



**MANUAL ON THE**

**RUNWAY INCURSIONS AND COLLISION AVOIDANCE**

**FIRST EDITION**

**01 OCT 2012**

**CIVIL AVIATION AUTHORITY OF BANGLADESH**



**RECORD OF AMENDMENTS**

<b>Version/ Revision</b>	<b>Chapter Changed</b>	<b>Pages Replaced</b>	<b>Signature</b>	<b>Date</b>

**REVISION HISTORY**

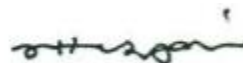
<b>Version/ Revision</b>	<b>Date</b>	<b>Chapter/ Section</b>	<b>Details</b>
0.00		All	Manual on the Runway Incursions and Collision Avoidance

## FOREWORD

In exercise of the powers conferred by Rule 4 of Civil Aviation Rules 1984 (CAR 84) Rule 259(3) of CAR 84, the Chairman of Civil Aviation authority, Bangladesh (CAAB) is pleased to issue this Air Navigation Order (ANO) as a Manual on the Runway Incursions and Collision Avoidance. An Aerodrome certificate holder is expected to comply with the Rules laid down in the Civil Aviation Rules 1984 and specifications of Manual of Aerodrome Standards (MAS), Bangladesh. There may be some circumstances where compliance of requirement has not been followed at an existing aerodrome because of physical constraints and where the facility had been provided earlier as per old regulations and continued to be in operation. Similarly there may be situation where compliance is not possible also for a new aerodrome due to physical constraints. These situations require CAA, Bangladesh to have procedures for the recent growth in air traffic in Bangladesh and enhancement of capacity at all major airports across the country, it has become vital that runway safety programmes are put in place to prevent runway incursions and collision hazard that may lead to incidents/ accidents.

This ANO is issued under Rules 4 of CAR 84 and in accordance with the provisions contained in Rule 259 (3) of CAR 84. This ANO stipulates the procedures to prevent runway incursions that may lead to incidents/ accidents. The responsibility for the technical matters within this ANO is the responsibility of the Flight Safety and Regulations Division of CAAB.

This ANO is issued and amended under the authority of the Chairman of Civil Aviation Authority, Bangladesh.



**Air Vice Marshal Mahmud Hussain, ndc, psc**  
**Chairman**  
**Civil Aviation Authority, Bangladesh**

**TABLE OF CONTENTS**

	<b>Page</b>
List of Effective Pages	01
Record of Amendments	02
Revision History	03
Foreword	04
Table of Contents	05-06
 <b>Chapter 1. Overview of the Manual</b>	
1.1 Background.....	07
1.2 Glossary.....	08
1.3 Abbreviation/Acronyms.....	09
 <b>Chapter 2. Introduction</b>	
2.1 Definition of a Runway Incursion.....	10
2.2 Introduction to Runway Incursion Prevention.....	10
2.3 Purpose of the Manual.....	11
 <b>Chapter 3. Establishing a Runway Incursion Prevention Programme</b>	
3.1 Establishment of Runway safety Team.....	12
3.2 Objectives of the Runway Safety Team.....	13
3.3 Generic Terms of Reference for the Runway Safety Team.....	13
3.4 Action Items to be Prepared & Monitored by the Runway Safety Team.....	14
 <b>Chapter 4. Contributory Factors</b>	
4.1 Background.....	15
4.2 Breakdown in Communications.....	15
4.3 Pilot Factors.....	16
4.4 Air Traffic Control Factors.....	16
4.5 Airside Vehicle Driver Factors.....	17
 <b>Chapter 5. Recommendations for the Prevention of Runway Incursion</b>	
5.1 Introduction.....	18
5.2 Communications.....	18
5.3 Aircraft operators (Pilots).....	18
5.4 Air Traffic Service Providers & Air Traffic Controllers.....	19
5.5 Aerodrome Operators & Vehicle Drivers.....	19
5.6 Incident Reporting & Investigation.....	20
5.7 Aeronautical Information.....	20

**Chapter 6. Incident Reporting & Data Collection**

6.1 A Standard Approach to Runway Incursion Incident Reporting & Data Collection 21

**Chapter 7. Classification of the Severity of Runway Incursion**

7.1 Severity Classification..... 21  
7.2 Objectives of Severity Classification..... 22

**Appendix A: Runway Incursion Initial Report Form..... 23-29**

**Appendix B: Runway Incursion Casual Factors Identification Form..... 30-36**

## CHAPTER-1

### Overview of the Manual

#### 1.1 Background

1.1.1 With the growth in traffic volume, runway incursions have been showing a growing trend world over which have raised a considerable safety concerns. Prevention of runway incursions has become a priority area. Runway incursions have sometimes led to serious accidents with significant loss of life. Although it is not a new problem, with the predicted growth of air traffic, the actual numbers of incidents are likely to rise, unless controlled and monitored with preventative actions.

1.1.2 Aviation safety programmes have a common goal – to reduce hazards, mitigate and manage residual risk in air transportation, which are the essential components of Safety Management System as recommended by ICAO in the field of Aircraft Operations (Annex-6), Air Traffic Service (Annex-11) and Aerodrome Operations (Annex-14). Runway operations, which are vital part of activity at an airport; the hazards and risks associated with it; therefore, needs to be managed in order to prevent runway incursions that may lead to accidents.

