



State of Kuwait



دولة الكويت



# Directorate General of Civil Aviation Aviation Safety Department

Guidance Material  
Document Number 1433

## Safeguarding of Aerodromes

ISSUE 01, REVISION 0,  
SEPTEMBER 2021

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## Foreword

This document has been compiled to enhance aviation safety in the aerodrome's environment. It is not intended to supersede or replace existing laws or regulations produced by the DGCA of the State of Kuwait. The distribution or publication of this document does not prejudice the State's ability to enforce existing National rules and regulations as stipulated in the KCASRs.

To the extent of any inconsistency between this document and National law, regulations (KCASRs), Safety Bulletins, or advisory publications, the National law, regulations (KCASRs), Safety Bulletins and advisory publications shall prevail.

## Scope

This document is intended to provide guidance for aerodrome operators and other stakeholders involved in aerodromes safeguarding.



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## Abbreviations

|       |                                      |
|-------|--------------------------------------|
| AIP   | Aeronautical information publication |
| ATS   | Air traffic services                 |
| OCA/H | Obstacle Clearance altitude/height   |
| OFZ   | Obstacle free zone                   |
| OLS   | Obstacle limitation surface          |

## Definitions

**Accuracy:** A degree of conformance between the estimated or measured value and the true value.

**Aerodrome:** A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

**Aerodrome certificate:** A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.

**Obstacle:** All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that: a) are located on an area intended for the surface movement of aircraft; or b) extend above a defined surface intended to protect aircraft in flight; or c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

**Obstacle free zone (OFZ):** The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

**Runway:** A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

## INTRODUCTION

### SAFEGUARDING – AN OVERVIEW

#### 1. The Purpose of this Document

The purpose of this Safety Advisory is to provide guidance on the Safeguarding of aerodromes by controlling proposed developments in areas surrounding aerodromes.

This publication explains the process; duties and responsibilities that will be adopted by the civil aviation regulators, service providers and concerned stakeholders.

#### 2. Background

When buildings encroach on the airspace needed for aircraft operations, restrictions limiting the aircraft operations should be established in the interest of safety. Such restrictions could seriously affect orderly and efficient air transportation to an airport and adversely affect the economy of the communities served by the airport.

Control of obstacles near airports is, therefore, a matter of interest and concern to national governments, local communities, property owners, and airport operators, air navigation services, as well as civil aviation authorities

#### 3. What is Safeguarding?

The word “Safeguard” means, according to the Concise Oxford Dictionary, “a provision, stipulation, quality or circumstance, that tends to prevent something undesirable”

#### 4. Purpose of Safeguarding

Thus, the purpose of Aerodrome Safeguarding is to take the measures necessary to ensure the safety of aircraft, and thereby the passengers and crews aboard them, while taking-off or landing, or while flying in the vicinity of an aerodrome Safeguarding is achieved by a process of checking proposed developments so as to:

- Protect the blocks of air through which aircraft fly, by preventing penetration of surfaces created to identify their lower limits (the minimum obstacle clearance altitude (MOCA));
- Protect the integrity of radar and other electronic aids to air navigation, by Preventing reflections and diffractions of the radio signals involved;
- Protect visual aids, such as Approach and Runway lighting, by preventing them from being obscured, or preventing the installation of other lights which could be confused for them; and
- Avoid any increase in the risk to aircraft of a bird strike by preventing any land use that may cause increase in hazardous bird species in the vicinity of the aerodrome and, whenever the opportunity arises, to reduce the level of risk.

Safeguarding of Aerodromes is implemented by establishing a series of protection imaginary surfaces around each aerodrome as follows:

## 5. Safeguarding Protection Types

### 5.1 Obstacle Limitation Surfaces (OLS):

- a. Obstacle Limitation Surfaces (OLS) represent the lower limit of the blocks of protected airspace around an aerodrome. They take the form of a complex set of 3- Dimensional surfaces, which extend upwards and outwards from the runway(s).
- b. The OLS completely surround the aerodrome, but those surfaces aligned with the runway(s) used to protect aircraft landing or taking-off can be more limiting than those surrounding the rest of the aerodrome, particularly as you get closer to the aerodrome. Details of the OLS found in **Appendix A**.

### 5.2 PANS-OPS:

- a. Surfaces established by designers of Procedures for Air Navigation Services and Aircraft Operations (PANS-OPS) are intended to safeguard the aircraft from collision with obstacles when flying on instruments.
- b. PANS-OPS specify the size and dimensions of the obstacle-free airspace needed for the approach, for the missed approach initiated at or above the OCA/H and for the visual maneuvering (circling) procedure.
- c. Visual maneuvering (circling procedures) described in PANS-OPS, is a visual extension of an instrument approach procedure. The size of the area for a visual maneuvering (circling) varies with the flight speed.
- d. It is permissible to eliminate from consideration a particular sector where a prominent non-removable obstacle exists by- establishing appropriate operational procedures.
- e. In many cases, the size of the area will be considerably larger than that covered by the KCASR 14 inner horizontal surface (as shown in figure below). Therefore, circling altitudes/height calculated according to PANS-OPS for actual operations may be higher than those based only on obstacles penetrating the inner horizontal surface area (**Appendix B**).

(more information in KCASR 6).



### Basic ILS surfaces:

“The basic ILS surfaces” defined in PANS-OPS represent the simplest form of protection for ILS operations. These surfaces are extensions of certain KCASR 14 surfaces, referenced to runway threshold level throughout and modified after threshold to protect the instrument missed approach.

The airspace bounded by the basic ILS surfaces is however usually too conservative and therefore another set of surfaces, “obstacle assessment surfaces”, is specified in PANS-OPS. (**Appendix C**).

### 5.3 Obstacle Assessment Surfaces (OAS):

Obstacle Assessment Surfaces (OAS) establish a volume of airspace, inside which it is assumed the flight paths of aeroplanes making ILS approaches and subsequent missed approaches will be contained with sufficiently high probability.

#### 5.4 Radar and other Electronic Aide to Air Navigation:

In low visibility conditions pilots are entirely dependent on the accuracy of the information displayed on the instruments in the cockpit to navigate and land their aircraft. Similarly, air traffic controllers rely on the accuracy of the information displayed on the radar screens in front of them to maintain safe separation between aircraft. It is essential, therefore, that this information has not been distorted by interference to the radio signals involved used in the operation of the navigation aids. All effort has to be done to safeguard Navigation aid's protection area needed for each of (radar / ILS / VOR / Microwave line.....), by:

- Contacting the Manufacturer company to provide all information about dimensions and slops of protection area for each electronic aids and any restriction needed.
- Minimizing the effect of sources of non-visible radiation, or the presence of moving, or fixed objects that may interfere with, or adversely affect, the performance of aeronautical communications, navigation and surveillance systems.

