



# Advisory Circular

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NIGERIAN CIVIL AVIATION AUTHORITY (NCAA)

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## **MOVEMENT AREA MAINTENANCE MANUAL**

### **1.0 GENERAL**

Nigerian Civil Aviation Authority Advisory Circulars from Aerodrome Standards Department contain information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated Regulations.

An AMC is not intended to be the only means of compliance with a regulation, and consideration will be given to other methods of compliance that may be presented to the Authority.

### **2.0 PURPOSE**

This Advisory Circular provides methods, acceptable to the Authority, for showing compliance with Movement Area Maintenance Manual requirements of Part 12 of Nig. CARs as well as explanatory and interpretative material to assist in showing compliance.

### **3.0 APPLICATION**

The material contained in this Advisory Circular is to be applied in the development of maintenance programmes for the safe operation of aerodromes.

### **4.0 REFERENCE**

The Advisory Circular relates specifically to Part 12.6.4 of Nig. CARs.

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## 1. Administration

### 1.1. Distribution of the "Aerodrome Movement Area and Related Facilities Maintenance" circular

A distribution list of the Aerodrome Operator's document on Aerodrome Movement Area and Related Facilities Maintenance should be established.

### 1.2. Amendment Procedures

The Aerodrome Operator should include an amendment procedure to its Aerodrome Movement Area and Related Facilities Maintenance document.

### 1.3. Record Keeping

The Aerodrome Operator should 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 should not be less than two (2) years.

## 2. Introduction

This guidance document aims to support the Aerodrome Operator for the establishment of aerodrome movement area and related facilities maintenance procedures.

The following subjects should 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

#### 3.1. Purpose of inspection

The Aerodrome Operator should 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 should specify the corrective actions to be taken and the report to be filed in after each inspection. Blank form should be attached.

#### 3.2. Areas inspected

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

#### 3.3. Inspections frequency

The inspection frequency should 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 should also be described, such as meteorological factors, pilot's requests, and work on the movement area surfaces, etc.

#### 3.4. Runway conditions reporting

The Aerodrome Operator should specify how and when the runway conditions are reported verbally and in writing to the ATS.

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

#### 3.5. Person responsible for inspections

The Aerodrome Operator should identify the person(s) responsible for these inspections and his (their) replacement(s). The job title should be used for this purpose.

## 4. Runway Lights Routine Inspections

### 4.1. Purpose of inspection

The purpose of this inspection should 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 should identify how deficiencies are reported and who is taking action for applying corrective measures. The follow-up method should 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.

### 4.2. Inspection coverage

The lighting system covered under this inspection should 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.

### 4.3. Inspection frequency

The inspection frequency should 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 should also be described, such as meteorological factors, pilot's requests, work on the movement area surfaces, movement of an exceptional aircraft exceeding the runway design criteria, etc.

### 4.4. Lighting system conditions reporting

The Aerodrome Operator should specify under which conditions report is done to the ATS as it relates to the condition of the runway, taxiway and apron lighting system and taking into account performance level objective to be achieved for the airport 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 should specify how deficiencies are reported to the technical service and who is taking action for applying corrective measures. The follow-up method should 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 should also define the conditions for the issuance of NOTAM concerning the airport lighting system as in Section 4.2 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.

**4.5. Person responsible for inspections**

The airport service responsible to perform these inspections should be identified by the Aerodrome Operator. The job title of the person(s) should be used. Replacement(s) should also be identified.

**5. Approach Lights Routine Inspection****5.1. Purpose of inspection**

The Aerodrome Operator should 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.

**5.2. Inspection coverage**

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

**5.3. Inspection frequency**

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

**5.4. Lighting system conditions reporting**

The Aerodrome Operator should 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 should specify how deficiencies are reported to the technical service and who is taking action for applying corrective measures. The follow-up method should 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 should also define the conditions for the issuance of NOTAM concerning the airport approach lighting system as described in Section 5.2 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.

**5.5. Person responsible for inspections**

The airport service responsible to perform these inspections should be identified by the Aerodrome Operator. The job title of the person(s) should be used. Replacement(s) should also be identified.

**6. Visual Aids (RIL, Wind Indicator and PAPI) Inspection****6.1. Purpose of inspection**

The Aerodrome Operator should 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.

**6.2. Inspection coverage**

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

**6.3. Inspection frequency**

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

**6.4. Visual aids conditions reporting**

The Aerodrome Operator should 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 should specify how deficiencies are reported to the technical service and who is taking action for applying corrective measures. The follow-up method should 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 should also define the conditions for the issuance of NOTAM concerning the airport visual aids as described in Section 6.2 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 Windsocks are concerned.



### 6.5. Person responsible for inspections

The airport service responsible to perform these inspections should be identified by the Aerodrome Operator. The job title of the person(s) should be used. Replacement(s) should also be identified.

## 7. NOTAM Issuance

### 7.1. Reasons for issuing NOTAM's

The Aerodrome Operator should 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 specifies that a NOTAM should 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.

### 7.2. Persons responsible for initiating NOTAM's

The Aerodrome Operator should 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

### 8.1. Scope of work

The Aerodrome Operator should 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 should be précised if the surfaces

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

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

are graded (levelled), compacted. It should also be mentioned that the runway(s) shoulders are levelled at the same level as the asphalt. Pre-threshold area should also be covered. Grass and bush cutting are covered at Section 11 below.

### 8.2. Frequency

It should be established by the Aerodrome Operator the frequency, on an annual basis, of accomplishment of each task listed at Section 8.1 above.

### 8.3. Equipment used

The equipment used for each of the task identified at Section 8.1 should be listed.

### 8.4. Persons responsible

The person responsible for programming and executing these tasks should be identified by the Aerodrome Operator.

