IT Project Management Office

Airport Management Suite Solution Scope of Work

Glossary

Acronym	Description
ACSA	Airports Company South Africa
ACARS	Aircraft Communications Addressing and Reporting System
Airline DB	Airline Databases
Airline Telex	a communication service involving teletypewriters connected by wire through automatic exchanges
AMS	Airport Management System
AMC	Airport Management Centre
ADS	Automatic Docking System
AODB	Airport Operational Database
APEX	Airport Collaborative System
APIs	Application Programming Interface
ATA	Actual Time of Arrival
ATD	Actual Time of Departure
ATNS	Air Traffic and Navigation Services
Billing Attributes	Operator, Operator Description, Charge Description, charger quality, charge price, Charge VAT, Total charge
BFN	Braam Fischer
BRS	Baggage Recompilation System
CAMU	Centralized Airspace Management Unit
CDM Tool	Collaborative Decision-Making Tool
CPT	Cape Town International Airport
D/I/R	Type of a Slot Request
DUR	King Shaka International Airport
DR	Disaster Recovery
e-Gate Smart Security	Electronic Gate Smart Security
ESB	Enterprise Service Bus
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETO	Estimated Time of Operation
F/I/R/L	Type of a slot priority and status
FIDS	Flight Information Display System
GOS	Gate Operating System
GRJ	George
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization

IT	Information Technology
IVS	ID Verification Systems
J/S/P	Type of a Slot Request Qualifier
DUR	Durban
ELS	East London
KIM	Kimberly
MTOW	Maximum Take-Off Weight
Movement	Flight's arrival leg and a departure leg
OAG	Official Airline Guide
OTP	On Time Performance
JNB	O.R Tambo International Airport
ORACLE	Financial Management system
PLZ	Port Elizabeth
Resources	Runway, Parking Bays, Airbridges, Contact Stands, Boarding Gates, Check-in Counters, Baggage Carousels, Baggage Chutes
REST	Stands for Representational State Transfer
SAC	Security Access Control System
SAQ	Slots Availability Request
SCR	Slots Clearance Request
SD	Service Development
SI	Service Integration
SIR	Sot's Information Request
Slot information	Details of a slot request from an airline
SOAP	Stands for Simple Object Access Protocol
SSIM	Standard Schedules Information Manual
Static data	Airport and aircraft information that does not change, such as airport name, airport code, aircraft registration, aircraft type etc.
STA	Scheduled Time of Arrival
STD	Scheduled Time of Departure
STO	Scheduled Time of Operation
SOW	Scope of Work
UTN	Upington
Tooltip	Text labels that appear when the user hovers over, focuses on, or touches an element.
UTC	Universal Time Constant
Web Services	Applications or data source that are accessible via a standard web protocol (HTTP or HTTPS)

2 DB	2-Dimensional Barcode

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1. Introduction

1.1. Background

ACSA wants to procure an AMS Suite solution that will comprise Airport Management Solution (AMS), Slots Management Solution (SLOTS) and Airport Collaborative Decision Making (A-CDM) solution, all embedded as modules within one solution. AMS is one of ACSA's biggest and most critical operational systems. The system is responsible for managing, among other things, operational logistics and planning; resource allocation; flight information display services and aeronautical billing. SLOTS is responsible for slots management and coordination across ACSA's airports, mainly three coordinated airports: OR Tambo International Airport, Cape Town International Airport and King Shaka International Airport. Slots management entails coordinating scheduled and ad-hoc slot requests from airlines, and this is a regulatory requirement from the Department of Transport. A-CDM is a collaborative solution that is responsible for airport collaborative decision-making that brings together internal and external stakeholders to enhance operational resilience and efficiency. These systems are currently operating as individual systems, and the new AMS Suite will consolidate all of them in one solution.

1.2. Purpose

The purpose of this scope of work document is to define the requirements that must be delivered by the new AMS Suite solution. The document will be used as a reference document against which all tender responses from potential service providers will be assessed.

1.3. Project Objectives

The objective is to appoint a Service Provider to implement a fully packaged AMS Suite solution that will deliver:

- Airport management system requirements, as outlined in section 2.1 of this document.
- Slot management requirements, as outlined in section 2.4 of this document.
- A-CDM requirements, as outlined in section 2.5 of this document.

1.4. Scope of project

The following section outlines what is included and excluded in the project scope of work.:

1.4.1. Scope

The following items are considered in scope for the project:

a) Delivery of all the requirements outlined in this document.

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b) Procurement, installation and configuration of the airport management solution with Slot Management and CDM modules embedded according to the business requirements for Airport Company South Africa network of airports.

c) Factory, site, and user acceptance testing of the airport management suite solution.

d) Provisioning of training and relevant training documentation

e) Establish support and maintenance agreements.

1.4.2. Out of Scope

Any requirements and systems not explicitly mentioned in this document must be deemed as out of scope.

1.5. Assumptions

The following assumptions are made for the project:

a) The solution will be hosted on Cloud, and access will be managed through Azure Active Directory

b) The solution will be supported and maintained by the appointed service provider.

c) The service provider will provide adequate training and relevant training documentation to ACSA users prior to using the system.

2. Business Requirements

2.1. Airport Management Solution Requirements:

REQ #	CATEGORY	REQUIREMENT DESCRIPTION	PRIORITY
2.1.1	**Planning Requirements**		
2.1.1.1		The system must have the capability to import slot information into the system automatically, at an operational window defined by ACSA for slot coordinated airports. The capability must be in line with industry standards.	High
2.1.1.2		The system must have the capability to cater for airline schedule at non-slot coordinated airports	High
2.1.1.3		The system must have the capability to switch an airport from non-coordinated to coordinated.	High
2.1.1.4		The system must have the capability to capture snapshot of the allocation plan once it's done	High
2.1.1.5		The system must have capability to compare seasonal allocation plan with live allocation plan	High
2.1.1.6		The system must have the capability to measure allocation plan vs actuals, showing a detailed data analytics report which clearly articulates the deviations between the planned and the actual (tracked). The system must also show in detail what flights are deviating from the plan. The deviation must be shown in: (i) Percentage form, (ii) Numbers, e.g., number of arrivals or departure flights	High

2.1.1.7	The system must provide flexibility to the user to define the allocation plan window i.e., (next day, week, next month(s)	High
2.1.1.8	The system must restrict the airlines to use only resources they are allocated to. An airline may only use the resource it is allocated to as per the allocation plan	High
2.1.1.9	The system must allow the user to create a flight manually	High
2.1.1.10	The system must have the capability to flag flights that have been created but not yet approved	High
2.1.1.11	The system must only allow users to allocate resources to flights that have been approved	High
2.1.1.12	The system must enable the user to create a movement (arrival and departure legs)	High
2.1.1.13	The system must enable the user to link a flight to a movement.	High
2.1.1.14	The system must provide the capability/ mechanism for airlines to send information, using ACSA prescribed format, on how their slots will be linked.	High
2.1.1.15	The system must enable the user to manually allocate resources to a movement	High
2.1.1.16	The system must enable the user to update allocated resources	High
2.1.1.17	The system must be able to automatically allocate and un-allocate resources	High
2.1.1.18	The system must enable the user to define resources to be auto allocated	High
2.1.1.19	The system's auto allocate functionality should work on a variety of variables e.g., ETA's, operator code	High
2.1.1.20	The system' auto-allocate functionality must allow flexibility when auto-allocating resources using different variables e.g., allocate per airline, per route, per handler etc.	High
2.1.1.21	The system must enable the user to confirm auto-allocation	High
2.1.1.22	The auto-allocate functionality should allow different allocation criteria options to allow different types of allocations e.g., Resource optimization (airbridges), Spread allocation (allocating all resources – minimizing congestion – e.g., bussing gates	High
2.1.1.23	The system must enable the user to view resource allocation e.g., by flight number, resource type	High
2.1.1.24	The system must not allow the user to delete flight information	High
2.1.1.25	The system must have the capability to export allocation plan to other formats in a predefined layout i.e., (Excel, CSV, PDF etc.).	High
2.1.1.26	The system must have the capability to email the allocation plan from within the system	High
2.1.1.27	The system must enable the user to change the flight status from operational to non-operational, arrived / departed, cancel status etc.)	High

