International Civil Aviation Organization

Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG

Singapore, 25 – 29 August 2025

Agenda Item 8: Any Other Business

INTRODUCTION TO THE JOINT SIMULATOR TRAINING FOR CONTROLLERS AND PILOTS

(Presented by China)

SUMMARY

This paper introduces the innovative practice of joint simulator training for controllers and pilots carried out by the Southwest Regional Air Traffic Management Bureau of China (hereinafter referred to as "SW-ATMB"), aiming to provide a reference for enhancing air-ground coordination capabilities and emergency response levels.

1. INTRODUCTION

1.1 For implementation of the relevant requirements of the ATMB of CAAC, for optimizing the controller training mechanism, to further strengthen the coordination mechanism between air traffic control units and airspace users and improve emergency response capabilities, Southwest ATMB has been continuously conducting joint simulator training for controllers and pilots since 2023. Guided by the core operational philosophy of "Air-Ground Cooperation, Efficient and Orderly," this joint recurrent training adheres to the requirements of ICAO *Manual on Air Traffic Controller Competency-based Training and Assessment* (Doc 10056), focuses on enhancing controllers' job competency, and strives to improve overall service quality through in-depth collaboration with airspace users and air-ground joint drills. It also aims to promptly identify and solve problems in practical scenarios.

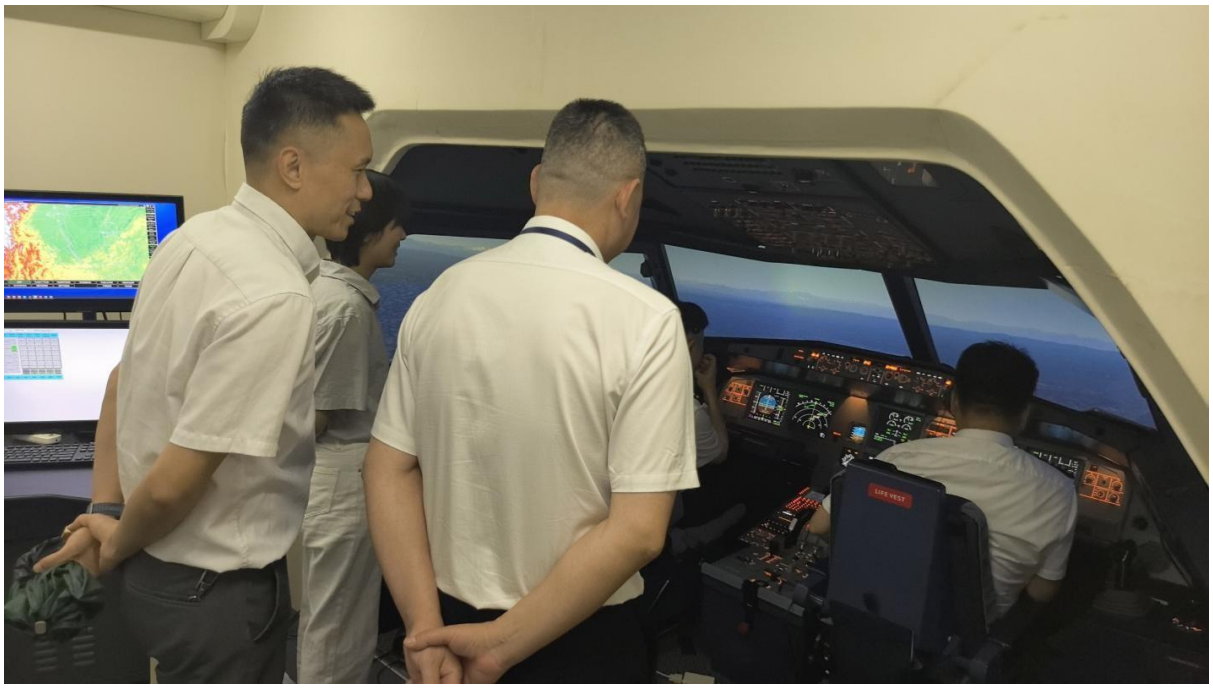
1.2 The Training Center of SW-ATMB is equipped with 52 radar simulators, five tower simulators, and one Airbus A320 flight simulator. All these simulators can achieve interconnection and intercommunication, providing solid technical support for full-process air-ground joint training for air traffic control.

