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WORKING PAPER

FOURTEENTH AIR NAVIGATION CONFERENCE

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Agenda Item 2: Timely and safe use of new technologies
2.3: 2026-2028 Edition of the Global Aviation Safety Plan (GASP)

IMPROVING PILOT HUMAN FACTORS TRAINING FOR RUNWAY SAFETY

(Presented by Japan)

EXECUTIVE SUMMARY

This working paper examines measures that have been implemented to prevent runway incursion accidents caused by pilot human error, and aims to introduce more practical Human Factors training to prevent runway incursion accidents caused by pilot human error.

Action: The Conference is invited to:
a) note the contents of this working paper;
b) request ICAO to develop guidance to help enhance crew resource management (CRM) training specific to runway incursions; and
c) request ICAO to collect information on the status of implementation of Human Factors training for non-airline pilots (small operators and private pilots) in each Contracting State, discuss practical Human Factors training methods for them, and add them to the ICAO manual referenced in paragraph 3.

1. INTRODUCTION

1.1 On 2 January 2024 (around 17:47 JST (08:47 UTC)), the Japan Airline JL516 (Airbus A350-900) landed at Tokyo International Airport (Haneda Airport) but collided with a coastguard plane (Bombardier DHC-8-300) on the runway. All twelve crew and 367 passengers on JL516 evacuated, but 5 of the 6 occupants on the coastguard plane were confirmed dead.

1.2 Such runway incursions[1] are not a problem unique to Japan but have been a problem throughout the world for many years and are one of the most challenging issues for international aviation. One of the main factors of runway incursions is pilot human error. In the past 10 years, there were 22

[1] The *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) defines a runway incursion as "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft."

runway incursions classified as serious incidents in Japan (excluding those under investigation), 16 of which were caused by or related to pilot human error, after the investigation of Japan Transport Safety Board.

1.3 To prevent accidents caused by pilot human error, the aviation community has taken various safety measures. Accidents resulting from pilot human errors, such as the Tenerife runway collision in 1977, have brought aspects of human factors to the attention of the aviation community. At a workshop, *Resource Management on the Flight Deck*, sponsored by the National Aeronautics and Space Administration (NASA) in 1979, the label cockpit resource management (CRM) was applied to the process of training crews to address "pilot error" by making better use of the resources on the flight deck. Since then, cockpit (and then crew) resource management (CRM) training programmes have introduced around the world. CRM is also included in *Human Factors Training Manual* (Doc 9683).

1.4 The ICAO Annex 1 – *Personnel Licensing*, requires that applicants for a pilot licence demonstrate knowledge of human performance and skill to recognize and manage threats and errors. Contracting states ensure that the privileges granted by the licence are not exercised unless the holder maintains competency. The Annex 6 — *Operation of Aircraft* requires that international commercial air transport operators establish and maintain ground and flight training programmes which include Human Factors training (training in knowledge and skills related to human performance). Doc 9683 describes CRM training as one means of complying with the human performance training requirement and discusses recommended practices for the development and integration of CRM in all aspects of flight operations.

1.5 As described above, in the aviation community, CRM is known as one practical application of Human Factors training, and also recognized as one effective measure to prevent runway incursions. The ICAO Global Runway Safety Action Plan (GRSAP), whose second edition was published in February 2024, recommends that aircraft operators ensure flight crew complete CRM training addressing runway incursion prevention. The Countermeasures Study Committee in light of the Haneda accident, where both hardware and software countermeasures for air traffic controllers and pilots are discussed, also point out the importance of CRM training as a measure to prevent pilot misidentification.

1.6 However, runway incursions caused by pilot human error have not yet been eradicated. One possible reason is that the skills acquired in Human Factors training are not sufficiently practiced in the actual operating environment.

1.7 In this paper, we would like to discuss the establishment of a more practical Human Factors training method to prevent runway incursions caused by pilot human error.

2. DISCUSSION

2.1 Human Factors training for airline pilots

2.1.1 After the human performance training requirement was included in Annex 6, most operators comply with the requirement mainly through CRM training. Airlines have invested considerable resources to develop CRM programmes, in many varied ways and with a multiplicity of designs.

2.1.2 ICAO has also developed a code of practice for CRM training. Doc 9683 provides specific methods for airlines to develop a CRM training program.

2.1.3 However, given the fact that runway incursions caused by airline pilot human errors still occur around the world, it is necessary to reconsider the CRM training content to be more practical so that pilots can demonstrate the skills acquired in CRM training during taxiing and take-off/landing.

2.1.4 Specifically, it would be useful for operators to develop a guidance material that provides specific ways to incorporate content related to runway incursions into CRM training.

2.2 Human Factors training for non-airline pilots

2.2.1 To prevent runway accidents caused by pilot human error and to achieve safer international aviation, it is necessary to provide Human Factors training not only to airline pilots but also to all pilots, including non-airline pilots (small operators and private pilots). This is because non-airline aircraft may mistakenly enter the runway where an airline aircraft is about to take off or land, resulting in a serious collision accident.

2.2.2 However, the current *Human Factors Training Manual* (Doc 9683) seems to be impractical for non-airline pilots. Although Doc 9683 provides a method for each operator to develop a CRM training program (e.g., assessment of operational experience, a commitment by top management to CRM implementation, etc.), it is difficult for small operators or individual private pilots to develop their own CRM training program in accordance with the Doc 9683 as they don't have sufficient organizational structure.

2.2.3 To disseminate Human Factors training to non-airline pilots, it would be effective to develop a guidance manual that provides a model for teaching materials to be used in Human Factors training. As developing a manual, information should be collected on Human Factors training being conducted for non-airline pilots in each Contracting State. Discussions based on the best practices or challenges in each Contracting State will help to develop a more practical manual.

3. CONCLUSION

3.1 The Conference is invited to:

a) recognize the importance to continue taking actions for improving runway safety;

b) request ICAO to develop guidance to help enhance crew resource management (CRM) training specific to runway incursions; and

c) request ICAO to collect information on the status of implementation of Human Factors training for non-airline pilots in each Contracting State, discuss practical Human Factors training methods for them, and incorporate them into the *Human Factors Training Manual* (Doc 9683).

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