#### 5.5 Visual Aids:

Visual aids, consisting primarily of aeronautical ground lighting, assist pilots to line up the aircraft with the runway when approaching to land. These have to be protected by:

- Preventing them from being obscured;
- Preventing the installation and display of other lights, particularly street lighting, in a pattern or color which could be mistaken for visual aids;
- Preventing a high level of background lighting which could diminish their effectiveness; and
- Preventing other lights which could dazzle pilots.

#### 5.6 Control Tower:

Aerodrome operator should do all effort needed to provide protection needed to keep control tower line of sight clear form any obstacles.

## 6. Duties and Responsibilities

### 6.1 State/Regulator:

- a. Review and approve aerodromes' OLS maps according to national regulations
- b. Have Obstacles assessment system and procedures in place.
- c. Arrange with Operators and Local Planning Authority (LPA), concerned ministries and all other parties involved in aerodrome safeguarding protection area as follows:
  - Provide formal notifications of safeguarding protection area attached to maps of protection surfaces for each aerodrome in the state to LPA
  - Review all urban future development within State level to assure that none may affect aerodrome future development.
  - Review and approve different land use locations (industrial, commercial in addition to any wind-farms, electricity poles, communication antennas and advertising high masts
  - Review all new roads and bridges with its light poles in area adjacent to aerodromes.
  - Other information as may be necessary, for example, landscaping details to enable the bird strike potential to be assessed, or the types of cladding materials proposed so that the potential for radar reflection can be modeled.
- d. As part of the Aerodrome Certificate, DGCA has to review/ accept all Obstacles' data and its aeronautical studies and make sure that all are published in AIP.
- e. Audit and support operator's safeguarding Monitoring system to take necessary actions when needed.
- f. Taking all measures to insure that obstacles are removed, lowered; marked or lit.
- g. Apply law enforcement in case of violation.

## 6.2 Operator

**6.2.1.** Observe the National Laws, Regulations and Advice Notes related to Aerodromes including all guidance materials issued by the competent authority on Safeguarding.

**6.2.2.** Establish and implement aerodrome safeguarding protection applicable to the aerodrome on a map to be reviewed and certified by DGCA to be updated from time to time by the Aerodrome in a way that will reflect the real situation/status in regard to obstacles deployment in the vicinity of the Aerodrome.

**6.2.3.** Designate members of the staff as an official team / department to be responsible for aerodrome safeguarding and furnish them with proper equipment and training to carry out their duties efficiently.

**6.2.4.** Establish procedures to:

- a.** Monitor all human activities and developments within areas underlying the OLS.
- b.** Identify the critical obstacles associated with the Non Precision Approach (NPA) procedures and have them recorded in the Aerodrome Manual.
- c.** Report to the procedure designer any changes of the status of the existing critical obstacles and any proposed development that is likely to be higher than the critical obstacles within the area depicted by the procedure designer.
- d.** Monitor changes in the obstacle environment, marking and lighting.
- e.** Monitor land use activities on the aerodrome and the areas surrounding the aerodrome, as specified in the relevant regulations, in coordination with the competent authorities.
- f.** Immediate report to DGCA any violations, potential obstacles or new buildings, changes of navigation aid equipment or changes of use of any building within the aerodrome fence.
- g.** Conduct an obstacle survey by competent surveyor to establish the initial coordinates and details of obstacles and conduct periodic surveys thereafter.
- h.** Ensure that the runway and taxiway strip areas are free from obstacles or objects which are considered hazardous to aircraft operations unless required to be there for air navigation purposes.
- i.** Mitigate the risks associated with changes on aerodrome and its surroundings identified by the monitoring procedures.

**6.2.5.** Define the scope, limits, tasks and responsibilities for the monitoring process, in coordination with the local authorities and air traffic services providers, and other relevant authorities.

**6.2.6.** Assess the risks caused by human activities and land use, determine the tolerability thereof and define the mitigation measures required. Risks to be assess should include but not limited to:

- a. Obstacles and the possibility of induced turbulence.
- b. Use of hazardous, confusing, and misleading lights.
- c. Dazzling caused by large and highly reflective surfaces.
- d. Sources of non-visible radiation, or the presence of moving, or fixed objects which may interfere with, or adversely affect, the performance of aeronautical communications, navigation and surveillance systems.
- e. Non-aeronautical ground light near an aerodrome which may endanger the safety of aircraft and which must be extinguished, screened, or otherwise modified so as to eliminate the source of danger.
- f. Protect area around aerodrome visual aid located outside aerodrome boundaries by all means of land acquisition (leasing, purchasing etc.) or by preventing new developments or extensions to existing structures from infringing the aerodrome safeguarding protection surfaces.
- g. Notify DGCA of any infringement or potential infringement of the aerodrome safeguarding protection surfaces providing the nature and location of obstacles, and report any subsequent addition, or removal of obstacles for action as necessary, including amendment of the AIS publications.
- h. Take necessary measures to assess the risks resulting from an infringement of OLS to identify whether or not the object creates an unacceptable risk or not, and carry out the necessary actions to remove the obstacle or mitigate the risk as appropriate to protect aircraft using the aerodrome.
- i. Publish and mark, when needed and where necessary, and make visible by means of lights any remaining obstacles.
- j. Provide electronic obstacle data for all obstacles in Area 2 (the part within the aerodrome boundary) that are assessed as hazardous to air navigation.

**Note:** Aerodrome operators need to liaise with appropriate planning authorities and companies that erect tall structures, to determine potential infringements. Every effort should be made to implement the OLS standards and limit the introduction of new obstacles.

When a new obstacle is detected, the aerodrome operator must ensure that the information is passed on to pilots, through NOTAM or through the Aerodrome's AIP if permanent, in accordance with the standards for aerodrome reporting procedures set out in the relevant Regulations.

## 7. Obstacle's Mechanism

### 7.1 Planning Phase:

- a. Safeguarding Process should be included in the LPAs legislation as an integral part of the planning procedure.
- b. LPAs are advised by law to contact DGCA before issuance of any building certificate, or define any land use.
- c. The LPAs then refer to DGCA/defined party of any new urban Planning within OLS area, to insure it meets certain criteria relating the height; location and type of use or any other restriction.
- d. In addition, any proposed developments with bird attractant properties or any wind farms within 30km of an aerodrome will also be referred for consultation.

### Who should apply:

- Any property owner / investors
- Local national Planning authority (LNPA)
- Aerodrome operator

### 7.2 Documents Assessment Phase:

- a) To enable accurate assessment of a proposed development, DGCA should require certain information to be provided by LPA / Owner as followed:
- b) Position: an accurate map reference from a 1:50,000 scale ordnance survey map so that the exact position may be plotted. OR
- c) Grid Reference (to at least 6 figures for each of easting and northings).
- d) The ground elevation of the proposed location referred to mean sea level (MSL) [to an accuracy of  $\pm 0.25\text{m}$ ].
- e) Application showing the following information:
  - Responsibility: Owner's name and address (for legal action in case the need to apply enforcement).
  - Height: required height referenced to MSL measured from the highest point of the building - or above ground level (where exact figures are not available, to the nearest 5 feet).
  - Type of use: (industrial, commercial, poles, electricity towers. ect.....any additional clarification could help the processing of the application).

