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**SUBJECT: Airport Movement Area and Related Facilities Maintenance**

**DATE: 01/08/2009**

## **GENERAL**

This Advisory Circular (CT) contains information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Authority. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Guidance Document.

## **PURPOSE**

This Advisory Circular provides methods, acceptable to the Authority, for showing compliance with the aerodromes maintenance requirements of CV CAR Part 14 and explanatory material to assist in showing compliance.

## **RELATED CV CAR**

This CT relates specifically to CV CAR PART 14.

## 1. ADMINISTRATION

The aerodrome operator shall determine a conservation period for documents related to the aerodrome movement area and related facilities maintenance, including, but not exclusively, the runway surface condition report, airside inspection check list, etc.. The conservation or archiving period shall not be less than two (2) years.

## 2. INTRODUCTION

This CT aims to support the aerodrome operator for the establishment of aerodrome movement area and related facilities maintenance procedures. It does constitute an element of the Safety Management System (SMS).

The following subjects shall be included in the maintenance program:

- Runway inspections
- Runway lighting inspections
- Approach lights inspections
- Visual aids inspections
- NOTAM issuance
- Maintenance of runway shoulders
- Crack filling
- Runway marking and markers
- Grass cutting
- Wildlife control
- FOD control
- Presence of obstructions
- Conditions of drainage system
- Surface conditions evaluation
- Runway lighting annual maintenance (edge and approach)
- Visual aids annual or quarterly maintenance (PAPI alignment, changing windsocks etc.)

## 3. RUNWAY INSPECTIONS

### A. Purpose of inspection

The aerodrome operator shall specify the purpose of the inspection. As an example: "to assess and to report the actual conditions of the runway in terms of "dry", "wet", "water accumulation", "braking index", etc..

The aerodrome operator shall specify the corrective actions to be taken and the report to be filled in after each inspection. Blank form shall be attached.

### B. Areas inspected

The areas inspected shall be described to include runway(s), taxiway(s), runway shoulders and strips, apron etc..

C. Inspections frequency

The inspection frequency shall be described as it related to the frequency per day, per week and the time of the year if seasonal variations are applicable. The time of the day or events commanding an inspection shall also be described, such as meteorological factors, pilots requests, work on the movement area surfaces, etc..

D. Runway conditions reporting

The aerodrome operator shall specify how and when the runway conditions are reported verbally and in writing to the ATS.

He shall also specify for how long and where the written reports are kept. That conservation or archiving period shall not be less than two (2) years.

E. Person responsible for inspections

The aerodrome operator shall identify the person(s) responsible for these inspections and his (their) replacement(s). The job title shall be used for this purpose.

#### **4. RUNWAY EDGE LIGHTS ROUTINE INSPECTIONS**

A. Purpose of inspection

The purpose of this inspection shall be described. As an example it could be "to make sure that the lighting system is working, as a whole. It also aims to identify any components of the system that would not be working."

The aerodrome operator shall identify how deficiencies are reported and who is taking action for applying corrective measures. The follow-up method shall also be described, i.e. how will the inspector be informed that corrective actions have been taken and that the situation is back to normal.

B. Inspection coverage

The lighting system covered under this inspection shall be described as it relates to runway(s) edge and threshold, to taxiway and apron edge lights. Example: 07-25 edge lights; Apron B edge lights, etc..

C. Inspection frequency

The inspection frequency shall be described as it relates to the frequency per day, per week and the time of the year if seasonal variations are applicable. The time of the day or events commanding an inspection shall also be described, such as meteorological

factors, pilots requests, work on the movement area surfaces, movement of an exceptional aircraft exceeding the runway design criteria, etc..

D. Lighting system conditions reporting

The aerodrome operator shall specify under which conditions report is done to the ATS as it relates to the condition of the runway, taxiway and apron lighting system. As an example: "when 15% or more of the lights is not operational or if two lights in a row are unserviceable.

