INTERNATIONAL CIVIL AVIATION ORGANIZATION

SECOND MEETING
OF THE NEW LARGER TASK FORCE (NLA/TF/2)
(Nairobi, 10 May 2005)

Agenda item 1: **Main characteristics New Larger Aeroplanes (NLA) and their impact on airport planning and operation.**

(Presented by the Secretariat)

SUMMARY

This paper shows the main characteristics of NLAs and their impact on airport planning and operation. As soon as aircraft manufacturers indicated their plans of development of aircraft larger than Boeing 747-400, ICAO introduced within Annex 14, Volume I Amendment n° 3, a new code letter reference F as well as new category 10 for rescue and fire fighting.

Action required: As indicated in Para. 6

References:
Annex 14, Volume I
ICAO Circular 305– AN/177

1. Amendment No. 3 of Annex 14 Volume I introduces a new aerodrome reference code F to cover aircraft whose wing span range from 65m to but not including 80m and out main gear wheel span ranging from 14m up to but not including 16m. The Airbus A380, currently under flight test, falls within the bracket defined by the code F.

2. In terms of airport planning and operation, the main NLAs characteristics compared with those of code E aeroplanes appear in Appendix A of ICAO Circular 305 (AN377). An extract recapitulating dimensions and capacities in terms of passengers and fuel-carrying of these aeroplanes is attached as Appendix to this paper.

3. Circular 305 Chapter 2 is devoted to the analysis of the impact of NLA characteristics on airport infrastructure with a particular emphasis on:

a) Dimensions of NLA;
b) Landing gear characteristics, mass and aircraft classification number (ACN) values;
c) Engine data;
d) Maximum passengers and fuel-carrying capacities, and;
e) Flight performance, including wake vortex.

4. It is essential when planning new airports to accommodate NLAs that all Annex 14 Volume I code F requirements be taken into consideration. These code F requirements are recapitulated hereafter.

4.1 The runway should have a width of 60 m, with shoulders of at least 7.5 m width each side, so as to obtain an overall minimum width (Runway + Shoulders) of 75 m.

4.2 The Obstacle Free Zone (OFZ) shall be extend to at least 77.5 m either side of the runway for a code 4 precision approach runway category I, II or III.

4.3 Precision approach category I, II and III runway-holding positions should be located at 107.50 m from the runway centreline, increased as necessary to avoid interference with radio navigation aids.

4.4 Straight portions of a taxiway must have a minimal width of 25 m with shoulders each side so that the overall width of the taxiway and its shoulders on straight portions is not less than 60m. Additional widening of the fillets is necessary on the inside of taxiway curves.

4.5 The total paved part of a taxiway bridge width should not be less than 60 m.

4.6 The centre portion of a taxiway strip should provide a graded area to a distance from the centreline of the taxiway of at least 30 m for Code F.

4.7 The clearance between an outer main wheel of an aircraft and the taxiway edge should be at least 4.5 m (the same as for Code E). However, a greater clearance is recommended for higher taxiing speeds.

4.8 The following minimum separations should apply:

- Taxiway centreline – instrument code 4 runway centreline : 190 m
- Taxiway centreline – non-instrument code 4 runway centreline: 115 m
- Taxiway centreline – taxiway centreline: 97,5 m
- Taxiway centreline – object: 57.5 m
- Aircraft stand taxilane centreline – object: 50,5 m

4.9 Minimum clearance between an aircraft using a stand and any adjacent building, aircraft on another stand and other objects for Code F is 7.5 m similar to Code E. Smaller clearances could be considered where aircraft are parked nose-in or where a parking guidance system is available.

4.10 With regard to runway pavement strength, no particular constraint is to be considered given the main gear configuration with six wheels. However, strengthening of bridges and culverts will be required to take account of increased total weight compared to code E aircraft.

4.11 For rescue and fire fighting, Annex 14, Volume I Table 9.2 shows the minimal quantities of extinguishing agents required. However, it will be essential, in particular with regard to rescue operations and airport emergency plans, to take account of the expected large increase in the potential number of occupants and the access/egress issues associated with the twin-deck fuselage.

5. With regard to existing airports code E, when preparing to accommodate a specific NLA like Airbus A380, it is essential that all dimensions, which exceed those of the aeplanes generally using the facilities, should be taken into consideration. Specific aeronautical studies should be conducted each time code F requirements cannot be implemented or when the accommodation cost would be prohibitive. Chapter 3 of ICAO Circular 305 contains guidance material for conducting aeronautical studies. Examples of aeronautical studies conducted in some States are also given in the Circular for ease of reference. However, it should be stressed that aeronautical studies are valid only for a given airport and a given NLA.