## 9. Crack Filling

### 9.1. Purpose of work

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

### 9.2. Scope of work

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

### 9.3. Frequency

The Aerodrome Operator should specify the maintenance frequency and the time of the year it is accomplished.

### 9.4. Equipment and material used

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

### 9.5. Persons responsible

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

## 10. Runway Marking and Markers

### 10.1. Purpose of work

Marking on the runway should be done according to the specifications in ASM Section 9.2.2. The purpose of work should 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".

### 10.2. Scope of work

All the surfaces should be identified by the Aerodrome Operator. (Runway, taxiway, apron, displaced threshold, etc). The paint colour used should be identified for each type of surface (runway, taxiway, apron, turning button (racquet)), displaced threshold etc.

### 10.3. Frequency

The Aerodrome Operator should specify the maintenance frequency and the time of the year it is accomplished.

### 10.4. Equipment used

The Aerodrome Operator should identify the type of equipment used, if it is an airport owned equipment, or a rented equipment.

### 10.5. Persons responsible

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

## 11. Grass and Bush Cutting

### 11.1. Purpose of work

The Aerodrome Operator should describe the purpose of work. The following text could be used: "The main purpose of grass cutting is to prevent the presence of bushes on the runway shoulders and to prevent the creation of obstructions to visual and electronic navigational aids."

### 11.2. Scope of work

The Aerodrome Operator should 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.

**11.3. Frequency**

For each of the areas identified in Section 11.2, the Aerodrome Operator should 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.

**11.4. Persons responsible**

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

**12. Wildlife Activities****12.1. Type of activities**

The Aerodrome Operator should describe any wildlife activities around the airport. He should also determine the time of the year each wildlife species can be observed on and around the airport.

**12.2. Preventive measures**

Depending on the species described in Section 12.1, the Aerodrome Operator should describe the mitigation measures put in place to minimize the impact of these animals on the flight safety. As an example, a fence has been erected around the airport to prevent large animals from entering the airport operational sector; more frequent inspections are conducted during intense migration activities, deterrent measures are applied, etc.

**12.3. Monitoring**

The Aerodrome Operator should describe the monitoring process in place. As an example, contact with (name of the country) wildlife survey department or private association (ornithologist), reports from pilots, etc.

**12.4. Method of control**

The Aerodrome Operator should describe the method of control, For example, Bird scaring etc.

**12.5. Persons responsible**

The airport service responsible to perform these inspections should be identified by the Aerodrome Operator. The job title of the person(s) should be used. Replacement(s) should also be identified.

## 13. FOD Control

### 13.1. Purpose of inspection

The Aerodrome Operator should 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 loss 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 Concord crash at Paris Charles-de-Gaulle is an example of FOD damages."

### 13.2. Inspection coverage

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

### 13.3. Inspection frequency

The Aerodrome Operator should identify the frequency of FOD inspections are performed. He should also develop an awareness program for all airport employees. Garbage bins should also be installed both on the airside and on the landside of the airport.

### 13.4. Reporting and corrective actions

The Aerodrome Operator, as a consequence of his awareness program, should 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 should also identify a person or a service to which more important FOD could be reported. In some cases the removal of FOD such as gravel, mud, etc. will require more important equipment and man-power.

### 13.5. Construction projects

The Aerodrome Operator should refer to Advisory Circular "Aerodrome Work Safety – Plan of Construction Operations (PCO)" for more details on this subject.

The Aerodrome Operator should submit a "Plan of Construction Operations" for each project taking place on the airside. This "Plan of Construction Operations" should call for a strict control of foreign objects during a construction project in or around the airport perimeter. PCO are mandatory for airport operator's project. The same rule applies to third parties' airport projects, as each project is authorised by the NCAA who imposes a strict control of foreign objects to these third parties.

"Plan of Construction Operations" is 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.

### 13.6. Persons responsible for inspections

The Aerodrome Operator should identify the person responsible for the FOD program, awareness, implementation and follow-up. He should also rely on the cooperation of all airport employees through awareness programme.

## 14. Presence of Obstruction

### 14.1. Purpose of monitoring

The Aerodrome Operator should 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 and ensure adequate marking and lighting of obstacles". These objects can be fixed like the construction of a new building or temporary such as a construction crane etc."

### 14.2. Monitoring coverage

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

### 14.3. Monitoring frequency

The monitoring frequency should be specified.

### 14.4. Reporting and corrective actions

The Aerodrome Operator should report suspected irregularities to the NCAA.

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 NCAA of the closure of a runway or any part of the movement area, etc.

**14.5. Person responsible for monitoring**

The Aerodrome Operator should identify a person or a service responsible for this monitoring activity.

**15. Conditions of Drainage System****15.1. Purpose of monitoring**

The Aerodrome Operator should 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 drains so as to avoid water accumulation on movement areas and to maintain the best possible conditions for the structural integrity of the whole infrastructures."

**15.2. Scope of monitoring**

The Aerodrome Operator should 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.

**15.3. Frequency**

The Aerodrome Operator should determine a method of monitoring and thorough inspection frequency of the drainage system. Special attention should be paid to the drainage system during the rainy season.

**15.4. Persons responsible**

The Aerodrome Operator should identify the person responsible for the day to day monitoring of the airport drainage system.

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

**16. Surfaces Condition Evaluation****16.1. Purpose of work**

The Aerodrome Operator should 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 determine the necessity of crack excavation, the resurfacing of the runway or part of it, etc.



**16.2. Scope of work**


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

**16.3. Frequency**

This in-depth condition evaluation frequency is to be established by the Aerodrome Operator.

**16.4. Persons responsible**

The Aerodrome Operator must identify the person responsible for the "surfaces condition evaluation".



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Director General