2.1.1.28	The system must have a platform within the live environment where the user can do/ run different allocation scenarios without impacting the live environment	High
2.1.1.29	The system must enable the user to compare different allocation scenarios against each other	High
2.1.1.30	The system must have the capability to visually show the results of the compared scenarios to enable the user to view the scenario in which the capacity is best optimized	High
2.1.1.31	The system must enable the user to select who can view their allocation scenarios	High
2.1.1.32	The system must enable the user to have a holistic view (aggregated and detailed level) of airport resource utilization	High
2.1.1.33	The system must enable the user to customize the resource utilization view to their preferred view in terms of the look and feel	High
2.1.1.34	The system must enable the user to save multiple allocation scenarios	High
2.1.1.35	The system must have the capability to provide descriptions for terms / abbreviations used in the system.	High
2.1.1.36	The system must enable the user to capture/ load resources individually	High
2.1.1.37	The system must enable the user to perform full as well as partial resource downtimes.	High
2.1.1.38	The system must not allow resource allocation on a fully down-timed resource.	High
2.1.1.39	The system must enable the user to view and pull out a report of all planned and ad hoc downtime resources	High
2.1.1.40	The system must be able to notify the user if there is pending action on a down-timed resource	High
2.1.1.41	The system must alert the user when trying to allocate on a down-timed resource	High
2.1.1.42	The system must enable the user to extend the duration of a down-timed resource	High
2.1.1.43	The system must record all transactions performed on a resource	High
2.1.1.44	The system must enable the user to allocate more than one movement in a resource	High
2.1.1.45	The system must have the capability to link allocation to the baggage reconciliation system (BRS), to ensure that there is alignment between the allocation and what can be accommodated by the baggage carousels.	High
2.1.1.46	The system must have a visual map capability of all common resources location, i.e., parking bays, check-in counter, baggage carousels etc.	High
2.1.1.47	The system must enable the user to capture buffer time	High
2.1.1.48	The system must enable the user to overlap two flights on a resource	High
2.1.1.49	The system must enable the user to associate resources (resource grouping).	High
2.1.1.50	The system must enable the user to configure aircraft towing rules.	High
2.1.1.51	The system must enable the user to compare their allocation plan to the base day allocation plan	High
2.1.1.34	The system must enable the user to capture notes	High

2.1.1.53	The system must enable the user to configure business rules	High
2.1.2	**Execution Requirements**	
2.1.2.1	The system must have a tracking capability to show tracked movements (arrivals & departures) in real time (current day)	High
2.1.2.2	The flight tracking capability must be in a grid format	High
2.1.2.3	The flight tracking grid must show all attributes of a flight that is being tracked.	High
2.1.2.4	The flight tracking grid must enable the user to insert / add a new movement.	High
2.1.2.5	The flight tracking grid must enable the user to update a movement	High
2.1.2.6	The flight tracking grid must enable the user to capture the following: ETA; ETD; STA; ATA; ATD; On CHK time; Off CHK time; Arrival runway; Departure runway; CCCHK (Cash of Chocks); Registration; Passengers etc. The system must have flexibility to add more fields.	High
2.1.2.7	The flight tracking grid must enable the user to update (ETA; ATA, ETD, ATD, On Chock time, Off Chock time)	High
2.1.2.8	The systems must enable the user to link and delink a movement	High
2.1.2.9	The systems must enable the user to swap movements (this must be visual)	High
2.1.2.10	The systems must enable the user to split a movement	High
2.1.2.11	The system must enable the user to cancel a movement	High
2.1.2.12	The system must enable the user to cancel a flight leg (either arrival or departure leg)	High
2.1.2.13	The system must enable the user to change flight status to non-operational	High
2.1.2.14	The systems must enable the user to delete a movement	High
2.1.2.15	The flight tracking grid must be editable. The extent to which the user can edit the system must be in line with their role or access rights given	High
2.1.2.16	The flight tracking grid must enable the user to capture reasons for change	High
2.1.2.17	The flight tracking grid must have the capability (pop-up form) to enable the user to manually add additional data i.e., extra landings, pax and codeshares.	High
2.1.2.18	The system must enable the user to reuse a flight number for unscheduled flights	High
2.1.2.19	The system must have the capability to generate an audit trail for all transactions that have been performed on a flight record e.g., entries / actions / changes on a flight	High
2.1.2.20	The system's audit trail must be in a grid format	High
2.1.2.21	The system's audit trail must be filterable using any attributes on the audit trail (i.e., filter by user, flight number.)	High

2.1.2.22	The system must have capability to export all tracking grid information to other formats, i.e., (EXCEL, CSV and PDF)	High
2.1.2.23	The system must enable the user to filter out the flight tracking grid using any of the attributes on the grid	High
2.1.2.24	The system must enable the user to sort the flight tracking grid using any of the records on the grid	High
2.1.2.25	The system must enable the user to add more dimensions on the grid as and when needed	High
2.1.2.26	The system must enable the user to customize the layout to their desired views	High
2.1.2.27	The system views must be customizable per airport i.e., have a tracking grid per airport	High
2.1.2.28	The system must enable a user to customize their views in various system functions	High
2.1.2.29	The system must enable the user to save their customized views	High
2.1.2.30	The system must alert the user if an operator does not have an Oracle account for a particular site/ airport	High
2.1.2.31	The system must have a short cut menu for all frequently used functionalities	High
2.1.2.32	The system must enable user-defined colouring depending on the flights statuses (colours should have descriptions)	High
2.1.2.33	The system must provide visual representation of the following: • Airport resources (fuel farms, air bridges, boarding gates, parking bays, apron stands etc) • Type of Aircrafts • Airport Map	High
2.1.2.34	The system must be configurable such that certain functions/ features are airport specific	High
2.1.2.35	The system must have the capability to configure User Groups	High
2.1.2.36	The system must be able to automatically calculate ETA for the flight's arrival airport based on the captured ETD	High
2.1.2.37	The system must be able activate systems function/ feature to be specific to an airport	High
2.1.2.38	The system must enable the user to capture static data which should show across other airports	High
2.1.2.39	The system must enable the user to do calculations using specified field record parameters	High
2.1.2.40	System must be able show time in Local Time and UTC format.	High
2.1.2.41	The system must have the capability to alert the user of certain events	High
2.1.2.42	The system must have the capability to warn the user of events that will require the user to act	High
2.1.2.43	The system must be able to cater for unexpected flight tracking events i.e., flight to be cancelled whilst on the runway, flights returning to the bay due to unexpected circumstances e.g., mechanical breakdown (would flights be billed again?)	High

2.1.2.44	The system must have an additional flight tracking grid for exceptional scenarios i.e., return to bay flights, diverted flights	High
2.1.2.45	The system must enable the user to view multiple tracking grids showing different data sets	High
2.1.3	**Billing Requirements**	
2.1.3.1	The system must have the capability to read and store passenger information / details when a passenger scans a boarding pass on the boarding gate	High
2.1.3.2	The system must have a capability to import Excel / CSV/ flat file for flight load data	High
2.1.3.3	The system must be able to verify the external flight load data against preloaded data on the system	High
2.1.3.4	The system must have ability to raise exception if the external flight load data does not match the preloaded information	High
2.1.3.5	The system must ensure that the whole flight data file is imported once the flight load data has been reconciled	High
2.1.3.6	The system must show a record / report of all data that was inputted vs data that was preloaded	High
2.1.3.7	The system must ensure that the source file is not editable or tampered with by the user	High
2.1.3.8	The system must enable the user to manually capture flight load data	High
2.1.3.9	The system must be able to generate a pre-billing report as well as post-billing report	High
2.1.3.10	The system must have the capability to exchange operational messages like slot information with external stakeholders e.g., airlines. The external stakeholders should be able to send information to the system automatically.	High
2.1.3.11	The system must have capability to populate dates so that information is correctly populated	High
2.1.3.12	The system must have an audit trail of all the data that was manually inputted, automatically inputted i.e., automatic as well as manually imported into the system.	High
2.1.3.13	The system must be able to generate proforma invoice at any time outside of the billing run	High
2.1.3.14	The system must have the capability to send information to 2D Barcode system and vice versa	High
2.1.3.15	The system must have the capability to process credit notes as well as debit notes post billing run	High
2.1.3.16	The system must have the capability to calculate airport service charges as per the government gazette	High
2.1.3.17	The system must enable the user to amend billing attributes	High
2.1.3.18	The system must enable the user to execute a billing process at any time / period centrally for all sites without impacting system's performance	High
2.1.3.19	The system must enable the user to verify if the charge calculation ran correctly	High
2.1.3.20	The system must be able to run billing per site without impacting billing on other sites	High
2.1.3.21	The system must have the capability to roll back	High

