International Civil Aviation Organization

Eleventh Meeting of the Air Traffic Management Sub-Group (ATM/SG/11) of APANPIRG

Singapore, 2 – 6 October 2023

Agenda Item 5: ATM Systems (Modernization, Seamless ATM, CNS, ATFM)

APPLICATION OF TIME TO THRESHOLD FUNCTION

(Presented by Airports Authority of India)

SUMMARY

This information paper presents about the implementation of Time to Threshold (TTT) concept, an ATM capacity and safety enhancement tool, at various high intensity runway operation (HIRO) airports in India.

1. INTRODUCTION

1.1 **Time to Threshold (TTT) or (Time to Go -TTG)** is very vital and useful information available through A-SMGCS display to Tower, APP and SMC Controller. TTT implies the time taken by the aircraft on approach to reach over the threshold of the landing runway. Distance based inter-arrival spacing is normally being used for planning of departure but the speed of the aircraft on approach varies due to various factors and consequently the actual time taken by the aircraft to arrive over the threshold also varies. Planning departures between arrivals based upon TTT is more efficient than inter arrival spacing/distance-based procedures. In the scenario of ever-increasing demand of air traffic, it is more prudent to implement the procedures based upon TTT to accommodate departures before an arrival.

2. DISCUSSION:

General

2.1 The distance based planning renders itself not so efficient in the current scenario of continuously increasing traffic arriving to and departing from busiest airports like Delhi, Mumbai and Bengaluru and hence TTT is being adopted to ease the decision making capability of Tower Controller and hence increasing the overall efficiency and safety of the system.

There are various factors to be considered for deciding the TTT at any airport. The main factors are:

a) Runway Occupancy Time by departing & arriving traffic,

b) Positioning of rapid exit taxiways (RET),

c) Runway length,

d) Wind patterns and weather phenomenon at Airport,

e) Type of fleet operating at airport etc.

Conditions / Requirements

2.2 The conditions to be met are as follows.

a) The procedure is generally applicable for all RWYS in all modes with ILS Approach.

b) A-SMGCS, Radar, Tower CWP shall be serviceable.

c) All RETs for the Runway in use shall be available.

d) The TTT information on A-SMGCS must be consistently available.

e) Dry RWY condition.

f) Wake turbulence separation shall supersede other separation/spacing requirements at all times.

g) The TWR controller must not hesitate to issue go around instructions to arrivals in case the required separation is likely to be breached.

Working Procedure

2.3 At all the airports, working procedures for TTT has been defined which takes care of various scenario. As an example, the following table represent the TTT timings for KIA, Bengaluru.

The desirable TTT spacing between successive arrivals during normal operations is as mentioned below:

Runway	TTT spacing between two Code C Arrivals	TTT spacing between two Code C Arrivals when there is a Code C Departure in between the Arrivals
RWY 09L/27R/09R/27L	95 Seconds	135 seconds

2.4 In case of delayed manoeuvre during lining up and take-off roll of the departure, following action shall be taken by the TWR controller to ensure appropriate level of safety:

a) The take-off clearance should be issued when the TTT of arriving aircraft is 80 seconds or more. If this TTT criterion is not met, then take off clearance shall not be issued by the TWR controller and appropriate action for the arrival shall be taken.

b) If the departing aircraft has not commenced the take-off roll and arrival TTT is equal to or less than 65 seconds, then take-off clearance shall be cancelled and arrival must be directed to go around (published missed approach).

c) If the departing aircraft has commenced the take-off role (speed more than 30kts) and TTT is 55 seconds or more, then the aircraft can be allowed to take-off and land, as per the situation.

Associate Aerodrome Controller (AAC)

2.5 In order to enhance safety and improve efficiency, Associate Aerodrome Controller position is introduced while implementing TTT operations. Associate Aerodrome Controller shall be positioned besides the Aerodrome Controller and keep surveillance and advise Aerodrome controller regarding any observed deviations from clearances/instructions. AAC will operate ground lighting panel, manage flight progress strips and keep an active watch on MET display panel and advise tower controller in case of any significant meteorological changes.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

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