

Agenda Item 2: Optimization of the SAM airspace

AGILE GRU PROJECT

(Presented by Brazil and IATA)

SUMMARY

This information paper presents the preliminary results of the initiative of Brazil aviation industry to optimization of runway capacity and traffic flow in São Paulo/Guarulhos International Airport (GRU), with segregated simultaneous operations under visual meteorological conditions (VMC).

1. Introduction

1.1 In the SAM/IG/22, Brazil, together with IATA, presented the initiative to optimize the use of runway capacity in Guarulhos - Sao Paulo, with the application of simultaneous segregated operations under VMC, called the AGILE GRU Project. Working paper WP/21 of the mentioned meeting presented details on a Performance Measurement Plan.

1.2 The second phase of AGILE GRU - SEGREGATED SIMULTANEOUS OPERATIONS UNDER VMC - was implemented on December 6th, 2018.

2. Phase 2 – Segregated Simultaneous Operations under VMC

2.1 The ICAO Annex 14 item 3.1.11 recommends the minimum distance of 210m (code number 3 or 4) between parallel runways centerlines where parallel non-instrument runways are intended for simultaneous use. The non-instrument runway is a runway intended for the operation of aircraft using visual approach procedures or an instrument approach procedure to a point beyond which the approach may continue in visual meteorological conditions.

2.2 The minimum distance between parallel runways in GRU is 375m:

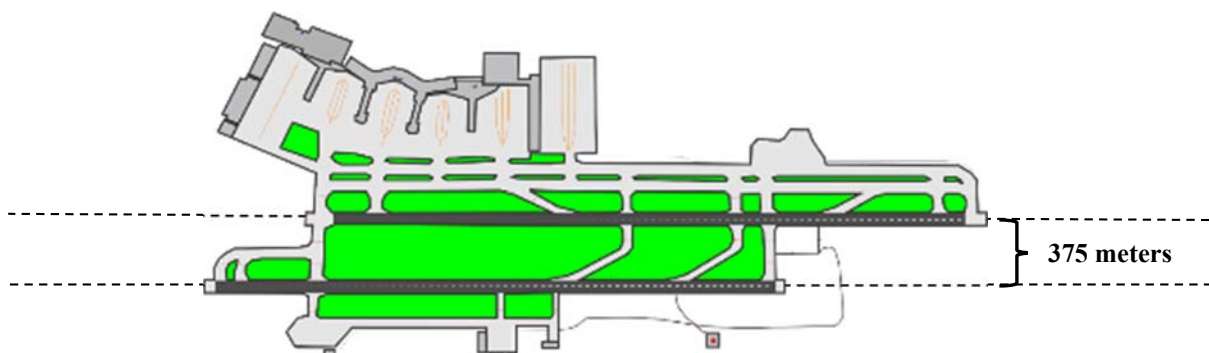


Figure 1 – Runway centerline spacing in GRU

2.3 The operational concept of phase 2 was based on the Annex 14 requirements and the on the experience of other airports around the world (for example, San Francisco Airport (SFO) in the USA) that had implemented VMC separations to improve your efficiency.

2.4 Four instrument approach procedures (ILS and RNAV) were developed to the preferred landing runway (09R and 27L) to be used when the meteorological conditions are above ceiling 1500 FT and visibility 5000m. The principle objective of them is to provide lateral and vertical separation between one aircraft executing the missed approach procedure and another aircraft executing the standard instrument departure at parallel runway.

2.5 There are some detailed studies about wake turbulence influence in GRU parallel runways, but for this first moment the Project have concluded that the segregated simultaneous operations shall not be applied when there is an aircraft classified as HEAVY approaching RWY 09R/RWY 27L or departing on runway 27R. In this case, due to configuration of runway 27L/27R, where runway 27L (arrival runway) is staggered away from the arriving aircraft.

