWTAM Reporting Format

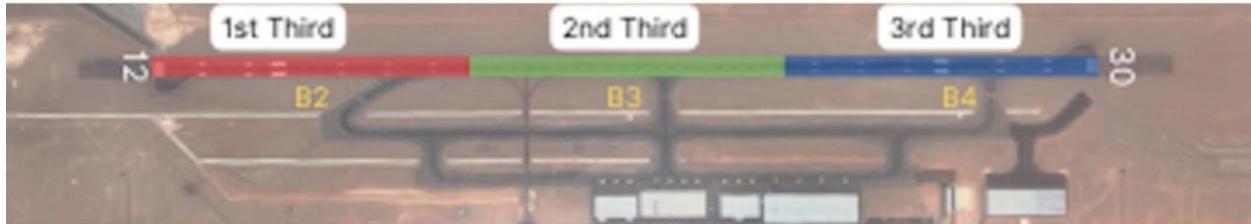
(COM heading)	(PRIORITY INDICATOR)	(ADDRESSES)										<=					
	(DATE AND TIME OF FILING)		(ORIGINATOR'S INDICATOR)														
(Abbreviated heading)	(SWAA* SERIAL NUMBER)	(LOCATION INDICATOR)		DATE-TIME OF ASSESSMENT						(OPTIONAL GROUP)		<=					
S W * *														<=			
SNOWTAM	(Serial number)	><=															
Aeroplane performance section																	
(AERODROME LOCATION INDICATOR)										M	A)						
(DATE/TIME OF ASSESSMENT (<i>Time of completion of assessment in UTC</i>))										M	B)						
(LOWER RUNWAY DESIGNATORS)										M	C)						
RUNWAY CONDITION CODE ON EACH THIRD OF RUNWAY (From Runway Condition Assessment Matrix (RCAM) 0, 1, 2, 3, 4, 5 or 6)										M	D) / /						
PER CENT COVERAGE CONTAMINANT FOR EACH RUNWAY THIRD										C	E) / /						
DEPTH (mm) OF LOOSE CONTAMINANT FOR EACH THIRD OF RUNWAY)										C	F) / /						
(CONDITION DESCRIPTION OVER TOTAL RUNWAY LENGTH (Observed on each third of the runway, starting from threshold having the lower runway designation number) DRY WET ICE WATER ON TOP OF COMPACTED SNOW DRY SNOW DRY SNOW ON TOP OF ICE WET SNOW ON TOP OF ICE ICE SLUSH STANDING WATER COMPACTED SNOW WET SNOW DRY SNOW ON TOP OF COMPACTED SNOW WET SNOW ON TOP OF COMPACTED SNOW WET FROST										M	G) / /						
(WIDTH OF RUNWAY TO WHICH THE RWYCCs APPLY, IF LESS THAN PUBLISHED WIDTH)										O	H) <=						
Situational awareness section																	
(REDUCED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))										O	I)						
DRIFTING SNOW ON THE RUNWAY										O	J)						
LOOSE SAND ON THE RUNWAY										O	K)						
CHEMICAL TREATMENT ON RUNWAY										O	L)						
(SNOWBANKS ON THE RUNWAY (If present, distance from runway centreline (m) followed by "L", "R" or "LR" as applicable))										O	M)						
(SNOWBANKS ON A TAXIWAY (If present, distance from the edge of runway (m) followed by "L", "R" or "LR" as applicable))										O	N)						
SNOWBANKS ADJACENT TO THE RUNWAY										O	O)						
(TAXIWAY CONDITIONS)										O	P)						
(APRON CONDITIONS)										O	R)						
(STATE APPROVED AND PUBLISHED USE OF MEASURED FRICTION COEFFICIENT)										O	S)						
(PLAIN-LANGUAGE REMARKS (Including contaminant coverage and other operationally significant information, e.g. sanding, de-icing))										O	T)) <=						
NOTES: 1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2. 2. Information on other runways, repeat from B to P. 3. Words in brackets () not to be transmitted.																	

