



Aerodrome Advisory Circular

AC (AD)NO-06

Surface Movement Guidance and Control System

Civil Aviation Authority of Bangladesh
16 June 2011

Surface Movement Guidance and Control System

1.Purpose:

The purpose of this Advisory Circular is to provide guidance to the aerodrome operators in developing system to support aircraft operations in order to maintain required capacity and safety levels, specially in low visibility conditions. This circular is expected to provide adequate capacity and safety in relation to specific weather conditions, traffic density and aerodrome layout by making use of latest available technologies and high level of integration between various functionalities. (Ref: Doc 9476, Doc 9830).

2.Scope

This Advisory Circular provides general guidance on requirement, application process and responsibilities of aerodrome operators concerning surface movement guidance and control system. This AC should be considered in conjunction with other related CAAB and ICAO documents.

3.Applications

The provisions under this AC shall apply to aerodromes where international Air Transport operations open to public use is conducted.

Standard- A surface movement guidance and control system shall be provided at an aerodrome intended to be used in visibility conditions less than a value of the order of 2700 ft (800 m).

Recommendation- A surface movement guidance and control system should be provided at an aerodrome

- a) Intended to be used in visibility conditions less than a value of the order of 9,200 ft (2800 m) or less, or
- b) Where the traffic density is heavy

4. Definitions

The definitions in this AC shall have the following meaning whenever they appear in this provisions. The definitions in CAR, 1984 shall be applicable as and where required under this AC.

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

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 visibility operational level (AVOL). The minimum visibility at or above which the declared movement rate can be sustained.

Airport authority. The entity responsible for the operational management of the airport.

Alert. An indication of an existing or pending situation during aerodrome operations, or an indication of an abnormal A-SMGCS operation, that requires attention and/or action.

Note.— The term alert covers warnings, cautions, advisories and alarms reflecting different levels of urgency or equipment performance.

Apron. A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Apron management service. A service provided to regulate the activities and the movement of aircraft and vehicles on an apron.

A-SMGCS capacity. The maximum number of simultaneous movements of aircraft and vehicles that the system can safely support with an acceptable delay commensurate with the runway and taxiway capacity at a particular aerodrome.

Conflict. A situation where there is a risk for collision between aircraft and/or vehicles.
Identification. The correlation of a known aircraft or vehicle call sign with the displayed target of that aircraft or vehicle on the display of the surveillance system.

Incursion. Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected areas of a surface designated for the landing, take-off, taxiing and parking of aircraft.

Manoeuvring area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and apron(s). *Note.— For A-SMGCS, the movement area does not include passive stands, empty stands and those areas of the apron(s) that are exclusively designated to vehicle movements.*

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.

Reversion time. Maximum time for reversion to manual light control to be completed.

Road. An established surface route on the movement area meant for the exclusive use of vehicles.

Route. A track from a defined starting point to a defined end point on the movement area.

Runway incursion. Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

Stand. A designated area on an apron intended to be used for the parking of an aircraft. Stands can be classified as:

a) **active stand** — a stand that is occupied by a stationary aircraft with engines operating, or on which an aircraft is moving, or that is being approached by an aircraft;

b) **passive stand** — a stand that is occupied by a stationary aircraft with engines not operating; or

c) **empty stand** — a stand that is vacant and not being approached by an aircraft. Surveillance. A function of the system which provides identification and accurate position information on aircraft, vehicles and obstacles within the designated area.

System accuracy. A degree of conformance between the estimated or measured value and the true value.

Note.— For A-SMGCS, this includes the position and the speed.

System availability. The ability of an A-SMGCS to perform a required function at the initiation of the intended operation within an area covered by the A-SMGCS.

System continuity. The ability of an A-SMGCS to perform its required function without non-scheduled interruption during the intended operation within an area covered by the A-SMGCS.

System integrity. System integrity relates to the trust which can be placed in the correctness of the information provided by an A-SMGCS. This includes the ability of an A-SMGCS to provide timely and valid alerts to the user(s) when the A-SMGCS must not be used for the intended operation.

