Civil Aviation Authority of Sri Lanka

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Runway Safety Programme

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Foreword

Sri Lanka as a Contracting State to the Convention on International Civil Aviation has an obligation to the international community to ensure that civil aviation activities under its jurisdiction are carried out in strict compliance with the Standards and Recommended Practices contained in all nineteen Annexes to the Convention on International Civil Aviation in order to maintain the required safe air transportation.

Landing and take-off being the critical phases of flight and runway is an area where the landing and departing aircraft may have the opportunities to interact with other taxiing aircrafts, ground vehicles, personnels, animals and foreign objects. Given the speed of aircraft and its limited ability in exercising avoiding action on the runway especially during take-off and landing roll, the potential hazard as may be created by runway incursions or presence of foreign objects have become a deep concern to aviation safety in many countries.

A runway incursion is defined as any occurrence at an aerodrome involving the incorrect presence of an aircraft. vehicle or persons on the protected area of a surface, designated for the landing and take-off of aircraft, with the traffic growth, runway incursions have been showing a growing trend the world over, and have been causing safety concerns.

Prevention of runway incursions has become a priority area; in- order to order to maintain the level of safety the Aerodromes of Sri Lanka has been maintaining vis- a- vis Runway incursion. The runway safety programme provides detailed guidelines to be observed variously, aircraft operators, aerodrome operators, air traffic controllers and personnel who have access to the runway.

Accordingly, SLCAP 2150 provides the procedure to be followed by Aerodrome Operator, ANS provider and Aircraft operators at Sri Lanka Aerodromes, for the purpose of preventing runway incursions.

This document is continually subject to revisions and amendments if required. Suggestions for improvement of the document are appreciated and should be addressed to the undersigned.

AVM Sagara Kotakadeniya (*Retd*)
Director General of Civil Aviation
Civil Aviation Authority of Sri Lanka
01st July 2024

Chapter 1 APPLICABILITY

This Guidance Material applies to all aerodrome operators, flying communities and air field users issued with aerodrome certificate under IS 037.

Chapter 2 INTRODUCTION

2.1. Landing and take-off are critical phases of flight and runway is an area where landing and departing aircraft may have the opportunities to interact with other taxiing aircraft, ground vehicles, personnel, animals and foreign objects. Given the speed of aircraft and its limited ability in exercising avoiding action on the runway especially during take-off and landing roll, the potential hazard as may be created by runway incursions or presence of foreign objects have become a deep concern to aviation safety in many countries. International Civil Aviation Organization (ICAO) has specified standards and recommended practices relating to airport system operation and development of operational procedures for the purpose of achieving runway safety.

2.3. However, with the predicted growth of air traffic and increasing complexity in airport operation, it is our view that the commitment to runway safety should also be addressed by a more systematic approach to ensure consistent and harmonized application of ICAO provisions with clear goals and common understanding shared by all stakeholders. This perspective is in line with the requirement of Annex 14. With the aforesaid objective in mind, the Civil Aviation Authority of Sri Lanka Runway Safety Programme serves to provide management guidelines and recommendations to stakeholders for enhancing runway safety. The Programme is distributed to Aircraft operators, Aerodrome Operator and Air Navigation Services Provider in Sri Lanka who are requested to observe these guidelines through continuous system improvement and adoption of industry best practice.

2.3. The Aerodromes section of the Civil Aviation Authority of Sri Lanka is responsible for periodic review of this Programme taking into consideration the current international requirements, the airport development, the growth in air traffic and technological advancement that in turn may help to better equip the airports in Sri Lanka in achieving a high level of runway safety.

Chapter 3 Aerodrome Operator

3.1 Overview

3.1.1 Favorable operating environment and prevention of runway incursions are important factors that contribute to runway safety. With these basic principles, an aerodrome operator should establish procedures to monitor the conditions of runway and ground aids which must be supported by effective maintenance programme to ensure system integrity. Logical layout, simplicity and avoidance of runway crossings should be included as elements in the design and introduction of new aerodrome infrastructure. Human factors shall be considered in setting up aerodrome procedures with the objectives of minimizing human errors and respecting user-friendliness when used by pilots, vehicle drivers and air traffic controllers.

