International Civil Aviation Organization

WORKING PAPER

ATConf/7-WP/34[1]
23/9/26
(Information Paper)
English and Chinese only

SEVENTH WORLDWIDE AIR TRANSPORT CONFERENCE (ATCONF/7)

Montréal, HQ, 16 to 20 November 2026

Agenda Item 2: Fostering aviation growth and air connectivity through investments in infrastructure, human capital and partnerships
2.2: Investment for the development and modernization of civil aviation infrastructure

PROPOSAL FOR THE PROMOTION OF THE NEW "NO-ENTRY CENTERLINE LIGHTS" TO MITIGATE RUNWAY INCURSION RISK

(Presented by China)

EXECUTIVE SUMMARY

To implement relevant recommendations in Annex 14 on reducing runway incursion risks in a cost-effective manner, China has developed an innovative solution that modifies the existing unidirectional centerline lights on exit only taxiways into bidirectional lights with constant red light for the reverse direction. This solution not only provides a visual warning against taxiing entering the runway from the reverse direction, but also reduces modification complexity, thereby improving efficiency and lowering costs. To date, this solution has been piloted at three airports in China with positive warning effects, and is being planned for broader application. It is recommended that the Conference consider this innovative solution and include it in relevant International Civil Aviation Organization (ICAO) guidance materials.

1. INTRODUCTION

1.1 Runway incursion is one of the major safety risks in airport ground operations. In Annex 14 (6th Edition), the International Civil Aviation Organization (ICAO) introduced a recommendation to install no-entry bars at the reverse thresholds of exit only taxiways for warning aircraft and ground vehicles against entering from the wrong direction, therefore mitigating the risk of incursion.

1.2 While no-entry bars may be directly installed at newly constructed airports, retrofitting existing airports with such bars faces numerous challenges, including the closure of rapid exit taxiways, pavement demolition, cable laying, and construction without disrupting ongoing operations, which would not only affect airport operational efficiency but also lead to increased investment and more safety risks.

1.3 To address the above issues, China has developed an innovative solution of no-entry centerline lights. This solution not only provides a visual warning against aircraft and ground vehicles

[1] English and Chinese versions provided by China.

entering the runway in wrong direction, but also reduces modification complexity, thus improving modification efficiency and saves relevant costs.

2. DISCUSSION

2.1 Core Principles and Technical Features of the Solution

2.1.1 The core of this solution involves modifying the centerline lights on exit only taxiways to upgrade them into bidirectional lights.

2.1.2 Direction to exit the runway: the lights display alternating yellow and green, functioning identically to the original centerline lights, to ensure normal taxiway guidance.

2.1.3 Direction to enter the runway: the lights display constant red, providing a clear and continuous visual warning to any aircraft or vehicle driver attempting to enter the runway from the reverse direction.

2.1.4 Technical specifications: the optical characteristics of modified lights, including light intensity and beam angle, will strictly comply with the technical requirements for taxiway centerline lights and no-entry bars specified in Annex 14 and relevant guidance materials, ensuring consistency with pilots' established visual expectations.

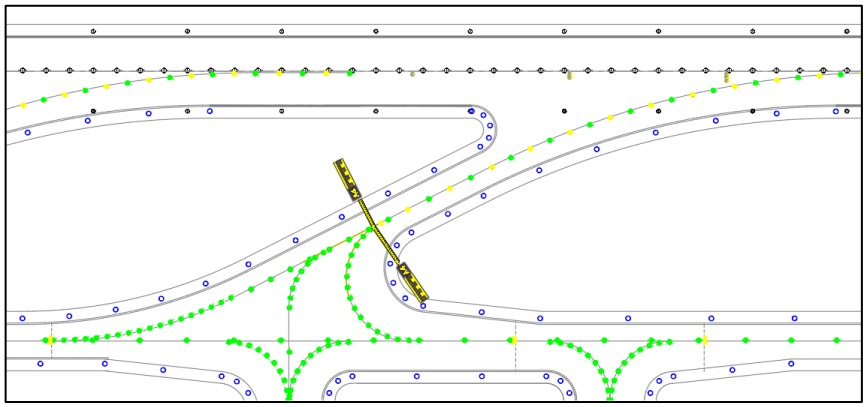


Figure 1: Diagram of centerline lights for rapid exit taxiway (viewed from exiting the runway)

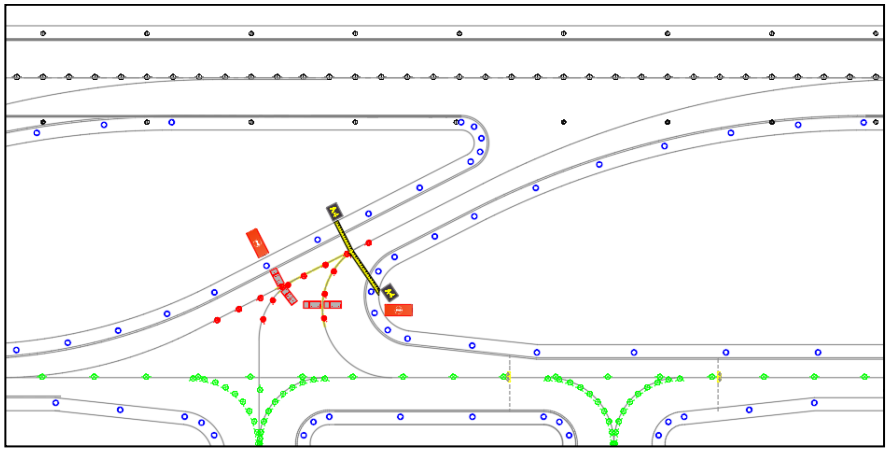


Figure 2: Diagram of centerline lights for rapid exit taxiway (viewed from entering the runway)

2.2 Advantage Analysis of the Solution

2.2.1 This solution is highly cost-effective, operationally feasible, and reliable. By modifying existing light pits, cables, and power supply systems, it avoids large-scale demolition of pavement and cablelaying, requiring low investment. The modification mainly involves light replacement and relevant system commissioning, which could be quickly completed during operational downtime and minimizing the impact on airport operations. The continuous red "taxi path" generated by the solution provides a visual warning effect equivalent to that of conventional no-entry bars, and in certain acute-angle configurations, offers even better visibility than crossbar lights.

2.3 Simulation Validation

2.3.1 Simulation validation of the lights' optical and physical characteristics has been conducted using 3D computer modeling. Simulation results indicate that this solution provides an effective warning effect.

2.4 Pilot Implementation

2.4.1 Pilot modification and assessment have been conducted on a total of 9 exit taxiways at Yinchuan Hedong Airport, Nanchang Changbei Airport, and Jieyang Chaoshan Airport in China. All three airports have completed the assembly and installation of lights, the solicitation of feedback and the analysis of results. The validation results show that the retrofitted lights provide effective warning against erroneous taxiing and have no adverse impact on routine operations or support activities.





Figure 3: Rendering of Nanchang Changbei Airport Modification

— END —