2.1.3.22	The system must ensure that billing data is not editable once billing is complete	High
2.1.3.23	The system must have the capability to generate aeronautical revenue forecast	High
2.1.3.24	The system must have capability to compare actual financials and budgets against the forecasted figures using data from the finance system	High
2.1.3.25	The system must automatically publish the forecast as well as the actuals on ACSA website	High
2.1.3.26	The system must have the capability to compare tower log information (external file) against flight information in the system	High
2.1.3.27	The system must have the capability to send billing files to Oracle	High
2.1.3.28	The system must have the capability to do financial adjustments	High
2.1.4	**AMS Administration**	
2.1.4.1	User Access Management	
2.1.4.1.1	The system must have the capability to grant user access	High
2.1.4.1.2	The system must have the capability to revoke user access	High
2.1.4.1.3	The system must have the capability to activate and deactivate user's access	High
2.1.4.1.4	The system's user's authentication and authorization must be managed through Activate Directory services	High
2.1.4.1.5	The system functions must be user-role specific.	High
2.1.4.1.6	The system must have the capability to grant access at a user-role level	High
2.1.4.1.7	The system must allow access control at a feature / functionality level	High
2.1.4.1.8	The system must be able to generate an audit trail of all log-in attempts (successful and unsuccessful)	High
2.1.4.1.9	The system must be able to cater for external users who cannot log-in using Active Directory	High
2.1.4.1.10	The system must have the capability to allow users to have multiple system access roles which will enable them to perform other tasks they would not ordinarily perform, i.e., Acting Manager role	High
2.1.4.2	Aircraft Data Management	
2.1.4.2.1	The system must enable the user to capture new aircraft details.	High
2.1.4.2.2	The system must enable the user to update aircraft details	High
2.1.4.2.3	The system must have the capability to activate and deactivate aircraft data.	High
2.1.4.2.4	The system must enable the user to capture static data information once and be visible across other sites.	High
2.1.4.2.5	The system must enable the user to enter aircraft registration validity period	High
2.1.4.3	Client /Operator Data Management	
2.1.4.3.1	The system must enable the user to create new operator	High
2.1.4.3.2	The system must enable the user to update operator details	High
2.1.4.3.3	The system must enable the user to update operator details	High
2.1.4.3.4	The system must have the capability to activate as well as deactivate the operator status	High

2.1.4.3.5	The system must have the capability to activate as well as deactivate the operator status	High
2.1.4.3.6	The system must alert the user when the configured data comes to an end	High
2.1.4.4	Resource Management	
2.1.4.4.1	The system must enable the user to create a resource	High
2.1.4.4.2	The system must enable user to capture resource information	High
2.1.4.4.3	The system must enable user to update resource details	High
2.1.4.4.4	The system must enable user to decommission resource	High
2.1.4.4.5	The system must enable the user to downtime a resource	High
2.1.4.4.6	The system must enable the user to pull out a history report of all the transactions performed against a resource	High
2.1.4.4.7	The system must have the capability to flag billable resources	High
2.1.4.5	Rate Management	
2.1.4.5.1	The system must enable the user to capture new rates or tariffs	High
2.1.4. 5.2	The system must enable the user to update rates	High
2.1.4.6	Route Management	
2.1.4.6.1	The system must enable the user to capture new routes.	High
2.1.4.6.2	The system must enable the user to update routes	High
2.1.4.7	Airline Logos Management	
2.1.4.7.1	The system must enable the user to capture new airline logo	High
2.1.4.7.2	The system must enable the user to update airline logo	High
2.1.5	**Reporting**	
2.1.5.1	• The system must have the capability to generate flight reports. • It must be possible to generate flight reports daily, weekly, monthly, quarterly, and yearly or any other criteria defined by the user.	High
2.1.5.2	• The system must have the capability to compare data and generate a report based on the compared data. • The compared data can be between days, weeks, months, years, seasons, and airports. It must be possible to generate a report based on any user defined criteria.	High
2.1.5.3	The system must have the Business Intelligence capabilities to collect, prepare, analyze unstructured data from internal & external systems and produce Business Intelligence reports	High
2.1.5.4	The system must have the capability to generate a report of the scenarios that have been run / done on the system	High
2.1.5.5	The system must have the capability to generate reports on down-timed resources. The report must clearly show the following:	High

Confidential

	• Who down timed-a resource	
	• The day on which a resource was down timed.	
	• Time at which the resource was down timed.	
	• The reason for downtime	
	• Duration of the downtime	
2.1.5.6	The system must be able to generate a billing report. • It must be possible to generate a billing report per airport. It must be possible to generate a billing report at any day of the month.	High
2.1.5.7	The system must enable the user to manipulate the look and feel of the reports.	High
2.1.5.8	The system must have the capability to export reports to other formats like EXCEL, CSV, and PDF	High
2.1.5.9	The system must enable the user to filter the report based on the user-defined criteria	High
2.1.5.10	The system must enable the user to sort the reports based on the user-defined criteria	High
2.1.5.11 The system must have the capability to send out reports in a format that will not require external stakeholders to do more formatting in order to view the report		High

2.2. Integration Requirements

The table below outlines the integration requirements that must be delivered by the new airport management solution. The table also lists all the systems and applications to which the new airport management system needs to integrate in order to deliver the business requirements.

NB: It must be noted that the system is not limited to integrating to just the following systems, it must be able to integrate to any other new system that might be acquired by ACSA. should be integrated to

REQ #	CATEGORY	REQUIREMENT DESCRIPTION	PRIORIRY
2.2.1	AMS-FIDS & FIDS Hotel		
2.2.1.1	The system must have the capability to send or communicate flight information through the FIDS screens, i.e., (flight ID, destination, time, gate, flight status, logos; codeshare, via routes, wayfinding and information sharing; time to get to the gate)		High
2.2.1.2	The FIDS devices must have the capability to accommodate flight information as well as non-flight information		High
2.2.1.3	The update or communication between the system and FIDS must be in real time		High
2.2.1.4	The non-flight information screens / devices must be separate from the flight information screens		High
2.2.1.5	The airline logos must be maintained in one place		High

2.2.2	AMS-Slot Management	
2.2.2.1	The Slot Management solution/module must be embedded within the Airport Management System	High
2.2.3	AMS-ORACLE Integration	
2.2.3.1	The system must have the capability to send billing information / files to Oracle system	High
2.2.4	AMS-Qlikview Integration	
2.2.4.1	The system must have the capability to integrate to QlikView for reporting purposes	High
2.2.5	AMS-BRS Integration	
2.2.5.1	The system must have the capability to send information from AMS to BRS and vice versa.	High
2.2.5.2	The communication between the systems must go through the ESB interface	High
2.2.6	AMS-2D Barcode / e-Gate Smart Security Integration	
2.2.6.1	The system must have the capability to send information from AMS to 2D Barcode / e-Gate Smart Security, and vice versa.	High
2.2.6.2	The bi-directional communication between the two systems must go through ESB interface	High
2.2.7	AMS – ADS/GOS/ Honeywell Integration	
2.2.7.1	The system must have the capability to integrate with ADS to provide accurate on-chock and off-chock timestamps in accordance with the Aircraft Docking System	High
2.2.7.2	The system must be able to integrate with KSIA Gate Operating System	High
2.2.7.3	The bi-directional communication between the two systems must go through the ESB interface	High
2.2.7.4	All movements in and out of the bay need to interface back to the AMS solution	High
2.2.7.5	The system must enable the user to prioritize AMS-incoming information from multiple sources	High
2.2.7.6	The system must enable the user to override information from airlines /external sources	High
2.2.8	AMS – SAC Integration	
2.2.8.1	The system must have the capability to send information to the SAC system and vice versa	High
2.2.8.2	The bi-directional communication between the two systems must go through the ESB interface	High
2.2.9	AMS-BIDAIR/ CHEV / Swissport / IVS Integration	