3.2 Annex 14 Provisions

3.2.1 An aerodrome operator is required to fully implement at high priority the requirements of the Implementing Standard 30 on Aerodromes and Implementing Standard 37 on Requirements for Aerodrome certification. The compliance to these implementing standards forms the basis for consideration of certifying aerodromes. Appropriate additional safeguards should be taken into account to avoid runway incursion.

3.3 Runway Maintenance Programme

3.3.1 A maintenance programme, including preventive maintenance where appropriate, shall be established for the aerodrome to maintain runway in a condition which does not impair the safety of aircraft operations. A robust maintenance programme should be implemented to prevent failure or degradation of runway facilities.

3.3.2 The design and application of the maintenance programme should observe Human Factors principles. Guidance material on Human Factors principles can be found in the ICAO Human Factors Training Manual (Doc 9683).

3.4 Pavement Maintenance

3.4.1 The surface of pavements (runways and adjacent areas) shall be kept clear of loose stones or other objects that might cause damage to aircraft structures or engines or impair the operations of aircraft systems. In this connection, a comprehensive runway inspection and sweeping programme should be incorporated into the standard operation procedures of the Aerodrome Operator.

3.4.2 The surface of runways shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance. Standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed as rapidly and completely as possible to minimize accumulation. On every landing, the runway touch-down zone is heavily loaded and rubber from aircraft tires would be inevitably deposited on runway surface. The adverse effect as a result of rubber deposit should be continuously monitored and addressed.

3.4.3 The aerodrome operator shall establish a programme to measure the friction characteristics of runway. Different levels of friction corresponding to the level of maintenance required, including rubber removal, should be defined. Pertinent information should be made available to air traffic control (ATC) for onward transmission to pilots if necessary.

3.5 Visual Aids

3.5.1 A system of preventive maintenance of visual aids shall be adopted to ensure the availability and reliability of the runway lighting and marking systems. Guidance on preventive maintenance of visual aids is given in the ICAO Airport Services Manual, Part 9 (Doc 9137 Part 9).

3.5.2 The system of preventive maintenance employed for a precision approach runway should include at least the following checks:

- visual inspection and in-field measurement of the intensity, beam spread, and orientation of lights included in the approach and runway lighting systems.

- control and measurement of the electrical characteristics of each circuitry included in the approach and runway lighting systems; and

- control of the correct functioning of light intensity settings used by the air traffic control unit.

3.6 Runway works

3.6.1. An aerodrome operator shall plan and implement works to be carried out at an aerodrome so as not to create any hazard to aircraft operations or confusion to pilots. A works plan should be developed whereby the work items are thoroughly coordinated amongst aerodrome users, air traffic control and other service providers after suitable consultations.

3.6.2. The aerodrome operator shall make arrangement to inspect the works areas, as circumstances require, to ensure aviation safety during and immediately after any period of construction or repair of runway facility or equipment that is critical to the safety of aircraft operations, and at any other time when there are conditions on the runway that could affect aircraft operations.

3.6.3. The aerodrome operator shall not close the runway to aircraft operations due to pre-planned aerodrome works unless an Aeronautical Information Manual (AIP) Supplement or a Notice to Airmen (NOTAM) giving notice of the closure has been issued in advance before the closure takes place.

3.6.4. An aerodrome operator shall appoint a person responsible for the safe and proper execution of each item of runway works. This person is responsible to ensure that the works information is widely promulgated to airport users by way of AIC, AIP Amendment or NOTAM.

3.6.5. Runways or taxiways sections that are closed as a result of the aerodrome works being carried out shall be suitably delineated with marker boards and lit in accordance with the appropriate aerodrome standards.

