



MINISTRY OF
TRAFFIC, TRANSPORT AND URBAN PLANNING
CURAÇAO CIVIL AVIATION AUTHORITY

Curaçao Civil Aviation Authority

***RUNWAY SAFETY
PROGRAM GUIDANCE***

August 2019
Edition 1

Document number:
CCAA.AGA.010

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Date: 20 August 2019
Edition 1

FOREWORD

This Runway Safety Program Guidance will be distributed to airlines certified in Curaçao or operating at the Curaçao International Airport, the Airport Operator, as well as the Curaçao Air Navigation Service Provider, who are requested to observe the guidelines through continuous system improvement and adoption of industry best practices.

The Curaçao Civil Aviation Authority (CCAA) is responsible for periodic review of the Runway Safety Program, 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 airport in achieving a high level of runway safety.

Enquiry on this Runway Safety Program may be channeled to the Aerodrome section of the CCAA.

The purpose of this guidance material is to provide management guidelines and recommendations to stakeholders for enhancing runway safety.

Curaçao Civil Aviation Authority

Drs. H.P.T. de Jong,
Director General.

Augustus 20, 2019
Date



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CHAPTER 1 INTRODUCTION

Landing and take-off are critical phases of flight and the runway is an area where landing and departing aircraft may have the opportunity 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 the presence of foreign objects have become a deep concern to aviation safety in many countries.

The International Civil Aviation Organization (ICAO) has specified standards and recommended practices relating to airport system operation and the development of operational procedures for the purpose of achieving runway safety.

The CCAA has noticed that worldwide appropriate measures have been introduced by individual airlines, airport operators and air navigation service providers in order to comply with the ICAO requirements.

However, with the predicted growth of air traffic and the increasing complexity in airport operations, it is the view of the CCAA 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, this Runway Safety Program serves to provide management guidelines and recommendations to stakeholders for enhancing runway safety.



CHAPTER 2 Airport Operations

Favorable operating environment and prevention of runway incursions are important factors that contribute to runway safety. With these basic principles, the aerodrome operator should establish procedures to monitor the conditions of runways and ground aids which must be supported by an effective maintenance program 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.

2.1 Annex 14 Provisions

An aerodrome operator is required to fully implement at high priority the ICAO provisions relevant to runway safety. Their compliance forms the basis for consideration of certifying aerodromes. Appropriate additional safeguards should be taken into account to avoid runway incursions.

2.2 Runway Maintenance Program

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

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

2.3 Pavement Maintenance

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 program should be incorporated into the standard operational procedures of aerodrome operators.

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 the runway surface. The adverse effect as a result of rubber deposit should be continuously monitored and addressed.

The aerodrome operator shall establish a program to measure the friction characteristics of the 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.

2.4 Visual Aids

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).

The frequency of measurement of lights for a precision approach runway should be based on traffic density, the local pollution level and the reliability of the installed lighting equipment. The results of the in-field measurements should be continuously assessed.

2.5 Runway Works

The 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.

The aerodrome operator shall make arrangements to inspect the work areas, as circumstances require, to ensure aviation safety during and immediately after any period of construction or repair of runway facilities 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.

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

The 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 an Airport Circular, an AIP Supplement or a NOTAM.

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.

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

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 airport operations department. The drivers of these work vehicles should be properly trained and briefed about the works details prior to each works session.

Aerodrome works involving equipment considered as obstacles shall be marked and lighted in accordance with the provisions in Annex 14.

2.6 Safety Management System (SMS)

The aerodrome operator shall implement a Safety Management System (SMS) in accordance with the provisions in Annex 14. 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.

2.6.1 SMS Implementation

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 3 Aircraft Operations

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.

3.1 Pilot Training

Pilots should be given training on visual aids, for example, aerodrome signage, lightings and markings, to assist in determining positions.

Emphasis shall 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 color of lightings that can be anticipated at aerodromes is vital.

3.2 Cockpit/Crew management during ground operation

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

Pilots should be familiar with the airport that they operate to and from. Airfield charts and NOTAMs should be reviewed prior to commencement of taxi and before top of descent. Special attention should be paid to the location of HOT SPOTS if known, i.e. complex intersections and runway crossings where runway incursions have taken place in the past.

Pilots shall 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.

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 and where the take-off ends of two runways are close to one another.

Pilots shall 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.

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

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.



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.

3.3 Communication with Air Traffic Control

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

Standard phraseology shall be used as far as practicable.

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

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.

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 shall seek clarification from ATC if in doubt.

Flight crew members shall pay extra attention to ATC messages when another aircraft with a similar callsign is on the frequency.

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

3.4 Crew Resource Management

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 shall be resolved immediately by contacting ATC for clarification.

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 4 Vehicle Operations on Airside

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

4.1 Control of Airside Driving and Airside Driving Certification

In order to ascertain drivers' competency for operating vehicles at airside, the aerodrome operator shall administer a Permit to Drive on Airside (PDA) System for the aerodrome.

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.

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

Where responsibility for the training of vehicle drivers is delegated to a third-party provider, the aerodrome operator shall institute a program of audits/examinations, as part of its SMS, to ensure that agreed standards are being maintained.

4.2 Airside Driving Training

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

Training material shall 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.

4.3 Airside Driving Discipline

Airside drivers must be given a clear message that ATC instructions must be followed at all time. 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 shall immediately contact the airport operations department or ATC Tower when uncertain of their exact position on an aerodrome.



Vehicle drivers experiencing radio problems while on the maneuvering area must immediately vacate the maneuvering area. Drivers with vehicle breakdowns on runways and taxiways must report to airport operations department or ATC immediately.

4.4 Language Proficiency in respect of Radiotelephony (RTF) Communication

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

4.5 Situational Awareness

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 shall be made with any visual cues, lightings and signage especially at times of darkness and poor visibility.



CHAPTER 5 Air Traffic Control Operation

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

5.1 Safety Management System

The top management of the Air Navigation Service Provider shall make a full commitment in promoting runway safety. Safety Management for Air Traffic Management is generally specified in Annex 11. The Air Navigation Service Provider 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.

5.2 Airfield Surveillance

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.

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.

5.3 Operational Management

Oversight of daily aerodrome operations 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.

In the situation of Curaçao, low weather minima operations do not occur frequently. The Air Navigation Service Provider management should ensure that aerodrome control staff are familiar with the Visibility procedures through refresher training, periodic briefing or discussion during proficiency examinations.

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, etcetera should be developed and provided for use by aerodrome control staff.



5.4 Operational Communication

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 operations.

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

Standard radio-telephone phraseology shall be used as far as practicable.

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

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

In the interest of situational awareness, all communications associated with runway operations should be monitored by ground operations.

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

Where practicable, en-route clearance delivery should be provided at the gate prior to taxi.

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