2.2.9.1	The system must have ability to send information to BIDAIR / CHEV / Swissport / IVS systems, which subsequently send the information to stakeholders	High
2.2.9.2	The information must be sent to stakeholders in real time	High
2.2.9.3	The information exchange must go through the ESB interface	High
2.2.10	AMS – OAG / Info Desk / SARS Integration	
2.2.10.1	The system must have the capability to send information to Official Aviation Guide (OAG) /Info Desk /SARS systems, which subsequently send the information to stakeholders.	High.
2.2.10.2	The information must be sent to stakeholders in real time	High
2.2.10.3	The information exchange must go through the ESB interface	High
2.2.11	AMS-ATNS Integration	
2.2.11.1	The system must be able to integrate with ATNS. The information exchange must be in real time.	High
2.2.12	Apex- Fuel System Apex Requirement	
2.2.12.1	The system must be able to integrate to ACSA Fuel system to have visibility and view of fuel levels	High
2.2.13	Apex (A-CDM)-Slot Management	
2.2.13.1	The A-CDM tool must have the capability to interface with the slot's management solution / module	High
2.2.14	AMS-Queue Management System	
2.2.14.1	The system must be able to integrate to the Queue Management system	High
2.2.15	AMS Suite- Airline DBs	
2.2.15.1	The system must be able to communicate with Airline DB's. The communication must be bi-directional and must go through the ESB interface.	High
2.2.16	AMS Suite -ACARS	
2.2.16.1	The system must be able to communicate with ACARS system. The communication must be bi-directional and must go through the ESB interface.	High
2.2.17	AMS Suite – Airline Telex	
2.2.17.1	The system must have the capability to read airline telex messages. The communication must happen through the ESB interface.	High
2.2.18	AMS Suite- Departure Control System (DCS)	

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2.2.18.1	The solution shall integrate to the airline departure control systems (DCS).	
2.2.19	Integration to new applications / systems not yet in the environment	
2.2.19.1	The system must be able to integrate to any new system(s) / application(s) with ease. When ACSA acquires a new solution that requires integration to the AMS Suite system, configuring integration between the two systems should be easy, not costly and time consuming.	High

2.3. Generic Functional Requirements

The following table outlines generic requirements whose functionalities will be usable across the system.

REQ #	CATERGORY	REQUIREMENTS DESCRIPTION	PRIORIRY
2..3.1		The system must have the capability to automatically import files and data into the system.	High
2..3.2		The system must have the capability to export files and data out of the system in any format (i.e., Excel, CSV, PDF etc.)	High
2..3.3		The system must have the capability to filter out information	High
2..3.4		The system must have the capability to sort out information	High
2..3.5		The system must have the capability to search information	High
2..3.6		The system must have the capability to zoom in and out all system screens / views	High
2..3.7		The resource allocation view should be able to include a secondary timeline not just current time. It's preferable that no changes be done on resource allocation until the secondary time has passed.	High

2.4. Slots Management Solution /Module Requirements:

It is worth noting that the slots management module should be embedded with the airport management solution. The following table outlines the Slot Management solution / module requirements that must be delivered by the new airport management solution.

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
2.4.1	Compliance		

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
2.4.1.1		The system must be able to comply with IATA SSIM format and standard.	High
2.4.1.2		The system must be able to accommodate slot requests from airlines (e.g., A, Z, P) and generate appropriate responses according to IATA format (H, U, O).	High
2.4.1.3		The system must be able to accommodate a SAQ and a SCR as per the SSIM format.	High
2.4.1.4		The system must be able to generate an SIR as per the SSIM format,	High
2.4.1.5		The generated response/outcome of the relevant slot request should be generated from the system instantly and in the correct format as per the SSIM.	High
2.4.2	Importing of Slots		
2.4.2.1		The system must be able to import and accommodate linked and unlinked slot requests.	High
2.4.2.2		The system must be able to import and accommodate slot requests in the original format sent by the airlines.	High
2.4.2.3		The system must be able to import and accommodate different slot flight types (D/I/R).	High
2.4.2.4		The system must be able to import and accommodate different slot request qualifiers (J/S/P etc.)	High
2.4.2.5		The system must be able to import and accommodate slot priorities and statuses (F/I/R/L)	High
2.4.2.6		The system must be able to inform the user if the slot request was imported / processed correctly.	High
	Slot Management		
206		a) The system must be able to perform capacity checks for different resources for different aircraft type for a whole season or for different granularity levels/time buckets. The system should be able to have different default time buckets for different resource types. b) The capacity checks performed by the system must ensure that the approved slot requests are practically executable.	High
207		The system must be able to provide the capability to link and unlink slots manually and automatically. The automatic linking should be done based on a calculation of historical data.	High
208		The system must be able to identify and alerts the user when a slot change request is just changing flight number or AC type.	High
209		The system must be able to make an alternative slot offer based on next available resource (even if offer is for only one day in that whole range). This offer must be given before and after the original requested time.	High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
210		The system must enable the user to insert / import comments on slot requests.	High
211		The system must be able to notify when a slot offer exceeds a certain date.	High
212		The system must be able to accommodate for slots spanning over more than one day.	High
213		The system must be able to cater for a linked slot that re-park to a hanger and back to the apron. It must be possible to specify when the flight is at the hanger and will not take up any capacity.	High
214		The system must be able to accommodate different validity periods for a slot request.	High
215		The system must enable the user to enter a registration even if it is not required. It must be possible to import the registration to AMS.	High
216		When registration changes are done on AMS at any time, the changes need to be checked back if there is any impact on Slots that have the registration affected	High
217		When a slot is offered in blocks, it should be possible to accept / decline any of the offers individually.	High
218		The system should warn the user before processing an aircraft type or route or airport that is not in AMS before it completely suspends the queue.	High
219		The system must be able to highlight where there are duplicate slots (and does not allow it, except in the case of an offer or a SAQ).	High
220		The system must be able to keep an offer and availability request for a period of e.g., 5 days (configurable) and then discard it if no update (i.e., no reply from airline) and will also give the user the functionality of deleting the original and keeping the offer if the airline accepts within the 5 days. This means that for up to the configured days there will be duplicate slots in the system.	High
221		The system must be able to notify when an offer exceeds a certain date (configured) before it will be discarded. The user should be able to extend/discard the offer/availability request.	High
222		The system must enable the user to check resource capacity in different time buckets e.g., 10min vs. 1hr. The system should be able to have different default time buckets for different resource types.	High
223		The system must be able to process cancellation of slots and have an audit trail of cancellations.	High
224		The system must not make an offer of an alternative slot if the original request was an L slot request. It should re-instate the original (H).	High
225		The system must enable the user to configure the date range of a slot season.	High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
226		The system must be able to process deleted slots but keep an archive of them.	High
227		The system must be able to recognize all length flight numbers, with 0001 being valid (instead of 1). It must also be able to read alpha numeric characters as part of the flight number (e.g., A0001).	High
228		The system must make it possible to create a hangar flight leg for a slot request with the least amount of effort. The hangar flight leg must contain all the necessary information of the slot flight leg. It must also be possible to specify the time that the hangar slot flight leg needs to happen.	High
229		The system must be able to delete multiple slots instantly.	High
230		The system must be able to cancel a slot request for 1 day only.	High
231		The system must be able to provide the "history" of everything linked to a specific flight number / carrier / time / etc. (E.g., at 09h00, number of international arrivals changed from 20 to 24 between 2013 and 2014).	High
232		The system must enable the user to manually create a slot	High
233		The system must enable the user to enter a Slot Availability Request (SAQ) into the system, and it must not be duplicate. The same principles of an "Offer" needs to apply.	High
234		The system must be able to provide a detailed explanation / user feedback of why requested slot could not be accommodated.	High
235		The system must be able to handle wait listing of slots (as per the SSIM process). The system needs to alert the user when a slot becomes available, and which waitlisted slot may now be given to the airline based on priority).	High
236		**Fragmentation at overloads** - The System must be able to evaluate all the capacity constraints and flag to the user where the constraints are.	High
237		**Fragmentation at overloads** – The system must make it possible to flag overloads on the initial submission and on ad hoc slot requests.	High
239		**Fragmentation of overloads** - The following variables are required to be configurable on fragmentation: Min Nr. of weeks per fragments for main fragments, Max Nr of Fragments Max Nr of ad hoc exceptions to the request. Operator Route.	High
240		**Fragmentation of overloads** - The slots that needs to be fragmented needs to be displayed visually to the users during initial submission and during processing of ad hoc slot change requests.	High
241		**Fragmentation at overloads** - The system must be able to evaluate all the capacity constraints and flag to the user where the constraints are.	High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
242	**Fragmentation of overloads** - The system must have a variable of the minimum and maximum Nr of weeks that fragmentation is allowed for		High
243	**Fragmentation of overloads** - The system must have different parameter values for initial submission and for ad hoc requests.		High
245	The system must be able to provide a "season resource vs. demand" view.		High
	Slot Monitoring - The system must be able to cater for section 31. Types of misuse of slots, repeatedly operates an aircraft at times significantly different from the allocated slots. Significantly is defined as more than 15 minutes for domestic flights and more than 30 minutes for international flights. Repeatedly is defined as more than once in the past 6 months.		High
	Operator Codes – The system must be compliant to IATA codes		High
	a) The system must be able to distinguish between a Busing Gate and a Parking Bay resources overloads when user handles a message specification: b) When handling a message, the system must clearly indicate to the user if the overload is on a Parking Bay resource or a Boarding Gate resource, or both. c) The system must also show the reason codes for the overloads		High
	Populating non-coordinated airports demand including VIA Routes: a) If a coordinated airport has a via route or the origin destination airport is an auto populated airport, it must reflect the demand correctly in the auto populated airports. b) This calculation should be done based on the block times between the relevant airports. c) For via routes to auto populated airports, ground stops should be considered. Example: a flight departs from JNB to ELS via PLZ. Because PLZ and ELS are auto populated airports, the system should create an arrival and the departure slots in PLZ, because it is a via route. Create an arrival slot in ELS because it is the destination of the aircraft.		High
	Reporting		
246	The system must have a "what-if" capability (scenarios can be tested and reported on). It should be able to populate the "what-if" with slots and resources from an existing live slot season or create an empty "what if". The resources and slots on the what if should be editable/changeable without having an effect on the main resource configuration on the live season.		High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
247		The system must be able to perform compliance checks of slots vs. actual operations. (E.g., 80/20 rule).	High
248		The system must be able to show resource utilization as a percentage of capacity per hour (generate intelligence to ROUTES for new airline business) what is available.	High
249		The system must be able to do slot comparison, e.g., S14 vs S15 or S14 vs W14 –to determine where the growth was.	High
250		The system must be able to show the busiest day forecast for the season (initial submission).	High
251		The system must be able to report on compliance checks as per the slot regulation for linked and unlinked slot requests combined.	High
252		The system must be able to toggle between UTC and local time. It must be able to view and allocate/change resources on both UTC and local time.	High
	System Functionality		
253		The system must be able to toggle between seeing slots in full validity period, a specified date range, a specific day, or a selection of days (e.g., day 2, day 4 and day 7). It must be possible to see the relevant allocated resources for a specific flight only.	High
254		The system must be able to filter slots based on a combination of all slot parameters.	High
255		The system must enable multiple users to work on it at the same time	High
256		The system must have an undo button.	High
257		The system must have a full transactional audit trail	High
258		A system must enable the user to create as well as grant access rights, e.g., admin, editor, specific functionality user, read users, etc.	High
259		The system must enable the user to configure different resources and resource capacity (e.g., runways, aprons) against which to check slot availability.	High
	Resource configuration		
260		Resource interdependency / configuration need to be considered when doing capacity checks (e.g., if apron E6 is occupied, apron E5 and apron E7 is also not available due to the bay configuration).	High
260		The system must make it possible to enter operational/local rules per airport and for airport resources for slot approval e.g., · A380 minimum 10 min separation on departures, not more than 3 in an	High