3.6.6. All obstacles including vehicles and plants created because of the aerodrome works being carried out shall be marked and lit in accordance with the appropriate aerodrome standards.

3.6.7. Vehicles used by works parties carrying out aerodrome works on the movement area should be equipped with a radio for two-way communications with air traffic control and the unit responsible for airfield control. The drivers of these works' vehicles should be properly trained and briefed about the works details prior to each works session.

3.7 Safety Management System (SMS)

3.7.1 An aerodrome operator shall implement a SMS in accordance with the provision in SLC IS 30. Facilities, equipment and procedures used to support runway operations shall be designed and operated in a way that the combination of the probability of occurrence and the seriousness of the consequences of the hazard occurring must not result in a level of risk that is unacceptable. Risk assessment matrices facilitate the determination of acceptable levels of risks taking into account the probability of occurrence and seriousness of consequences.

3.8 SMS Implementation

3.8.1 The implementation of the SMS should include the introduction of:

- Quantitative safety levels - an acceptable level of safety in respect of runway operations should be specified.

- System safety assessment - safety assessment exercises should be performed whenever changes, additions or replacements of runway facilities are introduced. All records should be documented.

- Safety committee - forum with members from pilot community, air traffic controllers, aerodrome operator, airline representatives and relevant franchisees with operations associated with runway operations should be formed to discuss issues on runway safety;

- Safety competency scheme - a scheme should be developed to assess the safety competency on staff involved in runway operations.

- Safety audit - periodic safety audits are to be performed to confirm the compliance with the safety requirements and the principles of the safety management system;

- Safety monitoring and reporting system - suitable monitoring and reporting mechanism should be developed for identifying undesirable trends in runway safety performance for further remedial action;

- Safety information dissemination - a system of information dissemination should be developed to keep aerodrome staff notified whenever a potential safety threat is discovered for enhancing their awareness; and

- Continuous safety promotion - efforts should be made to nurture a safety culture amongst the airport community.

Chapter 4 Aircraft Operations

4.1 Overview

4.2.1 Pilots play an important role in contributing to runway safety. Aircraft operators are therefore requested to review the suggestions put forward in this document and adopt these guidelines where necessary in order to refine their ground operation procedures.

4.2 Pilots Training

4.2.2 Pilots should be given training on visual aids, for example, aerodrome signage, lightings and markings, to assist in determining positions. Emphasis should be given to maintaining a high level of awareness in observing and complying with signs and markings. A sound knowledge of all the symbols, signs and colour of lightings that can be anticipated at aerodromes is vital.

4.3 Cockpit management during ground operation

4.3.1 The taxi phase should be treated as a 'critical phase of flight', which requires careful planning.

4.3.2 Pilots should be familiar with the airport that they operate to. Airfield charts and NOTAM should be reviewed prior to commencement of taxi and before top of descent. Special attention should be paid to the location of intersections and runway crossings where runway incursions have taken place in the past.

4.3.3 Pilots should monitor the aircraft's position against the aerodrome chart so as to ensure that instructions received from ATC are being followed correctly. Any uncertainty must be resolved through clarification and assistance from ATC.

4.3.4 Cockpit instruments, such as compass heading display or Instrument Landing System (ILS) localizer, should be used as supplement to visual observation, for confirming correct taxiway or runway alignment especially at complex intersections.

4.3.5 Pilots should exercise extra caution when being instructed to taxi into position and hold, particularly at night or in poor visibility. Remaining in position and holding on the departure runway for an extended period without direct communication with ATC should be avoided.

4.3.6 When crossing or entering runways, all flight crew members should assign full concentration on the runway condition. In addition to visual checking, other available means, such as monitoring of ATC frequency, aircraft radar may be used to obtain a better picture on the traffic situation.

