



ICAO

**The Fourth Meeting of the Aerodromes Operations and  
Planning Sub-Group (AOP/SG/4)**

*Video Teleconference, 10 to 13 November 2020*

**Agenda Item 4: Provision of AOP in the Asia/Pacific Region**  
– **Planning & Design of Aerodromes**

**RUNWAY WITH HOLDING BAYS OR MULTIPLE ENTRANCE TAXIWAYS**

(Presented by China)

**SUMMARY**

This paper presents that the schematic diagram and description of holding bays in ICAO Aerodrome Design Manual (Doc 9157) Part 2 do not tally with Annex 14 Aerodromes and does not match the actual operation. It also presents the possibility of aircraft ground collision when a runway is equipped with holding bay or multiple entrance taxiways and when an aircraft is passing behind another aircraft holding short of runway.

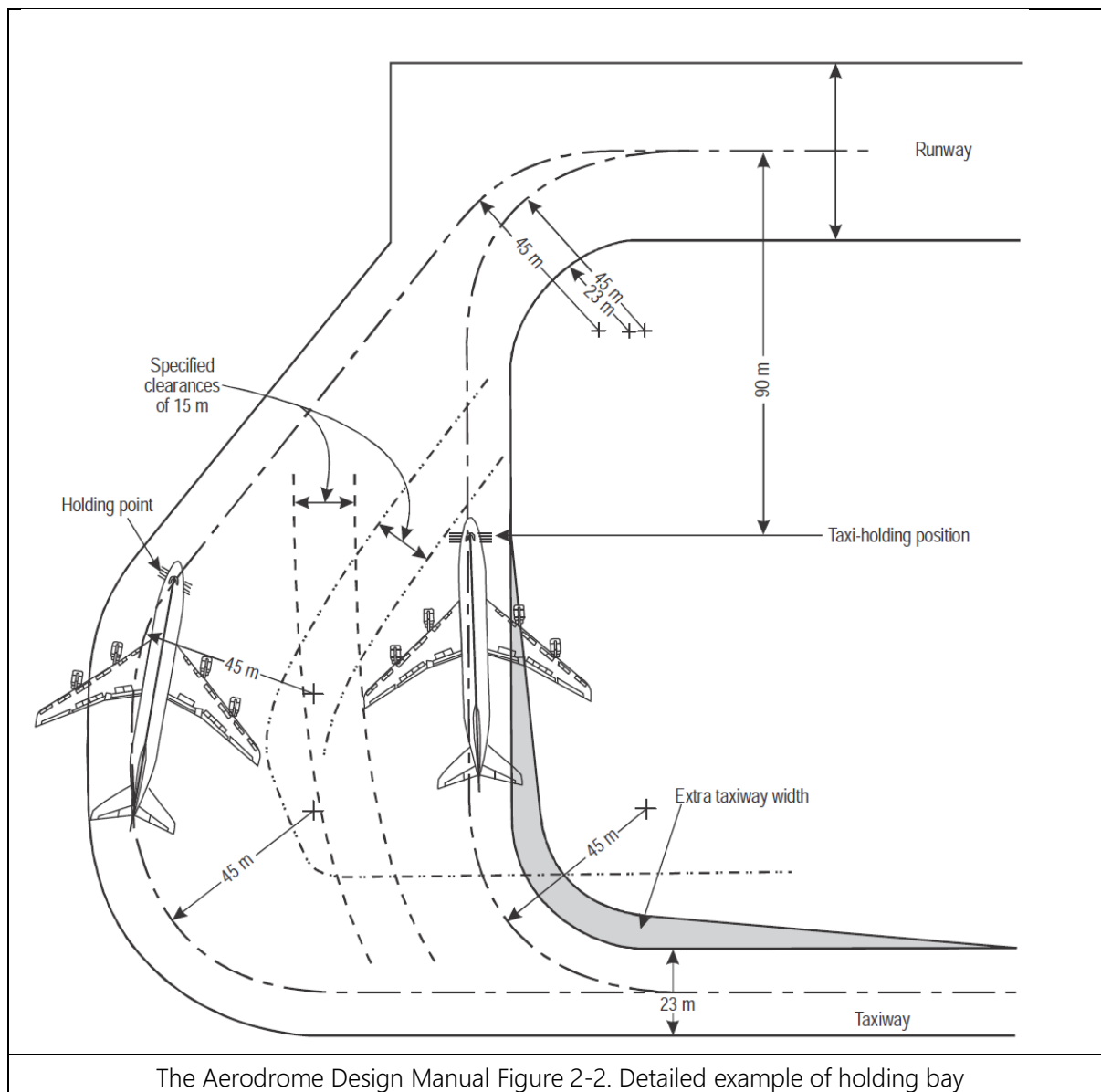
**1. INTRODUCTION**

1.1 In order to improve the flexibility of aircraft take-off order, reduce flight delay and enhance runway capacity, holding bays or multiple entrance taxiways are set up in busy airports.