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Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
		hour. · 14hr ground time exceeded. · Operating hours for all airports.	
261		The system must be able to identify which specific slots exceed the configured resource capacity and alerts the user respectively.	High
262		The system must enable the user to configure buffer time	High
263		"**Parking - Parking Buffer Time** – the system must have a Parking Buffer Timetable with the following fields: Name, Airport, Season-From, Season-To, Filter, Allocation Order, Arrival-Buffer Time, Departure-Buffer Time."	High
264		**Parking - Parking Buffer Time** – The buffer time needs to supersede the existing buffer times by stand or parking constraint if present.	High
265		**Parking - Towing** – The system must enable the user to configure parking bays that will be towed to and will be used as arrival and departure bays (Arrival or departure of flights, and tow movements).	High
266		**Parking - Towing** - The system must enable the user configure parking bays that will not be towed to (Only arrival or departure of flights).	High
267		**Parking - Towing** - The system must enable the user to configure bays that will only be towed to and will not be used as arrival and departure.	High
268		**Parking - Hangar Movements** - The system must enable the user to configure a slot as Hangar or not.	High
269		**Parking - Hangar Movements** - The system must be able to automatically populate the flight link and hangar table where slots are indicated to be linked to a hangar.	High
270		**Parking - Hangar Movements** - For flights that need to be towed to a Hangar, a parking pool defined as a towing pool needs to be created.	High
271		**Parking - Hangar Movements** - The system must enable the user to configure the system to use a usage expression that will ensure that only relevant flights are using this towing pool, and the number of bays in the towing pool will be set high enough to ensure that the capacity is unlimited.	High
272		**Parking** - The system must enable the user to configure Preference and exclusion rules per individual parking bay.	High
273		Parking – The system must have capability to export all parking bay and gate allocations for the whole season to a workable format (e.g., in CSV) to compare it to AMS Allocations.	High
274		SCORE AMS Conversion Table should include Operator description	High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
275		It should be possible to specify a shorter period, e.g., 12 Hours. for maximum linking of arrival and departure slots	High
276		It should be possible to have more information in the parking Gantt when you hover over a parking bay to be able to see what codes it can accommodate	High
277		Boarding Gates - The system must enable the user to configure the system for how long Gates need to be allocated, based on A/C type, A/C Type Group, Route.	High
278		**Boarding Gates** - The system must present a warning to the user when contact stands are no longer available and that bus gates will need to be used.	High
279		**Boarding Gates** - Gates that is linked to contact stands needs to be linked to the specific stand in the system as well.	High
280		**Boarding Gates**- The Number of bussing gates required and utilized needs to be presented graphically to the user on the initial submission stage.	High
281		**Boarding Gates** – The system must make it possible to represent the boarding gate in a Gantt / allocation format	High
282		**Boarding Gates** - The system must enable the user to view boarding gates and parking bays on the same and different views	High
283		**Boarding Gates** - The associated boarding gate to the allocated parking bay should be visible on the information tooltip.	High
284		**Check in Counters** - The system must enable the user to configure the system for different offsets for international and domestic check-in counters.	High
285		**Check in Counters** - The system must enable the user to configure different Check in Areas, e.g., Check in Zones.	High
286		**Check in Counters** - The system must enable the user to configure the check-in profiles for check-in of passengers, different profiles for domestic and international passengers.	High
287		**Check in Counters** - The system must enable the user to configure "Spill Over" from one check in area to another based on if the capacity is reached or not.	High
288		**Check in Counters** - The system must be able to show a Graphical view of the allocation to each check in area, as well as what slots are allocated because of spill over.	High
289		**Check in Counters** - The system must enable the user to get to the detail of each allocation bucket to view the slots allocated.	High
290		**Check in Counters** - The system must enable the user to change the Check in allocation to a specific area based on a usage expression	High