- Other information may be necessary, as for example: landscaping details to enable the bird strike potential to be assessed, or the types of cladding materials proposed so that the potential for radar reflection can be modelled.

### 7.3 Processing Phase:

It is recommended to have a committee of relevant specialists to review and process application regarding to its impact on:

- a) Aerodrome OLS.
- b) Obstacle Assessment Surfaces which protect Visual and Instrument Flight Paths.
- c) Visual and Electronic Aids, including Radar, to Air Navigation.
- d) Type of land use.

### 7.4 Following Assessment:

The reply from the aerodrome(s)/DGCA to the LPA will be any of the following:

- Aviation permit (no objection).
- Aviation conditioned permit [no objection subject to certain stated condition(s)].
- Aviation Objection letter (with reasons given).

### 7.5 Duration and Renewal of Permit:

- a) DGCA should define validation date to Aviation permits issued thereby taking into account normal time line of construction according to related law; and
- b) DGCA should set rules for renewal of the permit, unless permit is surrendered by the permit is holder or revoked by the DGCA in accordance with national regulation

### 7.6 Amendment of Permit:

Provided that the requirements of OLS been met, DGCA may amend a permit upon:

- a) Formal request of the owner providing reasons.
- b) Changes in the basic information due to inaccurate data/type of use formerly provided.
- c) Changes related to regulation.
- d) Change in the boundaries or component of the aerodrome (new runway or closure/extension of runway); or change of location or height of an aerodrome Navigation Aids.

### 7.7 Interim Permit:

DGCA may issue an interim height permit only for:

- a) new urban areas to provide guidance on permitted type of use and permitted heights.
- b) guidance for design / land evaluation purposes only.

### 7.8 Data Needed:

- a) Coordinates of highest point (or shown in a map);
- b) Proposed type of use; and
- c) Proposed height. (Above ground level).

### 7.9 Compliance with Height Permits:

- a) Each aerodrome operator / property owner or local authority in areas cotangent to aerodromes should undertake the necessary arrangements to apply at DGCA for compliance letter after completion of all construction work.
- b) If survey process shows violation to the permitted height/use a letter should be issued to the owner to rectify the violation, and If no action is taken by the owner during the grace period specified therein, DGCA/aerodrome operator should undertake all the necessary enforcement actions against such violation as prescribed by the relevant law and regulations.

### 7.10 Exemption:

- a) An applicant or a permit holder may submit to the DGCA petition to be exempted from compliance with a requirement of the relevant Regulation as the case may be. The petition must be accompanied with a statement depicting the reasons of such petition and all the details and particulars that may be of support thereto, with conducting an aeronautical study of the case to identify the associated hazards and analyze the consequent risks. Based on the study and analysis results, DGCA may grant an exemption after identifying the appropriate practical measures that must be undertaken and whereby an equivalent level of safety can be attained, with bearing in mind the safety objective of regulations and the applicable standards so that the intent of the regulations is not circumvented.
- b) Exemption may be, only, given in cases defined as for public interests or if the object which constitutes the subject matter of the exemption petition is shielded by non-removable obstacle.
- c) If exemption is granted for an object located within the areas underlying the safeguarding surfaces, especially the approach area of OFZ, the AIS should be notified of the exempted object location and all other details needed for publication as per the relevant Aviation Regulations.
- d) Finally, exempted objects should be lighted and marked when needed according to chapter 6 KCASR 14.

### 7.11 Cancellation / Provoke of a Permit:

A permit should be cancelled or provoked in case of:

- a) non-compliance with requirements/restrictions cited therein;
- b) safety reasons;
- c) New development of aerodrome; and/or
- d) New navigation aid.

A permit cancellation notification should be served upon the concerned parties (LPA, permit holder...) indicating the reasons for such cancellation.

### 7.12 Shielding Principle:

DGCA should set rules for applying the shielding principle to an obstacle shielded by and existing obstacle that does not adversely affect safety of civil aviation; depending on the location of such obstacle:

- a) approach / take-off surface;
- b) runway sides; and
- c) near navigation Aid protection area.

### 7.13 Follow-up Phase:

DGCA should establish rules for following up implementation of and compliance with the issued aviation permit through aerodrome operator.

## 8. Objects Outside the Obstacle Limitation Surfaces

1. Arrangements should be made to enable the DGCA to be consulted concerning proposed construction beyond the limits of the obstacle limitation surfaces that:

- a. extend to a defined height (for example 45m or more) above local ground level / or higher than the general tree height in the area;
- b. any communication antenna/ electricity poles/advertisement boards or poles.....etc; and
- c. wind farms, chimneys or any object that has outcome that could affect airspace safety.

2. In areas beyond the limits of the OLS, at least those objects which extend to a (defined height or) 120m or more above ground elevation should be regarded as obstacles, unless a special aeronautical study indicates that they do not constitute a hazard to aero planes.

Note: This study may have regard to the nature of operations concerned and may distinguish between day and night operations, and may be preferable to be lighted and marked.

## 9. Other Objects

1. Objects which do not project through the approach surface but which would nevertheless adversely affect the optimum siting or performance of visual or non- visual aids should, as far as practicable:

a. be removed.

b. Marked and/or lit.

2. Anything which may, in the opinion of the DGCA after aeronautical study, endanger aeroplanes on the movement area or in the air within the limits of the inner horizontal and conical surfaces should be regarded as an obstacle and should be removed in so far as practicable.

**Note:** In certain circumstances, objects that do not project above any of the surfaces enumerated in national regulation may constitute a hazard to aeroplanes as, for example, where there are one or more isolated objects in the vicinity of an aerodrome.

3. Temporary and transient obstacles. Temporary obstacles as cranes and transient (mobile) obstacles, such as road / vehicles / rail carriages or ships, in close proximity to the aerodrome and which penetrate the OLS for a short duration, must be referred to DGCA to determine whether they will be a hazard to aircraft operations.

4. Fences or levee banks. A fence or levee bank that penetrates the OLS must be treated as an obstacle.

## 10. Reporting

Several countries have enacted Legislation or adopted regulations designed to assign responsibility for reporting new construction projects. The obligation to report such construction may rest with local agencies such as planning bodies or construction licensing authorities or with the developer himself. In some cases, height limits have been specified; these are generally consistent with the criteria of KCASR 14, Chapter 4, below which local authorities may authorize a project without higher review.

If any part of a proposed development appears to penetrate an obstacle Limitation surface, then the project should be referred to DGCA for review. This review would examine the effect of the envisaged construction on air navigating in general and on operation procedures in use in particular if the conclusion of the above study is that the proposed construction can be permitted under some conditions, these should also be identified, e.g. display of obstacle marking and lighting, Compliance with other appropriate measures for continued safety of air navigation, etc.

Finally, all concerned should be notified oh of the new construction through charts (in accordance with KCASR 4 - Aeronautical Charts) and through Notices to Airmen (NOTAM) or Aeronautical Information Publications; (AIP) pursuant to KCASR 15.