2.6 The figures 2 - 5 lists in detail the operation on runways 09R/09L and 27R/27L.

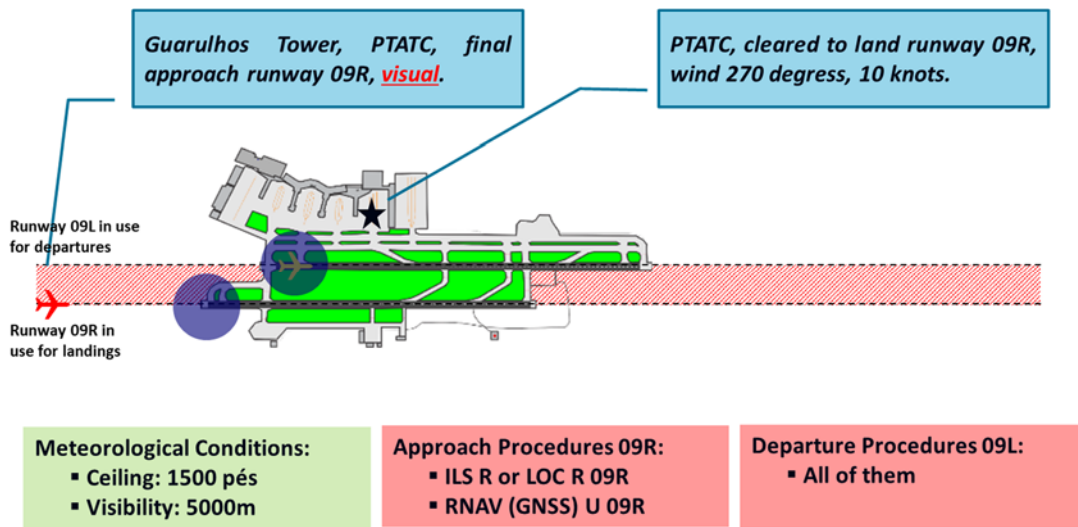


Figure 2 – Approach and Landing RWY 09R

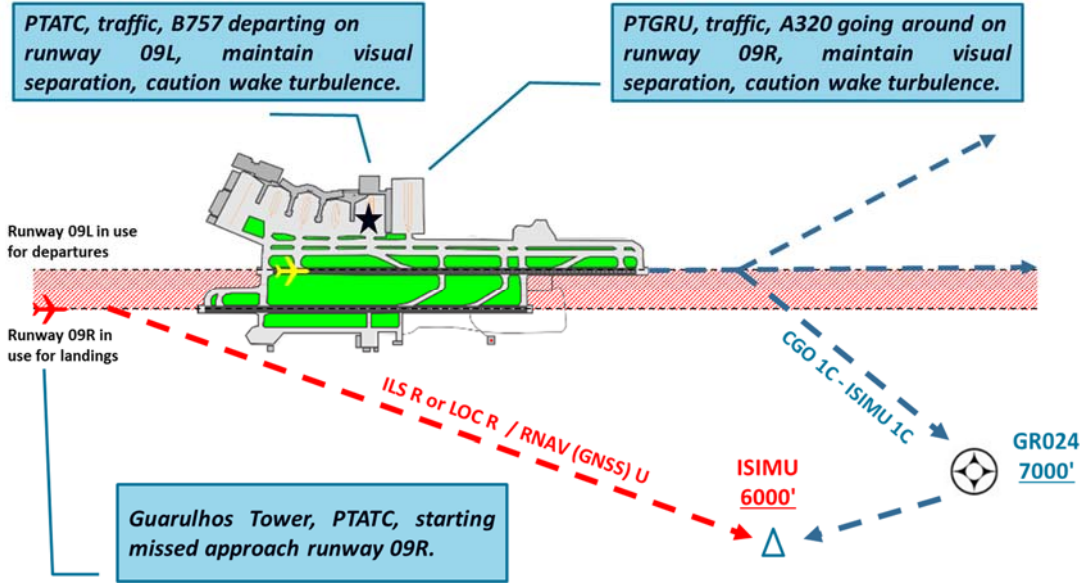


Figure 3 – Missed Approach Procedure RWY 09R

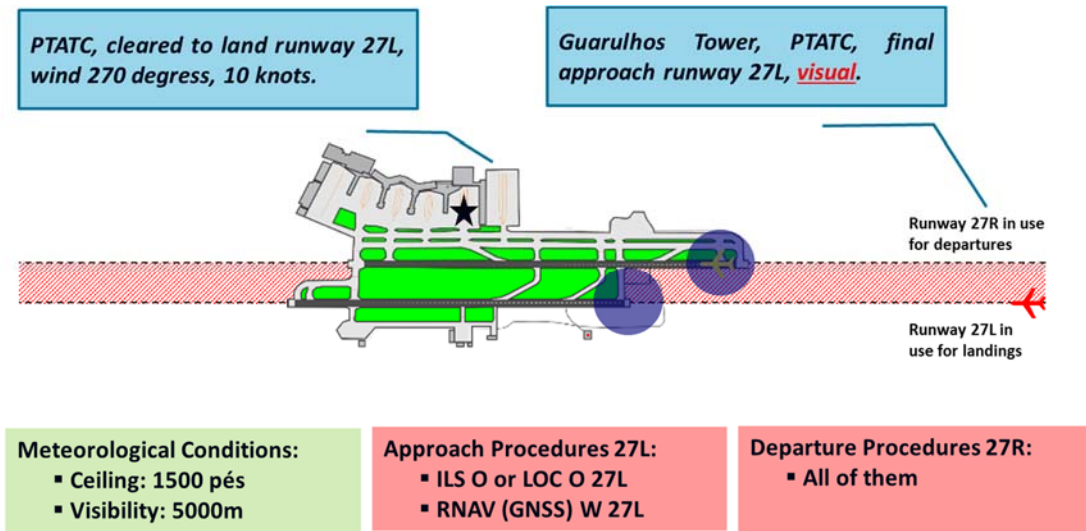


Figure 4 – Approach and Landing RWY 27L

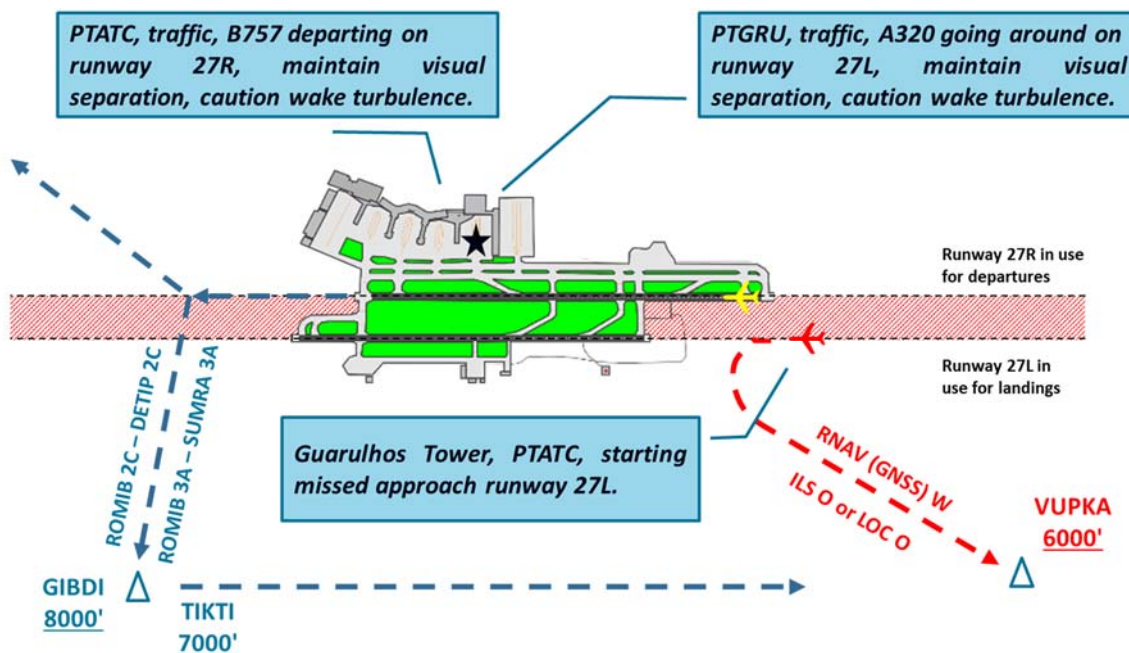


Figure 5 – Missed Approach Procedure RWY 27L

3. Results

3.1 Considering that segregated simultaneous operations were implemented few months ago, the results are not yet conclusive. However, the On-time Performance (OTP) was much worse in the period of Jan-Mar 2019 in comparison with the same period of 2018. (see table 1). This unexpected OTP was caused by the atypical severe weather in GRU in the 2019 summer (see Tables 2 and 3). The preliminary analysis also has indicated that if the segregated simultaneous operations had not been implemented, the OTP would have been even worse, taking into consideration that the taxi-out (average time between pushback and departure) decreased about 10% and the average time in the holding point for departure decreased about 30%.

