

Aerodrome Inspection Programme and Condition Reporting

General

Civil Aviation Authority (CAA) advisory circulars (ACs) contain information about standards, practices and procedures that the Director has found to be an **acceptable means of compliance** with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC provides guidance material on aerodrome inspection **and maintenance** programmes and aerodrome condition reporting requirements, to assist aerodrome operators to meet Civil Aviation Rule Part 139 *Aerodromes—Certification, Operation and Use*.

This material is intended for applicants for and holders of:

- an aerodrome operator certificate, and
- a qualifying aerodrome operator certificate.

It is also recommended to operators of non-certificated aerodromes.

As set out in Part 139, different types of aerodrome operators have different requirements with regards to Runway Condition Reports (RCRs). Operators of:

- **controlled (attended) aerodromes need to produce and issue RCRs, and**
- **uncontrolled (unattended) aerodromes need to produce RCRs, but only have to issue them if required by a prior agreement with the user of the information, but**
- **non-certificated aerodromes do not have to produce or RCRs.**

All aerodrome operators, however, including non-certificated aerodromes, need to keep their runway clear and free of foreign objects. In addition to RCR guidance, this AC contains advice about keeping runways free of debris, which we hope will be useful.

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Note: This AC uses the term 'take-off and landing performance assessment', instead of the common US acronym TALPA, since New Zealand practices in this area differ from those of the US.

Related Rules

This AC relates to Civil Aviation Rule Part 139 - specifically rules 139.23, 139.103, 139.107, 139.117 and 139.123, for qualifying aerodrome operator determination.

Change Notice

Revision 5 updates the content of this AC to align with ICAO's introduction of the Global Reporting Format (GRF) for runway condition reporting, as set out in ICAO Circular 355. This update adapts the contents of Circular 355 to provide guidance material for New Zealand conditions. It aligns with Amendment 15 of Part 139 to reflect ICAO guidance, specifically the update of rules 139.103 and 139.107.

For aerodrome operators to create RCRs, that aircraft operators can safely rely on to enable aeroplane take-off and landing performance assessment, it is necessary for operators to develop a good understanding of Part 139, in conjunction with other relevant rules, such as Part 172, and related ACs.

The main changes in this Revision are to add:

- a Version History
- an Abbreviations and a Definitions section
- APPENDIX A: RCRs – Assessment and Report Format
- APPENDIX B: Practical guide for the assessment, collection and issue of a runway condition report at a CONTROLLED aerodrome, and
- APPENDIX C: Practical guide for the assessment, collection and issue of a runway condition report at an UNCONTROLLED aerodrome

and to delete Section 4, Special Inspection, and incorporate relevant material into Section 3, Regular Inspections.

Revision 4 updates the content of this AC to align with the latest amendment to Part 139; and makes editorial and formatting changes.

Cancellation notice

This AC cancels Revision 4, dated 30 October 2015.

Version history

AC Revision No.	Effective Date	Summary of Changes
AC139-03A	1 May 1994	Initial Issue
2	27 April 2007	Re-formatted and re-numbered from AC 139-03A to AC 139-3 as part of project to standardise the numbering of all ACs.

3	20 December 2007	Amended the title of Chapter 7 to read Aerodrome condition notification
4	30 October 2015	Updated the content of this advisory circular to align with the latest amendment to Part 139; and made editorial and formatting changes.
5	Xx xxxx 2022	<p>Updates the content of this AC to align with ICAO's introduction of the GRF for runway condition reporting, as set out in ICAO Circular 355, adapted for New Zealand conditions.</p> <p>Reflects changes from Part 139 Amendment 15.</p> <p>Adds:</p> <ul style="list-style-type: none"> • A Version History. • An Abbreviations and a Definitions section • APPENDIX A: RCRs – Assessment and Report Format • APPENDIX B: Practical guide for the assessment, collection and issue of a runway condition report at a CONTROLLED aerodrome • APPENDIX C: Practical guide for the assessment, collection and issue of a runway condition report at an UNCONTROLLED aerodrome <p>Deletes Section 4, Special Inspection, and incorporates relevant material into Section 3, Regular Inspections.</p>

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OVERVIEW

While some hazardous aerodrome conditions develop virtually instantaneously, others are gradual. It is important, therefore, to have a comprehensive aerodrome inspection programme to ensure:

- (a) all areas are systematically checked for conformance with established requirements, and
- (b) any deficiencies are identified, and effective remedial action is taken before small defects develop into significant safety hazards.

An effective aerodrome inspection programme is an essential element of preventive maintenance and of aerodrome internal quality assurance.

This AC covers facilities, equipment and activities that could impact directly on the safety of operations. It does not cover those such as rescue fire services or emergency plans that are in place to respond to incidents or accidents.

Under Part 139, aerodromes may be operated:

- (a) under an aerodrome operator certificate
- (b) under a **qualifying** ~~qualified~~ aerodrome operator certificate, or
- (c) as a non-certificated aerodrome.

The types of operations being conducted, and the size of aeroplanes using the aerodrome determine the level of certification required. Part 139 identifies specific aerodrome inspection programme requirements depending on the level of certification.

The underlying principles for an aerodrome inspection programme are the same for all levels of certification, but the specific requirements under a **qualifying** ~~qualified~~ aerodrome operator certificate or a non-certificated aerodrome are less than those under an aerodrome operator certificate. Throughout this AC the generic term “aerodrome operator” is used unless it is necessary to refer to a particular type of operator.

This AC suggests components and items for continuous, regular, **and** periodic ~~and special~~ inspections and evaluations for use during these inspections and for aerodrome condition reporting. **All routine aerodrome condition reporting for publication to pilots is intended to conform with the ICAO (GRF)¹.**

At an uncontrolled aerodrome, where a routine runway condition must be produced on completion of a runway inspection, but is not required to be reported on for the purposes of aeroplane take-off and landing performance assessment, the aerodrome operator must at the same time be promulgating in the AIP the status “Runway condition not monitored”.

This AC is written **to meet** ~~around~~ the requirements for holders of an aerodrome **operator** ~~operation~~ certificate; however, this guidance can be modified to meet the less stringent

¹ CAA will determine and announce the date by which reporting needs to conform with the GRF, once Amendment 15 of part 139 has been published, in conjunction with other relevant rule parts.

requirements of qualifying or non-certificated aerodromes, of the lower levels of certification or to meet local situations.

The information in this AC is intended to explain provide an explanation of the requirements for (and the guiding philosophy behind) an aerodrome inspection programme. It provides the basis by which aerodrome operators can develop their own aerodrome inspection programmes. In updating this AC, the aim is that advice and tips on what to look out for when inspecting aerodromes will be of general use to all aerodrome operators.

ABBREVIATIONS

While some abbreviations used in this AC are standard abbreviations from Rule Part 1, *Definitions and Abbreviations*, they have been listed here for convenience.

AC	Advisory Circular
AIS	Aeronautical Information Service
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
ATS	Air Traffic Services
CAA	Civil Aviation Authority of New Zealand
EOL	Effective operational lengths
FOD	Foreign Object Debris
GRF	Global Reporting Format
IFIS	Internet Flight Information Service
mm	millimetres
MOWP	Method of Work Programme
NOTAM	Notice to Airmen
RCAM	Runway Condition Assessment Matrix
RWYCC	Runway Condition Code
REIL	Runway end indicator lights
RCR	Runway Condition Report
VASI	Visual Approach Slope Indicator

DEFINITIONS

The following definitions are provided to clarify how they are used in this AC:

Civil evening twilight The brightest of the three twilight phases, that is, the time between day and night when there is light outside, but the Sun is below the horizon. In civil evening twilight, the sun is just below the horizon, so there is generally enough natural light to carry out most outdoor activities.

Conservative The term “conservative” is not defined in ICAO Circular 355, but a close reading suggests that what is meant is a conservative assumption, that is, an estimate that tends to err on the side of caution and to a worst case, instead of a best case, scenario.

Controlled The same meaning as “attended” when referring to an aerodrome, that is, an aerodrome with ATC. For the purposes of this AC, the term “controlled” will be used for conciseness.

Director Director of the CAA.

Downgrade A decision to change any aspect of an RWYCC, to one less favourable, to reflect any changes in any relevant conditions, for example changes to weather conditions or runway surface conditions.

Issue The process of promulgating the information in an RCR, also known as to “disseminate”. For the purposes of this AC, the term “issue” will be used instead of “disseminate”.

Inspection A planned programme consisting of specific observations of aerodrome physical facilities including runways and taxiways, at a frequency determined by the aerodrome operator. Note that some areas delegated to “Special Inspections” in the previous revision of this AC, have now been included in areas to cover as part of Regular Inspections, in Section 3.

Maintenance Work done to maintain the conditions of an aerodrome, either as part of routine work programme or following issues that have been discovered as a result of inspections.

Monitoring Keeping an eye on aerodrome and other conditions, as part of normal work routines, as opposed to regular inspections, as part of continuous surveillance activities.

Paved In relation to a runway or other ground area, sealed or paved with asphalt or tarmac, as opposed to a grass or dirt runway.

Produce Collection of data and information that is organised to produce an RCR, whether issued or not. For the purposes of this AC, the term “produce” will be used instead of “collect”.

Reporting Issue of (also known as dissemination of) RCRs for use by pilots and other flight crew, either in the GRF, or another method that has been found acceptable by the Director.

Uncontrolled The same meaning as “unattended” when referring to an aerodrome, that is, an aerodrome with no ATC provided. For the purposes of this AC, the term “uncontrolled” will be used for conciseness.

Upgrade A decision to change any aspect of an RWYCC, to one more favourable, to reflect any changes in any relevant conditions, for example changes to weather conditions or runway surface conditions.

1. AERODROME INSPECTION OVERVIEW

1.1 Introduction

1.1.1 Aerodromes operating under an aerodrome operator certificate must have a documented aerodrome inspection programme, including regular runway and taxiway inspections, and reporting that follows the format required for the completion of RCRs. Part 139 sets out the requirements for all certificated (and controlled) aerodrome operators to monitor and publish RCRs and for all uncontrolled aerodrome operators to monitor the condition of their aerodrome and produce RCRs. A standardised method of assessing and reporting on runway conditions should be used, that is based on ICAO Circular 355, as outlined in this AC. For all aerodromes, any issues uncovered by inspections need to be followed up as part of a maintenance programme.

1.1.1.1 The holder of a qualifying aerodrome operator certificate may be required at initial certification, or by a determination made by the Director following an aeronautical study, to have an aerodrome inspection programme. A determination requiring an aerodrome inspection programme will specify all matters to be included in it, and these will be based on the requirements for certificated aerodromes. These requirements will be no more onerous than those for holders of an aerodrome operator certificate.

1.1.1.2 Non-certificated aerodromes are required have certain requirements to establish procedures to ensure aircraft movements are restricted or prohibited on parts of the aerodrome, where an unsafe condition exists. An aerodrome inspection programme may be needed as part of these procedures.