## **11. Other Requirement included in Regulation**

### **11.1 Protection form Light or Laser emission**

Each person proposing to operate a light or laser (within a distance about 15 Km from the airport) should notify the DGCA;

- a) Because of its glare or effect on a pilot's vision, the light or laser is liable to endanger aircraft;  
or
- b) For a laser, it would produce exposures in navigable air space exceeding the maximum permissible exposure defined for that laser; or it is likely to endanger aircraft by being mistaken for:
  - I. A light or part of a system of lights established or approved for display at or near an aerodrome; or
  - II. A light marking a hazard in navigable airspace.

### **11.2 Notice of use of weapons**

Each person or each person representing an organization, proposing to use weapons that will fire or launch a projectile that will have a trajectory higher than 60 m should notify the DGCA

### **11.3 Notice of use of pyrotechnics**

Each person proposing to stage a pyrotechnics display that will involve the firing or launching of a projectile that will have a trajectory higher than 60m shall notify the DGCA.

#### 11.4 Notice requirements.

1. Each person required to provide notice to the DGCA should complete related DGCA form and submit it to the Director DGCA at least 90 days prior to the proposed date of commencement of construction, alteration, or use.
2. In the case of an emergency involving essential public services, public health, or public safety, that requires immediate construction or alteration of a structure, or use of a structure, lights, lasers, weapons, or pyrotechnics—
  - the notice requirements in previous paragraph should not apply but,
  - the person responsible for the construction, alteration, or use should submit it to the Director as soon as possible for the construction, alteration, or use.
3. A person proposing to use lights, lasers, weapons, or pyrotechnics, in a control zone prescribed in national regulation during times when the appropriate ATS is on watch—
4. is not required to provide notice under paragraph (a); and
5. should submit it to the DGCA at least 14 working days prior to the commencement of the use.

### 12. Land Use Hazard

#### 12.1 Wildlife:

- a) Birds are attracted to the vicinity of an aerodrome by various types of development, including water features, landfill sites, nature reserves, gravel extraction and landscaping.
- b) The objective of the safeguarding process is to prevent any increase in, and where possible reduce, the bird strike risk at an aerodrome. This may be possible by altering planning proposals to remove bird attractive features or, failing this, to object outright to those that cannot be adequately redesigned.
- c) When determining whether a planning application will increase the bird strike risk at an aerodrome the following factors will be taken into account:
  1. what types of development are attractive to which species of bird;
  2. whether birds will move from existing sites to the proposed one and, in the process, cross aircraft flight paths near to the aerodrome, or indeed move onto the aerodrome itself; and
  3. where an LPA is consulted by a developer regarding the exercise of a permitted development right under these regulations, the LPA should refer the developer direct to the aerodrome operator for safeguarding advice.

#### 12.2 Radiation Interference

The safeguarding process is used to protect Radar and other Electronic Navigational Aids from radio frequency interference from other sources of radio emissions; radio signal reflections or diffractions caused by physical objects.

- A recent and less obvious source of radio frequency interference is the wind- driven generator.
- Therefore, proposed wind farms within 30km of aerodromes need to be considered in the safeguarding process.

### 12.3 Construction Concerns (activities / ...):

- a) Safeguarding aspects of a proposed development do not end with the grant of Aviation Permit.
  - b) The methods and equipment to be employed during construction may also need to be agreed, particularly if cranes or other tall construction equipment will be involved as these tend to be taller than the proposed structure.
  - c) For a project close to the aerodrome or under the approaches, the Developers must apply for a permit before operating carnage within a 6km circle of the airfield. The application for the permit must indicate the herein below listed information:
    - d) Crane operation:
      - Exact location of the crane marked on a map showing OS Grid.
      - Maximum operating height of crane Above Ground Level (AGL) plus ground in AOD.
      - Type of crane/equipment (e.g. Tower, Crane, Mobile Crane etc.)
      - Radius of the jib/boom of a fixed crane/the area of operation of a mobile crane.
      - Intended dates and times of operation.
      - Applicant's name and address.
- Once these details have been studied by EDGCA it will be determined whether the operation can proceed and whether restrictions will apply and a relevant Permit should be issued by DGCA setting out any restrictions as required to ensure aircraft operation safety.

### 12.4 Roads and Railways near Safeguarded Aerodromes:

- a) Roads and rail vehicles are potential obstructions to aircraft. The internationally agreed safety criteria recognize this by considering a road to be a mobile obstruction of 4.8 meters and a railway to be a mobile obstruction of 5.4 meters.

- b) The DGCA should adopt these provisions as part of its safeguarding practice. If a road or a railway forms part of a planning application, the LPA should regard it as development of a height of 4.8 or 5.4 meters, as the case may be, and consult in accordance with the color coding on the safeguarding map provided by DGCA thereto.
- c) Lighting columns and other street furniture, and signal gantries and power lines, should also be the subject of consultation appropriate to their height, in accordance with the color coding on the safeguarding maps.