6. **Action required:**

The task force is invited to:

- note the information contained in this paper;

- discuss the impact of A380 on AFI airports and make recommendations to States likely to accommodate this aeroplane in the short and medium term.

Characteristics of New Larger Aeroplanes

Table A-1. ICAO aerodrome code letters and corresponding aeroplane dimensions

	Code F	*A380-800*	*B747 Advanced***	*C5*	*An 124*	Code F	*A340-600*	*B747-400ER*	*B777-300ER*
Wingspan	65 up to but not including 80	79.8 m	66.7 m	67.9 m	73.3 m	52 m to but not including 65 m	63.4 m	64.9 m	64.8 m
Outer main gear wheel span	14m up to but not including 16m	14.3 m	12.7 m	11.4 m	8.0 m	9 m to but not including 16 m	12.6 m	12.6 m	12.9 m

Table A-2. Aeroplane dimensions and capacities

Aeroplane dimensions	*Code F*				*Code E*		
	A380-800	*B747Advanced**	*C5*	*An 124*	*A340-600*	*B747-400ER*	*B777-300ER*
Fuselage length	70.4 m	72.2m /73.7m**	70.3 m	69.9 m	73.5 m	68.6 m	73.1 m
Overall length	72.7 m	74.2m75.7m**	75.5 m	69.9 m	75.3 m	70.7 m	73.9 m
Fuselage width	7.1 m	6.5 m	7.1 m	7.3 m	5.6 m	6.5 m	6.2 m
Fuselage height at operating empty weight (OEW)	10.9 m	10.2 m	9.3 m	10.2 m	8.5 m	10.2 m	8.7 m
Main-deck sill height***	5.4 m	5.4 m	2.7 m	2.8 m	5.7 m	5.4 m	5.5 m
Upper-deck sill height***	8.1 m	7.9 m	7.1 m	7.5 m	—	7.9 m	—
Tail height at OEW	24.1 m	20.1 m	19.9 m	21.0 m	17.4 m	19.6 m	18.7 m
Wingspan	79.8 m	68.7 m	67.9 m	73.3 m	63.4 m	64.9 m	64.8 m
Wingspan (full fuel)#	—	—	—	—	63.6 m	64.9 m	—
Wingspan (jig)##	79.8 m	68.7 m	67.9 m	73.3 m	63.4 m	64.4 m	64.8 m
Wing tip vertical clearance at maximum take-off weight (MTOW)	5.3 m	~5.1 m	3.2 m	3.7 m	6.0 m	5.1 m	7.2 m
Wing tip vertical clearance at OEW	6.1 m	~5.7 m	4.0 m	Unknown	6.2 m	5.7 m	7.5 m
Maximum wing tip height at MTOW	7.5 m	~5.1 m	3.2 m	3.7 m	7.6 m	6.7 m	7.2 m
Maximum wing tip height at OEW	8.3 m	~5.7 m	4.0 m	Unknown	7.8 m	7.3 m	7.5 m
Cockpit view at OEW: • Cockpit height • Cockpit cut-off angle • Obscured segment	7.2 m 20° Max.19.8 m	8.7 m 18.4° 25.8 m	8.2 m Unknown Unknown	8.3 m Unknown Unknown	5.7 m 20° 15.7 m	8.7 m 18.4° 25.8 m	5.9 m 21° 14.6 m
Taxi camera	Yes	No	No	No	Yes	No	Yes
Pilot distance from nose landing gear	2.1 m	2.3 m	5.0 m	2.4 m	4.3 m	2.3 m	3.6 m
Pilot distance from main landing gear	31.8 m	28.4 m 29.9 m**	27.2 m	25.3 m	37.4 m	26.4 m	34.2 m
Three-class reference layout	555	450	—	—	380	416	365
Maximum passenger-carrying capacity	~800	~650	—	—	~475	~620	550
Wing fuel tank capacity (litres)#	287 000	Similar to B747-400ER	186 000	350 000	131 000	138 924	78 206
Tail empennage fuel tank capacity (litres)#	23 000	Similar to B747-400ER	0	0	8 300	12 490	0
Centre fuel tank capacity (litres)#	0	Similar to B747-400ER	0	0	56 000	64 973	103 077
Maximum fuel-carrying capacity (litres)	310 000	idem B747-400ER	186 000	350 000	194 878	228538*** 204 333**	181 283

~ Symbol indicates “approximate”. * B747-Advanced is a proposed aircraft (not yet in service), and therefore the specifications are subject to change. ** Freighter version values are provided where appropriate. *** Highest door at OEW. # For aircraft with large winglets (significant wing and winglet deflection with full fuel). ## For aircraft without winglets, reference is frequently made to “jig” span, i.e. the span as measured in the manufacturing jig (straight wing without 1G droop).