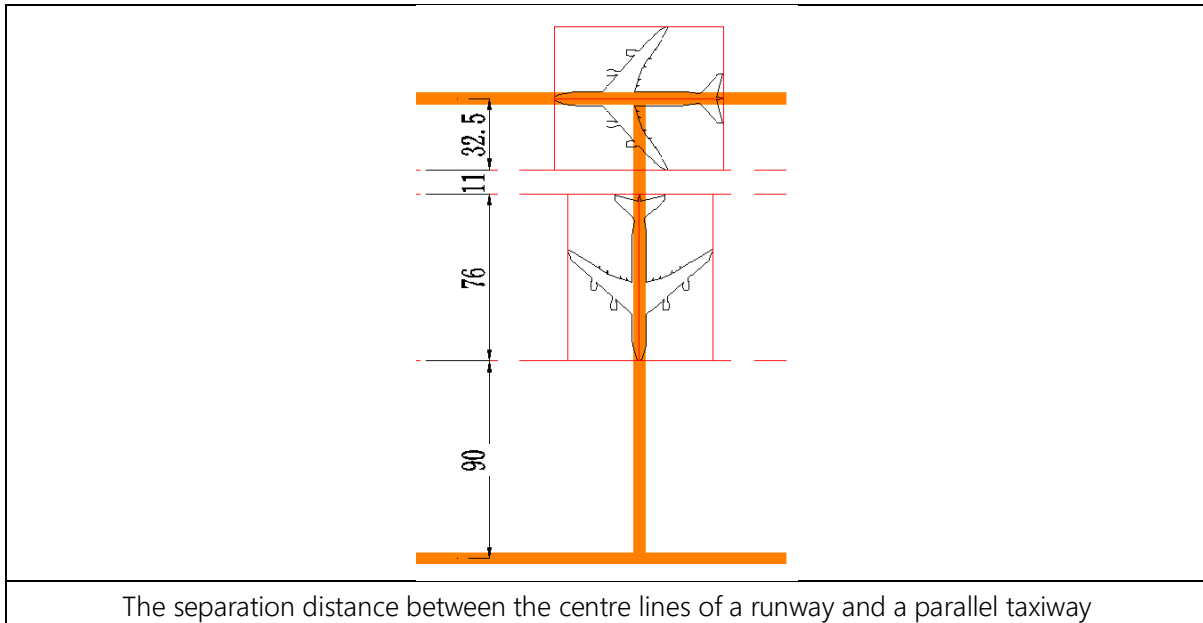
1.2 Some issues have been identified with the current guidance materials in ICAO Aerodrome Design Manual, Part 2. In addition, the current specifications for minimum distance between runway and taxiway centre lines may not be compatible with airports designed with multiple entrance taxiways. The issues are detailed in the following paragraphs.

**2. DISCUSSION**

2.1 In ICAO Aerodrome Design Manual Part 2, Figure 2-2, the following issues have been identified. First, in accordance with Annex 14 Volume I, paragraph 5.2.10, the runway-holding position marking shall be marked with double solid lines and double broken lines, with the double solid lines closer to the runway. The total thickness of the runway-holding position marking shall either be 1.05 m or 2.1 m. However, the same marking shown in Aerodrome Design Manual differed from the specification. Second, the locations of aircraft at the holding bays do not meet the regulations. Aircraft cockpit (which will be the location of pilot) straddled on runway-holding position marking (Figure 2-2. Detailed example of holding Bay) will in fact cause runway incursions according to ICAO Manual on the Prevention of Runway Incursions (Doc 9870), and also conflict with actual operations.