1.1.2 Routine RCRs should follow the GRF. Even if aerodromes they are not directly required have an aerodrome inspection programme to issue RCRs to aircraft (and have declared this intention in the AIP) they still need to ensure that their aerodrome is free from unsafe conditions. Therefore, it is recommended that qualifying aerodrome operator certificate holders, and non-certificated aerodrome operators, consider the relevance and applicability of all guidance in this AC to their aerodrome and adopt adapt it as necessary.

1.2 Responsibility

1.2.1 Part 139 refers to requirements the applicant must meet before a certificate is issued. This AC may refer reference may be made to the certificate holder, not the applicant as stated in the rule, because the holder must continue to comply with the same requirements that were met before the certificate was issued.

1.2.2 All matters are applicable to holders of an aerodrome operator certificate, but only those specifically included in a determination made by the Director are applicable for holders of a qualifying aerodrome operator certificate. The rules references are those applicable for aerodrome operator certificate holders.

1.2.3 Aerodrome inspection is a responsibility of the aerodrome operator. Primary attention should be given to such operational items as:

- pavement areas
- safety areas
- markings and signs
- lighting
- fuelling operations

- navigational aids
- ground vehicles
- obstructions
- public protection
- wildlife hazard management, and/or
- construction.

1.2.4 The responsibility for inspection of all or some of the aerodrome areas may be assigned to tenants or organisations, with whom which the aerodrome operator has a written agreement, but with the aerodrome operator retaining overall inspection supervision. The aerodrome operator cannot delegate responsibility for operating the aerodrome safely.

1.3 Components of an aerodrome inspection programme

1.3.1 An effective aerodrome inspection programme will, for all facilities and equipment on the aerodrome, have:

- (a) Established performance standards, including standards for operational area surfaces, paint markings etc., as well as equipment such as lights, signs, etc.
- (b) Identified environmental or other factors that could adversely affect these performance standards.
- (c) Pre-agreed assessments for Determined how quickly or slowly changes that could affect performance might take place.
- (d) An inspection regime to monitor and record ongoing performance and to identify any change or deterioration in performance before operational safety is compromised.
- (e) Timely and effective procedures to:
 - (i) notify aerodrome users of any operational limitations resulting from a deficiency, and
 - (ii) correct any deficiencies found.

1.3.2 Typically an aerodrome inspection programme has:

- (a) **continuous surveillance** of certain aerodrome activities, for example, vehicles on operational areas, passengers on the apron, fuelling operations, wildlife, construction and debris
- (b) **regular inspections** (as part of the RCR requirements) of physical facilities, for example, paved and unpaved movement areas, runway and taxiway strips, markings and signs, and lighting, to provide RCRs that may be relied upon by pilots:
 - (i) for the purposes of assessing aeroplane performance, or
 - (ii) after maintenance activity on the manoeuvring area, or
 - (iii) following an incident or accident, and

- (c) **periodic condition evaluations** for such things as rubber build-up on runways, runway surface friction, markings and signs, visual aids, obstructions infringing approach slopes, and visual aids, and
- (d) ~~special inspections during unusual conditions or situations such as inclement weather after maintenance activity on the manoeuvring area, or following an incident or accident, and~~
- (e) **flight checking** of visual aids to navigation and approach lighting.

1.3.3 The aerodrome inspection programme requirements discussed in this AC are outlined below in Table 1.

Table 1 Aerodrome inspection programme requirements

Requirement	Continuous Surveillance Section 2	Regular Inspection Section 3	Special Inspections Section 4	Periodic Condition Evaluation Section 5	Flight Checking of Visual Aids Section 6
Frequency of inspections / evaluations	2.1	3.2		5.2	6.2
Ground vehicles	2.2				
Paved movement areas		3.3			
Unpaved movement areas		3.4			
Runway and taxiway strips and safety areas		3.5			
Pavement surface conditions				5.3	
Heavy Precipitation and contamination of the runway		3.13	4.2		
Markings and signs		3.6.1		5.4	
Lighting		3.6.2		5.5	
Visual aids to navigation		3.6.3		5.6	
Flight checking criteria					6.3
Obstacles and obstructions		3.7		5.7	
Construction and maintenance	2.3	3.8	4.3		
Public protection	2.4	3.9			
Wildlife hazard management	2.5	3.10			
Potential problems	2.6	3.11			

Inspections prompted by events such as braking issues		3.12			
Operator reports		3.16	4.4		
Incidents and accidents		3.17	4.5		

1.4 Inspection frequency

1.4.1 The frequency of inspections should be determined by identifying factors areas critical to the ongoing safety of aircraft operations, taking into account factors including the:

- frequency of operations
- duration of operations
- types of aircraft served
- the aerodrome environment
- complexity of the facilities, and
- size of the aerodrome.

1.4.2 The reasons for establishing the frequency of inspections should be documented and submitted to support the contents sections of the exposition that address the certificate holder's safety inspection programme.

1.4.3 Further information on establishing the frequency of each inspection/evaluation type is given at the beginning of sections 2 to section 6 of this AC.

1.5 Inspection checklist

1.5.1 For even the smallest aerodrome, it is desirable to use an aerodrome inspection checklist which:

- (a) provides a record of all items inspected, and
- (b) can be used as a check that follow-up actions have been taken.

1.5.2 While the format of checklists may vary, it is important to develop one a checklist that is relevant to the aerodrome and its operation. The checklist format needs to clearly record the status or condition of every inspected item.

1.5.3 When preparing a checklist, the relevant requirements of Part 139, including all appendices, should be reviewed to ensure all applicable requirements have been identified.

1.5.4 For consistent interpretation of requirements, a checklist can include the standard, or a reference to the standard.

1.5.5 A checklist should identify the type of inspection, who carried it out, the date (and time if necessary), and the result for every item checked (pass or fail) with comments if needed. Following completion of After the inspection has been completed, the checklist should be signed to confirm it has been carried out in accordance with procedures. The use of electronic checklists with the results and deficiencies stored on an electronic database is acceptable.

1.5.6 If certain inspectors will be responsible for only certain items, separate checklists pertinent to those areas may be developed. If necessary, a sketch of the aerodrome should accompany the checklist to record the location of any problem.

1.5.7 Deficiencies found during an inspection should be recorded, with sufficient detail to ensure appropriate remedial action can be taken. It is suggested that photographs are used to support and clarify the nature of the deficiency.

1.5.8 A typical checklist should contain, at a minimum, the following information in the following example:

Figure 1 Example of an inspection checklist

EXAMPLE AERODROME		
Regular Inspection Checklist		
Inspection date: 18 July 2015		Inspector: A.B.C Smith
ITEM	Result	Location, Comments
3.3 Paved movement areas		
(a) Edges < 75mm lip	OK	
(b) Holes < 125 mm dia, < 75 mm deep < 45 degrees side slope (AC139-3, 3.3(b))	OK	Some damage on runway 125m from southern end, 2.3 m from eastern edge. Within spec. but needs repair
Comments: Large flock of seagulls on recently ploughed paddock east of 34 glidepath building		
I confirm this inspection has been carried out in accordance with procedures		Signed: A.B.C Smith

1.6 Corrective action

1.6.1 An effective aerodrome inspection programme requires a procedure for the reporting of deficiencies to the responsible person so that they can be corrected. The scheduled use of a dated **Going through a checklist at scheduled times and noting the date of inspections** checklist will ensure the regularity and thoroughness of safety inspections and follow-up of deficient items.

1.6.2 For any aerodrome condition or defect which could have an immediate and critical impact on the safety of aircraft operations, the aerodrome operator should inform the staff at the stationed ATS unit and notify the ~~Aeronautical Information Service (AIS)~~ for the issue of a NOTAM as soon as practicable. When corrective action has been taken, the NOTAM is to be cancelled. Section 7 of this AC provides the detailed requirements for aerodrome condition notification.

1.7 Inspection personnel

1.7.1 The holder of an aerodrome operator certificate, or a qualifying aerodrome operator certificate, if required under their certification, must have procedures to ensure that personnel performing aerodrome inspections are appropriately trained, and to provide ongoing assessment and assurance that personnel are continuing to maintain their competence. ~~The procedures need to assess and maintain the competence of these personnel. They need to~~ Personnel must:

- (a) for those facilities and equipment that they are inspecting, know:
 - (i) their location and types, and
 - (ii) the applicable inspection standards.

Note: For RCRs the applicable standard is the ICAO Circular 355 as reflected in this AC, or as accepted by the Director. While all aerodromes have to produce RCRs in the GRF, the way they report it can be different, as long as the method has been found to be acceptable to the Director. For example, some operators of non-certificated operators may pass the information to aircraft in different ways, such as a phone call.

- (b) be familiar with, and follow the established procedures for carrying out inspection on an operational aerodrome, including correct radio communication procedures and techniques
- (c) be familiar with any identified deficiencies found during previous inspections and which are not yet rectified
- (d) if construction is in process, be familiar with the method of work plan (MOWP) and safety plan for the project, and
- (e) be familiar with the aerodrome certification exposition requirements for aerodrome inspections.

1.8 Inspection equipment

1.8.1 Personnel conducting aerodrome inspections should:

- (a) be provided with a two-way radio for:
 - (i) communications with the air traffic services (ATS) unit, if provided for the aerodrome, and
 - (ii) notifying intentions and monitoring the uncontrolled unattended radio frequency used at the aerodrome, and
- (b) have a vehicle equipped with a flashing or rotating beacon or a chequered flag for day-time inspections, or a flashing or rotating beacon for night-time inspections, and
- (c) be supplied with checklists covering the various inspection areas.

1.9 Foreign object debris (FOD)

1.9.1 Foreign object debris (FOD) is fragments of loose material (such as sand, stone, paper, wood, metal and fragments of pavements) that:

- (a) are detrimental to aeroplane structures or engines, or that

- (b) might impair the operation of aeroplane systems if they strike the structure or are ingested into engines.

Damage caused by debris is also known as foreign object damage.

1.9.2 A program to control airport FOD should be adopted **and for maximum effectiveness should address four** ~~is most effective when it addresses 4~~ main areas:

- (a) Training of all personnel to include the identification and elimination of FOD.
- (b) Inspection of areas by airline, airport, and airplane handling agency personnel.
- (c) Maintenance of areas to include manual or mechanical sweeping. The areas in which ground support equipment (GSE) is staged should be swept periodically.
- (d) Coordination of landside and airside activities to control and contain generation of FOD.

2. CONTINUOUS SURVEILLANCE

2.1 Introduction

2.1.1 Continuous surveillance depends on the alertness of aerodrome personnel whenever they are on the aerodrome operational area. All aerodrome personnel should, as part of the induction process, and periodically thereafter, be encouraged to actively monitor and report any defects observed or raise concerns that they may have regarding operational activities. Continuous surveillance of aerodrome physical facilities and activities should cover at least the areas described in this section.

2.1.2 Continuous surveillance is in addition to the regular inspections covered in Section 3, for monitoring the runway condition to provide RCRs that may be relied upon by pilots for assessing aeroplane performance, and for publishing or communicating RCRs when required. It is useful, however, for all aerodrome personnel to be aware of areas covered in regular inspections, to make them more aware of potential areas of concern.

2.2 Ground vehicles

2.2.1 Check procedures for the orderly operation of ground vehicles (including grass mowing machines) are being followed.