SIGNATURE OF ORIGINATOR (*not for transmission*)

Appendix 5

Runway Condition Assessment Worksheet

Runway Condition Assessment Worksheet																																																																																																																																		
<input type="text"/> Aerodrome	Is more than 25% of any runway third surface wet or contaminated?																																																																																																																																	
<input type="text"/> Date/Time (UTC) of assessment (MM/DD/HHmm)	<input type="checkbox"/> Yes - assign Runway Condition Codes for each third and complete RWY Condition Report (Blue Box)																																																																																																																																	
<input type="text"/> Lower Runway Designator	<input type="checkbox"/> No - No report created																																																																																																																																	
<input type="text"/> Initials	Note: RWYCC 6/6/6 for all runway thirds may be used to indicate that the runway is no longer wet																																																																																																																																	
<table border="1"> <thead> <tr> <th colspan="2">1st RWY Third</th> <th colspan="2">2nd RWY Third</th> <th colspan="2">3rd RWY Third</th> </tr> <tr> <td colspan="2">For coverage 25% or less enter Code 6</td> <td colspan="2">For coverage 25% or less enter Code 6</td> <td colspan="2">For coverage 25% or less enter Code 6</td> </tr> </thead> <tbody> <tr> <td colspan="2"> <ul style="list-style-type: none"> - Identify % coverage if more than 25% of the RWY third - Identify depth (if applicable) - Identify Runway Condition Code - Record the most restrictive code in the box to the right: <table border="1"> <tr> <td>Dry</td> <td>6</td> </tr> <tr> <td>Wet (Damp)</td> <td>5</td> </tr> <tr> <td>Slippery Wet (Below Min Friction Level Classification)</td> <td>3</td> </tr> <tr> <td>% Cov.</td> <td>100</td> </tr> </table> </td> <td colspan="2"> <ul style="list-style-type: none"> - Identify % coverage if more than 25% of the RWY third - Identify depth (if applicable) - Identify Runway Condition Code - 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STANDARD OPERATING PROCEDURES

PROTECTION OF SITES FOR RADAR & NAVIGATION AIDS

Document information

General information

Document number	SOP_OEAO_ADM_01_022
Issue date	25/01/2023
Version	01.0
Document part of the Certification process	
Document Owner	Alula International Airport Operations

History of changes

Version	Date	Document Owner	Verified by	Authorized by	Modifications
01	30/01/2023	Alula International Airport Operations	Mujahed. Alnsari Rami Alhazmi		Issue

Document sign off

Name	Company	Job Title	Date	Signature
Eng.Abdulwahab Bokhari	Alula International Airport	Airport Director		

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1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139, Certification & Operations, Aerodromes , Version 8.0

External legal, standards and/or policy:

- CAO Annex 10

Other external references:

- ACI Airside Safety Handbook (2010)
- ACI Policies Handbook (10th Edition) 2020

Associated SOPs, OMs and O&MMs:

- SOP_OEAO_ADMIN_01_005 – Inspection of the Movement Area
- SOP_OEAO_ADMIN_01_008 – Aerodrome Signs and Markings

1.2. Purpose

This document defines Standard Operating Procedures (SOP) for Alula International Airport Operations use of the procedures for protection of sites for radar and navigation aids at OEAO.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedure are listed in Table 1.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Safety & Operations	GACA Aviation Standards
Saudi Air Navigation Services SANS	Alula International Airport FRCC