2.2 The Aerodrome Design Manual 1.2.19 states that “The separation distances are based on the concept of the wing of an aircraft centred on a parallel taxiway remaining clear of the associated runway strip. The formulas and separation distances are shown in Table 1-5. The separation distance between the centre lines of a runway and a parallel taxiway is based on the accepted principle that the wing tip of an aeroplane taxiing on the parallel taxiway should not penetrate the associated runway strip. However, this minimum separation distance may not provide adequate length for the link taxiway connecting the parallel taxiway and the runway to permit safe taxiing of another aircraft behind an aircraft holding short of the runway at the holding position. To permit such operations, the parallel taxiway should be so located as to comply with the requirements of Annex 14, Volume I, Tables 3-1 and 3-2, considering the dimensions of the most demanding aeroplane in a given aerodrome code. For example, at a code E aerodrome, this separation would be equal to the sum of the distance of the runway holding position from the runway centre line, plus the overall length of the most demanding aeroplane, and the taxiway-to-object distance specified in column E of Table 1-1.” This is inconsistent with the actual operation. It does not take into account the height of the aircraft, and the pilot's line of sight is greatly restricted. Runway and taxiways lack accurate means of guiding aircraft parking, and lack effective means to make the aircraft head close to the runway-holding position.



2.3 ICAO does not specify the extent to which aircraft should be parked close to the runway-holding position. There is no onboard tool or external visual aids for navigation for accurate positioning. There is also a lack of operating guidance materials and standard operating procedures to shorten the distance between aircraft and the runway-holding position. Pilot tends to keep a distance from the runway-holding position.

2.4 Pilots and controllers are generally unclear about the data and structure of runway and taxiways, while controllers and airport operators are not familiar with the characteristics of large aircraft models. Although the airport is clear about the data and structure of runway and taxiways, they understand aircraft ground operations. There could be insufficient participation. Except for airports where accidents have occurred, most airport management agencies, airlines and regulatory agencies have not been able to identify the safety risks of this operating mode and have not formulated corresponding safety control measures. The airport allows this mode of operation, and the Controller and pilots operate according to experience, which is relatively risky.

2.5 When there is aircraft waiting at the runway-holding position of multiple entrance taxiways or holding bays, whether other aircraft are allowed to taxi on the taxiways behind it is not clearly stipulated in the current regulations.

2.6 When the operating unit and personnel are waiting for aircraft at the runway-holding position of the entrance taxiways or holding bays, do they allow other aircraft to taxi on the taxiways behind them? Insufficient risk identification and control, and multiple aircraft ground collision incidents have occurred. ICAO has revised Annex 14, which shortened the distance between runway and taxiways and the distance between aircraft and objects, and further reduced the safety margin.

2.7 Due to various factors, the aircraft cannot be exactly close to the runway-holding position and wait to stop. This will inevitably cause the tail of the aircraft to enter the wingtip clearance of the aircraft taxiing in parallel taxiways. In fact, it does not meet Annex 14 aircraft distance on taxiways. The provisions of the object spacing standard.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) Note the information contained in this paper;
- b) Consider the Draft Conclusion contained at the end of this paper for the adoption of APANPIRG/31; and
- c) Discuss any relevant matters as appropriate.

<b>Draft Conclusion AOP/SG/4-x: Holding Bays and Multiple Entrance Taxiways</b>	
<p>What: That, the ICAO HQ be invited to consider to:</p> <ul style="list-style-type: none"> <li>a) Review Figure 2-2 of ICAO Airport Design Manual (Doc 9157), Part 2 <i>Taxiways, Aprons and Holding Bays</i> to tally with SARPs of runway-holding position marking and actual aircraft operations; and</li> <li>b) Review the current SARPs in Annex 14, <i>Aerodromes – Volume I, Aerodrome Design and Operations</i> to cater for the design of multiple entrance taxiways.</li> </ul>	<p>Expected impact:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Political / Global</li> <li><input type="checkbox"/> Inter-regional</li> <li><input type="checkbox"/> Economic</li> <li><input type="checkbox"/> Environmental</li> <li><input checked="" type="checkbox"/> Ops/Technical</li> </ul>
<p>Why: To tally a figure in ICAO guidance material with the applicable SARPs and to enhance aircraft safety</p>	<p>Follow-up: <input type="checkbox"/> Required from States</p>
<p>When: 16-Dec-20</p>	<p>Status: Draft to be adopted by PIRG</p>
<p>Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> CAO APAC RO <input type="checkbox"/> CAO HQ <input type="checkbox"/> Other:</p>	

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