### **12.5 Non-aeronautical Ground Lights:**

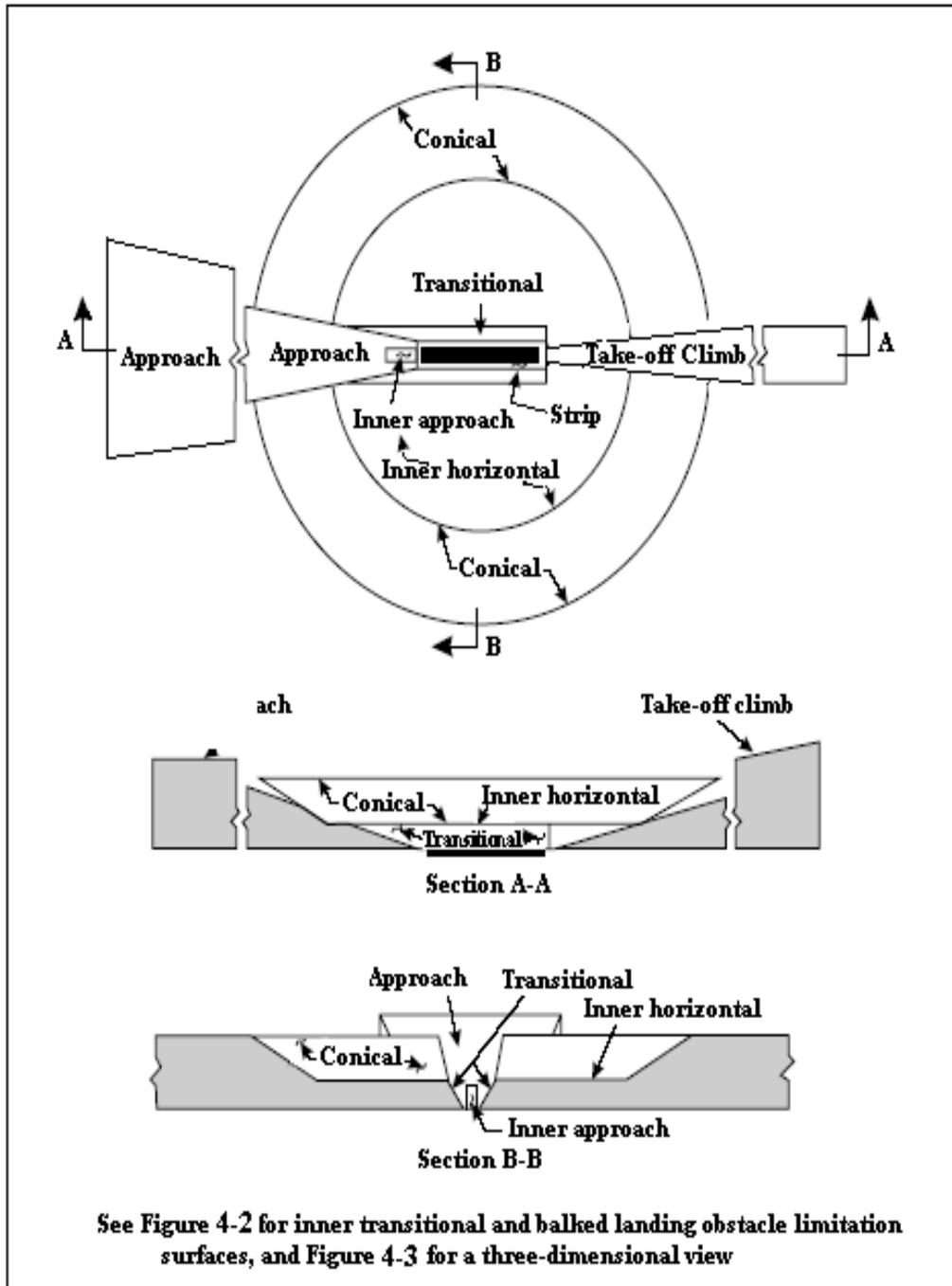
A non-aeronautical ground light which, by reason of its intensity, configuration or color, might prevent, or cause confusion in, the clear interpretation of aeronautical ground light should be extinguished, screened or otherwise modified so as to eliminate such a possibility. A detailed assessment should be conducted.

### 13. Recommendations

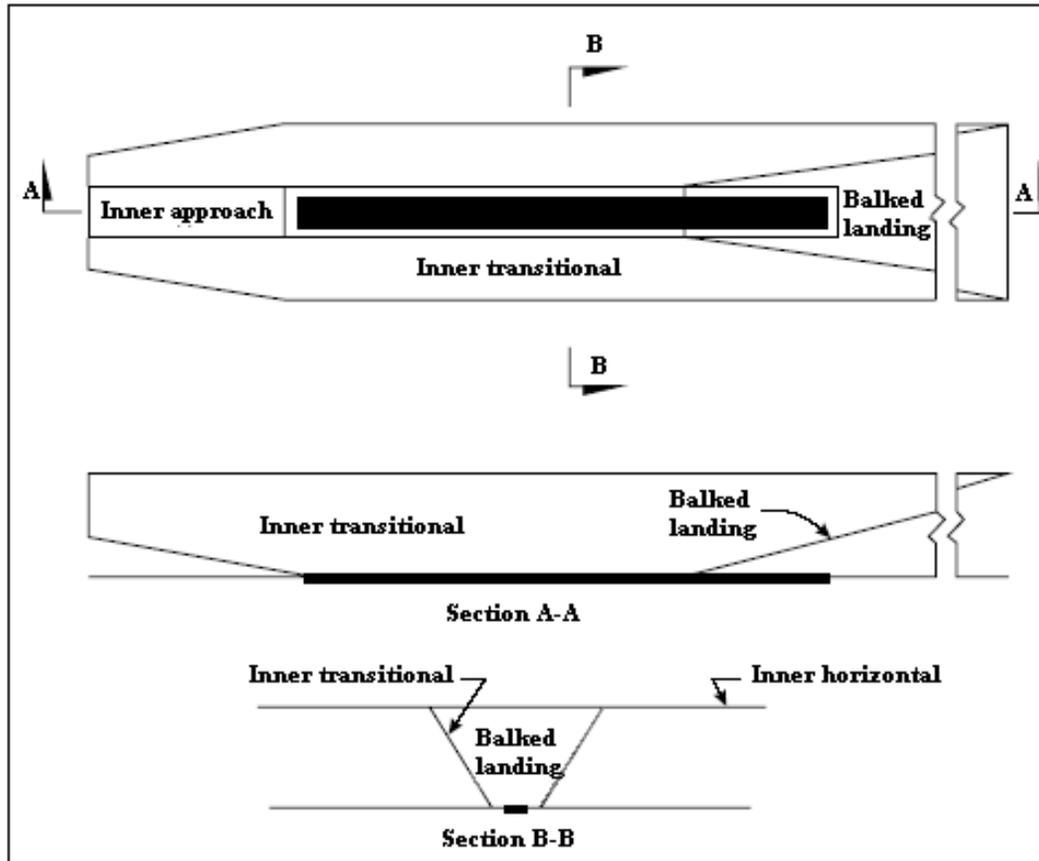
- a) Prior to a formal Planning Application being made, the aerodrome concerned may be prepared to offer informal advice on how to comply with the safeguarding requirement. The aerodrome advice will depend on the level of detail provided, but it is likely to be limited to lighting, landscaping and height limits. If it believes a detailed study is required in relation to specialist aspects such as the Bird Hazard or Navigational Aid installations, it may just advise that a suitable consultant be engaged so that their report(s) can be included with any subsequent Planning Application.
- b) Any advice would be informal and without prejudice to detailed consideration of any future Planning Application(s).
- c) The absence of any safeguarding concerns should not be construed as support for any proposed development(s).
- d) It must be stressed that a runway protected only by the obstacle limitation surfaces of KCASR 14 will not necessarily allow the achievement of the lowest possible operational minima if it does not, at the same time, satisfy the provisions of the PANS-OPS. Consequently, consideration needs to be given to objects which penetrate the PANS- OPS surfaces, regardless of whether or not they penetrating KCASR 14 obstacles limitation surface, and such obstacles may result in an operational penalty.

**In conclusion, the foregoing should be taken into account, together with all the other responses, when the LPA determines the outcome of the Planning Application.**

APPENDIX A



Obstacle's Limitation Surfaces (Type 1)



### Obstacle's Free Zones

APPENDIX B

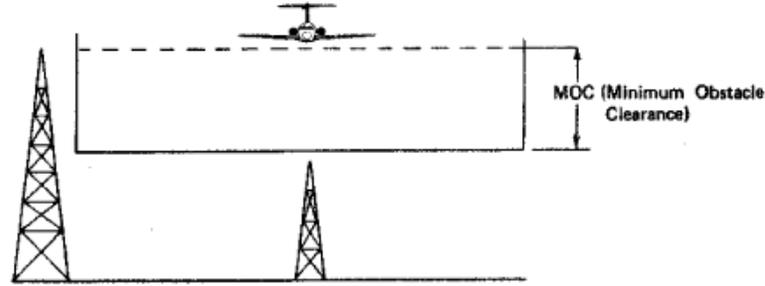


Figure 1-4.