Table 1: List of relevant stakeholders

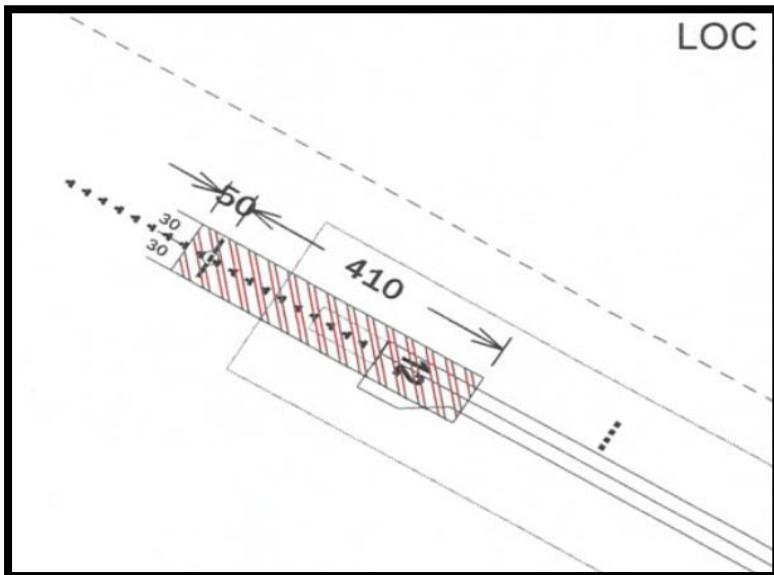
1.4. Scope

In scope: This SOP dictates the procedures of protecting the specified sites for radar and navigation aids within OEAO's movement area. It explains the responsibilities of various departments and it explains the procedures of identifying and marking location of utilities and NAVAIDS in construction areas

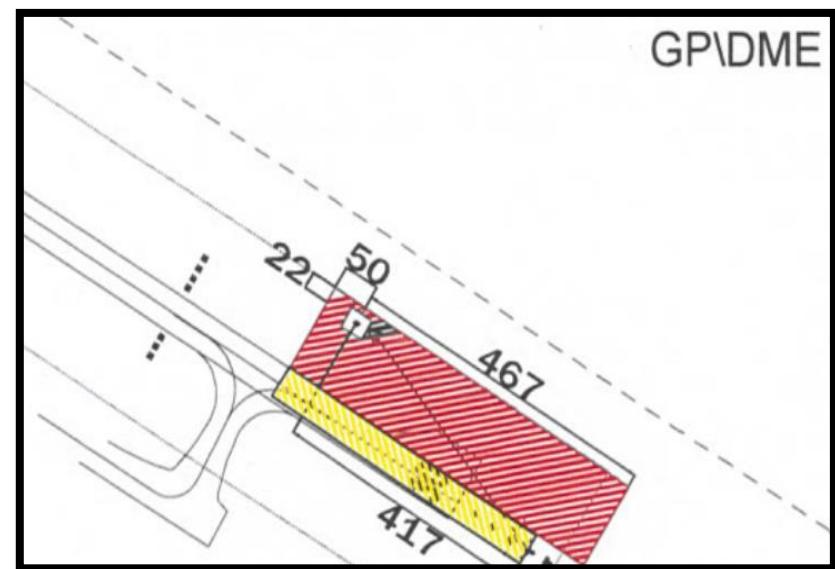
Out of scope: Operations external from the protection area.

1.5. Applicable Areas within the Airfield

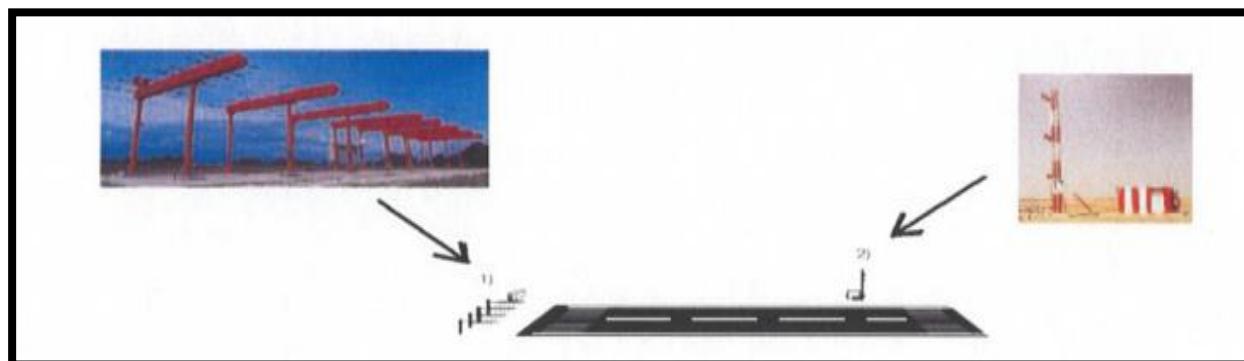
The applicable area for this SOP includes the movement in RWY12/30