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Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
291	**Check in Counters** - The system must enable the user to configure a processing rate, and load factor with a usage expression.		High
292	**Baggage Carousels** - The system must enable the user to configure baggage belt pools and be able to link same sized baggage carousels to a baggage carousel pool.		High
293	**Baggage Carousels** -The capacity needs to be defined on a pool and individual belt level as follows: Name, From and To-date time, Capacity per carousel or and pool.		High
294	**Baggage Carousels** - The system must enable the user to configure the allocation of carousels with usage expression.		High
295	**Baggage Carousels** - The system must enable the user to configure multiple allocation of flights to one carousel.		High
296	**Baggage Carousels** - The system must enable the user to configure offset time of when carousel needs to be allocated.		High
297	**Baggage Carousels** - The system must enable the user to configure the number of bags allocated per carousel as a factor of the passengers on the A/C.		High
298	**Baggage Carousels** - The system must enable the user to configure profiles based on usage expression to allocate bags to carousels.		High
299	**Baggage Carousels** - The system must enable the user to configure carousels to switch during the day between domestic and international (swing carousels).		High
300	**Baggage Carousels** -The system must enable the user to view the allocation of carousels graphically.		High
301	**Baggage Carousels** – The system must make it possible to get to the detail number of bags allocated for each individual slot for each time bucket on the graphical view.		High
302	**Baggage Carousels** - The system must make it possible to overlap allocations depending on if capacity is available on each carousel. It should be configurable to specify the allocation to use the least overlaps when allocating.		High
303	**Runway - Taxi Time** - The taxi time must have an offset before arrival slots and after departure slots. The offset needs to be configured with the following elements: Route, From Datetime, To Datetime, A/C Group, Arrival Taxi Time, Departure Taxi Time, Custom Filter Expression.		High
304	**Runway - Taxi Time** - The taxi time must be applied as an offset before the on chocks time and after the off chocks time to determine the runway utilization. The runway histogram should indicate the runway times with the offset calculated.		High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
305		The system must enable a contact stand to accommodate bussing gate for domestic and international traffic.	High
306		The system must be able to clearly distinguish between busing gate & parking bay resources overloads when user handles a message.	High
307		The system must be able to show all parking bay information when a mouse is hovered on the bay	High
308		The system must be able to accommodate slot requests for Airports Company South Africa's network of airports	High
		Linking of unlinked slots for parking bay and busing gate allocation: The system must have the capability to link unlinked slots automatically in order to achieve a responsible parking bay and busing gate. The allocation of slots needs to be practically executable during both initial submission and the approval of slots during a season. The allocation must be for the whole season	High
		The system must enable the contact stand to accommodate both domestic and international traffic as well as a busing gate where required.	High
	Airport Network capability		
309		The system must enable the user to input/enter block times/flying times into the system that will be used to populate slots for non-coordinated airports.	High
310		The system must make it possible to create a slot on a non-slot coordinated airport based on the departure slot created on the slot coordinated airport (e.g., JNB to BFN)	High
311		The system must be able to populate ACSA'S non-coordinated airports demand including VIA Routes.	High
312		**Auto populated Airports** – the system must make it possible to specify if an airport is coordinated or automatically populated.	High
313		**Auto populated Airports** -The system must enable the user to manually handle messages to be configured for non-coordinated airports.	High
314		**Auto populated Airports** – the system must make it possible to specify the from date and to date that the airport will be auto populated - This needs to be optional for each airport, to allow for a list of date-intervals (like any summer season).	High
315		**Auto populated Airports** - the system must make it possible to access the coordinated airport configuration	High
316		**Auto populated Airports** – the system must enable the user to handle slot requests manually and for an automatically populated airport as well.	High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
317	**Auto populated Airports** – The system must have capability to re-sync the coordinated airport to the automatically populated airport that will discard the slots in the automatically populated airport and re-sync it with the coordinated airport.		High
318	**Auto populated Airports** – the system must enable the user to enter block flight times to slots management system for all Airports in the Network. The elements that need to be entered are the following: Operator, A/C Type, A/C Group, From Airport, To Airport, From Datetime, To Datetime, Flight Time (Block time) in Minutes, and Tolerance in Minutes.		High
319	**Auto populated Airports** - The system must have capability to verify the impact of the Slot request on the coordinated airport and the automatically populated airport before the slot is confirmed.		High
320	**Auto populated Airports** - The system must take into account all the resource constraints setup on both coordinated and auto populated airports when the impact is checked/validated.		High
321	**Auto populated Airports** - The system must enable the user to set up a curfew as a resource constraint at automatically populated airports.		High
322	**Auto populated Airports** - Resource constraint checks against auto populated airports, needs to be possible at initial submission stage and for ad hoc slot requests.		High
323	**Auto populated Airports** - The impact of the slot test for the non-coordinated airport should be visible on the relevant resource matrixes and graphs of the automatically populated airports so that the slot times can be adjusted accordingly, especially during initial submission.		High
324	**Auto populated Airports** - The system must have capability to auto-populate the automatically populated airports (as per the requirement above).		High
325	**Auto populated Airports** - When a slot request is confirmed or modified in a coordinated airport for a destination that is an automatically populated airport, the block time that is specified in the block timetable needs to be used to populate the slot in the automatically populated airport.		High
326	**Auto populated Airports** - If a link flight record exists in the automatically populated airport, the slot must be linked when parking constraints is checked/verified.		High
327	**Auto populated Airports** - If the slot in the coordinated airport is fragmented, it should also fragment the automatically populated airport slots accordingly.		High

Nr	CATERGORY	REQUIREMENT DESCRIPTION	PRIORITY
329	**Coordinated Airports** - **Block time check** - The system must have capability to check if a linked slot exists in the relevant other coordinated airport, and alert/warn the user that the slot needs to be corrected. The system must alert/warn for both checks during the initial submission and for ad hoc slot requests. The tolerance needs to be taken into consideration when checking compliance, and the slots management system needs to warn the user when the block time is longer than the specified time and tolerance.	High
330	**Coordinated Airports- Block time check-** the system should cater for messages individually if slots are not received at the same time for both coordinated airports	High
333	**Slot Monitoring** - The system must be able to cater for the requirements of the Airport Slot Coordination Regulations 2012 (South African Rules).	High

2.5. Airport Collaborative Decision-Making Tool (A-CDM) Requirements:

It is worth noting that the CDM (Apex) solution / module should be embedded with the airport management solution. The following table outlines the CDM module requirements that must be delivered by new airport management solution.

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REQ #	CATERGORY	REQUIREMENTS DESCRIPTION	REQ PRIORITY
2.5.1	**AIRPORT MAP**		
2.5.1.1	Aircraft Positioning		
2.5.1.1.1	The system should be able to display the moving aircraft on the map displaying its position, speed and direction in which it is heading based on the ground radar system data.		High
2.5.1.1.2	The system should be able to display any aircraft which is currently taxiing and do not have ground radar feed, even when it's still slightly away from the stand they are heading towards or coming from		High
2.5.1.1.3	The system should enable users to have access to a layer on the airport map which shows aircrafts parked at the airport stand		High
2.5.1.1.4	The system should be able to allocate flights without bays to a parking lot section as soon as the flight have actual time of arrival (ATA)		High
2.5.1.1.5	The system should be able to filter by multiple carriers to represent a handler's, airline company or airline group view		High
2.5.1.2	Flight Information		
2.5.1.2.1	The system must ensure that all flights on map have tooltip information		High
2.5.1.2.2	The system must ensure that the tooltip shows for arrival and departure flights on the airport map		High
2.5.1.2.3	The system must enable tooltip to be pinned to the map		High
2.5.1.2.4	The system must ensure that when a user hover over a taxiing flight that has ground radar the screen must follow the aircraft		High
2.5.1.2.5	The system must enable users to create events from the aircraft on the map		High
2.5.1.2.6	The system must allow users to be able to retrieve flight information backdated to no more than 31 days		High
2.5.1.3	Flight Grid		
2.5.1.3.1	The system should communicate aircraft allocated resource changes to assigned airport community stakeholders through different communication platforms: system events, alerts, SMS, Email, etc.		High

REQ #	CATERGORY	REQUIREMENTS DESCRIPTION	REQ PRIORITY
2.5.1.3.2	The system must enable airport stakeholders to input or update specific data attributes for a specific flight in the flight grid		High
2.5.1.4	Delay Code Management		
2.5.1.4.1	System must be able to assign and reassign delay codes		High
2.5.1.4.2	The system must be able to assign the delay and sub delay to the responsible airline or airport community representative and account for the delay value		High
2.5.1.4.3	The system must have free text functionality to allow users to insert additional information associated to the delay code event		High
2.5.1.4.4	The system must provide a view of all delay codes within the system		High
2.5.1.4.5	The system must allow the user to insert a reason as to why the delay has been rejected		High
2.5.1.5	Event Management		
2.5.1.5.1	The system must generate and communicate all events to users who have access to the functionality		High
2.5.1.5.2	The system must generate event notifications to assigned users or groups		High
2.5.1.5.3	The system must be able to generate events based on the severity of the event as defined by the airports process and policies		High
2.5.1.5.4	High severity events need to be visible to all A-CDM users e.g., weather events.		High
2.5.1.5.5	The system must be able to define events based on a category and time		High
2.5.1.5.7	The system must enable events to be linked to a specific flight		High
2.5.1.5.8	The system must enable the user to create as well as update existing events		High
2.5.1.6	Status Performance Indicators		
2.5.1.6.1	The system must be able to calculate the Domestic Arrival OTP and Departure OTP		High
2.5.1.6.2	The system must be able to calculate the International Arrival OTP and Departure OTP		High
2.5.1.6.3	The system must be able to calculate the combined OTP per airport		High
2.5.1.6.4	The system must be able to calculate additional or other airport resource utilization OTP's such as Queue Management System.		High
2.5.1.6.5	The system must be able to calculate operators OTP		High

2.6.   Non-functional Requirements

The following table outlines the non-functional requirements that must be met by the new airport management solution.