1.3 From the perspective of collaborative training between Air Navigation Service Providers (ANSP) and Airspace Users (AU), this paper elaborates on the innovative ideas of joint training, aiming to promote the synchronous improvement of emergency response capabilities of both controllers and pilots and provide practical experience for the construction of industry air-ground coordination mechanisms.

2. DISCUSSION

Methods for Conducting Joint Training

2.1 **Participants:** On the ATC side, participants include controllers from Chengdu Area Control Center, Chengdu Terminal Control Center, as well as tower controllers from Chengdu Tianfu Airport (ZUTF) and Chengdu Shuangliu Airport (ZUUU), covering the entire operational process of flights from gate to gate. On the Air side, pilots from Sichuan Airlines' Airbus A320 fleet participate, ensuring that the training subjects are highly consistent with actual operational scenarios.



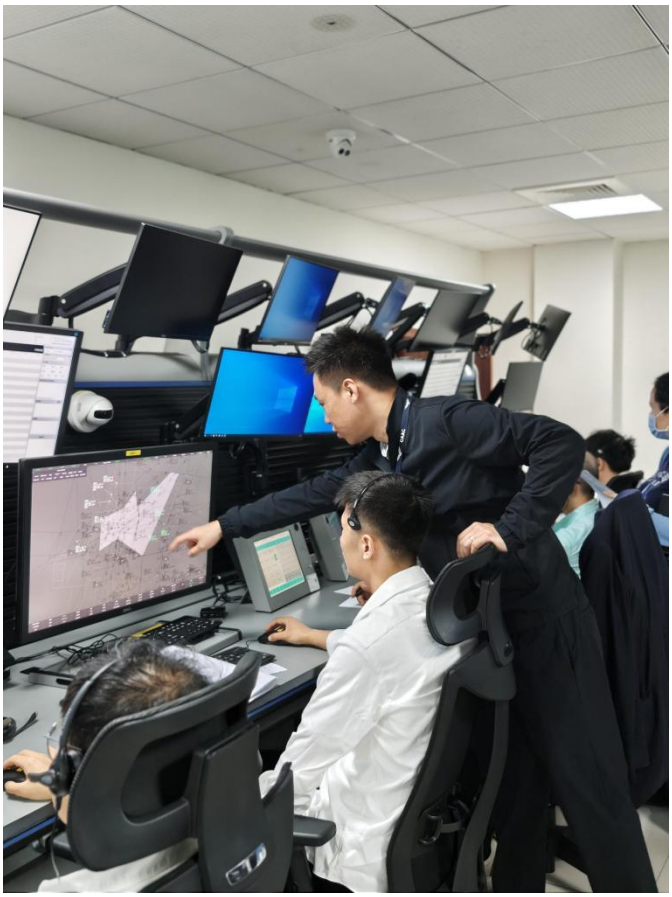
2.2 **Technical Support:** The training is based on a technical platform consisting of five area control simulators, eight TRACON simulators, five tower control simulators, and one Airbus A320 flight simulator. Through signal linkage between the air traffic control simulator system and the flight simulator system, a closed-loop training mode of "real pilots operating abnormal flights + controllers conducting real-time command" is realized, maximizing the realism of simulated scenarios.

2.3 **Training Scenarios and Subject Design:** The total duration of the joint training is 80 minutes. The training scenarios and special situation subjects are all derived from typical cases in front-line operations, including but not limited to: aircraft deviating from the planned route, unknown air situation disturbing flight, regional Global Navigation Satellite System (GNSS) interference, turbulence causing deviation from the instructed altitude, thunderstorm deviation under the new airspace structure, joint verification of holding procedures and declaration of minimum fuel, missed approach/go-around handling, runway reversal in thunderstorm weather, wind shear and turbulence response, aircraft flight computer failure, runway incursion, air drift object disposal, and guided visual approach.