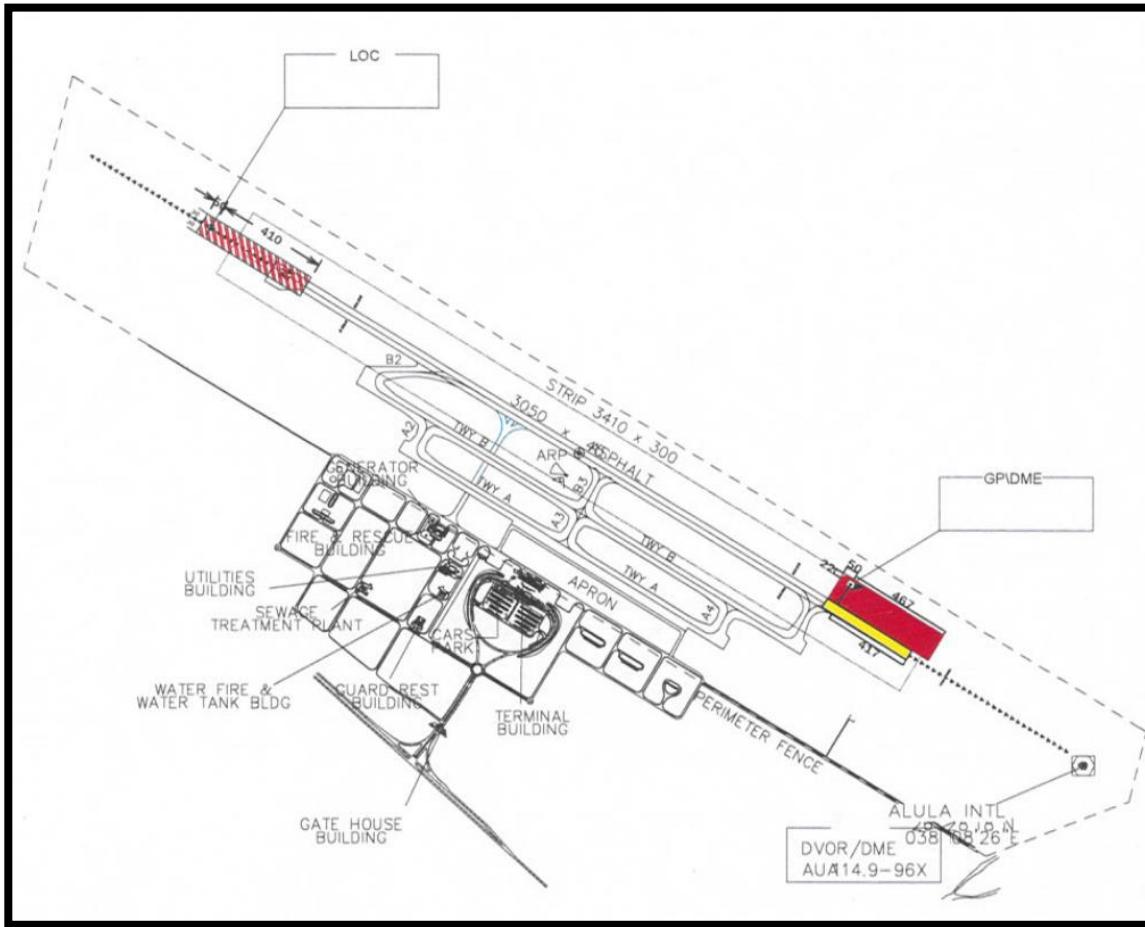
Localizer 12 – critical & sensitive area – CAT1



