



International Civil Aviation Organization

**NINETEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION
AND SURVEILLANCE SUB-GROUP (CNS SG/19) OF APANPIRG**

Bangkok, Thailand, 20 – 24 July 2015

Agenda Item 5.5: Other radio navigation issues

ASSESSMENT OF IMPACT ON BEIJING CAPITAL INTERNATIONAL AIRPORT ILS

(Presented by China)

SUMMARY

This paper presents the assessment of the impact of the aircraft/vehicles and airport environment on the ILS signals of Runway 01 and 36L during CAT III operations, to improve safe and efficiency level.

1. INTRODUCTION

1.1 Beijing Capital International airport is currently equipped with Instrument Landing Systems (ILS) of Category I and of category II. In the future, some of these ILS would be upgrade to Category III. We analyzed the impact of the aircraft/vehicles and airport environment on the ILS signals of RWY 01 and RWY 36L during CAT III operations and, based on which, to provide the recommendation for the optimization of airport operations and facilities, so as to make improvement of safe and efficiency.

2. DISCUSSION

2.1 ILS signal may be subject to interference caused by surrounding environment. Whether it is due to taxiing/holding aircraft or to fixed ground structures, these interferences have to be anticipated and controlled, so that aircraft can safely perform ILS approaches.

2.1.1 ICAO Annex 10 provides guidance material for defining ILS protection areas in a general manner, but these areas are in fact dependent from many parameters, among which:

- ILS antenna type
- ILS antenna setting (customizer radiation pattern)
- Aircraft size
- Airport taxiway layout (for aircraft location and orientation)
- Airport environment (buildings, fences)
- Airport topography

2.1.2 Taking into consideration this set of parameters during the definition of protection areas for a site-specific study enables to meet a dual purpose:

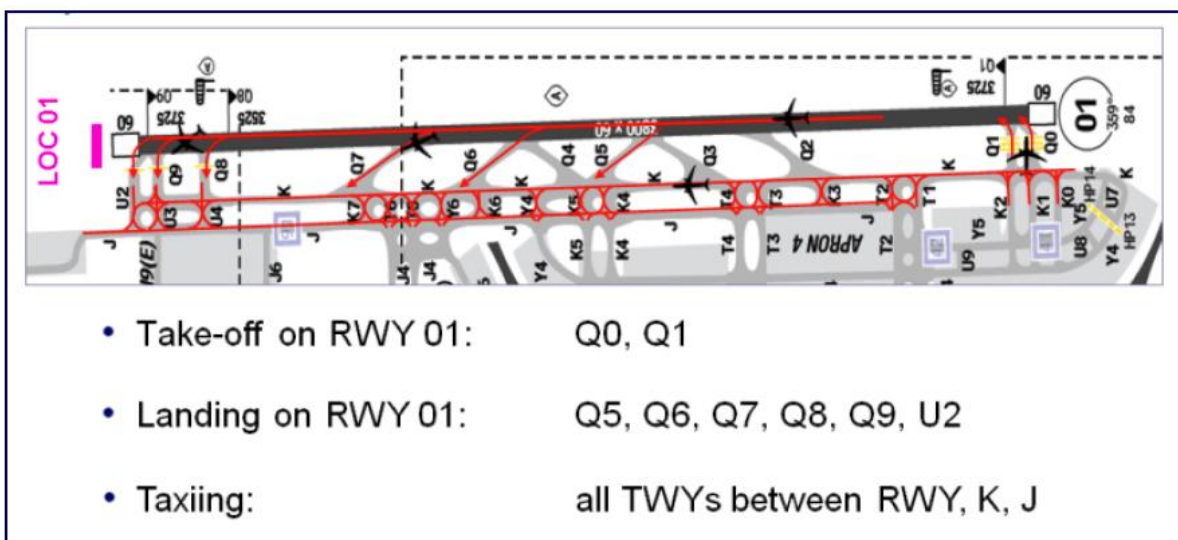
- Ensuring the level of safety required for ILS approaches,
- While not oversizing the dimensions of protections areas, which would results in unnecessary ground traffic constraints.