2.3 Construction and maintenance

2.3.1 Check for:

- (a) unauthorised use of runways, taxiways, and aprons by construction or maintenance personnel and equipment
- (b) potential runway incursions or other irregularities
- (c) compliance with the ~~method of work plans (MOWPs)~~ and safety plans for all construction or maintenance projects
- (d) containment of all debris
- (e) protection of navigation aids by exclusion of construction or maintenance equipment from critical areas, and
- (f) protection of the approach and take off flight paths immediately outside of the airport boundary, for installations or equipment that may impede normal safe operation.

2.4 Public protection

2.4.1 Check that:

- (a) there are no unauthorised persons, unsupervised passengers, vehicles or animals in operational areas
- (b) measures to protect persons and property from aircraft propeller wash or jet blast are implemented and effective
- (c) barriers and gates are serviceable and secure
- (d) emergency access for rescue and firefighting vehicles or other emergency services is not obstructed, and

- (e) designated points of emergency egress are not obstructed.

2.5 Wildlife hazard management

2.5.1 Check for any:

- (a) birds or animals on or adjacent to the runways, taxiways and aprons that could present a hazard to aircraft
- (b) unusual activity or change in numbers of birds, and
- (c) activity on or adjacent to the aerodrome that could attract birds to create a hazard.

2.6 Potential problems

2.6.1 Note any other issues, to include security of airfield buildings and airfield perimeter, which, if not dealt with, might affect the safe or efficient operation of the aerodrome.

3. REGULAR INSPECTIONS

3.1 Introduction

3.1.1 The Regular inspection consists of specific observations of aerodrome physical facilities at a frequency determined by the aerodrome operator.

3.1.2 It is important that whenever deficiencies that could affect the safety of aircraft operations are identified, aircraft operators are advised. Section 7 of this advisory circular AC provides information on these requirements.

3.2 Frequency of inspections

3.2.1 At a minimum, regular inspections should be carried out daily before the start of flight operations, with a second inspection at civil evening twilight if further aircraft operations are expected. Please refer to rule 139.107 (c) and (e) for rules covering RCR requirements for controlled and uncontrolled aerodromes before the start of an air transport operation carried out under Part 121.

3.2.2 If analysis of inspection reports identifies areas that require more frequent inspections, the inspection programme should be adjusted accordingly.

3.3 Paved movement areas

3.3.1 The condition of pavement surfaces is an important part of aerodrome safety, so and pavement inspections should be carried out to ensure all pavement surfaces are clear and have no defects that could present a hazard to aircraft. At a minimum the inspection should check:

- (a) pavement edges to assure that they are the minimum necessary to allow water to drain off the pavement. A lip height no greater than 25 mm to 35 mm is usually sufficient to allow proper drainage. Any edge of 75 mm or more is a hazard to aircraft
- (b) for any holes - a hole greater than 125 mm in diameter and 75 mm in depth with a side slope of 45 degrees or greater, is a hazard to aircraft
- (c) the condition of pavement areas for scaling, spalling, bumps, low spots, and for debris that could cause damage to aircraft
- (d) for any surface cracking
- (e) for vegetation growth along runway and taxiway edges that could impede drainage from the pavement surface or slowly break up the paved surface, and
- (f) for vegetation growth in cracks.

3.3.2 All results should be recorded on the aerodrome inspection checklist.

3.4 Unpaved movement areas

3.4.1 The condition of these surfaces is as important as paved surfaces, so and they should be inspected with the same thoroughness as those areas. At a minimum the inspection should check:

- (a) for ruts, depressions, humps or variations from the normal smooth surfaces that could present a hazard to aircraft
- (b) for holes that could cause directional control problems for aircraft

- (c) for debris and other foreign objects
- (d) the condition of grass surfaces, and that the height of the grass is not excessive, and
- (e) for vegetation growth along the edges that could impede drainage from the movement areas.

3.4.2 All results should be recorded on the aerodrome inspection checklist.

3.5 Runway and taxiway strips and safety areas

3.5.1 These surfaces should be inspected to the same level of thoroughness as other areas. At a minimum the inspection should check **that**:

- (a) there are no ruts, depressions, humps or variations from the normal smooth surface that could present a hazard to aircraft
- (b) there are no objects in these areas, except those that must be located there because of their function (for example, runway lights, signs, or navigation aids)
- (c) the base for any equipment is at the same level as the surrounding safety area
- (d) the ground has not been eroded from around light bases, manhole covers, or other fittings that should be flush with the surface, and
- (e) there is no damage that may have been caused by animals.

3.5.2 All results should be recorded on the aerodrome inspection checklist.

3.6 Markings and signs, lighting, and visual aids to navigation

3.6.1 Some aerodrome facilities may fit into more than one grouping under paragraph 3.6. ~~The following simplistic approach has therefore been taken—~~ **It is recommended that the facilities listed below are grouped in the following way:**

- (a) **Markings and signs** includes painted pavement markings and signage that provides direction pilots using the aerodrome.
- (b) **Lighting** includes runway and taxiway lighting, obstruction lighting, and any other lighting such as apron floodlighting found in the operational areas.
- (c) **Visual aids to navigation** include the wind direction indicator, the aerodrome beacon, and specialised lighting systems such as VASI and REIL.

3.6.2 When developing the inspection programme, particular facilities should be included where it works best for the aerodrome operator. ~~What is~~ **The most important consideration is** that all facilities and equipment are included.

3.6.3 Markings and signs: Markings and signs provide important information to pilots during take-off, landing and taxiing. A regular aerodrome inspection should check, at a minimum:

- (a) all painted pavement markings for correct colour, blistering, chipping, fading, or obscurity due to rubber build-up
- (b) all markers are correctly positioned and in good condition, and
- (c) that signs:

- (i) have the correct inscription, orientation and colour
 - (ii) are easy to read, secure, and in good condition
 - (iii) are frangible mounted if within the strip areas
 - (iv) are free of vegetation growth that would impede sign visibility, and
- (d) that no signs or markers are missing.

3.6.4 All results should be recorded on the aerodrome inspection checklist.

3.6.5 Lighting: At night and during periods of low visibility, lighting is important for safe aerodrome operations. Lights come in different shapes, sizes, colours, and configurations and can be flush mounted or elevated. At a minimum, the inspection should check:

- (a) all lights are working, and their optical systems are not obscured by vegetation or deposits of foreign material
- (b) no lights have broken lenses or other damage, and no fixtures are missing
- (c) runway, taxiway and runway threshold lights are the correct colour and are oriented correctly, and
- (d) lighting on-off and intensity controls are working correctly, including ~~This should include~~ any remotely operated, manual or automatic system for controlling the lighting.

3.6.6 All results should be recorded on the checklist and referenced against allowable outages detailed in the aerodromes local operating procedures.

3.6.7 Visual aids to navigation: The inspection should concentrate on the visual navigational aids and check:

- (a) the wind direction indicator (windsock) area is clear of vegetation and that it can be easily seen
- (b) the wind direction indicator is secure and in good condition, its supporting mast is upright, the indicator can move freely and, if lighted, the lights operate
- (c) the aerodrome beacon, if provided, is visible and working properly
- (d) the ~~runway end identifier lights (REIL)~~ are flashing, and not obscured to approaching aircraft, and
- (e) visual glide slope indicators (VASIS, PAPI), to ensure that their lights are working, not obscured to an approaching aircraft, and that the mountings have not been damaged or disturbed.

3.6.8 All results should be recorded on the checklist.

3.7 Obstructions

3.7.1 The inspection should concentrate on a visual check of any construction underway on or near the aerodrome that could affect aircraft operations. In particular, check:

- (a) for new or unreported obstructions such as cranes, masts, advertising hoardings, balloons, etc. that could intrude into the aerodrome obstacle free surfaces, and
- (b) that obstructions are properly marked and lit.

3.7.2 All results should be recorded on the checklist.

3.8 Construction and maintenance

3.8.1 The inspection should focus on construction or maintenance activities on the aerodrome to ensure that a high level of safety for aircraft operations is maintained. In particular, check:

- (a) construction or maintenance materials are properly stored or stockpiled to prevent them being moved by wind, jet blast, or propeller wash
- (b) construction or maintenance activities adjacent to movement areas are identified with conspicuous marking and lighting
- (c) heavy construction or maintenance equipment (such as bulldozers and cranes) are marked, lighted, and parked clear of the runway and taxiway strips and any safety areas
- (d) stockpiles and stored equipment are not left in a position that would infringe the obstacle free surfaces, and
- (e) construction and maintenance areas are managed to ensure all debris or foreign objects is contained within the work site.

3.8.2 All results should be recorded on the checklist.

3.9 Public protection

3.9.1 As part of the inspection, ~~should~~ check:

- (a) safeguards for preventing inadvertent entry of animals to the movement area
- (b) barriers for preventing unauthorised entry of persons and vehicles to the aerodrome operational area
- (c) proper operation of gates and doors with secured or controlled access, and
- (d) protection of persons and property from aircraft blast.

3.9.2 All results should be recorded on the checklist.

3.10 Wildlife hazard management

3.10.1 The inspection should check for any:

- (a) birds or animals on or adjacent to operational areas that could present a hazard to aircraft
- (b) unusual activity or change in numbers of birds, and
- (c) activity on or adjacent to the aerodrome that could attract birds to create a hazard.

3.10.2 All results should be recorded on the aerodrome inspection checklist.

3.11 Potential problems

3.11.1 Note on the aerodrome inspection checklist or other means, any other issues to include security of airfield buildings and airfield perimeter which, if not dealt with, might affect the safe or efficient operation of the aerodrome.

3.12 Inspections prompted by events such as braking issues

3.12.1 Aerodrome inspections should also occur after an unusual condition or event, after receipt of a complaint (for example, substandard braking action), or an accident or incident.

3.12.2 Depending upon circumstances, inspections can include any or all of components of regular inspections, periodic condition evaluations, or flight checking of visual aids.

3.12.3 Where an RCR is to be published or communicated for use by a pilot, the assessment and report format should conform with Appendix A of this AC.

3.13 Precipitation and contamination of the runway

3.13.1 Runway surface contamination is an ICAO-defined runway state. It is considered worse than wet/ice/snow and defined as a situation where more than 25% of the runway surface area within the required length and width is covered by surface water, slush, or loose snow more than 3 mm in depth, or ice on any part of the runway surface area.

3.13.2 Runway surface contamination and issues with any movement areas, must be notified immediately (via the local ATS unit if provided) to arriving and departing aircraft, and the AIS for the issue of a NOTAM, and any other parties identified in the aerodrome operator's procedures where an RCR may be relied upon by pilots for purposes of assessing aeroplane performance in accordance with Appendix A.

3.13.3 In the event of contaminants (for example standing water or ice) on the runway, an RCR should be completed in accordance with Appendix A.

3.14 Water on other areas than the runway

3.14.1 Other areas should be checked for ongoing serviceability:

(i) **Unpaved movement areas.** Check for ponding, and any surface softness which might affect the bearing strength and braking.