The aerodrome operator shall specify how deficiencies are reported to the technical service and who is taking action for applying corrective measures. The follow-up method shall also be described, i.e. how will the inspector be informed that corrective actions have been taken and that the situation is back to normal.

The aerodrome operator shall also define the conditions for the issuance of NOTAM concerning the airport lighting system as at 4.B. As an example, a major technical problem that cannot be corrected before the end of the daylight period or during a period of low visibility.

E. Person responsible for inspections

The airport service responsible to perform these inspections shall be identified by the aerodrome operator. The job title of the person(s) shall be used. Replacement(s) shall also be identified.

## 5. APPROACH LIGHTS ROUTINE INSPECTION

A. Purpose of inspection

The aerodrome operator shall mention the purpose of this inspection. As an example, it could be to ascertain that the approach lights systems as a whole is working and also to identify any components of the system that would not be working.

B. Inspection coverage

The approach lighting system(s) shall be identify as to their type, intensity and position at the beginning of each runway 02, 18, 22, etc..

C. Inspection frequency

The inspection shall be indicated, be it on daily, weekly, monthly or annual basis.

D. Lighting system conditions reporting

The aerodrome operator shall specify under which conditions report is done to the ATS as it relates to the condition of the approach lighting system. As an example: "when 15% or more of the lights is not operational or if two lights in a row are unserviceable.

The aerodrome operator shall specify how deficiencies are reported to the technical service and who is taking action for applying corrective measures. The follow-up method shall also be described, i.e. how will the inspector be informed that corrective actions have been taken and that the situation is back to normal.

The aerodrome operator shall also define the conditions for the issuance of NOTAM concerning the airport approach lighting system as described at 5.B. As an example, a major technical problem that cannot be corrected before the end of the daylight period or during a period of low visibility.

E. Person responsible for inspections

The airport service responsible to perform these inspections shall be identified by the aerodrome operator. The job title of the person(s) shall be used. Replacement(s) shall also be identified.

## 6. VISUAL AIDS (RIL, Wind Indicator and PAPI) INSPECTION

A. Purpose of inspection

The aerodrome operator shall mention the purpose of this inspection. As an example, it could be to ascertain that the windsock fabrics are in good conditions, that their lighting system is working properly, etc., and also to identify any components of the system that would not be working.

The PAPI correct alignment will be dealt with separately at point 18.

B. Inspection coverage

All visual aids being subject to this inspection shall be listed. As an example, RIL 22, PAPI 12 etc..

C. Inspection frequency

The inspection frequency shall be determined for each components of the airport visual aids system excluding the runway edge lighting and approach lighting (ref. points 4 and 5 above).

D. Visual aids conditions reporting

The aerodrome operator shall specify under which conditions report is done to the ATS as it relates to the condition of the visual aids. As an example: "when 15% or more of the lights is not operational or if two lights in a row are unserviceable.

The aerodrome operator shall specify how deficiencies are reported to the technical service and who is taking action for applying corrective measures. The follow-up

method shall also be described, i.e. how will the inspector be informed that corrective actions have been taken and that the situation is back to normal.

The aerodrome operator shall also define the conditions for the issuance of NOTAM concerning the airport visual aids as described at 6.B above. As an example, a major technical problem that cannot be corrected before the end of the daylight period or during a period of low visibility as far as RIL and Windssocks are concerned. To be completed for PAPI, when to issue a NOTAM.

E. Person responsible for inspections

The airport service responsible to perform these inspections shall be identified by the aerodrome operator. The job title of the person(s) shall be used. Replacement(s) shall also be identified.

## 7. NOTAM ISSUANCE

A. Reasons for issuing NOTAM's

The aerodrome operator shall specify the reasons for issuing NOTAM's for each items dealt with in this document. As an example, and more generally speaking, the aerodrome Manual (to mention also the CAR article) specifies that a NOTAM shall be issued in the following situations:

- a) Penetration of an obstacle limitation surface by any object;
- b) The presence of an obstacle or the existence of a dangerous situation jeopardising aviation safety at the airport or adjacent to it;
- c) A decrease in the level of services provided at the airport and specified in the Aeronautical Information Publication; (it means airport lighting system, approach lighting system, PAPI, etc..)
- d) Closure of part of the airport manoeuvring area;
- e) The existence of any situation that could jeopardise aviation safety at the airport and for which certain preventive measures should be justifiably taken.