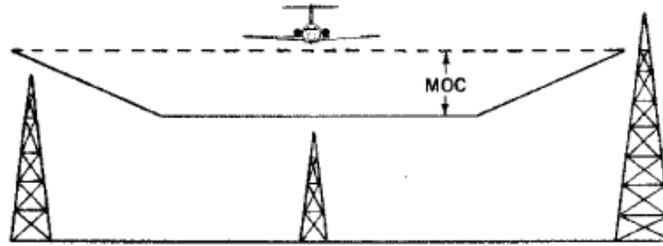
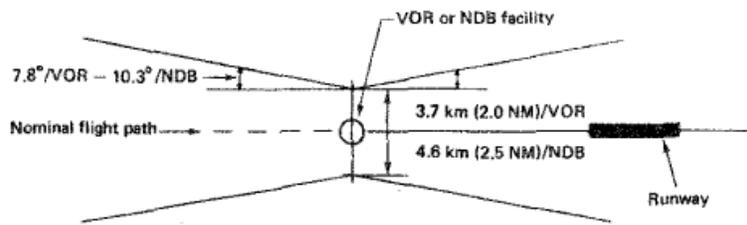
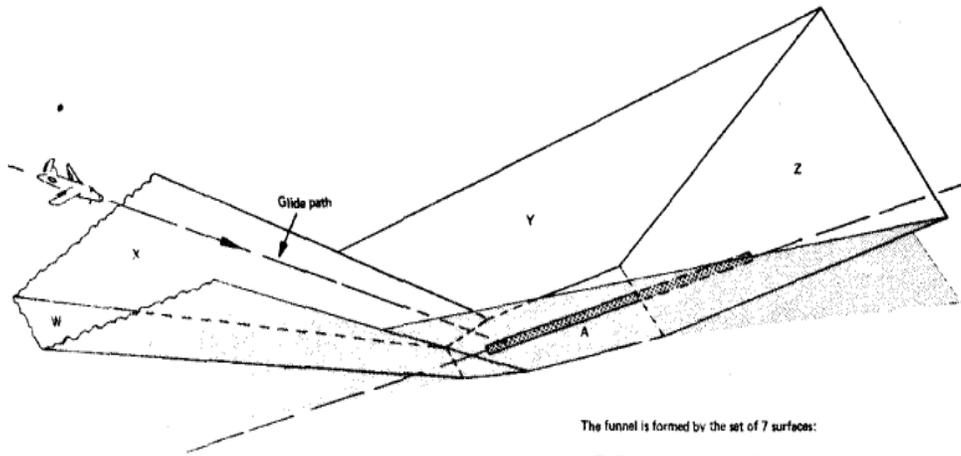


Figure 1-5.



PANS-OPS

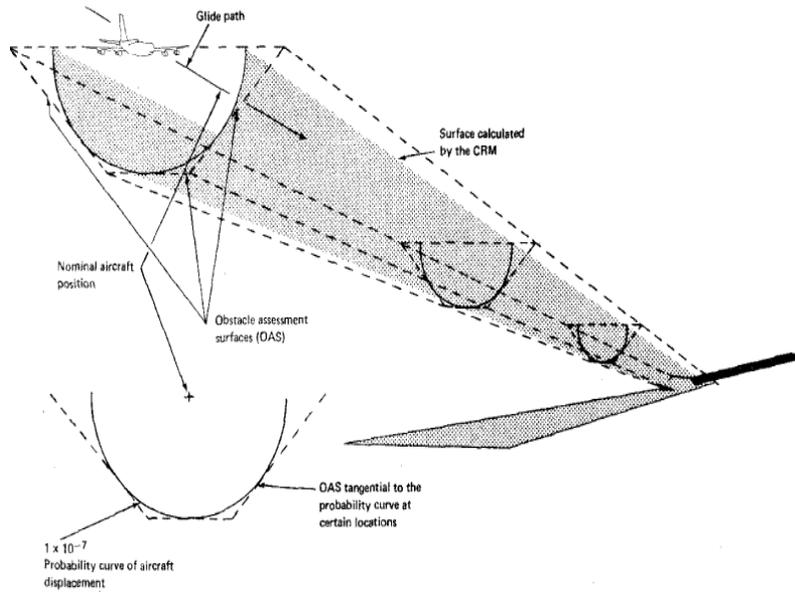
APPENDIX C



The funnel is formed by the set of 7 surfaces:

- The W and two X approach surfaces.
- The "footprint" A.
- The missed approach surface Z.
- The two Y transitional surfaces.

The approach Funnel (OAS)



The approaches funnel (CRM)

## APPENDIX D

### Establish and Implement Safeguarding System

#### INTRODUCTION

- The following checklists are developed to give guidance for the purpose of:
  - Starting Safeguarding System; or
  - As guidance for implementation and Obstacle Monitoring.

A. Establish new Safeguarding System

Questions for Building up Safeguarding System:

|   | Yes | No | Comment |
|---|-----|----|---------|
| Are you aware by KCASR14? ICAO doc 9137 "part 6"? and Related documentation   |     |    |         |
| Do you have an updated data about your civil airports: <ul style="list-style-type: none"> <li>• Number.</li> <li>• Type of each Aerodrome</li> <li>• Operation (Hours, Season...).</li> <li>• No. and code of Runways.</li> <li>• Type and number of Navigation Aids</li> </ul>   |     |    |         |
| Does state/airport operator has a development plan for the next 20 to 30 years with respect to : <ul style="list-style-type: none"> <li>• New aerodromes.</li> <li>• New Runways.</li> <li>• Changing Aerodrome Reference Code.</li> <li>• Installing / uninstalling or upgrading Nav. Aid equipment.</li> </ul>  |     |    |         |
| Clear definition of "Obstacles Limitation Surfaces" and guidance material for each aerodrome : <ul style="list-style-type: none"> <li>• Type of definition and guidance material (law, decree, national regulation, maps, electronic data.....)</li> <li>• Type of map used (contour, tourism, Cadastral...)</li> <li>• Scale of used map (if applicable)</li> <li>• Surfaces according to KCASR 14 or different? list of differences?</li> </ul> |     |    |         |