2.2 Currently, RWY 01 is equipped with ILS capable of supporting CAT II precision approach and landing operations; RWY 36L is equipped with ILS CAT I.



Layout of RWY 01/19 & RWY 18R/36L

2.3 Results and Recommendations (Critical Area and Building)
2.3.1 LOC 01 Critical Area



- Take-off on RWY 01: Q0, Q1
- Landing on RWY 01: Q5, Q6, Q7, Q8, Q9, U2
- Taxiing: all TWYs between RWY, K, J

Table of results - LOC 01 Critical Area

Scenario	Taxiway	Lateral Distance from Runway CL to LCA (m)			
		A380	B747	A321	Truck
After landing	U2	50	40	No impact	No impact
	Q9	50	40	No impact	No impact
	Q8	50	No impact	No impact	No impact
	Q7	No impact	No impact	No impact	No impact
	Q6	No impact	No impact	No impact	No impact
	Q5	No impact	No impact	No impact	No impact
Grass area	-	-	-	-	No impact
Rolling	Runway	No impact	No impact	No impact	-

Table of recommendations - LOC 01 Critical Area

Exit Taxiways	Recommendations
U2	Operational procedure required for A380 and B747
Q9	Operational procedure required for A380 and 747
Q8	Operational procedure required for A380
Q7, Q6, Q5	No restriction

2.3.2 LOC 36L Critical Area

Operations on RWY 36L

- Take-off on RWY 01: P0, P1
- Landing on RWY 01: P4, P6, P7, P8, P9
- Taxi: all TWYs between C and D2 and D1

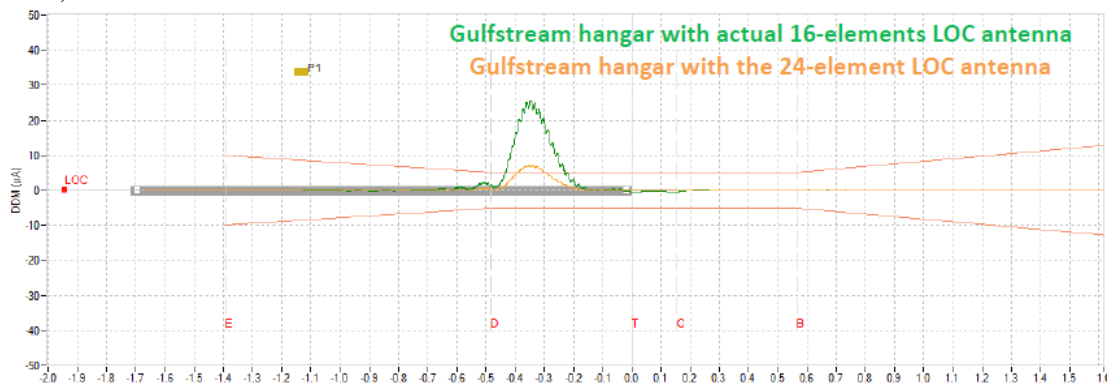
Table of results - LOC 36L Critical Area

Scenario	Taxiway	Lateral Distance from Runway CL to LCA (m)			
		A380	B747	A321	Truck
After landing	P9	50	40	No impact	No impact
	P8	50	No impact	No impact	No impact
	P7	No impact	No impact	No impact	No impact
Grass & taxiways		-	-	-	No impact
Rolling	Runway	No impact	No impact	No impact	-

Table of recommendations - LOC 36L Critical Area

Exit Taxiway	Recommendations
P9	Operational procedure required for A380 and B747
P8	Operational procedure required for A380
P7, P6, P4	No restriction

2.3.3 The Gulfstream hangar is building around RWY 36L capable of causing the highest static bend, which is 80m long and 35-40m high. The building is at 725m from the runway centerline and at 1,460m from LOC 36L antennas.



The static disturbance caused by the gulfstream hangar is around 25μA with the existing 16-element antenna and around 7μA with the 24-element antenna.

2.4 These assessments prove that the efficient and safe level of airport operation can be improved by dynamically setting the ILS CSA taking account of the ILS antenna type, environment, aircraft type and airport operation requirement.

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.