4.3.7 Prior to entering a runway, each flight crew member must cross check and positively confirm with the other the runway identification signage and that the aircraft heading aligns with the designated runway.

4.3.8 After landing and exiting the runway, non-essential communications and non-essential flight crew actions should not be initiated until clear of all runways, in accordance with sterile cockpit procedures.

4.4 Communication with air traffic control

4.4.1 It is vital that pilots follow the clearance or instructions that are received, and not the one that they expected to receive.

4.4.2 Standard phraseology should be used as far as practicable.

4.4.3 Clearance should be read back in its full content with the aircraft call sign included. The runway designator should be included in case of hold short, runway crossing, take-off, or landing.

4.4.4 The receipt of a clearance to taxi to a point beyond a runway does not automatically include the authorization to cross that runway. Each taxi clearance beyond a runway should contain an explicit clearance to cross the runway or an instruction to hold short of that runway.

4.4.5 An ATC instruction to follow other traffic does not automatically imply that permission to enter or cross a runway is given. Each aircraft requires a specific clearance to enter or cross any runway. Flight crew should seek clarification from ATC if in doubt.

4.4.6 Flight crew members should pay extra attention to ATC messages when another aircraft with a similar call sign is on the frequency.

4.4.7 All pilots are required to attain at least ICAO Level 4 in the language proficiency test.

4.5 Crew resource management

4.5.1 Flight crew members should support each other in managing the cockpit. All flight crew members should monitor the frequency and agree upon the acceptance of a clearance to taxi, cross a runway, and take-off or land on a nominated runway. Any misunderstanding or disagreement among flight crew on flight deck duties should be resolved immediately by contacting ATC for clarification.

4.5.2 All the visual information that is available should correlate with the actual position. The gathering of visual information, allowing a critical review and cross-checking of position, is the task of the entire flight crew. Any crew member who is uncertain or in doubt about the current aircraft position must speak up and resolve that uncertainty.

Chapter 5 Vehicle Operations in Airside

Runway incursion by vehicles has caused considerable concern in daily operation at airfields. An aerodrome operator therefore should establish comprehensive procedures to regulate the quality and discipline of airside drivers. Suitable measures should be introduced to promote a safety culture in general and arouse the situation awareness of drivers and aircrew.

5.1 Control of Airside Driving and Airside Driving Certification

5.1.1 In order to ascertain drivers' competency for operating vehicles at airside, an aerodrome operator shall administer an Airside Driving Permit issuing system for the aerodrome.

5.1.2 The numbers of drivers permitted to drive on the maneuvering area should be kept to the minimum necessary. The driving operations should be related to the functions of their duties.

5.1.3 All drivers should be trained and assessed initially and be provided with refresher training at agreed intervals for re-examination to ascertain their competency.

5.2 Airside Driving Training

5.2.1 An aerodrome operator should introduce a formal driver training and assessment programme. Training guidelines should be provided and a set of agreed standards on driver competency should be developed in administering the programme.

5.2.2 Training material should cover general aerodrome layout including :

- runway, taxiway, apron, roads, crossings, runway holding points, etc.
- all aerodrome signs, markings and lights for both vehicles and aircraft
- specific reference to signs, markings and lights used to guard runways and critical areas and
- specific reference to low visibility operation.
- Radio telephony and Communication in accordance with ICAO DOC. 9432

5.3 Airside Driving Discipline

5.3.1 Airside drivers must be given a clear message that ATC instructions must be followed at all times. Without ATC's authorization, drivers must not enter the runway. If there is any doubt in the mind of a vehicle driver when receiving a clearance or instruction, clarification should be immediately requested from ATC before the clearance or instruction is enacted. Vehicle drivers should immediately contact the unit responsible for airfield control or ATC when uncertain of their exact position on an aerodrome.

5.3.2 Vehicle drivers experiencing radio problems while on maneuvering area must immediately vacate the maneuvering area. Driver with vehicle breakdown on runways and taxiways must report to airfield control or ATC immediately.

