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UNITING AVIATION

Setting the scene – Basic SMGCS provisions from ICAO

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The ICAO Regulations

- Annex 14 Volume I - Aerodromes
- Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476)
- Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual (Doc 9830).
- PANS –Aerodrome, Doc 9157 Part 4, etc.



Surface movement guidance and control (SMGC) system consists of the provision of guidance to, and control or regulation of, all aircraft, ground vehicles and personnel on the movement area of an aerodrome.



Annex 14, Vol I

9.8.1 A surface movement guidance and control system (SMGCS) shall be provided at an aerodrome.

9.8.2 Recommendation.— *The design of an SMGCS should take into account:*

- *a) the density of air traffic;*
- *b) the visibility conditions under which operations are intended;*
- *c) the need for pilot orientation;*
- *d) the complexity of the aerodrome layout; and*
- *e) movements of vehicles.*



The key Stakeholders

- Aerodrome engineering, operations, communications,
- Aerodrome air traffic control service,
- Operators and pilot requirements.



The key Requirements

General Requirements (Aerodrome?)

- Communication Capabilities
- Visual aids and procedures
- Compatibility between various elements
- current and forecast meteorological conditions
- Workload on users

Aerodrome air traffic control service

- identity, position and progress of aircraft and Vehicles
- information on temporary obstacles or other hazards;
- information on the operational status of elements of the system; and
- facilities appropriate to the control to be exercised.



The key Requirements

- Pilot requirements –
 - orientation, guidance and control
 - information on the route to be followed;
 - information on position along the route being followed;
 - guidance along the route being followed and parking guidance;
 - warning of:
 - changes in direction;
 - stops and other speed adjustments;
 - identification of areas to be avoided;
 - information to prevent collision with other aircraft, ground vehicles or obstacles; and
 - information on system failures affecting safety



Advanced surface movement guidance and control system (A-SMGCS)

providing routing, guidance and surveillance for the control of aircraft and vehicles in order to maintain the declared surface movement rate under all weather conditions within the aerodrome visibility operational level (AVOL) while maintaining the required level of safety



The Global Aviation Safety Plan

- Runway excursion identified as a High Risk Category

9.8.4 Recommendation.— *An SMGCS should be designed to assist in the prevention of inadvertent incursions of aircraft and vehicles onto an active runway.*



ELEMENTS

Element ID	Title
SURF-B0/1	Basic ATCO tools to manage traffic during ground operations
SURF-B0/2	Comprehensive situational awareness of surface operations
SURF-B0/3	Initial ATCO alerting service for surface operations
SURF-B1/1	Advanced features using visual aids to support traffic management during ground operations
SURF-B1/2	Comprehensive pilot situational awareness on the airport surface
SURF-B1/3	Enhanced ATCO alerting service for surface operations
SURF-B1/4	Routing service to support ATCO surface operations management
SURF-B1/5	Enhanced vision systems for taxi operations
SURF-B2/1	Enhanced surface guidance for pilots and vehicle drivers
SURF-B2/2	Comprehensive vehicle driver situational awareness on the airport surface
SURF-B2/3	Conflict alerting for pilots for runway operations
SURF-B3/1	Optimization of surface traffic management in complex situations



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