1.1.3 The Air Navigation Conference of ICAO, which closely examined runway incursion prevention, in its eleventh meeting held in September – October 2003 in Montreal, Canada, recommended that States take appropriate actions to improve runway safety worldwide through the implementation of runway safety programmes. It also recommended that when capacity-enhancing procedures at aerodromes are considered, appropriate safety studies should be conducted which would take due consideration of the effect on runway safety.

1.1.4 With the recent growth in air traffic in Bangladesh and enhancement of capacity at all major airports across the country, it has become vital that runway safety programmes are put in place to prevent runway incursions that may lead to incidents/ accidents.



## 1.2 GLOSSARY

### 1.2.1 TERMS

**Hot spot.** A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

**Just Culture.** An atmosphere of trust in which people are encouraged (even rewarded) for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior.

**Local runway safety teams.** A team comprised of representatives from aerodrome operations, air traffic services providers, airlines or aircraft operators, pilot and air traffic controllers associations and any other group with a direct involvement in runway operations that advise the appropriate management on the potential runway incursion issues and recommend mitigation strategies.

**Runway incursion.** 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 incursion severity classification (RISC) calculator.** A computer programme that classifies the outcome of runway incursions.

**Sterile flight deck.** Any period of time when the flight crew should not be disturbed, except for matters critical to the safe operation of the aircraft.

### 1.3 ABBREVIATIONS/ACRONYMS

ADP	Airside driving permit
AIP	Aeronautical Information Publication
ARIA	Aerodrome runway incursion assessment
ATC	Air traffic control
ATIS	Automatic terminal information service
ATM	Air traffic management
NOTAM	Notice to airmen
PANS	Procedures for Air Navigation Services
RISC	Runway incursion severity classification
RTF	Radiotelephony
RVR	Runway visual range
RWY	Runway
SARPs	Standards and Recommended Practices
SMS	Safety management system(s)
SSR	Secondary surveillance radar
UHF	Ultra-high frequency
VHF	Very high frequency

## Chapter 2

### INTRODUCTION

#### 2.1 DEFINITION OF A RUNWAY INCURSION

“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.”

#### 2.2 INTRODUCTION TO RUNWAY INCURSION PREVENTION

2.2.1 Runway incursions have sometimes led to serious accidents with significant loss of life. Although they are not a new problem, with increasing air traffic, runway incursions have been on the rise.

2.2.2 Aviation safety programmes have a common goal — to reduce hazards and mitigate and manage residual risk in air transportation. Runway operations are an integral part of aviation; the hazards and risks associated with runway operations need to be managed in order to prevent runway incursions that may lead to accidents.

2.2.3 A number of factors are likely to be responsible for the continuing increase in runway incursions, including traffic volume, capacity-enhancing procedures and aerodrome design. The factors are:

- a) As traffic volume increases, the likelihood of a runway incursion increases more rapidly when capacity-enhancing procedures are in effect than when they are not;
- b) If traffic remains the same, the potential for a runway incursion increases when capacity-enhancing procedures are put into operation;
- c) Many aerodrome improvement projects have resulted in a more complex aerodrome layout which, together with inadequate aerodrome design standards, signage, markings and lighting, and the lack of standard taxi routes and availability of improved aerodrome diagrams, has worsened the situation; and
- d) Increasing environmental pressure can compromise safe air traffic control (ATC) practices by requiring too many configuration changes.

The above factors, combined with inadequate training, poor infrastructure and system design and inadequate ATC facilities, can lead to an increased risk of runway incursions.

## **2.3 PURPOSE OF THIS MANUAL**

2.3.1 While runway safety takes into account issues such as foreign object debris and animals straying onto the runway and other logistical deficiencies, this manual specifically addresses the subject of runway incursion prevention as it relates to the safe operation of aircraft, air traffic management, vehicle movement on the manoeuvring area and aerodrome management. Survey data have shown that pilots, drivers and controllers consider runway incursions and the potential for collisions to be the most significant risk in aerodrome operations.

2.3.2 Successful prevention of runway incursions requires the collaboration of air traffic controllers, pilots, vehicle drivers and aerodrome management. This manual is for use by the regulators, aerodrome designers and planners, aircraft operators, air navigation service providers, aerodrome operators and investigation boards within Bangladesh.

2.3.3 This manual aims primarily to provide guidance essential for the implementation of national/local runway safety programmes. Such initiatives aim to remove hazards and minimize the residual risk of runway incursions and to reduce active failures and the severity of their consequences. In all aspects of this manual, the principles of safety management systems (SMS) should be used to mitigate or eliminate the hazardous factors.

### Chapter-3

## ESTABLISHING A RUNWAY INCURSION PREVENTION PROGRAMME

### 3.1 Establishment of Runway Safety Team

A runway incursion Prevention programme starts with the establishment of runway safety teams at Individual airports.