5.4 Language Proficiency in respect of Radiotelephony (RTF) Communication

5.4.1 Standard phraseology should be used for communication among drivers, controllers and airfield control personnel. Vehicle driver or his team members who communicates with air traffic controller should read back all instructions pertaining to entering, leaving or crossing runways.

5.5 Situational Awareness

5.5.1 On the part of airside drivers, situational awareness is about knowing where they are and where they want to go, as well as knowing the traffic in the surrounding. Drivers should be encouraged to exercise extra vigilance when operating in the vicinity of runways. Close references should be made with any visual cues, lightings and signage especially at times of darkness and poor visibility.

Chapter 6 Air Traffic Control Operations

One of the primary objectives of air traffic control is to prevent collision on the ground between aircraft and between aircraft and obstructions (vehicles). The skills and procedures for achieving this objective have been included in the basic training, On the Job training and proficiency assessment of air traffic control personnel. However, air navigation service provider is advised to make continuous effort to promote runway safety through service quality assurance, excelling of operational management and improvement of air traffic control facilities through utilization of state-of-the-art technology.

6.1 Safety Management System

6.1.1 The top management of an air navigation service provider (ANSP) should make full commitment in promoting runway safety. Safety Management for Air Traffic Management is generally specified in Annex 11. ANSP shall implement the necessary Safety Management provisions and practices stated therein and make effort to arouse the safety awareness of its staff and motivate a safety culture within the organization.

6.2 Airfield Surveillance

6.2.1 In addition to the basic skills of aerodrome control, controllers should be advised through training or periodic briefing on the importance of visual surveillance with particular emphasis on vigilance in determining aircraft and vehicle positions. Restrictions to the visibility from the control tower that may have a potential impact to the ability of controllers to see the runway should be assessed and clearly made known to aerodrome controllers.

6.2.2 Other airport units may be requested to provide supplementary surveillance from their locations or vehicles on aircraft/vehicle positions if necessitated by circumstances such as at night or in time of poor visibility.

6.2.3 Equipment (such as stop bars, guard lights) should be provided as aids to controllers in controlling the access to runways. The proper utilization of these aids should be emphasized in order to gain the required benefit of the equipment installed.

6.3 Operational Management

6.3.1 Oversight of daily aerodrome operation should be exercised by competent supervisory staff. The workload of individual control positions in the tower should be closely monitored to ensure that it is within the manageable limit.

6.3.2 In the situation of Doha where low weather minima operations occur frequently due to fog and dust, ANSP management should ensure that aerodrome control staff are familiar with the Low Visibility procedures through refresher training, periodic briefing or discussion during proficiency examinations.

6.3.3 A system or work practice serving the purpose of a memory aid to indicate that the runway is being occupied by towing aircraft, vehicles or maintenance personnel etc… should be developed and provided for use by aerodrome control staff.

6.4 Operational Communication

6.4.1 The radio equipment used for communication with pilots and airport ground vehicles must be thoroughly evaluated to ensure that it provides adequate coverage for runway operation.

6.4.2 All aerodrome controllers are required to attain at least ICAO Level 4 in the language proficiency test.

6.4.3 Standard radio-telephone phraseology should be used as far as practicable.

6.4.4 Instructions for aircraft or vehicles to enter/exit the runway shall be issued in a clear and unambiguous manner. Full call sign of aircraft or vehicles and runway designator should be used to avoid confusion.

6.4.5 All clearances for operation on the maneuvering area should be read back by the receivers.

6.4.6 In the interest of situation awareness, all communications associated with runway operations should be conducted on a common frequency when practicable.

6.4.7 If the taxi route is expected to be long and complex, controller should use where applicable progressive taxi instructions to reduce pilot workload and the likelihood of confusion.

6.4.8 As far as practicable, en-route clearance should be passed before leaving the gate to avoid distraction to pilots during taxiing