B. Persons responsible for initiating NOTAM's

The aerodrome operator shall identify the person(s) or service(s) authorize to request the issuance of NOTAMs in their respective field of competence.

## 8. RUNWAY SHOULDERS<sup>1</sup> AND STRIP<sup>2</sup> MAINTENANCE

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<sup>1</sup> Shoulders is usually understood as an area of approximately 8 meters wide extending on each side of a runway.

<sup>2</sup> The runway strip include the shoulders and extend on a much larger area on each side of the runway.

A. Scope of work

The aerodrome operator shall identify the level and frequency of maintenance activities performed on the runway shoulders and strip and on the shoulders of the taxiway(s) and apron(s). As an example, it shall be precised if the surfaces are graded (levelled), compacted. It shall also be mentioned that the runway(s) shoulders are levelled at the same level as the asphalt. Pre-threshold area shall also be covered. Grass and bush cutting are covered at point 11 below.

B. Frequency

It shall be established by the aerodrome operator the frequency, on an annual basis, of accomplishment of each task listed at 8.A above.

C. Equipment used

The equipment used for each of the task identified at 8.A shall be listed.

D. Persons responsible

The person responsible for programming and executing these tasks shall be identified by the aerodrome operator.

## 9. CRACK FILLING

A. Purpose of work

The aerodrome operator shall describe the method used for filling the cracks appearing at the surface of the runway. The method used shall prevent the infiltration of water so to avoid the washing out of fine granular material supporting the asphalt layer.

B. Scope of work

The aerodrome operator shall identify the surfaces covered by this maintenance activity. As an example, Runway 22 and asphalted shoulders, Taxiway "A", Apron 1 etc..

C. Frequency

The aerodrome operator shall specify the maintenance frequency and the time of the year it is accomplished.

D. Equipment and material used

The equipment and the product used shall be identified as well as the process (cold or hot material).

E. Persons responsible

The person(s) responsible for the programming and the accomplishment of these tasks shall be listed.

## 10. RUNWAY MARKING AND MARKERS

A. Purpose of work

Marking on the runway shall be done according to the Manual of Aerodrome Standards (MOS 14). The purpose of work shall be described by the aerodrome operator. As an example, the following text could be used "Marking is a visual aid to identify the centre line of the runway, the touchdown zone areas amongst others. In order to be visible from the cockpit of an approaching or taxiing aircraft".

B. Scope of work

All the surfaces shall be identified by the aerodrome operator. (runway, taxiway, apron, displaced threshold, etc.. The paint color used shall be identified for each type of surface (runway, taxiway, apron, turning button (racquet), displaced threshold etc..

C. Frequency

The aerodrome operator shall specify the maintenance frequency and the time of the year it is accomplished.

D. Equipment used

The aerodrome operator shall identified the type of equipment used, if it is an airport owned equipment, a pool owned equipment (used for many airports) or a rented equipment.

E. Persons responsible

The person(s) responsible for the programming and the accomplishment of these tasks shall be identified.

## 11. GRASS AND BUSH CUTTING

A. Purpose of work

The aerodrome operator shall describe the purpose of work. The following text could be used: "The main purpose of grass cutting is to prevent the implementation of bushes on the runway shoulders and to prevent the creation of obstructions to visual and electronic navigational aids."



B. Scope of work

The aerodrome operator shall describe the areas where grass and bush are to be cut, as well as the area covered (length and width). As an example: runway shoulders 07-25 and 13-31, on the glide path pad and around the localizer antennas, runway strips 07-25 and 13-31, around the runway lights, in front of the PAPI, in front of the airport signs, etc..