The requirement for establishing the runway safety team is given below:

- a) Individual aerodrome operator shall establish runway safety teams at each of their aerodromes.
- b) The runway safety team shall comprise of representatives from -
  - i. Aerodrome operator,
  - ii. Air traffic service provider,
  - iii. Airlines or aircraft operators, and
  - iv. Any other groups with a direct involvement in runway operations.
- c) The team shall be headed by the Director/ Airport Manager of the Airport as appropriate.
- d) The runway safety team shall have the terms of reference as given in Article 3.3.
- e) The primary role of a runway safety team shall be -
  - i. To develop action plan for runway safety,
  - ii. Identify potential runway incursion issues, and
  - iii. Recommend strategies for hazard removal and mitigation of the individual risk.
- f) The team shall meet at least once in three month at aerodromes used for International Air Transport Services and once in six month at other aerodromes. Frequency of meetings may be increased keeping in view of traffic growth due to capacity enhancement.

### 3.2 Objectives of the runway safety team

Once the overall number, type and severity of runway incursions have been determined, the team shall establish the following goals to improve the safety of runway operations:

- a) To improve runway safety data collection, analysis and dissemination as required in the SMS;
- b) To check that signage and markings are compliant with ANO(AD) A.1 and visible to pilots and drivers;
- c) To develop initiatives for improving the standard of communications;
- d) To identify potential new technologies that may reduce the possibility of runway incursion;
- e) To initiate local awareness by developing and distributing runway safety education and training material to Air Traffic controllers, pilots, personnel driving vehicles on the air side and personnel working at aerodromes.

### 3.3 Generic terms of reference for the runway safety team

The generic Terms of Reference for the runway safety team formed at individual aerodromes shall be:

- a) Determining the number, type and, if available, the severity of runway incursions;
- b) Considering the outcome of investigation reports in order to establish local hot spots or problem areas at the aerodromes;
- c) Working as a cohesive team to better understand the operating difficulties of personnel working in other areas and recommending areas for improvement;
- d) Ensuring that the recommendations contained in the *Manual on the Prevention of Runway Incursions* (ICAO Doc 9870) and applicable on the various aspects of aerodrome operation are implemented;
- e) Identifying any local problem areas and suggesting improvements;
- f) Conducting a runway safety awareness campaign that focuses on local issues, e.g., producing and distributing local hot spot maps or other guidance material as considered necessary; and
- g) Regularly reviewing the airfield to ensure its adequacy and compliance with regulatory requirements contained in CAR 84 & ANO (AD) A.1 of CAAB and other guidance material issued by Chairman, CAAB from time to time.
- h) Forwarding 'Runway Incursion Initial Report Form' and 'Casual Factors identification Form' (Appendix A & B) to Director FS&R by the Safety Managers of Aerodrome Operator. Casual Factor identification form to be completed in association with the assistance of Safety Managers.

### 3.4 Action items to be prepared and monitored by the Runway Safety Team

- a) The outcome of the meetings of the Runway Safety Team shall be the development of a plan containing action items for mitigating runway safety deficiencies. The action plan would be aerodrome specific and linked to a runway safety concern, issue or problem at that aerodrome.
- b) Each action item shall have a designated person or organization which is responsible for completing the relevant tasks. There may be more than one person or organization affected by an action item; in such cases head of the safety team, shall co-ordinate with such persons or organizations for the completion of all tasks associated with the action item.
- c) The effectiveness of the implemented and/or completed action items should be assessed periodically. This can be accomplished by comparing the results of the initial analysis and the current runway incursion status. For example, if an action item was to provide training for controllers, pilots or vehicle drivers, the effectiveness of such training should be evaluated by the team. If the analysis shows little or no improvement in the number, type or severity of runway incursions, the team should re-evaluate the implementation of that action item.
- d) Education and awareness material such as newsletters, posters, stickers and other educational information are invaluable tools for reducing the risk of runway incursions. These should be used by the runway safety teams for the guidance and education of controllers, pilots, vehicle drivers and personnel working at the aerodromes.

- e) Identification of Hot Spots. Suitable strategies should be implemented to remove the hazard associated with hot spots. When this is not immediately possible, action should be initiated by adopting strategies to manage and mitigate the risk. These strategies may include-
  - i. Awareness campaigns,
  - ii. Additional visual aids (signs, markings and lighting),
  - iii. Use of alternative routings,
  - vi. Construction of new taxiways, and
  - v. The mitigation of blind spots in the aerodrome control tower.
  
- f) Aerodromes charts showing hot spots should be produced by the aerodrome operator, checked regularly for accuracy, revised as needed, distributed locally and published in the Aeronautical Information Publication (AIP).

## Chapter 4

### CONTRIBUTORY FACTORS

#### 4.1 BACKGROUND

4.1.1 Pilots, controllers and drivers can all be involved in runway incursions. A survey of operational staff showed that approximately thirty per cent of drivers, twenty per cent of air traffic controllers and fifty per cent of pilots have reported being involved in runway incursions.

4.1.2 Runway incursions can be divided into several recurring scenarios. Common scenarios include:

- a) An aircraft or vehicle crossing in front of a landing aircraft;
- b) An aircraft or vehicle crossing in front of an aircraft taking off;
- c) An aircraft or vehicle crossing the runway-holding position marking;
- d) An aircraft or vehicle unsure of its position and inadvertently entering an active runway;
- e) A breakdown in communications leading to failure to follow an air traffic control instruction; and
- f) An aircraft passing behind an aircraft or vehicle that has not vacated the runway.