(ii) **Runway and taxiway strips and safety areas:**

○ check storm water system to verify that inlets are not clogged, and drainage channels are free of debris

○ note any standing water, and

○ ensure all drain covers are in place and flush with the surface.

3.15 Construction and maintenance

3.15.1 After maintenance or construction, the aerodrome should be inspected to confirm:

(a) any operational area has been restored to fully operational condition before reopening

(b) all pavement markings are correct and that any unserviceable markers in place during the work have been removed

- (c) no hazardous conditions have been created (equipment left in safety areas, unacceptable pavement edges created by ground alteration work, ruts from equipment), and
- (d) no damage has been done to other equipment or facilities in the vicinity of the work.

3.16 Aircraft operator reports

3.16.1 Following aircraft operator reports of unsatisfactory equipment or facility performance it may be necessary to inspect the aerodrome. Pilot reports of runway braking action should be recorded and assessed as part of the procedures addressed in Appendix A of this AC. The circumstances of aircraft operator reports will vary with each report, as will the action taken, but the following options should be considered:

- (a) a pilot report on runway braking action being processed in accordance with Appendix A
- (b) the equipment or facility being immediately removed from service until an inspection verifies it can safely be returned to service
- (c) an inspection being done to determine if removal from service is necessary, and
- (d) the information reported identifying an issue that does not affect the safety of operations, and no immediate follow-up being needed to maintain operations.

3.16.2 The inspection should use relevant parts of the regular inspection and periodic condition evaluation checklists, supplemented by additional items as necessary.

3.17 Incidents and accidents

3.17.1 There are mandatory requirements for occurrence investigation, and for reporting certain incidents and all accidents to the CAA under Part 12. These requirements are summarised in:

- AC12-1, *Mandatory Occurrence Notification and Information*², and
- AC12-2, *Occurrence investigation*.

3.17.2 Following an incident or accident involving an aircraft, it may be necessary to carry out an aerodrome inspection if there is any suggestion that aerodrome equipment or facilities caused or contributed to the incident or accident. The circumstances will vary as will the action taken, but typically:

- (a) the equipment or facility would need to be immediately removed from service until an inspection verifies it can safely be returned to service, and
- (b) a special inspection would need to be done to determine if permanent removal from service is necessary.

3.17.3 The inspection should use relevant parts of the regular inspection and periodic condition evaluation checklists, supplemented by additional items as necessary.

3.17.4 In particular, any time an aircraft has left the pavement and entered a strip or safety area, check to ensure that no ruts or holes have been made by the aircraft tires or personnel and equipment during the recovery operation.

² A full list of aerodrome incidents is contained in Appendix A of that AC.

4. SPECIAL INSPECTIONS INCORPORATED INTO REGULAR INSPECTIONS

Since the last Revision of this AC, relevant parts of the Special Inspections covered in Section 4 have been incorporated into Section 3, Routine Inspections.

4.1 Introduction

4.1.1—Special aerodrome inspections should occur after an unusual condition or event, after receipt of a complaint (for example, substandard braking action), or an accident or incident.

4.1.2—Depending upon circumstances, special inspections can include any or all of components of regular inspections, periodic condition evaluations, or flight checking of visual aids.

4.2 Heavy precipitation

4.2.1—Runway surface contamination, and issues with any movement areas, must be notified immediately (via the local air traffic services unit if provided) to arriving and departing aircraft, and the AIS for the issue of a NOTAM.

4.2.2—After heavy precipitation an inspection should be made to assess the runway surface contamination.

~~(b) **Water on a runway.** Whenever water is present on a runway, a description of the runway surface conditions on the centre half of the width of the runway, including the possible assessment of water depth, where applicable, should be made available using the following terms—~~

~~(i) **DAMP**—the surface shows a change of colour due to moisture.~~

~~(ii) **WET**—the surface is soaked but there is no standing water.~~

~~(iii) **STANDING WATER**—more than 25% of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by water more than 3 mm deep.~~

~~(c) **Snow, slush or ice on a runway.** Whenever a runway is affected by snow, slush or ice, and it has not been possible to clear the precipitant fully, the condition of the runway should be assessed.~~

~~Whenever dry snow, wet snow or slush is present on a runway, an assessment of the mean depth over each third of the runway should be made to an accuracy of approximately 20 mm for dry snow, 10 mm for wet snow and 3 mm for slush.~~

~~(d) **Water on other areas.** Other areas should be checked for ongoing serviceability—~~

~~(i) **Unpaved movement areas.** Check for ponding, and any surface softness which might affect the bearing strength and braking.~~

~~(ii) **Runway and taxiway strips and safety areas—**~~

~~○ check storm water system to verify that inlets are not clogged and drainage channels are free of debris. Note any standing water; and~~

~~○ ensure all drain covers are in place and flush with the surface.~~

4.3 — Construction and maintenance

~~4.3.1 — After maintenance or construction a special aerodrome inspection should be made to confirm—~~

- ~~(e) any operational area has been restored to fully operational condition before reopening; and~~
- ~~(f) all pavement markings are correct and that any unserviceable markers in place during the work have been removed; and~~
- ~~(g) no hazardous conditions have been created (equipment left in safety areas, unacceptable pavement edges created by ground alteration work, ruts from equipment); and~~
- ~~(h) no damage has been done to other equipment or facilities in the vicinity of the work.~~

4.4 — Aircraft operator reports

~~4.4.1 — Following aircraft operator reports of unsatisfactory equipment or facility performance it may be necessary to carry out a special aerodrome inspection. The circumstances will vary with each report as will the action taken, but the following options should be considered:~~

- ~~(e) the equipment or facility is immediately removed from service until an inspection verifies it can safely be returned to service;~~
- ~~(f) a special inspection is done to determine if removal from service is necessary;~~
- ~~(g) the information reported identifies an issue that does not affect the safety of operations, and no immediate follow up is needed to maintain operations.~~

~~4.4.2 — The inspection should use relevant parts of the regular inspection and periodic condition evaluation checklists, supplemented by additional items as necessary.~~

4.5 — Incidents and accidents

~~4.5.1 — There are mandatory requirements for incident investigation, and for reporting certain incidents and all accidents to the CAA under Civil Aviation Rule Part 12. These requirements are summarised in—~~

- ~~• AC12-1 *Mandatory Occurrence Notification and Information*. A full list of aerodrome incidents is contained in Appendix A; and~~
- ~~• AC12-2 *Incident investigation*.~~

~~4.5.2 — Following an incident or accident involving an aircraft it may be necessary to carry out a special aerodrome inspection if there is any suggestion that aerodrome equipment or facilities were caused or contributed to the incident or accident. The circumstances will vary as will the action taken, but typically:~~

- ~~(c) the equipment or facility is immediately removed from service until an inspection verifies it can safely be returned to service;~~
- ~~(d) a special inspection is done to determine if permanent removal from service is necessary.~~

~~4.5.3 — The special inspection should use relevant parts of the regular inspection and periodic condition evaluation checklists, supplemented by additional items as necessary.~~

~~4.5.4~~—In particular, any time an aircraft has left the pavement and entered a strip or safety area, check to ensure that no ruts or holes have been made by the aircraft tires or personnel and equipment during the recovery operation.

5. PERIODIC CONDITION EVALUATION

5.1 Introduction

5.1.1 Periodic condition evaluations consist of specific aerodrome inspections on a regularly scheduled basis. These evaluations have the same goals as a long-term maintenance plan. They are engineering-focused, so they have an emphasis on areas like assessing the quality and smoothness of the tarmac, and determining any repairs or maintenance that is needed. Because of this focus, these inspections may require use of specialist equipment. They should cover at least the areas described in this section.

5.2 Frequency of evaluations

5.2.1 All facilities and equipment will, over time, slowly deteriorate until they reach a point where they will fail to meet their specified performance criteria. Restoring performance to an “as new” condition can require major (and often expensive) maintenance work which may take some time to complete.

5.2.2 A periodic condition evaluation programme will help to measure this deterioration so remedial work can be scheduled and completed before performance drops below the minimum performance requirements.

5.2.3 The frequency of periodic evaluation should be adjusted as necessary if analysis of evaluation reports, and regular inspection reports, shows deterioration is occurring at a slower or faster rate than was anticipated when the programme was established.

5.3 Pavement surface condition

5.3.1 The condition of all pavement surfaces should be evaluated periodically. At a minimum, and in addition to the items covered during regular inspections, the evaluation should confirm:

- (a) pavement meets current specifications
- (b) pavement, particularly in the touchdown zone areas, is not affected by rubber build-up
- (c) pavement has not deteriorated to a point where, without remedial work, it is likely it will be found defective during regular inspections before the next periodic condition evaluation, and
- (d) runway surface friction has been measured and meets specified standards.

5.3.2 Detailed information on the specific requirements and procedures to be used for determining and reporting the friction characteristics of runways are contained in AC139-13 *Aerodrome Maintenance: Runway Surface Friction Characteristics and Friction Testing*.

5.3.3 AC139-13 outlines the procedures for undertaking runway surface friction assessments and defines the criteria by which friction values should be assessed on runways, under specified conditions. These assessments are for maintenance purposes only. Surface contamination measurement is covered in section 4 of this AC139-13.

5.4 Markings and signs

5.4.1 A periodic condition evaluation of pavement markings and signs should be carried out to determine that they:

- (a) conform to current specifications

- (b) are clearly visible (if night operations take place, this evaluation should be carried out at night)
- (c) have not deteriorated to a point where, if remedial work is not undertaken, it is likely they will be found defective during regular inspections before the next periodic condition evaluation, and
- (d) are not affected by rubber build-up, particularly in the touchdown zone areas.

5.4.2 Detailed information on the specific requirements for marking and signs is contained in AC139-6 *Aerodrome Design Requirements*.

5.5 Lighting

5.5.1 In addition to the periodic inspection requirements, a periodic condition evaluation should confirm, at a minimum that:

- (a) lighting is positioned correctly and meets current standards
- (b) switching and intensity controls are working correctly
- (c) power supply reliability, including changeover to auxiliary power, if provided, meets specified changeover times with no effect on performance, and
- (d) all prescribed maintenance has been carried out.

5.6 Visual aids to navigation

5.6.1 A periodic condition evaluation must be carried out for all visual aids to navigation. This, at a minimum, should confirm:

- (a) accurate alignment of visual navigation aids
- (b) correct light emission
- (c) correct operation of control switching
- (d) power supply reliability, including changeover to auxiliary power, if provided, meets specified changeover times with no effect on performance, and
- (e) that all prescribed maintenance has been carried out.

5.6.2 The periodic condition evaluation of some visual aids to navigation requires a flight check to verify performance. This is covered in section 6 of this AC.

5.7 Obstacles

5.7.1 Obstacles need to be evaluated periodically to ensure significant obstructions, such as tree growth and new structures, etc. are identified, and that appropriate action is taken to minimise any hazard to aircraft operations that they may create. The period between checks should be determined by identifying the rate changes are likely to occur. This, At a minimum, this means: should confirm:

- (a) If the aerodrome is required to provide the AIS with data for the promulgation of aerodrome obstacle charts, the aerodrome must survey all take-off flight paths to confirm the accuracy of the data.