System reliability. The ability of an A-SMGCS to perform a required function under given conditions for a given time interval.

Target. An aircraft, vehicle or obstacle that is displayed on a surveillance display.

Target level of safety (TLS). The probability of an accident (fatal or hull loss) during aircraft movement on the aerodrome.

5.Characteristics

Recommendation- The design of a surface movement guidance and control system should take into account: the density of air traffic ;

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

6.Visual aids

Recommendation- The visual aid components of surface movement guidance and control system, i.e. markings, lights and signs should be designed to conform with the relevant specification in MAS 5.2, 5.3, 5.4 respectively.

Recommendation- A surface movement guidance and control system should be designed to assist in the prevention of inadvertent incursions of aircraft and vehicles onto an active runway.

Recommendation- The system should be designed to assist in the prevention of collisions between aircraft, and between aircraft and vehicles or objects, on any part of the movement area.

7.Standards:

Where a surface movement guidance and control system is provided by selective switching of stop bars and taxiway centre line lights, the following requirements shall be met:

- a) taxiway routes which are indicated by illuminated taxiway centre line lights shall be capable of being terminated by an illuminated stop bar;
- b) the control circuits shall be so arranged that when a stop bar located in the direction of movement is illuminated, the appropriate section of taxiway centre line lights beyond it is suppressed; and
- c) the taxiway centre line lights are activated in the intended direction of movement of the aircraft when the stop bar (if any) is suppressed.

- d) If necessary, a control should be provided, permitting air traffic controllers to override the system at their discretion and to deactivate a route which crosses an operational runway;
- e) System faults or incorrect operation of the system should be indicated by a visual monitor on the control panel.

8.Operational Requirements:

8.1 The level of the SMGC system that is provided at an aerodrome should be related to the operational conditions under which it is intended that the system shall operate. It is important to recognize that a complex SMGC system is not needed and is uneconomic at aerodromes where visibility, aerodrome layout complexity and traffic density, separately or in combination, do not at present cause problems for the ground movement operations of aircraft and vehicles. However, failure to provide an SMGC system with a capacity properly matched to the operational demands at an aerodrome will restrict the movement rate and may affect safety.

8.2 SMGC systems have four basic functions:

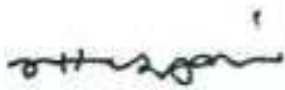
- a) *guidance*, which consists of the facilities, information and advice that are necessary to provide continuous, unambiguous and reliable information to pilots of aircraft and drivers of vehicles to keep their aircraft or vehicles on the surfaces and assigned routes intended for their use;
- b) *routing*, which is the planning and assignment of a route to individual aircraft and vehicles to provide safe, expeditious and efficient movement from the current position to the intended position;
- c) *control*, which is the application of measures to prevent collisions and runway incursions thereby ensuring safe, expeditious and efficient ground movements; and
- d) *surveillance*, which provides identification and accurate positional information on aircraft, vehicles and other objects.

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8.3 Guidance and control of the many vehicles that operate in stand areas present special problems in relation to the level of the SMGC system that is required. These can be dealt with by using the concept that the role of any particular stand changes with time. When an aircraft is stationary on a stand with engines running or an aircraft is moving on the stand or an aircraft is approaching the stand, then the stand is part of the movement area and appropriate SMGC system provisions are required. If a stand is occupied but the aircraft engines are not running or if the stand is vacant and not being approached by an aircraft, then the stand is not at that time part of the movement area, and SMGC system provisions are not required.

8.4 The tendency in A-SMCGS implementation is towards a reduction in the voice communications workload, an increase in the use of surface guidance aids and a greater reliance on avionics in the cockpit to help guide the pilot to and from the runway. ATC surveillance of aircraft and vehicles will make greater use of electronic aids, and automation will play an increasing role in the monitoring of the dynamics of surface operations.

Chairman, Civil Aviation Authority, Bangladesh is pleased to issue this Advisory Circular in pursuance of Rule 4 of CAR '84, ANO (AD)A.1&ICAO Doc-9476



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