



International Civil Aviation Organization

Fifth Meeting of the Aerodrome Safety, Planning & Implementation Group

(ASPIG/5) (Doha, Qatar, 13-15 June 2023)

Agenda Item 3: Regional Performance Framework for Aerodromes Capacity and Efficiency

GANP/ASBU SURFACE OPERATIONS THREAD

(Presented by the Secretariat)

SUMMARY

This paper presents the the Surface Operations thread of the GANP ASBU. The paper emphasis on the need to establish a Regional Implementation Plan to manage and monitor the implementation of the A-SMGCS Elements at the Regional Level.

Action by the meeting is at paragraph 3.

REFERENCES

- ICAO GANP 7th Edition
- ASPIG Reports

1. INTRODUCTION

1.1 The International Civil Aviation Organization (ICAO) Global Air Navigation Plan (GANP) is a framework that outlines the key strategies and objectives for the development of the global air navigation system. The GANP recognizes the importance of collaborative decision-making in improving the overall efficiency of airport operations and reducing delays.

2. DISCUSSION

Operational Thread: Surface Operation

2.1 The meeting may wish to note that the baseline of the Surface Operations thread is the Traditional surface movement guidance and control system (**SMGCS**) implementing visual surveillance systems, aerodrome signage, lighting and markings. Surface operations are comprising all operations on the platform including those dedicated to airport maintenance functions.

2.2 The meeting may wish to note that the proposed operational improvement in this area consists of implementing the **A-SMGCS** to enhance the situational awareness of Air Traffic Controllers and pilots during ground operations by the provision of the aerodrome surface situation on their respective displays being A-SMGCS for the controller or electronic maps in the cockpit, in addition to some initial alerting services for prevention of runway incursions are proposed to the controller.

2.3 The meeting may wish to note that the implementation of an A-SMGCS system is typically required when an airport reaches a certain level of traffic or complexity, or when there is a

need to improve safety and efficiency on the airport surface. The specific requirements for A-SMGCS implementation may vary depending on the airport's size, location, and operational needs, but in general, the decision to implement an A-SMGCS system will depend on a variety of factors, including the airport's size, traffic volume, complexity, and National or Regional Regulatory requirements, as well as the need to improve safety and efficiency on the airport surface.

2.4 The meeting may wish to indicate that some other some additional factors that may influence the decision to implement an A-SMGCS system at an airport, would be:

- ***Increasing demand for airport services:*** If an airport is experiencing increasing demand for its services, it may need to implement A-SMGCS to handle the additional traffic while ensuring safety and efficiency. This can be particularly important for airports that are expanding or adding new facilities, such as runways or terminals.
- ***Operational constraints:*** If an airport has operational constraints, such as limited airspace or runway capacity, it may need to implement A-SMGCS to optimize the use of available resources. By reducing taxi times and improving the flow of traffic, A-SMGCS can help to increase the capacity of the airport and reduce delays.
- ***Safety concerns:*** If an airport has a history of safety incidents or accidents, or if there are concerns about the safety of operations on the airport surface, it may need to implement A-SMGCS to improve safety and reduce the risk of incidents. This can be particularly important for airports that handle a high volume of commercial traffic or have complex layouts.

Need for a Regional Implementation Plan for the SURF Thread

2.5 The meeting may wish to note that an A-SMGCS is a system that supports surface movement operations in all weather conditions at an aerodrome based on defined operational procedures. It consists of the:

1. ***Surveillance Service*** that provides the position, identification and tracking of mobiles, and can include a combination of the following services.
2. The ***Airport Safety Support Service*** that provides the functions: Runway Monitoring and Conflict Alerting (RMCA), Conflicting ATC Clearances (CATC), Conformance Monitoring Alerts for Controllers (CMAC).
3. The ***Routing Service*** that generates ground trajectories for mobiles.
4. The ***Guidance Service***.

2.6 The meeting may wish to note that in addition to the previous services, a Controller Working Position (CWP) is made available to provide Controllers with a Human Machine Interface (HMI) and for some services an Electronic Clearance Input (ECI) means.

The A-SMGCS Elements

2.7 The meeting may wish to note that the elements needed to implement each service of the A-SMGCS would be the following:

- The ***Surveillance Service*** requires a radar system or other sensor technology, such as multilateration or ADS-B, to provide the position, identification, and tracking of mobiles. The system must be able to accurately detect and track all Mobiles (vehicles and aircraft) on the airport surface.
- The ***Airport Safety Support Service*** includes several functions, including Runway Monitoring and Conflict Alerting (RMCA), Conflicting ATC Clearances (CATC), and Conformance Monitoring Alerts for Controllers (CMAC). In order to implement these functions, the system must have access to a database of airport layout and

configuration, as well as a set of predefined rules and procedures to detect and alert potential conflicts or deviations from safe operations.

- The ***Routing Service*** generates ground trajectories for mobiles, which requires data on the current location, destination, and flight plan of each aircraft and vehicle on the airport surface, as well as a set of algorithms to determine the most efficient and safe routes to their destinations. The system may also require access to weather and other environmental data to optimize routing decisions.
- ***The Guidance Service*** provides guidance to pilots and ground vehicles, which requires a set of visual and/or audio cues to be displayed on the CWP and/or on mobile devices carried by pilots and drivers. The system may also require access to real-time data on airport conditions, such as weather, runway closures, and ground congestion, to provide accurate guidance.

2.8 The meeting may wish to highlight that the CWP provides the human-machine interface (HMI) for controllers to monitor and control airport surface movements. The system must have a graphical user interface (GUI) with real-time information on the location and status of all aircraft and vehicles on the surface, as well as access to the various A-SMGCS services described above. In addition, some services may require an Electronic Clearance Input (ECI) means, such as a touch screen or keyboard, for controllers to input and modify clearances and flight plans.

2.9 The meeting may wish to note that similarly to the ACDM, the ASPIG may wish to note the need to establish a Regional Implementation Plan to manage and monitor the implementation of the A-SMGCS Elements at the Regional Level

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the content of the working paper and take action, as appropriate.

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