- (b) **The aerodrome must** survey the other aerodrome obstacle limitation surfaces established ~~for the aerodrome~~ for clearance from protruding obstacles.
- (c) If an obstruction is found to infringe an obstacle limitation surface, either:
 - (i) immediately remove the obstruction, **or**
 - (ii) notify the AIS with the corrected effective operational lengths (EOL) for promulgation in a NOTAM.
- (d) If the infringing obstruction is permanent, notify the AIS of the permanent EOL for promulgation in the AIP.

6. FLIGHT CHECKING OF VISUAL AIDS

6.1 Introduction

6.1.1 Flight checking of visual aids is carried out to confirm the accuracy of guidance provided, and to verify all lights required for the aerodrome are conspicuous from the air.

6.1.2 Flight checking is not intended to determine the serviceability of lights and visual aids. This is best done by the inspection and evaluation programmes covered in sections 2, 3 and 5 of this advisory circular AC. The need for ongoing flight checking can be minimised by the effective application of these programmes.

6.2 Specific flight checking

6.2.1 Visual aids to navigation include approach lighting, specialised lighting systems such as VASI and REIL, runway markings and lighting, the wind direction indicator, and the aerodrome beacon.

6.2.2 Visual aids and aerodrome lights, other than taxiway and apron lights, should be flight checked: in the following circumstances:

- (a) prior to commissioning into service
- (b) when any major component has been replaced with re-alignment or re-siting required
- (c) when any visual aid is re-sited, and
- (d) periodically, to confirm ongoing performance.

6.3 Flight checking criteria

6.3.1 The flight check should establish that all lights are clearly visible, and there must be no interference to visibility by any objects or other lights. The appearance of all lights must be in accordance with the standards specified. Where variable intensity lighting is provided levels should be checked.

6.3.2 Approach slope indicators should be flight checked to confirm that each aid provides accurate guidance within the tolerances prescribed for that aid.

6.3.3 All other visual aids should be flight checked to verify the appearance, uniformity, and intensities of the light.

7. AERODROME CONDITION NOTIFICATION

7.1 Introduction

7.1.1 The holder of an aerodrome operator certificate or qualifying aerodrome operator certificate is required to provide information on any conditions that might affect the safe operations of aircraft.

7.1.2 Information on the condition of the movement area and the operational status of related facilities should be notified to the AIS. The local ~~air traffic service~~ **ATS** unit should also be notified to enable them to provide the information to arriving and departing aircraft. The information must be kept up to date and changes in condition reported without delay.

7.2 Notice to Airmen (NOTAM)

7.2.1 The certificate holder or aerodrome operator must ensure that if an unsafe condition that cannot be immediately rectified is found:

- (a) appropriate NOTAM/s are issued, and
- (b) local aerodrome users are notified.

After providing the information to the AIS, the aerodrome operator should follow up to ensure the NOTAM/s were issued.

7.2.2 Once a NOTAM has been issued it is the responsibility of the aerodrome operator to monitor the reported condition and to either:

- (a) update the NOTAM information if necessary, or
- (b) cancel the NOTAM when the condition has been rectified.

7.3 Information

7.3.1 The information provided for the issue of NOTAM/s should be clear and precise and should contain:

- (a) type of unserviceability or unsafe condition
- (b) extent (area) of the unserviceability or condition, and
- (c) duration (expected length of time) the condition will remain.

7.3.2 It is important that the area in which the unserviceability or unsafe condition occurs is referred to correctly. Runways and runway strips should be referred to by the correct runway designator rather than the “long” or “main strip”. Similarly, the difference between the runways and runway strips should be recognised and the correct terminology used.

7.3.3 To comply with the rule, the aerodrome operator should provide information to the AIS for the issue of a NOTAM on any of the following aerodrome conditions which may affect the safe operations of aircraft:

- (a) establishment, closure or significant changes in the operation of the aerodrome or runways
- (b) establishment, withdrawal or significant changes made to visual aids

- (c) interruption of, or return to operation of major components of the aerodrome lighting systems
- (d) occurrence, or correction of major defects or impediments in the manoeuvring areas
- (e) changes to and limitations on availability of fuel, oil and oxygen (international aerodromes)
- (f) establishment, withdrawal or return to operation of hazard beacons marking significant obstacle to air navigation
- (g) erecting, removal of or changes to significant obstacles to air navigation in the take-off, climb, missed approach, approach areas, and runway strip
- (h) significant changes in the level of rescue and firefighting protection normally provided at the aerodrome
- (i) presence or removal of significant changes in hazardous conditions due to snow, slush, ice or water on the movement area, and/or
- (j) any other occurrence associated with the aerodrome which might be a hazard to the safety of aircraft operations.

8.SUPPORTING PUBLICATIONS

There are several publications available which address the elements of Aerodrome Inspection Programme and Condition Reporting. Below is a list of some including the publications listed below: which can be referred to, for further guidance material.

- *ICAO Annex 14 Volume 1 – Aerodromes*
- *Doc 9137 Airport Services Manual Part 2 – Pavement Surface Conditions*
- *Doc 9137 Airport Services Manual Part 8 – Airport Operational Services*
- *Doc 9137 Airport Services Manual Part 9 – Airport Maintenance Practices*
- *Doc 9157 Aerodrome Design Manual Part 1 – Runways*
- *Doc 9157 Aerodrome Design Manual Part 2 – Taxiways, Apron and Holding Bays*
- *Doc 9157 Aerodrome Design Manual Part 3 – Pavements*
- *Doc 9365 Manual of All-Weather Operations*
- *Doc 9981 PANS OPS Aerodromes*
- *ICAO Circular 355 Assessment, Measure and Reporting of Runway Surface Conditions*

APPENDIX A: RCRs – Assessment and Report Format

Note: Contaminants, such as volcanic ash, mud, and oil, that are not included the list of eight contaminants in paragraph 3.5 of this Appendix are outside the scope of this Appendix and should be reported to AIS and flight crews in the best way, depending on the contaminant and the circumstances, to ensure aircraft safety is not compromised.

1. Background Information

1.1. Aeroplane performance can be impacted whenever the coverage of any water-based contaminant on any runway third exceeds 25%. The intent of the assessment and reporting procedures is to communicate the runway surface conditions impacted by any remaining contamination to the aeroplane operators in a way consistent with the effect on aeroplane performance.

1.2. The intent of the RCR is to put into place a common language between all system users (or what ICAO terms “actors”), based on the impact of runway surface conditions on aeroplane performance. ICAO also stipulates that all members of the information chain, from data origin to end users, need to have been given proper training. To meet this requirement, aerodrome operators need to ensure that everyone involved at each step of the process is given proper training on reporting procedures and maintains their competency.

1.3. It is important for aerodrome personnel to make the best attempt to accurately report runway surface conditions, rather than seeking a systematically “conservative”³ assessment (for example an estimate that builds in a margin of error) or trying to do their own risk assessment. Aerodrome personnel should not be evaluating or assessing risk: they should only be reporting on runway surface conditions. Aerodromes need to provide appropriate training to aerodrome personnel to enable accurate reporting of runway surface condition.

1.4. By contrast, it is the role of flight crews to evaluate the information from aerodromes to decide the worst runway surface conditions that would be acceptable for the intended operation. This is an additional safeguard against lack of conservatism, that is, relying on over-optimistic assessments. Conservatism is recommended in the judgement of observations versus criteria such as 3 mm depth or 25% coverage, but not for the RWYCC. A conservative assessment is different from a “downgrade”⁴, that is, a changed assessment motivated by other observations or local knowledge.

1.5. Aircraft manufacturers have determined that variances in contaminant type, depth and air temperature cause specific changes in aircraft braking performance. As a result, it has been possible to take the aircraft manufacturers’ data for specific contaminants and produce the Runway Condition Assessment Matrix (RCAM) for use by aerodrome operators. When the runway condition is being monitored by the aerodrome operator, the RCR can be used by pilots to undertake an assessment of aeroplane performance at various stages of the flight (from flight planning to cockpit preparation for departure; in-flight replanning; and approach preparation).

³ Please see the Definitions section for how this term is used in this AC.

⁴ As above.

1.6. Aerodrome personnel monitoring and reporting the runway surface conditions must focus on identifying and reporting any significant changes whenever they occur. A significant change is any change that requires the RCR to be updated with any new information.

1.7. The flight crew's ability to receive the RCR in the various phases of flight is dependent upon the technology made available to them and consequently, will vary between aeroplane operators. The procedures for aerodrome operators providing RCRs intended to support aeroplane performance, whether a manual observation or automated measuring system, may need to incorporate specific additional communication arrangements with aircraft operators that intend using take-off and landing performance assessment (in addition to reporting RCRs to the ATS provider where present, and via NOTAM and ATIS or local communication direct to pilots). In all cases, however, it is important that flight crew know how current an RCR is.

2. RCR scenarios

2.1. Aerodrome operators can elect to adopt one of two reporting formats in their procedures, depending on whether the aerodrome is one that:

- (a) is not exposed to snow or ice which therefore has no need to use the full GRF other than for water, or
- (b) will be fully prepared to use the GRF (fully equipped, fully trained for all contaminant types).

2.2. This two-level solution allowed in New Zealand will mean that each aerodrome operator can choose a set of provisions that suits its needs.

3. Report concept defined

3.1. The following terms are used to define the fundamental, conceptual part of the report and assessment of the runway surface conditions methodology.

3.2. There are five fundamental elements:

- (a) RCR
- (b) RCAM
- (c) RWYCC
- (d) runway surface conditions, and
- (e) runway surface condition descriptors.

3.3. There are four runway surface conditions:

- (a) dry runway
- (b) wet runway
- (c) slippery wet, and
- (d) contaminated runway.

3.4. Due to the challenges of reporting fluctuations between damp and wet runway conditions in a timely manner, any water film up to 3 mm in depth is reported as “WET” for the purposes of performance calculation.

3.5. There are eight contaminated runway surface condition descriptors:

- (a) compacted snow
- (b) dry snow
- (c) frost
- (d) ice
- (e) slush
- (f) standing water
- (g) wet ice, and
- (h) wet snow.

4. Runway Condition Assessment Matrix (RCAM)

Runway Condition Code - RWYCC	Assessment of Runway Surface Condition	Pilot report of aeroplane deceleration or directional control	Pilot report of runway braking action
6	DRY	---	---
5	FROST WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth) SLUSH (Up to & inc 3 mm depth) DRY SNOW (Up to & inc 3 mm depth) WET SNOW (Up to & inc 3 mm depth)	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	-15°C and lower outside air temperature ¹ : COMPACTED SNOW	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	WET (“slippery wet” runway) DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM

	<p>DRY SNOW (More than 3 mm depth)</p> <p>WET SNOW (More than 3 mm depth)</p> <p>Higher than -15°C outside air temperature¹:</p> <p>COMPACTED SNOW</p>		
2	<p>STANDING WATER (More than 3 mm depth)</p> <p>SLUSH (More than 3 mm depth)</p>	Braking deceleration OR directional control is between Medium and Poor	MEDIUM TO POOR
1	ICE ²	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	<p>WET ICE²</p> <p>WATER ON TOP OF COMPACTED SNOW²</p> <p>DRY SNOW or WET SNOW ON TOP OF ICE²</p>	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

Note 1: Runway surface temperature should preferably be used where available.