4.1.3 Statistics show that most runway incursions occur in visual meteorological conditions during daylight hours; however, most accidents occur in low visibility or at night. All runway incursions should be reported and analysed, whether or not another aircraft or vehicle is present at the time of the occurrence.

#### 4.2 BREAKDOWN IN COMMUNICATIONS

A breakdown in communications between controllers and pilots or airside vehicle drivers is a common factor in runway incursions and often involves:

- a) Use of non-standardized phraseology;
- b) Failure of the pilot or the vehicle driver to provide a correct read back of an instruction;
- c) Failure of the controller to ensure that the read back by the pilot or the vehicle driver conforms with the clearance issued;
- d) The pilot and/or vehicle driver misunderstanding the controller's instructions;
- e) The pilot and/or vehicle driver accepting a clearance intended for another aircraft or vehicle;
- f) Blocked and partially blocked transmissions; and
- g) Overlong or complex transmissions.



### 4.3 PILOT FACTORS

4.3.1 Pilot factors that may result in a runway incursion include inadvertent non-compliance with ATC clearances. Often these cases result from a breakdown in communications or a loss of situational awareness in which pilots think that they are at one location on the aerodrome (such as a specific taxiway or intersection) when they are actually elsewhere, or they believe that the clearance issued was to enter the runway, when in fact it was not.

4.3.2 Other common factors include:

- a) Inadequate signage and markings (particularly the inability to see the runway-holding position lines);
- b) Controllers issuing instructions as the aircraft is rolling out after landing (when pilot workload and cockpit noise are both very high);
- c) Pilots performing mandatory head-down tasks, which reduces situational awareness;
- d) Pilots being pressed by complicated and/or capacity enhancement procedures, leading to rushed behaviour;
- e) A complicated airport design where runways have to be crossed;
- f) Incomplete, non-standard or obsolete information about the taxi routing to expect; and
- g) Last-minute changes by ATC in taxi or departure routings.

### 4.4 AIR TRAFFIC CONTROL FACTORS

4.4.1 The most common controller-related actions identified in several studies are:

- a) Momentarily forgetting about:
  - i. An aircraft;
  - ii. The closure of a runway,
  - iii. A vehicle on the runway, or
  - vi. A clearance that had been issued,
- b) Failure to anticipate the required separation, or miscalculation of the impending separation;
- c) Inadequate coordination between controllers;
- d) A crossing clearance issued by a ground controller instead of an air/tower controller;
- e) Misidentification of an aircraft or its location;
- f) Failure of the controller to provide a correct read back of another controller's instruction;
- g) Failure of the controller to ensure that the read back by the pilot or the vehicle driver conforms with the clearance issued;
- h) Communication errors;

- i) Overlong or complex instructions;
- j) Use of non-standard phraseologies; and
- k) Reduced reaction time due to on-the-job training.

#### 4.4.2 Other common factors include:

- a) Workload & distraction;
- b) Inadequate training & experience level;
- c) Lack of a clear line of sight from the control tower;
- d) Incorrect or inadequate handover between controllers.

### **4.5 AIRSIDE VEHICLE DRIVER FACTORS**

The most common driver-related factors identified in several studies are:

- a) Failure to obtain clearance to enter the runway;
- b) Failure to comply with ATC instructions;
- c) Inaccurate reporting of position to ATC;
- d) Communication errors;
- e) Inadequate training of airside vehicle drivers;
- f) Absence of radiotelephony equipment;
- g) Absence of radiotelephony training;
- h) Lack of familiarization with the aerodrome;
- i) Lack of knowledge of aerodrome signs and markings; and
- j) Lack of aerodrome maps for reference in vehicles.

## **Chapter 5**

### **RECOMMENDATIONS FOR THE PREVENTION OF RUNWAY INCURSIONS**

#### **5.1 INTRODUCTION**

5.1.1 The following recommendations are the result of a systemic analysis of a number of runway incursions, the purpose of which was to identify the causes and contributory factors, both as active and latent failures, that led to the incidents that took place.

5.1.2 These recommendations will enhance the safety of runway operations through the consistent and uniform application of existing ICAO provisions, leading to predictability and greater situational awareness.

#### **5.2 COMMUNICATIONS**

5.2.1 The full aircraft or vehicle call sign should be used for all communications associated with runway operations.

5.2.2 Standard ICAO phraseologies should be used in all communications associated with runway operations.

5.2.3 Periodically it should be verified that pilots, drivers and air traffic controllers are using standard ICAO phraseologies in all communications associated with runway operations.

5.2.4 All communications associated with the operation of each runway (vehicles, crossing aircraft, etc.) should be conducted on the same frequency as utilized for the take-off and landing of aircraft.

5.2.5 Short and simple messages should be used in ATC communications.

#### **5.3 AIRCRAFT OPERATORS (PILOTS)**

5.3.1 Pilots should be thoroughly trained on aerodrome signage, markings and lighting.

5.3.2 Pilots should never cross illuminated red stop bars when lining up on, or crossing, a runway unless contingency procedures are in use that specifically allow this.

5.3.3 If lined up on the runway and held more than 90 seconds beyond anticipated departure time, pilots should contact ATC and advise that they are holding on the runway.

5.3.4 Pilots should turn on aircraft landing lights when take-off or landing clearance is received, and when on approach.