|  |                         |                               |  |
|--|-------------------------|-------------------------------|--|
| <p><b>Is there in place "Obstacle Assessment System" reflecting KCASR 14 requirements and related documentation?</b></p> <ul style="list-style-type: none"> <li>● In which type? (Digital, CAD, Paper...)?</li> <li>● Last update?</li> <li>● Degree of Accuracy?</li> </ul> <p><b>Metadata?</b></p>                               |                         |                               |  |
| <p><b>Do you have division/department in-charge of Safeguarding?</b></p>   |                         |                               |  |
| <p><b>Do you have restrictions to control / monitor type of construction materials in the area around the aerodromes?</b></p>  |                         |                               |  |
| <p><b>Do you have defined land use control?</b></p> <p><b>Do you have procedures for bird-strike control within a circle of (13km) diameter?</b></p>   |                         |                               |  |
| <p><b>Do you have a field survey (Footprint\Elevation) for the near-by buildings &amp; high objects around the civil aerodromes?</b></p> <ul style="list-style-type: none"> <li>● Area</li> <li>● Description.</li> <li>● Type of object/buildings?</li> <li>● Accuracy of Footprint?</li> <li>● Accuracy of Elevation?</li> </ul> |                         |                               |  |
| <p><b>Do you have procedures for implementing eTOD requirement?</b></p> <ul style="list-style-type: none"> <li>● Areas of implementation</li> <li>● Degree of implementation</li> <li>● Degree of accuracy</li> </ul>  |                         |                               |  |
| <p><b>Can you determine the amount of penetration for buildings/objects within the OLS &amp; OAS?</b></p> <p><input type="checkbox"/> <b>Do you have technical tool for checking amount of penetration? (required for high density urban area)</b></p> <p><b>Way of performing analysis? (required for low density urban)</b></p>  |                         |                               |  |
| <p><b>REMARK:</b></p>  |                         |                               |  |
| <p><b>Aerodrome Personnel:</b></p>   | <p><b>Position:</b></p> | <p><b>Signature/date:</b></p> |  |
|  |                         |                               |  |

**(System's input-output)**

**Expected inputs, output expected and coordination needed for building Safeguarding system.**

|   | Yes       | No              | Comment |
|---|-----------|-----------------|---------|
| Expected "Urban Expansion" around each civil aerodrome?   |           |                 |         |
| Arrangements with other authorities / parties regarding urban extension   |           |                 |         |
| Establishment of monitoring system (new/change in land use that might result of the expected urban extension)   |           |                 |         |
| Database system for land-use in place which may develop bird attractant/hazard to pilots (close coordination with planning authorities to prevent landscaping / water features / land-fill sites). This may also involve the listing of trees, bushes, berries as know bird attractants   |           |                 |         |
| Policy and assessment for areas used for wind farms and solar panels including, with roles for performing aeronautical study about its impact on nav. Aids.   |           |                 |         |
| Regulations includes how to deal with any type of violations (height/type of material/land use....)?  |           |                 |         |
| Is the current civil aviation law implemented?  |           |                 |         |
| Is your aviation regulation reflected in the aviation law?  |           |                 |         |
| Responsibility for issuance/define max allowable height permissions / monitoring new buildings / objects in the area around the civil aerodromes?<br>• The Aerodrome Operator? or<br>• The Civil Aviation Authority? or<br>• The Urban Planning Authority?  |           |                 |         |
| Coordination between the authorities in charge of issuance the max allowable height for buildings / objects & the Civil Aviation Authority or vice versa?<br>• What is the mechanism of data exchange?<br>• Does the other entities' Law/regulation reflect the civil aviation authority regulations?<br>• Are you informed regularly with each new building/object allowable height? Can you review its license? |           |                 |         |
| <b>REMARKS:</b>   |           |                 |         |
| Assigned personnel name:  | Position: | Signature/date: |         |
|   |           |                 |         |

Existing Safeguarding System

This checklist is used for checking system compliance level with legislation's requirements.

|  |  | Yes       | No | Comment         |
|--|--|-----------|----|-----------------|
| Procedures for issuance aviation permits/permission to building/object within OLS area? And special cases outside it?  |  |           |    |                 |
| Is there any permission fees?  |  |           |    |                 |
| Work plan (work cycle) to monitor buildings\objects' compliance with their max allowable heights within safeguarded area around the civil airports?  |  |           |    |                 |
| Is there a clear steps\Phases to accurate measurement of height violation?<br><ul style="list-style-type: none"> <li>• Steps for a building / object that already has a permitted height? (legal Case)</li> <li>• Steps for buildings / objects that has no max height permit? (illegal Case)</li> </ul> |  |           |    |                 |
| Defined range for accepted level of violation providing that it doesn't affect safety?   |  |           |    |                 |
| Are there clear responsibilities and procedures for assessing the violation impact on safety and issue required permission?  |  |           |    |                 |
| For urban areas around the civil aerodromes:   |  |           |    |                 |
| Manual inspection  | <ul style="list-style-type: none"> <li>• Procedures for field visits to inspect / monitor objects / buildings around the aerodrome?</li> <li>• Do you have arrangements in place with other department regarding Field Survey procedures for objects / buildings? Or</li> <li>• Do you have your field surveyor's team?</li> <li>• Do you have the tools for previous task? – <ul style="list-style-type: none"> <li>○ Ordinary tools (levelling-total station) Or</li> <li>○ High technology tools (GPS) for fast and accurate results?</li> </ul> </li> <li>• Do you have manual DEM? Area?</li> </ul> |           |    |                 |
| Digital inspection   | <ul style="list-style-type: none"> <li>• Do you have an access to recent Satellite images for OLS area?</li> <li>• What is the horizontal / vertical accuracy of the satellite images?</li> <li>• Can the objects / features in these images be extracted &amp; converted to digital form by any way?</li> <li>• Do you have another tool to verify the Satellite images digital output (extracted features)?</li> </ul>   |           |    |                 |
| What is the operator's role in the monitoring process? Is it approved by the concerned department in the DGCA?<br>Description of data flow?<br>Does the result of that process been forwarded to DGCA ?  |  |           |    |                 |
| REMARK:  |  |           |    |                 |
| Assigned personnel name:   |  | Position: |    | Signature/date: |
|  |  |           |    |                 |

APPENDIX E

Safeguarding System Compliance

A. Aerodrome manual compliance with safeguarding requirement

| General Information  |   |                     |          |
|--|---|---------------------|----------|
|  | Name of Aerodrome/Aerodrome:  |                     |          |
|  | Address:  |                     |          |
|  | Name of Operator:   |                     |          |
|  | Name of Aerodrome Manager:  |                     |          |
|  | Head of Safeguarding Department:                                    |                     |          |
|  | Operational Hours:  |                     |          |
|  | E-mail Address:   |                     |          |
|  | Telephone Numbers:  |                     |          |
|  | Reference:<br>Regulation.....<br>MOS.....<br>Advisory Circular..... |                     |          |
|  |   |                     |          |
| Activity and Objective   | Regulatory /Standards Reference                                     | Status Yes/No/(N/A) | Comments |
| <u>Aerodrome Manual</u>  |   |                     |          |
| Does the manual contain synopsis of system to control and removal of obstacles at the aerodrome and its environs (off the aerodrome) including : |   |                     |          |
| • Establishing OLS for the aerodrome in accordance with ICAO requirement and methodology for obstacle assessment?                                |   |                     |          |
| • Reasonable measures to monitor the OLS including restriction to different areas? And   |   |                     |          |
| • Establishment of system to Obstacle removal system   |   |                     |          |
| • Establishing bird-strike monitor system to control a surface of (13km) in diameter?  |   |                     |          |
| • Continuous monitoring system for area in the vicinity of the aerodrome to control new obstacles  |   |                     |          |