Note 2: The aerodrome operator may assign a higher RWYCC (but no higher than RWYCC 3) for each third of the runway, provided the procedure in PANS-Aerodromes (Doc 9981), 1.1.3.15, is followed.

5. Runway condition assessment and measurement

5.1. For all aerodromes:

- (a) Assessment can be made by visual observations or by the use of an automated system of sensing and report compilation. Aerodrome personnel need to use their training, best judgement and experience to determine an RWYCC that best reflects the prevailing situation.
- (b) In the data-gathering process, almost all runway information can typically be gathered from visual observations.
- (c) If data or information is gathered from measuring devices or instruments, they must be calibrated and operated within their limitations and in compliance with standards set or agreed by CAA.
- (d) The data is then converted into information by personnel trained to perform their duties.
- (e) The depth of contamination (in mm) can be determined by ruler measurement, or any equipment suited to the purpose. In particular, a 3 mm depth needs to be measured quickly and easily – the NZ one-dollar coin is just under 3 mm thick!

- (f) The assessed RWYCC is reported for each third of the runway. These are identified as the first, second or third part of the runway length with the first being the first third as seen viewed in the direction of the lowest runway designator.
- (g) The length of any displaced threshold is included in the third at that end of the runway.
- (h) The percentage of the reported condition code for the runway third must be assessed. The highest condition code affecting more than 25% of the runway third should be adopted for the assessment. Water or contaminant affecting less than 25% of a runway third generally does not warrant reporting.
- (i) When a runway third contains a single contaminant, the RWYCC for that third is directly based on that contaminant in the RCAM as follows:
- 5.1.i.1. if the contaminant coverage for that third is less than 10%, an RWYCC of 6 is to be generated for that third and no contaminant is to be reported. If all thirds have less than 10% contaminant coverage, no report is generated
- 5.1.i.2. if the percentage contaminant coverage for that third is greater than or equal to 10% and less than or equal to 25%, an RWYCC of 6 is to be generated for that third and the contaminant reported at 25% coverage, or
- 5.1.i.3. if the percentage contaminant coverage for that third is greater than 25%, the RWYCC for that third shall be based on the contaminant present.

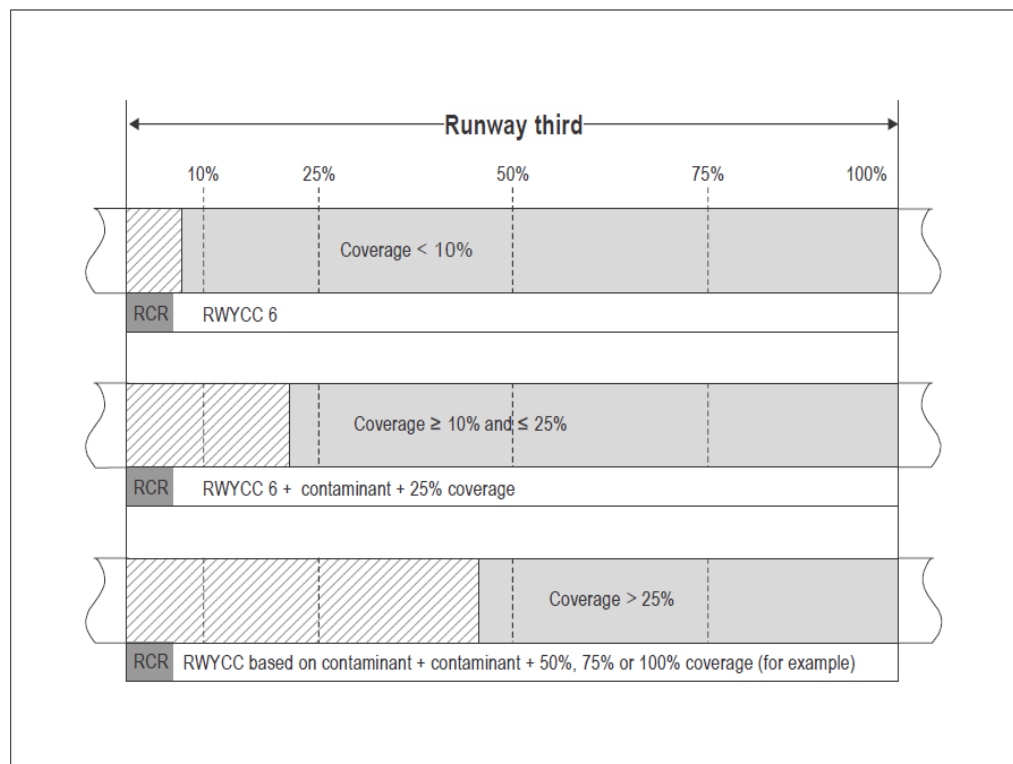


Figure 4-1. Single contaminant

- (j) If multiple contaminants are present where the total coverage is more than 25% but no single contaminant covers more than 25% of any runway third, the RWYCC is based upon the judgment by trained personnel, considering what contaminant will most likely be encountered by the aeroplane and its likely effect on the aeroplane's performance. Typically, this would be the most widespread contaminant, but this is not an absolute.
- (k) Continuously monitoring the development of the situation and prevailing weather condition is essential to ensuring safe flight operations. If an RCR is being issued without continuous monitoring by appropriately trained personnel, the aerodrome operator must include clear AIP and NOTAM advice to all users stating: "Not monitored for Runway Condition Reports". This will ensure an RCR is not being used by a pilot for the purposes of assessing aeroplane performance when a change in the conditions may not necessarily be reported.
- (l) Similarly, if 24-hour continuous monitoring is not available by appropriately trained personnel, the aerodrome operator should publish in the AIP and/or NOTAM the circumstances when continuous monitoring is or is not being provided.
- (m) New RCRs only need to be issued when assessment of the runway condition gives rise to change in the most recently issued RCR (for example, a change in depth of water from 3 mm to 1 mm would not generate a changed report).

5.2. For airports operating with water only contamination scenario:

- (a) RCRs will generally consist of only the RCR data string.
- (b) Unless water ponds to more than 3 mm over 25% or more of a runway third, the assessment will be limited to determining the extent to which the runway is WET or DRY.
- (c) Aerodromes with an air traffic service should agree protocols with the ATS provider to issue RCRs with RWYCC 6 and RWYCC 5 on behalf of the aerodrome operator based on observations by their personnel, with ability to call for inspections where water may be ponding to more than 3 mm depth.
- (d) Aerodromes could consider studying the unique physical properties of the runway to determine whether a safe procedure can be developed to use rainfall intensity and wind conditions. This procedure would be a guide to situations likely to give rise to more than 3 mm of water ponding on more than 25% of any runway third, where either the ATS or the aerodrome operator would assign appropriately trained personnel to make on-runway inspections to monitor for any change to RWYCC 2.

5.3. For airports operating with full (water, snow, slush, ice⁵) contamination scenario:

- (a) The aerodrome operator should include the format of SNOWTAM to be used for RCRs in their exposition. The ICAO recommended format is shown below. It may

⁵ Or, as defined by ICAO: "wet, dry, standing water, ice".

be varied to suit specific arrangements with aircraft operators, provided the arrangements are clearly documented in the aerodrome exposition.

- (b) If SNOWTAM are used only during winter conditions, the circumstances in which SNOWTAMS will be issued should be published through the AIS.

Note: New Zealand doesn't use SNOWTAM as in ICAO standards, but we use NOTAM with snow-related information in it, where necessary, adapting ICAO practice.

SNOWTAM FORMAT

Source: *Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066)*
(see Appendix 4)

(Applicable as of 5 November 2020)

(COM heading)	(PRIORITY INDICATOR)	(ADDRESSES)										<≡
	(DATE AND TIME (OF FILING))	(ORIGINATOR'S INDICATOR)										<≡
(Abbreviated heading)	(SWAA* SERIAL NUMBER)	(LOCATION INDICATOR)	DATE/TIME OF ASSESSMENT					(OPTIONAL GROUP)				<≡ (
	S W * *											

SNOWTAM →	(Serial number)	<≡		
Aeroplane performance calculation section				
(AERODROME LOCATION INDICATOR)	M	A)		<≡
(DATE/TIME OF ASSESSMENT (<i>Time of completion of assessment in UTC</i>))	M	B)		→
(LOWER RUNWAY DESIGNATION NUMBER)	M	C)		→
(RUNWAY CONDITION CODE (RWYCC) ON EACH RUNWAY THIRD) <i>(From Runway Condition Assessment Matrix (RCAM) 0, 1, 2, 3, 4, 5 or 6)</i>	M	D)	/ /	→
(PER CENT COVERAGE CONTAMINANT FOR EACH RUNWAY THIRD)	C	E)	/ /	→
(DEPTH (<i>mm</i>) OF LOOSE CONTAMINANT FOR EACH RUNWAY THIRD)	C	F)	/ /	→
(CONDITION DESCRIPTION OVER TOTAL RUNWAY LENGTH <i>(Observed on each runway third, starting from threshold having the lower runway designation number)</i>	M	G)	/ /	
COMPACTED SNOW DRY DRY SNOW DRY SNOW ON TOP OF COMPACTED SNOW DRY SNOW ON TOP OF ICE FROST ICE SLUSH				

STANDING WATER WATER ON TOP OF COMPACTED SNOW WET WET ICE WET SNOW WET SNOW ON TOP OF COMPACTED SNOW WET SNOW ON TOP OF ICE			→
(WIDTH OF RUNWAY TO WHICH THE RUNWAY CONDITION CODES APPLY, IF LESS THAN PUBLISHED WIDTH)	O	H)	<≡
Situational awareness section			
(REDUCED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))	O	I)	→
(DRIFTING SNOW ON THE RUNWAY)	O	J)	→
(LOOSE SAND ON THE RUNWAY)	O	K)	→
(CHEMICAL TREATMENT ON THE RUNWAY)	O	L)	→
(SNOWBANKS ON THE RUNWAY) (If present, distance from runway centreline (m) followed by "L", "R" or "LR" as applicable)	O	M)	→
(SNOWBANKS ON A TAXIWAY)	O	N)	→
(SNOWBANKS ADJACENT TO THE RUNWAY)	O	O)	→
(TAXIWAY CONDITIONS)	O	P)	→
(APRON CONDITIONS)	O	R)	→
(MEASURED FRICTION COEFFICIENT)	O	S)	
(PLAIN-LANGUAGE REMARKS)	O	T))
NOTES:			
1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2 or otherwise applicable aerodrome identifier.			
2. Information on other runways, repeat from B to H.			
3. Information in the situational awareness section repeated for each runway, taxiway and apron. Repeat as applicable when reported.			
4. Words in brackets () not to be transmitted.			
5. For letters A) to T), refer to the <i>Instructions for the completion of the SNOWTAM Format</i> , paragraph 1, item b), in Appendix 4 of PANS-AIM (Doc 10066).			