Glide path 30 – critical & sensitive area – CAT1



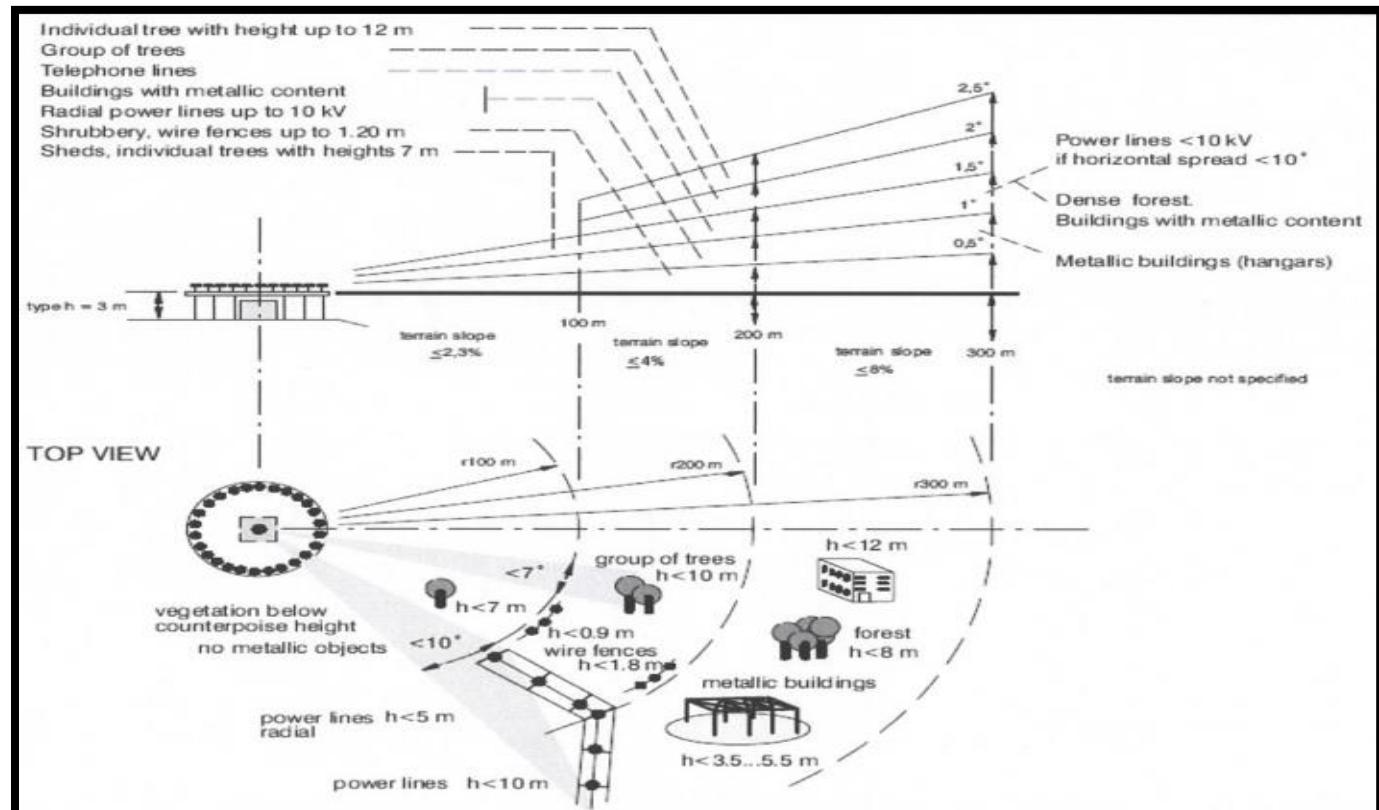
2. ILS Critical & Sensitive area :



ILS Critical & Sensitive areas – RWY12/30

2.1 General process of ILS Critical & Sensitive areas

- Critical Area: ILS critical area is an area of defined dimensions about the localizer and glide path antennas where vehicles, including aircraft, are excluded during all ILS operations. The critical area is protected because the presence of vehicles and/or aircraft inside its boundaries will cause unacceptable disturbance to the ILS signal-in-space.
- Sensitive Area: ILS sensitive area is an area extending beyond the critical area where the parking and/or movement of vehicles, including aircraft, is controlled to prevent the possibility of unacceptable interference to the ILS signal during ILS operations. The sensitive area is protected against interference caused by large moving objects outside the critical area but still normally within the airfield boundary
- FRCC,Safety & Airport OPS team are responsible for constant control of NAVAIDs critical areas against any obstacle or signal disturbance activity
- DVOR/DME Siting Criteria:



DVOR/DME Siting Criteria

2.2 Protection of NAVAIDS :

- Saudi Air Navigation Company (SANS) is responsible for identifying critical and sensitive areas and must share it with OEAO (Airport Safety and operations).
- (Airport Safety and operations) is responsible for applying all protection measures (Marking, Signs) that would protect these areas from any unauthorized entry in coordination with Airport maintenance .
- It is part of Alula Airport operations daily inspections (Maneuvering area inspection) to inspect critical areas of SANS equipment. If any unsafe or abnormal condition/activity observed which may affect the performance of SANS navigational equipment, Aerodrome operations staff will immediately report the case to SANS .
- At the airport, NAVAIDS are protected against vandalism, theft and unauthorized entry by their location within the security fenced area of the airport which is protected by Airport security department (RSAF).
- Each ILS equipment critical area is designated with red/white markers (Frangible poles).
- No person or equipment shall cross ILS critical area markers unless authorized/allowed by Airport Tower.

2.3 Identifying & Marking Location of Utilities & NAVAIDS in Construction Areas

- Prior to beginning any construction, servicing or repairs, all utilities and NAVAIDS shall be identified, marked and signed by aerodrome maintenance in-charge in coordination with SANS (SME) to inform workmen of their presence to avoid damage.
- Airport Director shall be consulted prior to any construction, servicing or repairs being performed near NAVAIDS. Hazard assessment Risk and hazard analysis should be completed for:

Appendix A. Glossary

A.1. Terms and definitions

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.
Aerodrome control tower	A unit established to provide air traffic control service to aerodrome traffic.
Aerodrome Manual	The Aerodrome Manual contains all the pertinent information concerning the aerodrome site, facilities, services, equipment, operating procedures, organization, and management (including the Safety Management System) and is a fundamental requirement of the certification process; it demonstrates that the aerodrome conforms to the certification standards and practices, and that there are no apparent shortcomings which would adversely affect the safety of aircraft operations.
Airside	<p>The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.</p> <p>Authorization for an aircraft (or vehicle) to proceed under conditions specified by an air traffic control unit.</p>
Air traffic control clearance	<p>Note 1: For convenience, the term “air traffic control clearance” is frequently abbreviated to “clearance” when used in appropriate context.</p> <p>Note 2: The abbreviated term “clearance” may be prefixed by the words “taxi”, “take-off”, “departure”, “en route”, “approach” or “landing” to indicate the particular portion of flight to which the air traffic control clearance relates.</p>
Air traffic control unit	A generic term meaning variously, area control center, approach control unit or aerodrome control tower
Apron	A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.
Clearway	A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an airplane may make a portion of its initial climb to a specified height.
Movement area	That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).

Night	The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority. Note: Civil twilight ends in the evening when the center of the sun's disc is 6 degrees below the horizon and begins in the morning when the center of the sun's disc is 6 degrees below the horizon.
NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Obstacle	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight. Note: The term obstacle is used in Annex 4 Edition 10 solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.
Runway	A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.
Runway end safety area RESA	An area symmetrical about the extended runway center line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an airplane undershooting or overrunning the runway.
Runway guard lights	A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.
Runway strip	A defined area including the runway and stop-way, if provided, intended: a) to reduce the risk of damage to aircraft running off a runway; and b) to protect aircraft flying over it during take-off or landing operations.
Runway-holding position	A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower. Note: In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.
Safety management system	A system for the management of safety at aerodromes, including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for control of safety at, and the safe use of, the aerodrome.

Stop-way	A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off
Taxiway	A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including: a) Aircraft stand taxi-lane. A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only. b) Apron taxiway. A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron. c) Rapid exit taxiway. A taxiway connected to a runway at an acute angle and designed to allow landing airplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.
Taxiway strip	An area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.
Touchdown zone	The portion of a runway, beyond the threshold, where it is intended landing airplanes first contact the runway.