3.2 In consequence of the OTP in JAN-MAR 2019 and the trend for severe weather intensification in the next years, AGILE GRU included the development of Severe Weather Avoidance Plan in its working program to mitigate its effects in SAO TMA and in GRU Airport.

3.3 The key performance indicators are being collected and the feedback from pilots and air traffic controllers has been positive, but all advantages of the proposed changes could not yet be observed in quantitative terms.

	Jan - 24 MAR 2018	Jan - 24 MAR 2019	Variation
ATRASOS DEP + ARR			
DEP + ARR	12866	15666	+21.76%
Minutos (total)	476564	665489	+39.64%
Media	37	42	+13.51%

Table 1 – OTP – JAN/MAR 2018 X JAN/MAR 2019

Month/Y	DEC/2017	JAN/2018	FEB/2018	DEZ/2018	JAN/2019	FEB/2019
TOTAL	131.5	144.7	38.7	97.1	407.9	318.8
Source: Airport Meteorological Service (INFRAERO EPTA-GRU)						

Table 2 – Rainfall in mm

YEAR	MONTH	NUM REPORTS	THUNDER EVENTS
2015	Jan	912	219
2015	Dec	852	100
2016	Jan	800	40
2016	Dec	865	96
2017	Jan	903	158
2017	Dec	819	59
2018	Jan	833	74
2018	Dec	842	85
2019	Jan	937	208
Analysis: GRU had a total of 293 TSRA observations during Dec18-Jan19 compared to only 133 TSRA events in Dec17-Jan18. Observing the data since 2015, the number of convective activity was pretty bad. January 2019 had a total of 208 TSRA, the 2nd worst month of any Jan or Dec.			
Source: One International Airline			

Table 3 – Thunderstorm Events