SIGNATURE OF ORIGINATOR (not for transmission)

6. RCR data string

6.1. The following explains the components of the RCR data string:

Aerodrome location indicator (nnnn)	Date & time (UTC) (MMDDhhmm)	Lower runway designator number (nn or nn[L], nn[C], or nn[R])	RWYCC for each runway third (n/n/n)	Percent coverage contaminant for each runway third ([n]nn/[n]nn/[n]nn)	Depth in mm of loose contaminant for each runway third ([n]nn/[n]nn/[n]nn)	Condition description (contaminant type) for each runway third
--	---------------------------------	--	--	---	---	--

6.2. The runway thirds are always listed in the direction of the lower runway designator irrespective of the runway in use.

7. RCR Data String

7.1. The following is an example of the RCR data string:

NZPM	08010300	07	6/5/2	NR/75/100	NR/NR/4	Dry / Wet / Standing Water
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8. Upgrading and Downgrading of RWYCC

8.1. Downgrading and upgrading is an integral part of the assessment process and is essential to making relevant reports of the prevailing runway surface conditions. When all other observations, experience and local knowledge indicate to trained aerodrome personnel that the primary assignment of the RWYCC does not accurately reflect the prevailing conditions, a downgrade or upgrade can be made.

8.2. Through the upgrading procedures, RWYCC 1 or 0 can be upgraded to no higher than RWYCC 3.

8.3. For RWYCC 0 assessed by aerodrome personnel or a pilot report of runway braking action reported as LESS THAN POOR by a flight crew, the suspension of operations on that runway shall be considered until corrective action has been taken to improve the runway surface conditions and an RWYCC between 1 and 3 can be reported appropriately.

8.4. Aspects to be considered when assessing the runway's slipperiness for a downgrade include:

(a) prevailing weather conditions:

8.4.a.1. stable below freezing temperature

8.4.a.2. dynamic conditions

8.4.a.3. active precipitation, and

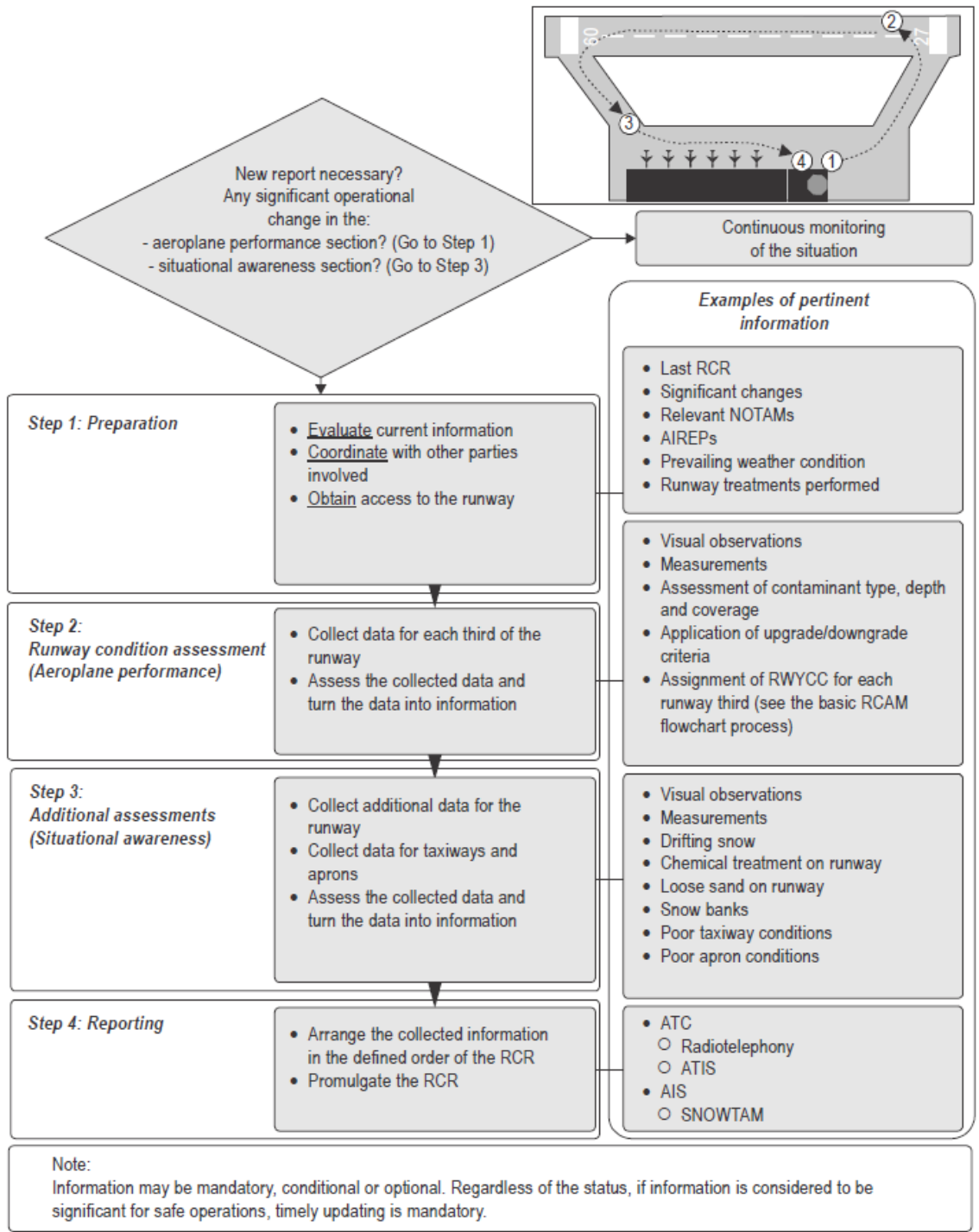
(b) observations (information and source)

- (c) measurements:
 - 8.4.c.1. friction measurements
 - 8.4.c.2. vehicle behaviour, and
 - 8.4.c.3. shoe scraping, and
- (d) experience (local knowledge), and
- (e) AIREPs (Air-Reports).

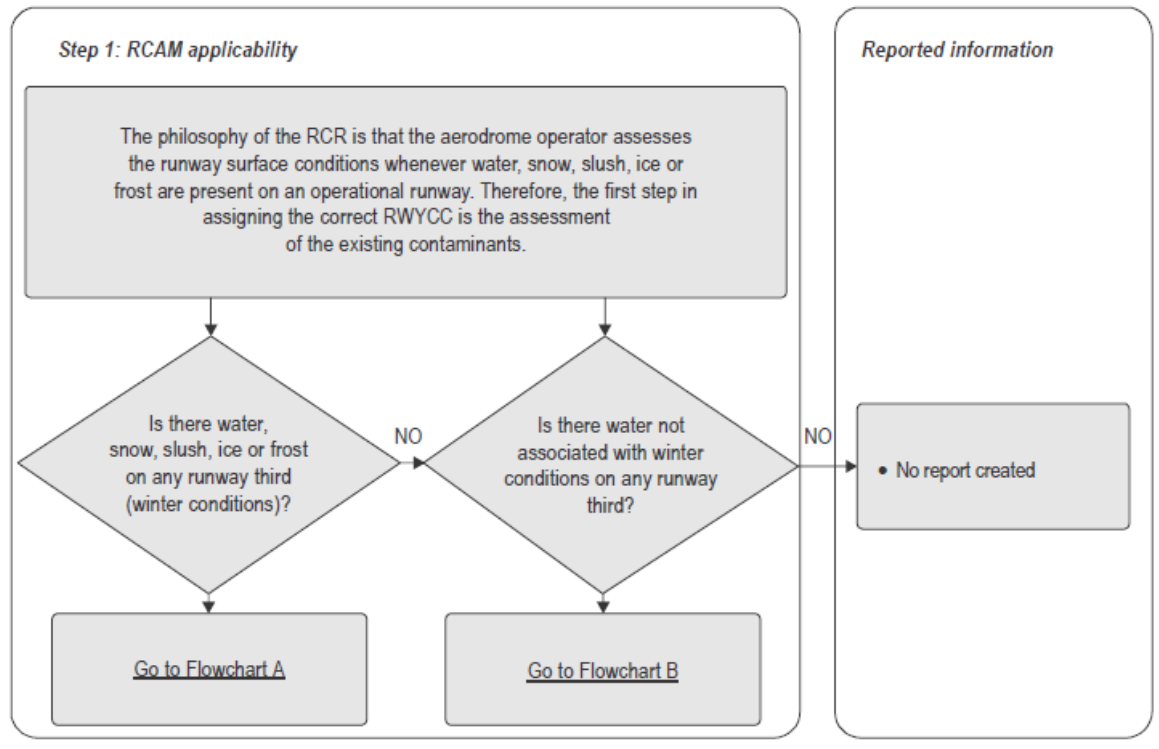
8.5. Pilot reports of runway braking action via AIREPs may be a trigger for a new assessment or be directly taken into account in the downgrade process (in accordance with the last two columns of the RCAM).

- (a) If ATS units receive an AIREP by voice communications concerning braking action that is found not to be as good as that reported, they will forward the AIREP without delay to the appropriate aerodrome operator. This is a prerequisite for using the AIREP for downgrading purposes when assessing the RWYCC. The distribution of AIREPs to aerodrome operators may be determined by service level agreements (SLAs) between the aerodrome operator and the ATS.