## **5.4 AIR TRAFFIC SERVICE PROVIDERS AND AIR TRAFFIC CONTROLLERS**

5.4.1 Safety management systems that are in accordance with ICAO provisions should be implemented.

5.4.2 ATC should, whenever practical, give ATC en-route clearance prior to taxi.

5.4.3 Stop bars should be switched on to indicate that all traffic shall stop and switched off to indicate that traffic may proceed.

5.4.4 Aircraft or vehicles should never be instructed to cross illuminated red stop bars when entering a runway. In the event of unserviceable stop bars that cannot be deselected, contingency measures, such as follow-me vehicles, should be used.

5.4.5 It should be ensured that ATC procedures contain a requirement to issue an explicit clearance including the runway designator when authorizing a runway crossing or to hold short of any runway. This includes runways not in use.

5.4.6 It should be ensured that ATC procedures contain a requirement to include the runway designator when an instruction to hold short of any runway is issued.

5.4.7 Standard taxi routes should be developed and utilized to minimize the potential for pilot confusion.

5.4.8 Where applicable, progressive taxi instructions should be used to reduce pilot workload and the potential for confusion. Progressive taxi instructions must not infer a clearance to cross a runway.

5.4.9 Environmental constraints should not compromise safety, e.g. regular, multiple changes to the runway configuration.

5.4.10 It should be ensured that runway safety issues are included in the training and briefings for ATC staff.

5.4.11 Any hazards should be identified and any risks associated with runway capacity enhancing procedures (intersection departures, multiple line-ups, conditional clearances, etc.), when used individually or in combination, should be evaluated. If necessary, appropriate mitigation strategies should be developed.

5.4.12 When using multiple or intersection departures, oblique or angled taxiways that limit the ability of the flight crew to see the landing runway threshold or final approach area should not be used.

5.4.13 Controllers should be “head-up” for a continuous watch on aerodrome operations.

## **5.5 AERODROME OPERATORS AND VEHICLE DRIVERS**

5.5.1 The aerodrome operators shall include the optimal use of perimeter taxiways, the avoidance of runway crossings, simplistic and logical taxi/runway layouts and other related elements in the design and location of the aerodrome infrastructure.

5.5.2 It should be ensured that signs and markings are maintained and are clearly visible, adequate and unambiguous in all operating conditions.

5.5.3 During construction or maintenance, information about temporary work areas should be adequately disseminated and temporary signs and markings should be clearly visible, adequate and unambiguous in all operating conditions.

5.5.4 A formal driver training and assessment programme should be introduced.

5.5.5 Formal communications training and assessment for drivers and other personnel who operate on or near the runway should be introduced

## **5.6 INCIDENT REPORTING AND INVESTIGATION**

5.6.1 It should be ensured that all runway incursions are reported and investigated in sufficient detail to identify specific causal and contributory factors (see the reporting forms in Appendices F and G).

5.6.2 To enhance lesson learning, related runway safety data should be shared with other aviation safety organizations.

## **5.7 AERONAUTICAL INFORMATION**

5.7.1 Time-critical aerodrome information that may affect operations on or near the runway should be provided to pilots in “real time” using radiotelephony communications.

5.7.2 Providers of aeronautical databases and charts should establish a process with aeronautical information services with the objective of ensuring the accuracy, timeliness and integrity of data. A process should be put in place to allow users to provide feedback on the accuracy of aeronautical information.

## Chapter 6

### INCIDENT REPORTING AND DATA COLLECTION

#### **6.1. A STANDARD APPROACH TO RUNWAY INCURSION INCIDENT REPORTING AND DATA COLLECTION**

6.1.1 The initial runway incursion notification form (see Appendix A) requires the inclusion of data to describe the event and to classify its severity.

6.1.2 The runway incursion causal factors identification form (see Appendix B) establishes the how, what and why concerning the event and is to be completed once the detailed investigation into the event has been completed.

6.1.3 Since there are few reported runway incursions per thousand aircraft movements, such incidents may appear to be unique to a particular aerodrome. It is only by pooling data that patterns of common causal factors can emerge.

6.1.4 The pooling of data requires that all participating organizations adopt a common, reliable and robust method of data collection. Furthermore, methods used to analyse the results should be harmonized to ensure the comparability of assessment results.

## Chapter 7

### CLASSIFICATION OF THE SEVERITY OF RUNWAY INCURSIONS

#### 7.1 SEVERITY CLASSIFICATION

Severity of Runway Incursions is classified as follows:

Severity Classification	Description
A	A serious incident in which a collision is narrowly avoided.
B	An incident in which separation decreases and there is significant potential for collision, which may result in a time-critical corrective/evasive response to avoid a collision.
C	An incident characterized by ample time and/or distance to avoid a collision.
D	An incident that meets the definition of runway incursion such as the incorrect presence of a single vehicle, person or aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.
E	Insufficient information or inconclusive or conflicting evidence precludes a severity assessment.

#### 7.2 Objectives of Severity classification:

7.2.1 To produce and record an assessment of each runway incursion and probability of its recurrence.

7.2.2 To determine the causal and contributory factors and to apply the appropriate risk mitigation measures.

7.2.3 To assess any incident notification with due regard to its severity classification and start the investigation process.