A.2. Abbreviations and acronyms

ACI	Airports Council International
SANS	Saudi Air Navigation Services
FBO	Fixed Base Operation
FRCC	Fire Rescue Communication Centre
FOD	Foreign object damage, foreign object debris
GACA	General Authority for Civil Aviation
ICAO	International Civil Aviation Organisation
NOTAM	Notice to Airmen
OLS	Obstacle limitation surface
OM	Operations Manual
RGL	Runway guard light
RWY	Runway
SOP	Standard Operating Procedure
SP	Specialized
TOCC	Terminal Operations Control Centre
TWY	Taxiway
VDGS	Visual docking guidance system



STANDARD **O**PERATING **P**ROCEDURES

Helicopter Operation Procedures

Document information

General information

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1. Introduction

1.1. Regulation and reference documents

Internal legal, regulatory standards:

- GACAR part 139
- GACAR part 138
- OEAO Aerodrome Manual

Reference to the ISO Standards & Guidelines (If applicable)

- ISO 9001:2015 Clause 7.5; 7.4 and 8.1
- ISO 14001:2015 Clauses 7.5 and 7.4

1.2. Purpose

The purpose of this document is to clearly explain the required procedures in case of Helicopter operation is necessarily required within OEAO aerodrome.

1.3. Relevant stakeholders

The stakeholders who shall directly use this SOP together with those who shall be aware of the procedures.

Relevant stakeholders	
Direct use	Aware of
Alula International Airport Operations	GACA
Helicopter operators at OEAO	SANS

1.4. Scope

This SOP explains the procedures in case of Helicopter operation is necessarily required within OEAO aerodrome (within the movement area).

1.5.Applicable areas within the airport operation

Aerodrome Movement area

2. Helicopter Arrival and Departure Procedures at OEAO

All helicopters must use Runway (30-12) for arrival and departure at aerodrome.

3. Arrival Procedures

All arriving helicopter must contact AFIS on (118,775), apply TIBA procedure (122:800) as per flight plan , if AFIS not available must contact FIRE Control on (133:500) .

Step	Action
3.1	AFIS shall inform Airport OPERATIONS giving details of helicopter arrival. AIRPORT OPERATIONS shall allocate the Parking Stand/Apron for arriving helicopter.
3.2	Helicopters with under carriage landing gears must land on runway and ground taxi to allocated parking stand/apron (apron) as per instructions of Operation Supervisor, parking designated for Helicopters (S5 -S6) or as requested by Airport Operations.
3.3	Helicopters without landing gears (with skid type under carriage) must use runway for landing and once reach over touch down point on runway, shall hover and air-taxi to allotted parking stand/apron as per instructions of Operation Supervisor, parking designated for Helicopters (S5 -S6) or as requested by Airport Ops.
3.4	All helicopters must use taxi via (B3 , A3). Helicopter pilot shall contact AFIS and they shall inform AIRPORT OPERATIONS and airport operaitons will coordinate for ground handling services, follow me services etc. if so required.

4. Departure Procedures

All departing helicopters must contact AFIS on (118,775), and AFIS will inform AIRPORT OPERATIONS, shall apply TIBA procedure.

Step	Action
4.1	Helicopter pilot shall contact AIRPORT OPERATIONS and coordinate for ground handling and refueling services etc., as required.
4.2	All helicopters shall follow prescribed departure procedures and apply TIBA procedure for start-up.
4.3	Helicopters shall apply TIBA for taxi out (ground taxi or air-taxi) and must take-off from the runway.
4.4	Helicopter pilot shall contact AIRPORT OPERATIONS and coordinate, if required follow me services.

5. Parking Stands/ Apron

All helicopters shall use parking stands (S5 -S6) or as requested by Airport Operations at the apron. All helicopters must use marshaller service for arrival and departure.

Appendix A. Abbreviations

A.1. Abbreviations and acronyms

AFIS	Aerodrome Flight Information Services
GACA	General Authority of Civil Aviation of Saudi Arabia
SANS	Saudi Air Navigation Services
SOP	Standard Operating Procedure
OEAO	Alula International Airport
TIBA	Traffic Information Broadcast by Aircraft