C. Frequency

For each of the areas identified at 11.B, the aerodrome operator shall identify the frequency of the tasks to be accomplished. The aerodrome operator may prefer to indicate the conditions under which it will be required to cut grass and bush, i.e. eight of the grass.

D. Persons responsible

The person(s) responsible for the programming and the accomplishment of these tasks shall be identified.

## 12. WILDLIFE ACTIVITIES

A. Type of activities

The aerodrome operator shall describe any wildlife activities around the airport. He shall also determine the time of the year each wildlife species can be observed on and around the airport.

B. Preventive measures

Depending on the species described at 12.A, the aerodrome operator shall describe the mitigation measures put in place to minimize the impact of these animals on the air security.

C. Monitoring

The aerodrome operator shall describe the monitoring process in place. As an example, contact with Cape Verde wildlife survey department, reports from pilots, etc..

D. Method of control

The aerodrome operator shall describe the method of control, ex. Bird scaring etc.

E. Persons responsible

The airport service responsible to perform these inspections shall be identified by the aerodrome operator. The job title of the person(s) shall be used. Replacement(s) shall also be identified.

## 13. FOD<sup>3</sup> CONTROL

### A. Purpose of inspection

The aerodrome operator shall identify the purposes of these inspections. The following text could be used: "The purpose of FOD control is to prevent aircraft damage and eventually the lost of life. Foreign objects can be ingested by jet engine with catastrophic consequences during the take-off phase of the flights for instance. Other objects could cause flat tires with same consequences. The Concorde crash at Paris Charles-de-Gaulle is an example of FOD damages."

### B. Inspection coverage

The aerodrome operator shall identify the areas that are to be inspected. As a minimum this shall cover the runway(s), taxiway(s) and apron(s). It shall also include areas adjacent to these surfaces. It shall also include areas which are likely to generate FOD, be it a construction site or other temporary or permanent sites.

### C. Inspection frequency

The aerodrome operator shall identify the frequency FOD inspections are performed. He shall also develop an awareness program for all airport employees. Garbage bins shall also be installed both on the airside and on the ground side of the airport.

### D. Reporting and corrective actions

The aerodrome operator, as a consequence of his awareness program, shall rely on all airport employees for corrective actions, i.e. that each airport employee will remove foreign object from and around aircraft movement areas.

The aerodrome operator shall also identify a person or a service to which more important FOD could be reported. In some cases the removal of FOD such gravel, mud, etc. will require more important equipment and man-power.

### E. Construction projects

The aerodrome operator should refer to CT "Aerodrome Work Safety – Plan of Construction Operations" No. CT 42-003 for more details on this subject.

The aerodrome operator shall submit a "Plans of Construction Operations" for each project taking place on the airside. This "Plan of Construction Operations" shall call for a strict control of foreign objects during a construction project in or around the airport perimeter. PCO are mandatory for aerodrome operator project. The same rule applies to third parties airport projects as each project is authorized by the AAC who imposes a strict control of foreign objects to these third parties.

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<sup>3</sup> FOD : Foreign Object Damage. The term is used to identify any foreign object that could cause damages to aircraft.

"Plan of Construction Operations" are not required for:

- a) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
- b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;
- c) other similar minor nature works.

F. Persons responsible for inspections

The aerodrome operator shall identify the person responsible for the FOD program, awareness, implementation and follow-up. He shall also rely on the cooperation of all airport employees through his awareness program.

## 14. PRESENCE OF OBSTRUCTION

A. Purpose of monitoring

The aerodrome operator shall identify the main purpose of this activity. The following text could be used: "The purpose of monitoring the situation is to prevent "the penetration of an obstacle limitation surface by any object". These objects can be fixed like the construction of a new building or temporary such as a construction crane etc.."

B. Monitoring coverage

The area covered by monitoring activities shall be described. The following text could be used: "The monitoring must covered the entire airport "obstacle limitation surface", but more specifically the runway approaches and the immediate vicinity of the airport."