7.2.4 For the purpose of global harmonization and effective data sharing.

**Appendix A**

**RUNWAY INCURSION INITIAL REPORT FORM**

Name of Aerodrome:

Report no:

\_\_\_\_\_

A. Date/time of runway incursion (in UTC)

(YYYYMMDD hh mm)

\_\_\_\_\_

Day

Night

B. Person submitting the report

Name:

\_\_\_\_\_

Job title:

\_\_\_\_\_

Telephone no.:

\_\_\_\_\_

Facility/unit:

\_\_\_\_\_

Date/time/place of completion of form:

\_\_\_\_\_

C. ICAO aerodrome designator

\_\_\_\_\_

D. Surface conditions (*Braking*)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

E. Aircraft, vehicle or person involved in the runway incursion (indicate all those involved in the occurrence)

Aircraft 1:

\_\_\_\_\_

Aircraft 2:

\_\_\_\_\_

Aircraft 3:

\_\_\_\_\_

Vehicle:

—

\_\_\_\_\_

Person:

\_\_\_\_\_



F. Weather conditions

Wind: \_\_\_\_\_ Visibility/RVR: \_\_\_\_\_

Temperature (° Celsius): \_\_\_\_\_ Ceiling/cloud: \_\_\_\_\_

Additional information:

---

G. Evasive action — Aircraft 1

No

Yes  Select from the list below as appropriate:

Cancelled take-off clearance

Rejected take-off  distance rolled: \_\_\_\_\_

Rotated early

Delayed rotation

Abrupt stop

Swerved

Missed approach  distance to runway threshold: \_\_\_\_\_

Other

H. Evasive action — Aircraft 2

No

Yes  *Select from the list below as appropriate:*

Cancelled take-off clearance

Rejected take-off  distance rolled: \_\_\_\_\_

Rotated early

Delayed rotation

Abrupt stop

Swerved

Missed approach  distance to runway threshold: \_\_\_\_\_

Other

I. Evasive action — Vehicle

No

Yes  *Select from the list below as appropriate:*

Abrupt stop

Swerved

Other

J. Closest proximity Vertical (ft): \_\_\_\_\_ Horizontal (m): \_\_\_\_\_

K. Communication difficulties

No

Yes  *Select from the list below as appropriate:*

Readback/hearback

Blocked communication

Confused call signs

Aircraft on wrong frequency/no radio

Non-standard phraseology

L. ATC

Did ATC forget about:	Yes	No
An aircraft/person/vehicle cleared onto or to cross a runway?	<input type="checkbox"/>	<input type="checkbox"/>
An aircraft on approach to land?	<input type="checkbox"/>	<input type="checkbox"/>
A runway closure?	<input type="checkbox"/>	<input type="checkbox"/>

M. Description of the incident and relevant circumstances

1. A description or diagram of the geometry of the incident scenario:

Description:

---

---

---

---

2. A description of any evasive or corrective action taken to avoid a collision:

---

---

3. An assessment of the available reaction time and the effectiveness of the evasive or corrective action:

---

---

---

4. An indication of whether a review of voice communication has been completed and the results of that review:

---

---

---

5. Initial assessment of severity:

---

---

---

N. Aircraft details — Aircraft 1

Registration no.: \_\_\_\_\_ Call sign: \_\_\_\_\_ SSR code (if applicable): \_\_\_\_\_

Flight no.: \_\_\_\_\_ Owner/operator: \_\_\_\_\_ Aircraft 1 type: \_\_\_\_\_

Flight details (select from the list below as appropriate):

<i>Type of flight</i>	<i>Flight rules</i>
General aviation <input type="checkbox"/>	IFR <input type="checkbox"/> VFR <input type="checkbox"/>
Military <input type="checkbox"/>	
Non-scheduled <input type="checkbox"/>	
Scheduled <input type="checkbox"/>	
Other <input type="checkbox"/>	
Not applicable <input type="checkbox"/>	

O. Aircraft details — Aircraft 2

Registration no.: \_\_\_\_\_ Call sign: \_\_\_\_\_ SSR code (if applicable): \_\_\_\_\_

Flight no.: \_\_\_\_\_ Owner/operator: \_\_\_\_\_ Aircraft 2 type: \_\_\_\_\_

Flight details (select from the list below as appropriate):

<i>Type of flight</i>	<i>Flight rules</i>
General aviation <input type="checkbox"/>	IFR <input type="checkbox"/> VFR <input type="checkbox"/>
Military <input type="checkbox"/>	
Non-scheduled <input type="checkbox"/>	
Scheduled <input type="checkbox"/>	
Other <input type="checkbox"/>	
Not applicable <input type="checkbox"/>	

P. Vehicle details — Vehicle 1

Registration no.: \_\_\_\_\_ Call sign: \_\_\_\_\_

Mobile no.: \_\_\_\_\_ Owner/operator: \_\_\_\_\_ Vehicle 1 type: \_\_\_\_\_

Other details (select from the list below below as appropriate):

<i>Type of vehicle</i>	
Runway inspection <input type="checkbox"/>	
Bird control <input type="checkbox"/>	
Tugging/towing <input type="checkbox"/>	
Fire brigade <input type="checkbox"/>	
Maintenance <input type="checkbox"/>	
Snow clearing <input type="checkbox"/>	