REQ #	CATERGORY	REQUIREMENTS DESCRIPTION	REQ PRIORITY
2.6.1	System's Usability		

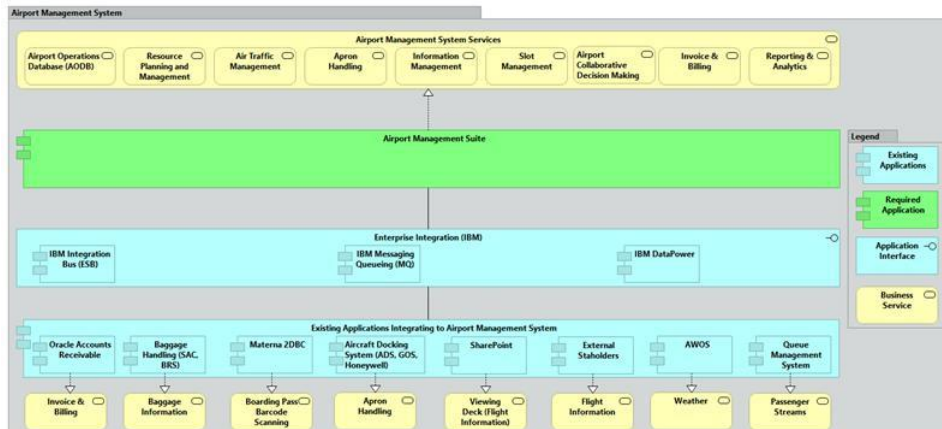| 2.6.1.1	The user interface must be easy to use and navigate around	High
2.6.2	System's environment	
2.6.2.1	The system must have the following environments: • Development • Quality Assurance (QA) / Test • Preprod • Production • Training	High
2.6.3	System's support	
2.6.3.1	The system needs to be supported adequately by the IT Service desk (1st level), 2nd level (Airport Systems) and 3rd level support (Service provider).	High

2.6.4	Website Capability	
2.6.4.1	The system must be web-based. The system must enable the user to capture information even when it's offline	High
2.6.5	Messaging Protocol	
2.6.5.1	The system must support industry standard messaging protocols	High
2.6.6	System Availability	
2.6.6.1	The system's availability must be at 99,5%	High
2.6.7	System Accessibility	
2.6.7.1	The system must be accessible in one central platform.	High
2.6.7.2	The system must be accessible to all 9 ACSA airports	High
2.6.7.3	The system must be accessible via laptops, desktops and mobile devices	High
2.6.8	Network Requirements	
2.6.8.1	The service provider to provide the amount of bandwidth required for their solution. Refer to Annexure A. for the table with estimated bandwidth costs per meg per site to be used for their calculations	High
2.6.9	System Scalability	
2.6.9.1	The system must be able to handle a minimum of 200 concurrent users at a time. The system should be flexible enough to accommodate more than 200 concurrent users at a time.	High
2.6.10	Backup Requirements:	
2.6.10.1	Backup requirements to be defined once the application has been received and the data thereof been classified.	High
2.6.10.2	The system must be backed up every hour at OR Tambo, Cape Town and King Shaka airports	High
2.6.10.3	The system must be backed up daily for Kimberly, George, Bloemfontein, East London, Port Elizabeth and Upington airports.	High
2.6.11	Disaster Recovery Requirements	
2.6.11.1	• The system must have a disaster recovery solution that is able to meet the business recovery objectives. • The recovery time objective (RTO) and recovery point objective (RPO) must be 2 hours.	High
2.6.11.2	The system must have a high availability (HA) server and a disaster recovery (DR) server	High
2.6.11.3	The DR and HA servers must be tested once a year	High
2.6.12	System Security	
2.6.12.1	**Authentication:**	High

	The system must uniquely identify users and also authenticate them according to ACSA's IT user authentication policy. Administrator accounts must be segregated from normal user accounts.	
2.6.12.2	**Authorization** The system must enable role-based permissions to be configured in order to control what system features and data users can access	High

2.6.12.3	**Audit**	High
	The system must keep an audit trail of all activities performed in the system (includes but not limited to the following who created, updated and deleted (must be authorized by super users) the record, with time and date stamp.	
2.6.12.4	**Data integrity**	High
	The system must maintain data integrity and quality. It must be a single source of truth in terms of data and calculations. All captured information must conform to predefined industry standards.	
2.6.12.5	**ACSA Security Standards:**	High
	The system must comply with ACSA's Security Standards.	
2.6.12.6	**Server-level security features:**	High
	The Service Provider must ensure that Server-level security features are in place for the solution. They must provide information related to the following: e.g., patching, anti-virus, vulnerability scanning, intrusion detection with real-time alerts etc.	
2.6.12.7	**Regulatory:**	High
	The application must comply with the Protection of Personal Information act (POPIA), General Data Protection Regulation 2016/679 (GDPR) and/or any other laws of the land.	
2.6.12.8	**Maintainability:**	High
	The application must be flexible in terms of modifications, bugs fixing and adding of new functionality.	
2.6.12.9	**Manageability:**	High
	The application must be monitored for anomalies.	
2.6.12.10	**Asset Protection:**	High
	***The system must protect ACSA data from being viewed by unauthorized personnel. The system must limit access to suspicious visitors and monitor for traffic spikes to prevent overloads like DDoS attacks.	
2.6.13	User Rights Change	
2.6.13.1	The system must have the capability to generate a report when the user access rights have been changed as well as when last the user logged into the system.	High
2.6.14	System Performance	
2.6.14.1	The application must have a fast response time when in use and must be able to plot a route to a point of interest in less than 5-10 milliseconds, depending on a functionality or activity being performed	High
2.6.15	Interoperability	
2.6.15.1	The application must be easy to integrate to other systems	High

2.6.16	System's Architecture Approval	
2.6.16.1	The system architecture needs to be approved by the ACSA ITAC committee.	High

2.7. AMS Suite Conceptual Design

2.8. In-project Implementation Guidelines

2.8.1. Incremental Development:

2.8.1.1. The Supplier must propose how to best group features and provide incremental solution development, testing and release plan.

2.8.1.2. The implementation timelines are such that the solution must be developed, tested and deployed by the 31 January 2023.

2.8.1.3. The project is planned to start in January 2022; however, the receipting will commence in FY 22/23. Therefore, milestones should be planning accordingly. The constrain will assist ACSA in managing cashflows.

2.8.1.4. Software testing services for the solution must be aligned to the ACSA standards as provided in the document **Annexure A.**

2.8.1.5. IT infrastructure for the solution must be aligned to ACSA standards as provided in the document **Annexure B.**

2.8.1.6. Project management for the solution must be aligned to the ACSA standards as provided in the document **Annexure C.**

2.8.1.7. Business Analysis for the solution must be aligned to the ACSA standards as provided in the document **Annexure D.**

2.8.2.   Implementation SLAs

2.8.2.1.   The Implementation schedule (dates, milestones, success criteria etc.), including the escalation process to ensure swift decision-making will be defined in the project kick off meeting. Should such schedule not be agreed to, it is stated that there is no consensus between the parties and affects the validity of the contract.