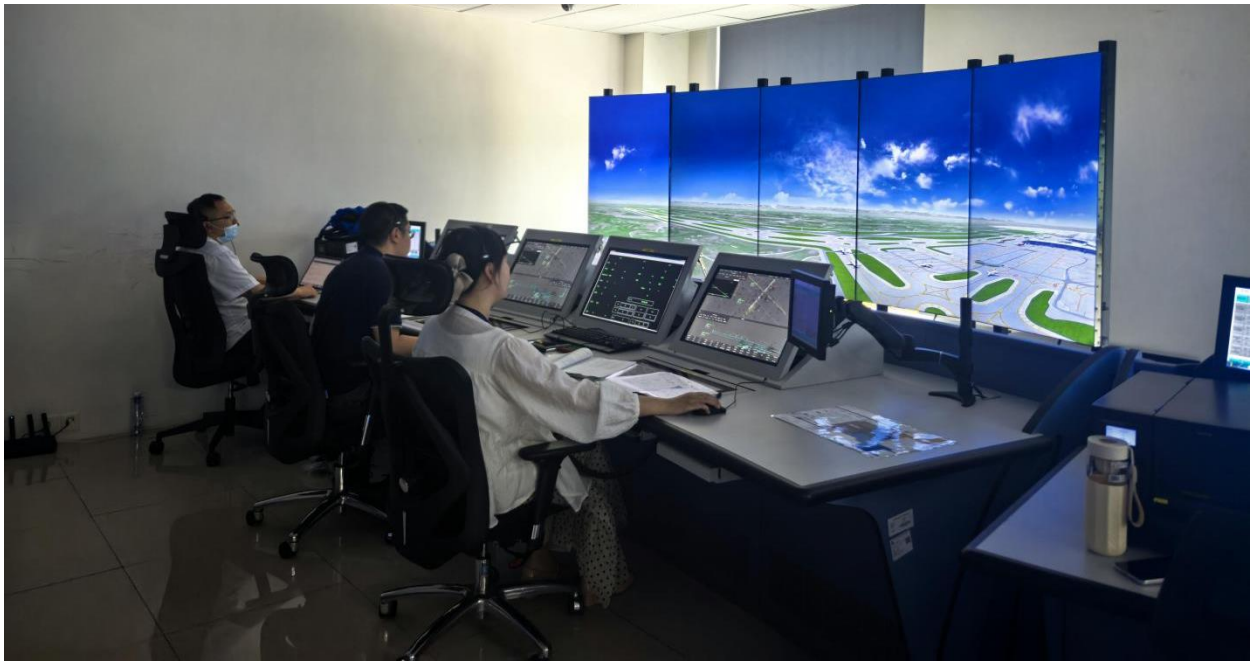
2.4 To ensure that the training is close to reality, the flow management department accurately plans key parameters such as the number of delayed flights and inbound distribution based on flight schedule plans, corridor distribution, static capacity, and daily flow restrictions, significantly improving the fit between training scenarios and real operational environments.

Training Achievements and Highlights

2.5 **Significantly improved realism**: Relying on the interconnection technology of simulation equipment, real-time signal linkage between the air traffic control and flight simulation systems is realized. Abnormal flights are operated by real pilots, and controllers conduct synchronous command. The entire process reproduces the communication frequencies, command specifications, and scenario logic in actual operations. The realism is significantly higher than that of traditional single simulation training, providing a training environment highly close to actual combat for air-ground collaborative disposal.



2.6 **Enhanced air-ground situational awareness coordination**: Through drills on scenarios such as "aircraft deviating from the planned route" and "declaration of minimum fuel," the efficiency and accuracy of information transmission between controllers and pilots have been significantly improved. For example, in the "regional GNSS interference" scenario, pilots feedback positioning abnormalities in the first place, and controllers quickly determine the interference range based on radar data. Both parties collaboratively determine the temporary rerouting route based on a unified air situation awareness. For scenarios such as "missed approach/go-around handling," standardized command response terms are established through repeated drills, reducing disposal delays caused by semantic ambiguity, and the consistency of common situational awareness has been significantly improved.



2.7 **Two-way improvement of air-ground capabilities:** Controllers' logicality in emergency command and decision-making efficiency have been significantly enhanced in complex scenarios such as "runway incursion" and "unknown air situation disturbing flight." For instance, when facing the special situation of "air drift objects interfering with the runway," controllers can issue runway closure orders, divert inbound flights, and conduct cross-departmental collaborative notifications in a short time, with a significant improvement in special situation response speed. Pilots, through practical operations in scenarios such as "wind shear disposal" and "flight computer failure," have significantly improved their operational standardization under extreme conditions and cooperation tacit understanding with controllers. In the "runway reversal in thunderstorm weather" scenario, their psychological quality and adaptability in responding to special situations have been effectively tempered.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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