Military <input type="checkbox"/>	
-----------------------------------	--

Q. Vehicle details — Vehicle 2

Registration no.: \_\_\_\_\_ Call sign: \_\_\_\_\_

Mobile no.: \_\_\_\_\_ Owner/operator: \_\_\_\_\_

Vehicle 2 type: \_\_\_\_\_

Other details (select from the list below as appropriate):

Runway inspection

Bird control

Tugging/towing

Fire brigade

Maintenance

Snow clearing

Military

R. Report received by \_\_\_\_\_ (name of person)  
\_\_\_\_\_ (date)

Date when detailed investigation will commence \_\_\_\_\_

**2. INSTRUCTIONS FOR COMPLETING THE RUNWAY INCURSION INITIAL REPORT FORM**Item

- A Indicate the date/time (in UTC) and conditions (day or night) of the runway incursion.
- B Provide details about the person submitting the report.
- C Provide the aerodrome designator as indicated in *Location Indicators* (Doc 7910).
- D Supply information regarding the runway condition at the time of the runway incursion, which affected the braking action of the aircraft.
- E Identify the aircraft, vehicles or persons involved in the runway incursion. More details should be provided in N, O, P and Q.
- F Provide information on weather conditions such as wind, visibility, RVR, temperature, ceiling, cloud and additional information as required.
- G, H, I Provide information regarding evasive action taken by the aircraft and/or vehicles.
- J Provide information regarding the closest proximity or distance, horizontally and/or vertically, between both parties during the runway incursion or at the point at which both parties were aware of the situation and the aircraft was under control at taxi speed or less.
- K, L Provide information regarding communication difficulties and ATC memory lapses.
- M Describe the runway incursion, by providing the information requested. Attach additional pages as required.
- N, O, P, Q Supply detailed information regarding the aircraft and vehicles involved in the runway incursion.
- R Provide the name of the person receiving the report and date.
- S Indicate the date when the detailed investigation of the runway incursion will commence.

**Appendix B**

**RUNWAY INCURSION  
CAUSAL FACTORS IDENTIFICATION FORM**

Name of the Aerodrome: \_\_\_\_\_

Initial runway incursion report no: \_\_\_\_\_

A. Date/time/place of runway incursion (in UTC)  
(YYYYMMDDhhmm) \_\_\_\_\_  
(date) (time) (place)

B. Aircraft, vehicle or person involved in the runway incursion (indicate all those involved in the occurrence)

Aircraft 1: \_\_\_\_\_

Aircraft 2: \_\_\_\_\_

Aircraft 3: \_\_\_\_\_

Vehicle: \_\_\_\_\_

Person: \_\_\_\_\_

C. Severity of the runway incursion (select as appropriate)

<i>Severity</i>	
A	
B	
C	?
D	<input type="checkbox"/>

E

D. Causal and coincident factors (select from the list as appropriate — multiple choices can be made)

**1. AIR TRAFFIC CONTROL**

**1.1 Communications**

1.1.1 Transmitted instructions were long, complex, spoken rapidly or not in accordance with ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language)

1.1.2 Did not obtain read backs for clearances, instructions and coordination as required by ICAO





- 1.1.3 Did not correct an error in a read back □
- 1.1.4 Issued a clearance to the wrong aircraft □
- 1.1.5 Confused similar call signs □
- 1.1.6 Transmission was completely blocked □
- 1.1.7 Deviation from established ICAO standard phraseologies □
- 1.1.8 Other (please specify). If not an ICAO procedure, please briefly describe the procedure used and where. □

---



---



---

**1.2 Situational awareness**

1.2.1 Head-down time due to equipment/displays; duties other than traffic processing such as inputting flight data □

1.2.2 Forgot:

- aircraft on an active runway □
- aircraft cleared to cross a runway ☒
- aircraft in the lined-up position ☒
- aircraft on approach to land ☒
- to issue a clearance ☒
- that a clearance had already been issued ☒
- closed runways ☒
- a vehicle on an active runway ☒
- a vehicle cleared to cross a runway ☒

1.2.3 Distractions due to:

- performing other assigned duties, such as conducting operational telephone calls,
- engaging in non-operational activities such as a personal telephone call, extraneous conversation, observations and recording, issuing NOTAM and other operational information reading material and radios □

1.2.4 Used a language not in accordance with ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language)

1.2.5 Other (please specify).

1.2.6 Misidentified the aircraft or the aircraft's position due to:

- incorrect position report □
- an incorrect expectation (e.g. expected the aircraft to be clear of the runway) ?

1.2.8 Limitations on the view of the manoeuvring area from the ATC tower □

1.2.7 Lack of visual scanning of ground movements

1.2.9 Recent runway configuration change

□

01 OCT 2012

- 31 -

- 1.2.10 Unusual runway configuration
- 1.2.11 Error occurred within 15 minutes of assuming the control position
- 1.2.12 Controller was conducting on-the-job training
- 1.2.13 Fatigue
- 1.2.14 Other (please specify).
- 1.3 Staffing**
- 1.3.1 ATC positions were combined on the same frequency
- 1.3.2 Absence of a supervisor in the tower
- 1.3.3 Supervisor was working a control position.
- 1.4 Decision making**
- 1.4.1 Misjudged separation or anticipated separation
- 1.4.2 Inadequate ATC to ATC coordination
- 1.4.3 Other (please specify).
- 1.5 Procedures**
- 1.5.1 Misapplication of conditional clearances
- 1.5.2 Use of multiple line-up clearances
- 1.5.3 Other (please specify). If not an ICAO procedure, please briefly describe the procedure used and where.
- 1.6 Aerodrome works**
- 1.6.1 ATC not advised of works on the manoeuvring area
- 1.6.2 Other (please specify).