2.8.2.2.   For each release that misses the scheduled release date, ACSA will withhold 10% of the implementation fee per release.

2.8.2.3.   Should the whole implementation be completed i.e., developed, tested, deployed and accepted by ACSA by 31 January 2023 the withheld release payments will be processed.

2.9.   Support and Maintenance

The Service Provider is required to provide technical support, bug fixes and upgrades of the airport management solution. The following section describes the incidents, priorities and service level agreements that the Service Provider will need to comply with:

2.9.1.   Definition of incidents, priorities and service level agreement (SLA)

ACSA requires the Service Provider to adhere to the following incident resolution times based on priority definitions described in Tables 1 and 2 below:

P1 – Total systems failure.

P2 – Partial system failure with minimum monitoring functionality.

P3 – Non-critical fault/failure logged at night or over the weekend. It has no impact on the operations of the airport.

P4 – Minor incidents or move/change or installation of new item.

Incident management response and resolution times for (Office Hours)			
	Response	**Resolution**	**Update Feedback**
P1	15min	2hrs	30min
P2	30min	4hrs	1 hour
P3	60min	8hrs	2hrs
P4	4hours	24hrs	8hrs

Table 1:Incident management (Priority levels, response and resolution times)

Incident management response and resolution times for (After Hours, Weekends and Public Holidays)			
	Response	Resolution	Update Feedback
P1	15min	3hrs	15min
P2	30min	5hrs	30min
P3	60min	8hrs	2hrs
P4	4hours	24hrs	8hrs

Table 2: Incident Management

2.9.2. Breach and Penalties

The following penalties as detailed out in the next sections shall apply in an event of breach of service levels as agreed. The service provider shall restore the solutions that are in scope within times specified in the service level agreement. The following incident-based penalties shall apply for failing to restore the services within agreed timelines:

SLA Breach	Penalty
P1 Incidents are resolved within one hour after SLA time lapsed for two consecutive times in one month across any of the sites in scope	20 % of the monthly fee will be deducted per invoice up to 60% in one contractual year, thereafter termination procedures will be implemented.
Incidents are resolved within two hours and beyond after SLA time lapsed for three consecutive times in one month across any of the sites in scope	30 % of the monthly fee will be deducted up to 60% in one contractual year, thereafter termination procedures will be implemented.
If a Service Provider misses Incident Management SLAs in any 3 consecutive months across any sites in scope	50 % of the monthly fee will be deducted.
If a Service Provider misses Incident Management SLA's consecutively in any 4 months across all sites in scope – this will be deemed as a material breach, and the contract will be referred for performance management and termination procedures	50 % of the monthly fee will be deducted.
Five or more missed SLAs across all sites in scope on or across Acquisition Management, IMACDs; Asset Management; Configuration Management; Maintenance and Repair in a measuring period	20% of the monthly fee will be deducted per invoice

Table 3: SLA breaches and penalties

Failure to perform maintenance and / or services in accordance with the scheduled dates or Priority list and SLA agreements shall result in the following penalties:

Maintenance	Penalty
Services not done or proof of carrying maintenance out not submitted.	No payment of invoice.

Table 4: Failure to provide maintenance.

2.9.3. Service level agreement measurement exclusions

The following table provides a list of events that will not impact on the measurement of the Service Level Agreements should they occur.

Number	Service Level Measurement Exclusions
1	The connection of ancillary equipment, not supplied by the Service Provider, or not approved by the manufacturer of the equipment and software;
2	Damage during any transportation of equipment and software by ACSA;
3	Electrical work not performed by the Service Provider;
4	Causes external to the equipment such as failure or proven fluctuation of electrical power;
5	Any authorized / unauthorized changes not communicated to the Service Provider
6	Failure of equipment or services not directly under the control of, or within the responsibility of the Service Provider.

Table 5: SLA measurement exclusion

2.10. Reporting

The Service Provider will be expected to provide the weekly progress report to an ACSA representative during implementation.

Post implementation, the Service Provider must provide monthly reports to ACSA on the following:

2.10.1.	Usage of the application

2.10.2.	System availability and downtimes

2.10.3.	Number of logged and status.

 ACSA reserves the right to change a list of reports as requested and will review these on a regular basis, and such changes should not attract additional costs.

2.11. Meetings

As part of ongoing performance management and project delivery, ACSA requires that the Service Provider attend monthly and weekly meetings.

Frequency	Meeting Name	Standing Agenda	Participants and Role	Prior documents to be submitted by the Service Provider	Documents to be produced after meeting
Monthly	Project Board Meeting	- Discuss all aspects of monthly report. - Discuss Project Costs, Timelines, Risks, Issues, Resources, etc. - Discuss all deliverables produced to trace successful delivery on Business Requirements.	- IT PMO - Service Provider - ACSA contract owner - ACSA Technical Lead - Project Sponsor - Project Manager - Other Stakeholders per Invitation	- Project Board Pack including planned presentation. - Previous Minutes. - Monthly Reports.	- Attendance Register - Minutes of meeting including updated action items, Decisions Made, Risks & Issues Log - Acceptance of deliverables
Weekly	Progress Meeting	- Action items Progress Made, - Planned tasks for next week, Issues and Risks	ACSA IT SI / SD (Project Manager, Business Analyst), Technical Lead and Service Provider	- Minutes of Previous Meeting. - Updated Risk and Issue Log.	- Attendance Register. - Minutes of Meeting. - Acceptance of deliverables.

Frequency	Meeting Name	Standing Agenda	Participants and Role	Prior documents to be submitted by the Service Provider	Documents to be produced after meeting
Ad-hoc	Ad-hoc	Ad-hoc	Stakeholders as and when required	Ad-hoc	As agreed by all parties
Monthly	Operational Meetings	Review system operations, vendor performance	Service provider & IT Operations Department	Operational reports	Minutes, attendance register.

Table 6: Meeting's matrix

2.12.   Documentation

2.12.1.   The following project related documentation must be produced by the Service Provider during implementation of the project:

2.12.2.   Project Management deliverables as per ACSA methodology.

2.12.3.   Architectural design

2.12.4.   Functional specification

2.12.5.   Technical specification.

2.12.6.   Interface Control document.

2.12.7.   Quality Assurance Specification documentation (Test Plan, Test Cases, Test results for different types of solution testing (unit, functional, performance, stress, vulnerability), List of defects

2.12.8.   Operational manuals

2.12.9.   Training manuals

2.13.   Solution Guidelines:

2.13.1.   The solution must provide functions and services required to support the business capability.

2.13.2.   There should be a single application to support a given business capability, i.e., the solution must not re-implement a capability already available in the portfolio, unless it is replacing the current one.

2.13.3.   The solution must be as secure as the business requirements dictate.

2.13.4.   The solution must meet the legal and conformance requirements, including those for privacy.

2.13.5.   The solution must provide adequate performance and responsiveness.

2.13.6.   The solution must be able to scale, without re-development, foe anticipated increase in volumes for the next 5 years.

2.13.7.   The solution must be reliable and easily recoverable.

2.13.8.   The solution must validate input data and maintain integrity of any data added, updated or exported.

2.13.9.   The solution must provide APIs which allow services to be accessed via an interface conforming to industry standards adopted by ACSA, e.g., Web Service (REST, SOAP).

2.13.10.   The solution must avoid "hard coding" of value, i.e., any variables which are likely to change must be externalized to the database or parameter/rule files.

2.13.11.   The solution must trap errors and report them in a meaningful and persistent way.

2.13.12.   The solution end user interfaces must be intuitive, and standard-based to facilitate ease of adoption and reliable usage as well as reduced training requirements.

2.13.13.   The solution must be documented to a standard that makes it easy to facilitate:

2.13.14.   The solution must be easy to install and configure.

2.13.15.   The solution must be easy to operate.

2.13.16.   The solution must be designed is such a way that it easy to determine and resolve problems.

2.13.17.   The Service Provider must provide impact analysis for change requests.

2.13.18.   The solution must be easy to adapt when required.

2.13.19.   The solution must not expose ACSA to undue risk.

2.14.   Pricing:

2.14.1.   Pricing for the solution should take into consideration guidelines in Section 2.8.

2.14.2.   Pricing should include an OEM warranty on the solution in its entirety for a period of three (3) years.