



ICAO

*International Civil Aviation Organization***SEVENTH MEETING OF THE ASIA/PACIFIC AIR  
TRAFFIC MANAGEMENT AUTOMATION SYSTEM  
TASK FORCE (ATMAS TF/7)***Bangkok, Thailand 2-4 June 2026*

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Agenda Item 4: ATM Automation System Implementation Experience by States

4.6. Development of New Technology

**RUNWAY INCONSISTENT WARNING FUNCTION IN AIR TRAFFIC MANAGEMENT  
AUTOMATION SYSTEMS**

(Presented by China)

**SUMMARY**

This working paper presents the Runway Inconsistent Warning (RIW) function of Air Traffic Management Automation Systems (ATMAS). When detecting an inconsistency between the assigned runway and trajectory of flight, ATMAS issues a warning. This functionality aims to enhance controller situational awareness and mitigate safety risks related to incorrect runway landing.

**1. INTRODUCTION**

1.1 With the growing number of runways, controllers face heavier workloads when monitoring the traffic situation during final approach, increasing the risk of aircraft landing on the incorrect runway. Consequently, prevention through technical measures has become essential to ensuring operational safety.

1.2 To address this issue, the Runway Inconsistent Warning (RIW) function monitors aircraft during final approach. Once it detects an aircraft heading for the incorrect runway, it generates an RIW visual and aural warning. This prompts the controller to strengthen surveillance on the specific aircraft and take timely control actions.

**2. DISCUSSION**

Warning Mechanism

2.1 For multi-runway airports, RIW polygonal areas are defined for each runway. These areas are referenced to the extended runway centerline and bounded by the point at which aircraft commence alignment with the runway after intercepting the ILS signal.

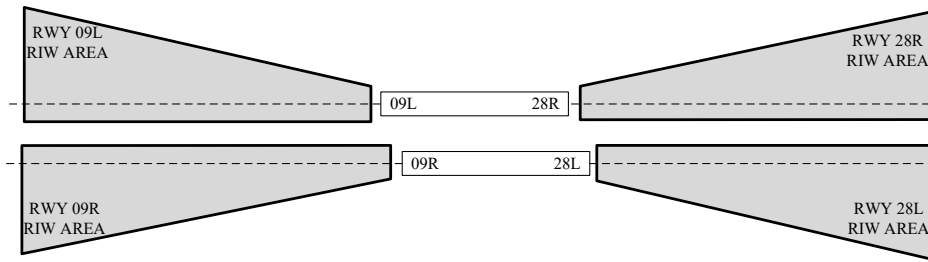


Figure 1 Definition of the RIW Area

2.2 Once a landing aircraft enters the RIW polygonal zone, the system compares the angle between its flight track and the corresponding runway direction with the predefined deviation threshold. If the angle exceeds the threshold, the aircraft is deemed misaligned with the runway and is excluded from the RIW calculation. Conversely, if the angle is less than or equal to the threshold, the aircraft is judged to be in alignment with the runway, thereby triggering the RIW calculation process.

2.3 A track is eligible for the RIW calculation only when all the following conditions are met: it is successfully coupled with a flight plan, the landing airport information is accurate, and a landing runway has been assigned.

2.4 The system verifies whether RIW area where the flight is located matches the assigned landing runway. If consistent, the track alignment is deemed correct and no warning. In case of inconsistency, the system displays the alert string "RI" on the track label of the Human-Machine Interface (HMI) and outputs repeated aural warning. The warning persists until the track exits RIW area. For example, if a coupled track assigned to land on runway 03L enters the 03L RIW area and aligns with the runway, no warning will be generated. Conversely, if the track enters the 03R RIW area and aligns with runway 03R, the system detects the inconsistency and generates an RIW warning.

2.5 The RIW warning function can be configured online via the Supervisor Working Position (SUP), with three modes available: Fully Enabled (both visual and aural warning), Visual Warning Only, and Disabled.

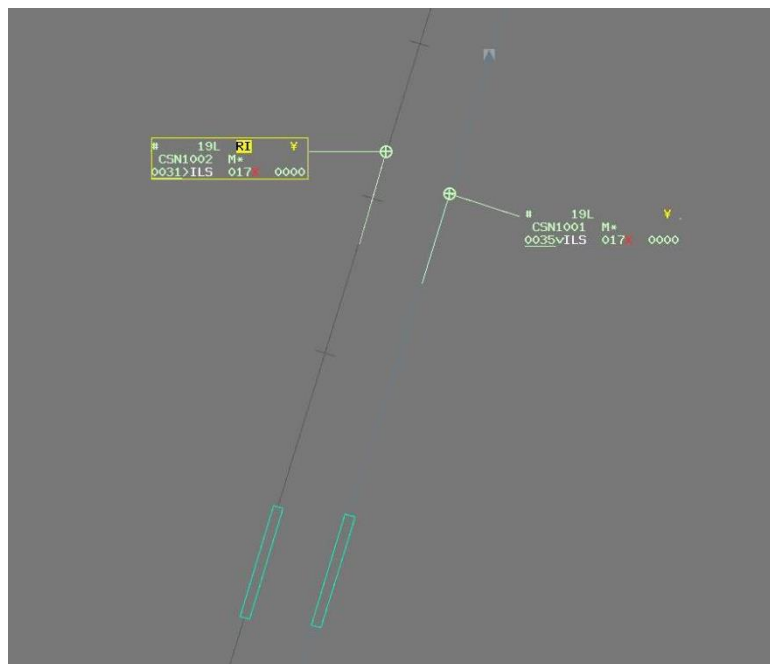


Figure 2 RIW Warning on HMI

Achievement

2.6 At Guangzhou Baiyun International Airport, which operates five parallel runways, the risk of a landing aircraft aligning with the incorrect runway during final approach is higher than at most other airports. The RIW function of ATMAS provides real-time monitoring of runway alignment during the final approach and mitigates the safety risks associated with incorrect runway landings through technical means, thereby enhancing the safety and efficiency of air traffic operations.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) revise ATMAS IGD to add the description of RIW function; and
- c) discuss any relevant matter as appropriate

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