



GOVERNMENT OF INDIA  
O/o DIRECTOR GENERAL OF CIVIL AVIATION  
Opp. Safdarjung Airport, New Delhi- 110003

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## **Air Safety Circular 02 of 2024**

**Subject: Mitigation strategies for Runway Incursion Risk**

### **1. Introduction**

Runway Incursion is an 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.

The International Civil Aviation Organization (ICAO) places runway incursions among the five highest-risk categories of events that must be addressed to mitigate the risk of aviation fatalities. The potential consequences of a runway incursion are severe, especially if that incursion ends in a collision.

India has also identified runway incursions as a National High Risk Category of occurrence in the National Aviation Safety Plan and working towards its mitigation since the introduction of first National Aviation Safety Plan (State Safety Plan) 2015-16.

Overall, runway incursion risks include a complex combination of factors that can only be addressed through a collaborative approach involving aircraft operators, air navigation service providers (ANSPs), aerodrome operators and regulators.

### **2. Causative factors of Runway Incursion**

Runway incursions can result from a variety of factors, and their severity varies from minor infractions to situations with the potential for catastrophic consequences. The significant contributing factor for the runway incursions are as follows:

- Loss of situational awareness by pilots, non-familiarization with aerodrome layout.
- Incorrect instructions issued by ATC to pilot or the vehicle driver and failure to monitor the read back. Lack of coordination between the controllers and ground unit.
- Failure to obtain clearance to enter the runway by pilot
- Failure to obtain clearance to enter the runway by vehicle driver.
- Unauthorized entry on runway by person
- The pilot and/or vehicle driver misunderstanding the controller's instructions and incorrect read back.
- Inadequate signage and markings (particularly the inability to see the runway-holding position markings) or multiple holding position.
- Use of non-standardized phraseology
- Pilot and or vehicle driver accepting a clearance intended for another aircraft or vehicle.
- Complicated airport design involving runway crossings.

Analysis of five year data of runway incursion occurred in India brings out following top three causative factors contributing to runway incursions:

- Incorrect instructions issued by the ATC to the pilot or the vehicle drivers.
- Loss of situational awareness by the pilots, non-familiarization with aerodrome layout.
- Failure to obtain the clearance to enter the runway by pilot.

### **3. Prevention of Runway Incursion**

3.1 ICAO Doc 9870 on "Manual on the Prevention of Runway Incursions" lays down the detailed guidelines on prevention of runway incursion. Also Global Action Plan for the prevention of Runway Incursions (GAPPRI) an outcome of combined work of ICAO, Flight safety foundation, Euro Control, ACI World, CANSO and IATA provides recommendations for Aerodrome Operators, Air Navigation Service Providers, Aircraft Operators, Manufactures, State & Regulators etc. NASP-India also contains safety enhancement initiatives for the prevention of Runway Incursion. These documents/publications should be referred by all applicable stakeholders for developing their safety action plan in order to minimize the risk of runway incursion and meet the safety objectives and their respective targets published in the NASP-India.

3.2 Nevertheless, the following mitigation actions based on the top three causative factor are outlined for compliance by all applicable stakeholders:

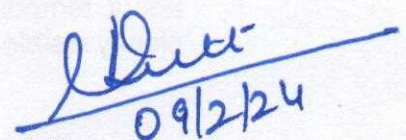
- (a) Standard ICAO phraseologies must be consistently used in all communications related to runway operations by both pilots and ATC.

- (b) The read-back procedures as outlined in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) must be ensured including for communications with vehicles operating in the manoeuvring area.
- (c) Pilots should undergo comprehensive training on aerodrome signage, markings, lighting. After an initial course, it should be covered during refresher.
- (d) Before operation to an aerodrome, pilots and AMEs (cleared for taxi) should be familiarized/briefed about the layout, taxi procedure, locations of holding point and hotspots specific to operating aerodrome.
- (e) Flight deck procedures should include a requirement for pilots to obtain explicit clearance before crossing any runway, irrespective of its current use.
- (f) Aircraft operator's procedures should include policy and procedures to minimize "heads-down" activities and enable effective monitoring of the movement area whilst taxiing. For multi-pilot flight decks, "heads-down" activities for more than one pilot should be restricted to times when the aircraft is stationary with the parking brake set
- (g) Adopt the sterile flight deck concept during taxiing.
- (h) Pilots must not cross illuminated red stop bars when lining up on, or crossing a runway.
- (i) Pilots should promptly stop the aircraft and contact ATC if any doubt arises regarding their exact position on the aerodrome surface.
- (j) ATC should ensure stop bars are switched on to signal a stop and switched off to indicate traffic may proceed. In no case, aircraft or vehicles be instructed to cross illuminated red stop bars. Aerodrome, ATC and airlines should implement contingency measures to cater to unserviceable stop bars.
- (k) ATC must issue explicit clearances, including the runway designator, when authorizing a runway crossing or instructing to hold short of any runway, including those not in use.
- (l) Use progressive taxi instructions to reduce pilot workload and potential confusion.
- (m) Aerodrome Operators should ensure signage and markings are well-maintained, clearly visible, adequate, and unambiguous in all operating conditions. During construction or maintenance, disseminate information about temporary work areas, ensuring temporary signs and markings are clearly visible and unambiguous.

- (n) Aerodrome operators should develop and introduce procedure to significantly reduce vehicular movements on the maneuvering area during low visibility/bad weather conditions.
- (o) The formal driver training and assessment programme should lay emphasis on speed limitation and Hot Spot in the maneuvering area.
- (p) Technological Intervention should be adopted to facilitate situational awareness that enables ATC and other stakeholders to locate and identify traffic in the manoeuvring area. These includes tools like Advanced- Surface Movement Guidance and Control System (A-SMGCS). Aerodrome operators should consider installation of appropriate category of A-SMGCS in accordance with the criteria defined in ICAO DOC-9830.
- (q) Inadequately mitigated human factors may impact the performance and contribute to runway incursions. Involved service providers should have appropriate program and policy for detection and mitigation of human factor. This aspect can take many forms such as:
- Pilots and vehicle drivers should be aware and cautious of expectation bias.
  - Lack of comprehension of instructions such as clearances due to poor communications quality or cultural differences e.g. accent of the operational personnel involved.
  - Confusion caused by lack of clarity in instructions, markings, signage, lighting and publications.
  - Loss of situational awareness.
  - Distractions and excessive workload.
  - Working under mental anguish or pressure. The involved person should carefully consider whether it is appropriate to take on operational duties under such situations.

#### 4. Runway Safety Team(RST)

CAR Section 4 Section X Part I mandates establishment of Runway Safety Team at all licensed aerodromes and detailed guidelines for prevention of runway incursion. The runway safety team should be effective and on routine basis carryout their assessment by using ICAO runway safety maturity checklist. As part of safety communication, aerodrome operators should develop mechanism for sharing critical safety information among RSTs.

  
09/2/24

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Director General of Civil Aviation