## 2. FLIGHT CREW

- 2.1 Communications**
- 2.1.1 Transmission was completely blocked
- 2.1.2 Transmission was partially blocked (“stepped-on”)
- 2.1.3 Accepted a similar aircraft’s clearance:
- with similar call signs
  - without similar call signs
- 2.1.4 Deviation from established ICAO standard phraseologies
- 2.1.5 Used other than ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language) in a situation not covered by ICAO standard phraseology
- 2.1.6 Used language not in accordance with ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language)



## 2.1.7 Speech quality:

- not proficient in ICAO language requirements for air-ground radiotelephony communications (language normally used by the station on the ground or the English language)
- poorly enunciated or heavily accented
- spoken rapidly
- spoken with an inconsistent volume

2.1.8 Did not use headsets 2.1.9 Received clearance or instructions during periods of high cockpit workload 2.1.10 Did not advise ATC of a delay on the runway prior to take-off 2.1.11 Other (please specify). **2.2 Situational awareness**2.2.1 Crew conducting checklists while taxiing 2.2.2 Crew member programming flight management system or other flight deck system while taxiing 2.2.3 Crew member was on another radio frequency 2.2.4 Competing radio communications 2.2.5 Unfamiliar with the aerodrome layout 

## 2.2.6 Crew mistook their position on the aerodrome (thought they were in a different location)

2.2.7 Fatigue 2.2.8 Reported incorrect location to ATC 2.2.9 Taxied fast 2.2.10 Did not refer to the aerodrome diagram 2.2.11 Did not listen to the automatic terminal information service (ATIS) 2.2.12 Works on the manoeuvring area were not previously advised by NOTAM 2.2.13 Used out-of-date or inaccurate publications or charts 2.2.14 Failed to apply or correctly observe sterile cockpit procedures 2.2.15 Other (please specify).

**2.3 Markings, signs and lighting**

- 2.3.1 Not ICAO-compliant
- 2.3.2 Not provided
- 2.3.3 Irregularly spaced
- 2.3.4 Ambiguous and difficult to follow
- 2.3.5 Poorly sized
- 2.3.6 Poorly situated
- 2.3.7 Poorly maintained
- 2.3.8 Other (please specify).

**2.4 Clearances and instructions**

- 2.4.1 Misunderstood clearance:
- conditional
  - follow
  - other
- 2.4.2 Flight crew did not ask for clarification when they did not understand a clearance or instruction
- 2.4.3 Did not inform ATC when could not comply with a clearance
- 2.4.4 Forgot part of the clearance or instruction
- 2.4.5 Entered the runway after being instructed to “hold short”
- 2.4.6 Lined up on the runway after instruction to taxi to the runway-holding position (point)
- 2.4.7 Took off without a clearance after being instructed to “line up and wait”
- 2.4.8 Took off without a clearance after being instructed to taxi to the runway-holding position (point)
- 2.4.9 Landed or departed on the wrong runway
- 2.4.10 Landed or departed on the taxiway
- 2.4.11 Other (please specify).

### 3. VEHICLE DRIVERS AND PEDESTRIANS

#### 3.1 *Communications*

3.1.1 Did not operate on the appropriate:

- ground frequency for operations outside the runway strip
- tower frequency for operations within the runway strip

3.1.2 Turned the radio volume down or off after initial communication with ATC

3.1.3 Other (please specify).

#### 3.2 *Situational awareness*

3.2.1 Forgot the details/limits of any clearance to operate on the manoeuvring area

3.2.2 Distracted by:

- current work
- high noise levels
- monitoring more than one frequency and possibly a mobile telephone

- being disoriented or lost on the aerodrome

3.2.3 Failure to report correct location

3.2.4 Other (please specify).

#### 3.3 *Markings, signs and lighting*

3.3.1 Not ICAO-compliant

3.3.2 Not provided

3.3.3 Irregularly spaced

3.3.4 Ambiguous and difficult to follow

3.3.5 Poorly sized

3.3.6 Poorly situated

3.3.7 Poorly maintained

3.3.8 Other (please specify).

#### 3.4 *Procedures*

3.4.1 Not adequately familiar with the aerodrome and its procedural requirements

- 3.4.2 Did not refer to the current aerodrome NOTAM
- 3.4.3 Did not refer to the current aerodrome diagram
- 3.4.4 Used out-of-date or inaccurate publications or charts
- 3.4.5 Did not advise ATC of work that affected operations
- 3.4.6 Ground vehicles did not stop at required positions
- 3.4.7 Other (please specify).
- 3.5 *Clearances and instructions***
- 3.5.1 Did not comply with ATC clearances and instructions
- 3.5.2 Mistook a clearance intended for another vehicle or aircraft
- 3.5.3 The driver did not advise ATC that he/she did not understand the clearance or instruction
- 3.5.4 Other (please specify).

**E. Person submitting the form**

Name :

Title :

Date :