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International Civil Aviation Organization

THIRD MEETING OF THE GREPECAS ATM/CNS SUBGROUP ATM COMMITTEE AIR TRAFFIC MANAGEMENT TASK FORCE – (ATFM/TF/3)

(San Andrés, Colombia, 18 to 22 June 2007)

Agenda Item 1: ATFM existent national Plans in the CAR/SAM Regions

AERODROME ACCEPTANCE RATE

(Presented by the United States of America)

SUMMARY

This working paper provides a summary of the work accomplished by the Federal Aviation Administration with regard to establishing the aerodrome acceptance rate (AAR). The purpose of the working paper is to provide States/Territories/International Organizations with a model to utilize in order to establish the AAR at select aerodromes in their airspace.

1 Background

1.1 An important foundation for providing Air Traffic Flow Management service is the establishment of the aerodrome acceptance rate (AAR). Traffic managers require a numeric value for the arrival rate at key aerodromes in order to: measure the aircraft demand at the aerodrome against the available capacity; establish the traffic management initiatives required to balance demand and capacity; and evaluate the effectiveness of Air Traffic Flow Management (ATFM) measures.

1.2 The AAR is typically developed for three types of meteorological conditions: Visual Meteorological Conditions (VMC), Marginal VMC, and Instrument Meteorological Conditions (IMC). By defining the AAR for these three sets of weather conditions, traffic managers can adjust quickly to the capacity declared at an aerodrome by air traffic control.

1.3 The information in this working paper is based on years of work conducted by the Federal Aviation Administration and on the practical application of this model at aerodromes across the United States. This methodology has been successfully employed and has proven very useful and beneficial for traffic managers.

2 Discussion

2.1 Definitions:

a. **Aerodrome Acceptance Rate (AAR):** The number of arrival aircraft that an aerodrome -- in conjunction with weather conditions, terminal airspace, ramp space, parking space, and facilities -- can accept per hour.

b. **Aerodrome Primary Runway Configuration**: Each aerodrome configuration which handles 3 percent or more of the annual operations.

c. **Potential AAR**: The theoretical acceptance rate at the runway threshold – before taking other factors into consideration.

d. **Actual AAR**: The Potential AAR at the runway threshold adjusted for other factors.
For any runway configuration, the Potential AAR minus Adjustment Factors equals the Actual AAR:

POTENTIAL AAR
-- ADJUSTMENT FACTORS

ACTUAL AAR

e. **Adjustment factors**: The factors that must be considered when establishing the Actual AAR. These include, but are not limited to:
1. Weather conditions
2. Runway conditions
3. Taxiway layout
4. Ramp space
5. Facilities

2.2 Establishing the Actual AAR.

a. Establish Actual AAR values for each aerodrome runway configuration for the following weather conditions:

1. Visual Meteorological Conditions (VMC) - weather allows vectoring for visual approaches.

2. Marginal VMC - weather does not allow vectoring for visual approaches, but visual separation on final is possible.

3. Instrument Meteorological Conditions (IMC) – Visual approaches and visual separation on final are not possible.

2.3 Calculate the Actual AAR as follows:

a. First, calculate the Potential AAR.

1. Determine the average ground speed crossing the runway threshold and the spacing interval required between successive arrivals.

2. Divide the groundspeed by the spacing interval to determine the Potential AAR.

3. FORMULA METHOD: Ground speed in knots at the runway threshold divided by spacing interval at the runway threshold in miles.

NOTE: when the quotient is a fraction, round down to the next whole number

4. Example 1: 130 KTS / 5 nm = 26
Potential AAR = 26 arrivals per hour

5. Example 2: 120 KTS / 7 nm = 17.14
round down to 17

Potential AAR = 17 arrivals per hour

6. Or, use the TABLE METHOD to determine the Potential AAR.

Table: Potential AAR

Nautical miles between aircraft at the Runway Threshold										
	3	**3.5**	**4**	**4.5**	**5**	**6**	**7**	**8**	**9**	**10**
	Potential AAR									
Ground Speed at the Runway Threshold										
140 knots	46	40	35	31	28	23	20	17	15	14
130 knots	43	37	32	28	26	21	18	16	14	13
120 knots	40	34	30	26	24	20	17	15	13	12
110 knots	36	31	27	24	22	18	15	13	12	11

b. Next, identify any conditions that may reduce the Potential AAR. Conditions include:

1. Intersecting arrival and departure runways

2. Lateral distance between arrival runways

3. Dual use runways – runways that share arrivals and departures

4. Land and Hold Short operations

5. Availability of high speed taxiways

6. Airspace limitations and constraints

7. Procedural limitations (noise abatement, missed approach procedures)

8. Taxiway layouts

9. Meteorological conditions

c. Finally, subtract the adjustments from the Potential AAR to determine the Actual AAR for each runway used in an aerodrome configuration.

POTENTIAL AAR
-- ADJUSTMENT FACTORS

ACTUAL AAR

d. Example

Table: EXAMPLE OF AN ACTUAL AAR TABLE

RUNWAY CONFIGURATION	AAR for VMC	AAR for MARGINAL VMC	AAR for IMC
RWY 13	24	21	19
RWY 31	23	20	17

2.4 Administrative considerations:

a. Identify the organization responsible for the establishment and implementation of AARs at select aerodromes.

b. Establish a table of Actual AARs for the aerodromes identified by each State/Territory.

c. Review and validate the aerodrome primary runway configurations and associated AARs at least once each year.

3 Recommendation

3.1 The meeting is invited to:

a. Review the model for determining the AAR;

b. Consider using the model to develop the AAR for select aerodromes; and,

c. Develop a table of AARs for select aerodromes in the CAR/SAM Regions.