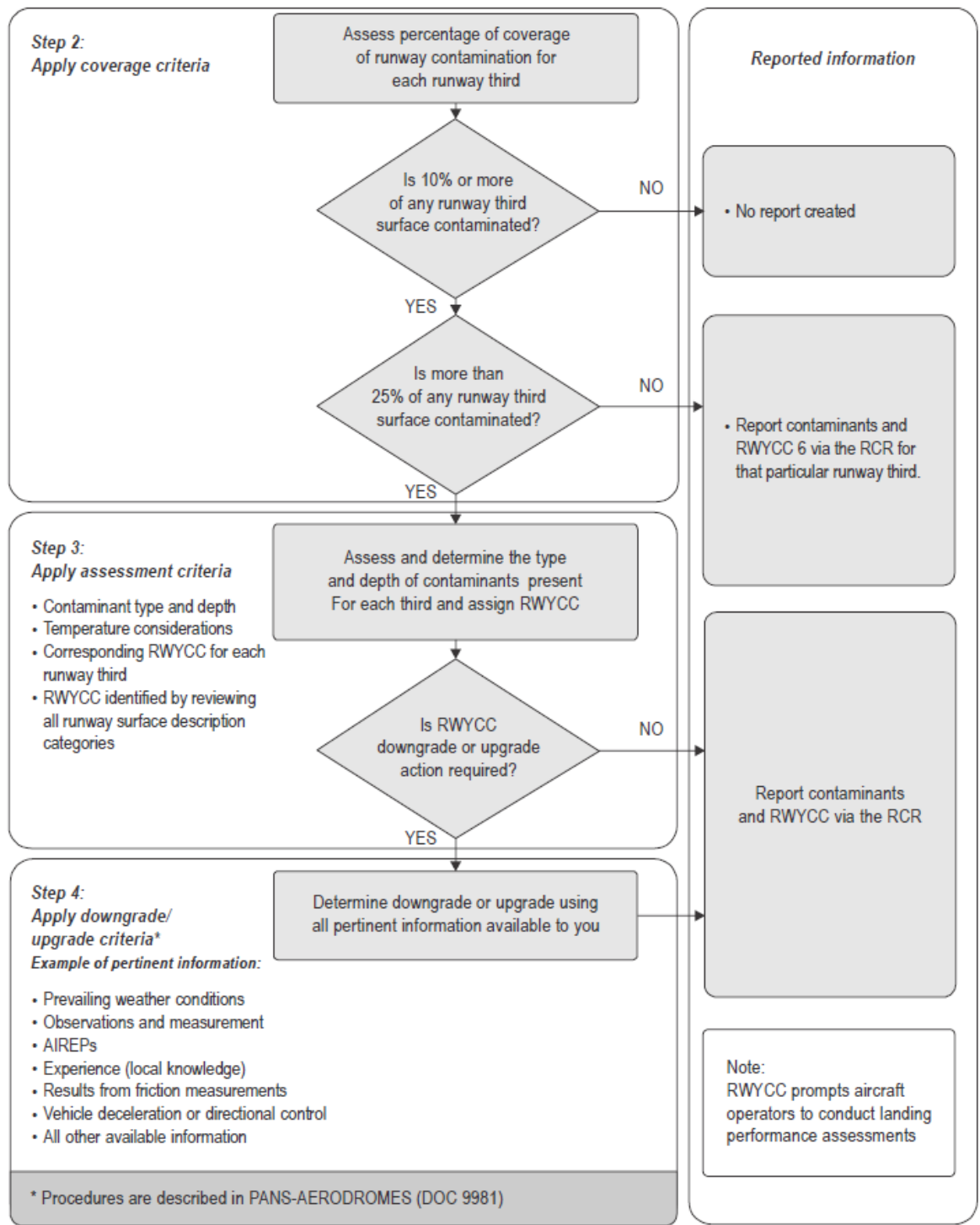
9. Flowchart of the generic runway condition process



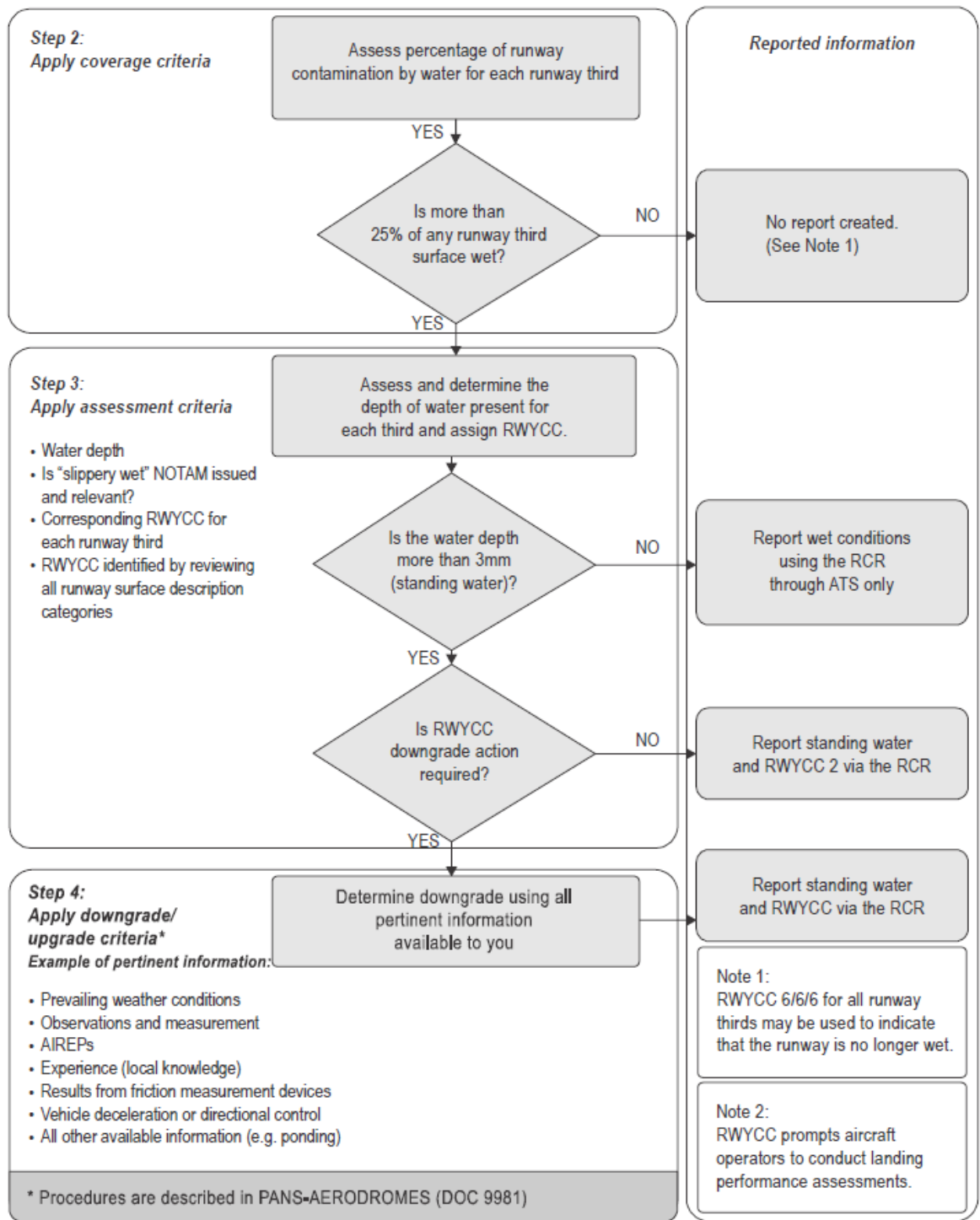
10. The basic RCAM flowchart process



11. Flowchart A – for aerodrome scenario of all contaminants



12. Flowchart B – for aerodrome scenario of water only



13. Publishing RCRs

13.1. The methods of reporting may include all ICAO methods of reporting and promulgating information as follows:

- aeronautical information publications (AIPs)
- aeronautical information circulars (AICs)

- (c) NOTAMs
- (d) SNOWTAMs (not adopted in New Zealand)
- (e) AIREPs
- (f) automatic terminal information services (ATIS), and
- (g) air traffic control (ATC) communications.

13.2. All RCRs should be advised promptly (as close to real-time as practical), whether automated or manually prepared, to:

- (a) ATS when present at an aerodrome
- (b) ATIS and D-ATIS
- (c) NOTAM when appropriate, and
- (d) aircraft operators in the form (such as email, phone, fax, radio) agreed with those operators and incorporated in the aerodrome operator's exposition.

13.3. The aerodrome operator should ensure the AIS publishes where "Runway conditions not monitored" and/or "Runway conditions not reported".

APPENDIX B: Practical guide for the assessment, collection and issue of a runway condition report at a CONTROLLED aerodrome

1. For runway conditions of DRY and WET:

1.1. These surface condition of the paved in-use runway is monitored and assessed by the on-duty Air Traffic Controller from a position in the cab of the ATC Tower.

1.2. When the surface condition of the paved in-use runway is observed as changing from DRY to WET or from WET to DRY, the Air Traffic Controller is to amend the Voice-ATIS and D-ATIS.

2. For runway conditions of SLIPPERY WET and CONTAMINATED:

2.1 The assessment of the runway condition of SLIPPERY WET, and the assessment of a CONTAMINATED runway is the responsibility of the aerodrome operator.

2.2 The aerodrome operator should provide readily available, trained and competent staff able to provide an RCR in accordance with guidance in this AC and ICAO Circular 355.

2.3 The runway surface condition is assessed by the aerodrome operator using the runway condition assessment matrix (RCAM).

2.4 On completion of the runway condition assessment the details are to be entered into the applicable portal within IFIS [*insert new IFIS URL web address here*]. The runway condition assessment can be transferred into the IFIS by selecting from drop down menus and use of some pre-populated fields. The process is designed to be similar to the process used for raising a NOTAM in the IFIS tool.

Note: *IFIS is an electronic system, owned and operated by Airways. At the time of Amendment 15 to Part 139, and this AC being open for public consultation, Airways is adding a new portal into the existing IFIS system which will enable the RCR to be inputted into IFIS electronically by the aerodrome operator. When published, this AC will be updated to reflect the correct URL in paragraph 2.4 above.*

2.5 Once all available fields within the IFIS portal are complete, the RCR will be automatically issued.

2.6 The Air Traffic Controller should now be informed that the runway condition has been assessed, the RCR has been produced (that is, entered in IFIS) and the automatic issuance of the RCR has commenced.

2.7 The issuance of the RCR via the IFIS portal will generate an amended ATIS, Voice-ATIS and D-ATIS.

2.8 The issuance of the RCR via the IFIS portal will generate a NOTAM ready for issuance by the NOTAM office.

2.9 All completed RCRs should be retained by the aerodrome operator.

APPENDIX C: Practical guide for the assessment, collection and issue of a runway condition report at an UNCONTROLLED aerodrome

Note 1: At a minimum, runway inspections, including the assessment of the runway surface condition and production of an RCR, should be carried out daily before the start of aeroplane operations, with a second inspection at civil evening twilight if further aircraft operations are expected. Please refer to rule 139.107 (c) and (e) for rules covering RCR requirements for controlled and uncontrolled aerodromes before the start of an air transport operation carried out under Part 121.

Note 2: If the airline operator(s) and aerodrome operator have agreed that RCRs are required to be reported on for the purposes of aeroplane take-off and landing performance assessment, the RCR should be made available for issue in a timely manner and in a format acceptable to the Director.

Note 3: If the airline operator(s) and aerodrome operator have agreed that RCRs are not required to be reported on for the purposes of aeroplane take-off and landing performance assessment, the aerodrome operator must, at the same time, promulgate in the AIP the status "Runway condition not monitored".

1. For runway conditions of DRY and WET:

1.1. These surface conditions of the paved in-use runway are monitored and assessed by the aerodrome operator.

2. For runway conditions of SLIPPERY WET and CONTAMINATED:

2.1 The assessment of the runway condition of SLIPPERY WET, and the assessment of a CONTAMINATED runway is the responsibility of the aerodrome operator.

2.2 The aerodrome operator should provide readily available, trained and competent staff able to provide an RCR as part of the runway inspection in accordance with the guidance in this AC and ICAO Circular 355.

2.3 The runway surface condition is assessed by the aerodrome operator using the runway condition assessment matrix (RCAM).

2.4 On completion of the runway condition assessment the details should be used to produce an RCR.

2.5 If the airline operator(s) and aerodrome operator have agreed that RCRs are required, the RCR should be made available for issue in a timely manner and in a format acceptable to the Director.

2.6 If the aerodrome operator is not issuing the RCR to airline operators, the aerodrome operator must, at the same time, promulgate in the AIP the status "Runway condition not monitored".

2.7 All completed RCRs should be retained by the aerodrome operator.