C. Monitoring frequency

The monitoring frequency shall be specified.

D. Reporting and corrective actions

The aerodrome operator shall identify a person or a service to whom zoning irregularities or suspected irregularities should be reported.

If the objects penetrating the "obstacle limitation surface cannot be removed immediately, the aerodrome operator must describe the measures taken to mitigate the effects of this obstacle. It could be the issuance of a NOTAM, voice advisory by ATC, to inform the AAC, the closure of a runway or any part of the movement area, etc..

E. Person responsible for monitoring

The aerodrome operator shall identify a person or a service responsible for this monitoring activity.

## 15. CONDITIONS OF DRAINAGE SYSTEM

### A. Purpose of monitoring

The aerodrome operator shall establish the reasons why the airport drainage system must be monitored, inspected and maintained in good conditions. The following text can be used: "The purpose of this monitoring is to ensure the adequate drainage of the airport platform so as to avoid water accumulation on movement areas and to maintain the best possible conditions for the structural bases of the whole infrastructures."

### B. Scope of monitoring

The aerodrome operator shall identify the ditches located on the airport territory (airport property) and those outside airport properties which could have an impact on the efficiency of the ditches located on the airport property.

### C. Frequency

The aerodrome operator shall determine a method of monitoring and thorough inspection frequency of the drainage system. Special attention shall be paid to the drainage system during the rain season.

### D. Persons responsible

The aerodrome operator shall identify the person responsible for the day to day monitoring of the airport drainage system.

The aerodrome operator shall also identify the "expertise" used for a more complete and structural review of the drainage system. The frequency of such an in-depth inspection shall also be specified.

## 16. SURFACES CONDITIONS EVALUATION

### A. Purpose of work

The aerodrome operator shall expose the reasons why the airport movement areas must be inspected and evaluated. The following text can be used: "These evaluation inspections are performed to evaluate the conditions of not only the surface but also the structure of the runways, taxiways and apron. The end result of these inspections is to determined the necessity of crack excavation, the resurfacing of the runway or part of it, etc.. "

### B. Scope of work

The runway(s), taxiway(s) and apron(s) to be inspected shall be listed.

C. Frequency

This in-depth condition evaluation frequency is to be established by the aerodrome operator. .

D. Persons responsible

The aerodrome operator must identify the person responsible for the "surfaces condition evaluation".

## **17. RUNWAY LIGHTING ANNUAL<sup>5</sup> MAINTENANCE (Edge and Approach )**

A. Purpose of work

The aerodrome operator shall establish the purpose and scope of the work to be done. The following text can be used: "The runway lights as well as the approach lights must be set in the proper angle in order to present an optimum visibility for pilots. The lens must be cleaned to insure maximum transparency. The gaskets must be replaced to insure protection against water infiltration. The lens must be properly positioned on the socket.

B. Frequency

The aerodrome operator shall determine the frequency of work. Local conditions shall be taken into account, blowing sand, strong winds etc..

C. Person responsible

The aerodrome operator shall identify the person(s) responsible to program and to do this work.

## **18. VISUAL AIDS ANNUAL OR QUARTERLY MAINTENANCE (PAPI and RIL Alignment and Changing Windsocks)**

A. Purpose of work

Some annual and/or quarterly maintenance must be performed on visual aids. The aerodrome operator can use the following text to describe the "purpose of work": "PAPI's must be checked from the ground and they must be flight checked once in a while. RIL's must be set in the proper angle. Windsocks fabrics must be changed and the electrical system checked."

B. Frequency

The aerodrome operator shall establish a PAPI level check and adjustment schedule, both from the ground and from the air (flight check). The same schedule shall also be established for RIL'S angle setting. Windsocks fabrics must be checked regularly

according to local conditions (wind and sun). The maintenance schedule shall also be in accordance with ICAO and AAC recommendations and standards.

C. Persons responsible

The aerodrome operator shall identify the person(s) responsible for programming and executing the work.



Carlos Monteiro

President of the Board

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