|  |  |  |  |
|--|--|--|--|
| <ul style="list-style-type: none"><li>• Procedures for quick detection of new obstacles? Including objects, buildings, and structures</li><li>• Procedure for DGCA notification about new obstacles or additional removed obstacles?</li></ul> |  |  |  |
| <ul style="list-style-type: none"><li>• Procedures for dealing with Wind farms / solar panels and electricity poles assessment?</li></ul>  |  |  |  |

|  |  |  |  |
|--|--|--|--|
| • Monitoring the Type A chart take-off surfaces for obstacles?   |  |  |  |
| • System to obtain and report data of obstacles in each surface with full details? With a process for amending the AIS publications regarding obstacles?   |  |  |  |
| • Monitoring building developments (to ensure compliance with allowed height, nonstructural material and shape) within the horizontal limit of the obstacle limitation surfaces?                       |  |  |  |
| • if the aerodrome has instrument approach procedures, is there procedures for monitoring new objects or building developments in any other areas nominated by the instrument procedure designers?     |  |  |  |
| • Arrangements between DGCA and local planning authorities and other relevant organizations in relation to the approval of building developments that may infringe the obstacle limitation surfaces?   |  |  |  |
| • Arrangements and procedures for controlling and monitoring non-aeronautical lights / laser beams and fireworks   |  |  |  |
| • Arrangements between aerodromes' operators and any crane operator works within safeguarding area or outside it for heights more than 30m above ground level or more than 150m above runway threshold |  |  |  |
| • Arrangement with DGCA to assess proposed obstacles? (If applicable to the aerodrome)   |  |  |  |
| • Reporting obstacles by NOTAM including amended declared distances?   |  |  |  |
| • Procedures for conducting OLS survey requirement? How frequent? Degree of accuracy?  |  |  |  |
| • Names, telephone numbers and roles of the persons responsible for planning and implementing obstacle control?  |  |  |  |
| <b>Protection of Radar and Navigation Sites:</b>   |  |  |  |
| <b>Procedures for protection, operations and maintenance of radar and radio navigation aids</b>  |  |  |  |
| • Number and Description of aerodrome's navigation aids  |  |  |  |
| • Definition and description of protection surfaces needed for each equipment supported by Document  |  |  |  |
| • Maps reflecting protection area for each equipment.  |  |  |  |

|   |  |                                |                 |
|---|--|--------------------------------|-----------------|
| <b>• Name and Details of persons responsible</b>  |  |                                |                 |
| <b>Record Keeping</b>   |  |                                |                 |
| <b>List of documents checked.</b>   |  |                                |                 |
| <b>List of Obstacles inside and outside aerodrome with all details</b>  |  |                                |                 |
| <b>Forms used to assess or report obstacles</b>   |  |                                |                 |
| <b>Is the operator maintaining records in accordance with the aerodrome manual? (Check OLS survey data, Inspection logbooks, Obstacle control reporting (NOTAM) etc.)</b> |  |                                |                 |
| <b>Facilities</b>   |  |                                |                 |
| <b>Are adequate and suitable staff and resources available?</b>   |  |                                |                 |
| <b>Are adequate and suitable equipment, training and resources available?</b>   |  |                                |                 |
| <b>Are OLS surveys conducted by an appropriately trained or qualified person?</b>   |  |                                |                 |
| <b>Activity and objective</b>   | <b>Regulatory/ standards reference</b> | <b>Status<br/>Yes/No/(N/A)</b> | <b>Comments</b> |
| <b>Procedures</b>   |  |                                |                 |
| <b>Is the OLS monitored in accordance with the manual?</b>  |  |                                |                 |
| <b>Is type A surfaces monitored in accordance with the manual?</b>  |  |                                |                 |
| <b>Are NPA areas monitored in accordance with the manual?</b>   |  |                                |                 |
| <b>Does monitoring conducted includes temporary and permanent structures?</b>   |  |                                |                 |
| <b>And for gaseous refluxes?</b>  |  |                                |                 |
| <b>Are the procedures for liaising with other authorities being followed?</b>   |  |                                |                 |
| <b>Is the staff aware of safety requirements related to obstacles?</b>  |  |                                |                 |
| <b>Are any conditions or exemptions complied with?</b>  |  |                                |                 |
| <b>Product Check</b>  |  |                                |                 |
| <b>Is OLS plan prepared in accordance with national regulation according to ICAO requirement?</b>   |  |                                |                 |
| <b>Do survey records agree with published information?</b>  |  |                                |                 |
| <b>Does field condition appear to reflect survey data and published information?</b>  |  |                                |                 |

|  |  |                  |  |                          |  |
|--|--|------------------|--|--------------------------|--|
| <b>Does obstacle related NOTAMs reflect fieldcondition?</b>            |  |                  |  |                          |  |
| <b>Feedback</b>  |  |                  |  |                          |  |
| <b>Are obstacle control incidents noted, reported and followed up?</b> |  |                  |  |                          |  |
| <b>INSPECTOR'S REMARK:</b>   |  |                  |  |                          |  |
| <b>Inspectors Name:</b>  |  | <b>Position:</b> |  | <b>Signature / date:</b> |  |
|  |  |                  |  |                          |  |

### B. Obstacle's Assessment Checklist

This checklist is used obstacle assessment to be to measure its impact on safety.

|  |   |  |
|--|---|--|
|  | <b>Name of Aerodrome/Aerodrome</b>      |  |
|  | <b>Name of Operator:</b>                |  |
|  | <b>Name of Aerodrome Manager:</b>       |  |
|  | <b>Head of Safeguarding Department:</b> |  |
|  | <b>Reference: Regulation.....</b>       |  |
|  | <b>MOS.....</b>                         |  |
|  | <b>Advisory Circular.....</b>           |  |
| <b>Obstacle Assessment</b>   |   |  |
| <b>The nature of the obstacle and its location relative to the surface origin, to the extended centre line of the runway or normal approach and departure paths and to existing obstructions</b> |   |  |
| <b>The location of the obstacle relative to Air Navigation surfaces</b>  |   |  |
| <b>The amount by which the surface is infringed</b>  |   |  |
| <b>The gradient presented by the obstacle to the surface origin</b>  |   |  |
| <b>The type of air traffic at the aerodrome; and</b>   |   |  |
| <b>Type of building materials</b>  |   |  |
| <b>Shape of Obstacle</b>   |   |  |
| <b>Nature and height of surroundings</b>   |   |  |
| <b>Is it shielded by another reported fixed obstacle</b>   |   |  |
| <b>The instrument approach procedures published for the aerodrome</b>  |   |  |
| <b>Safety Measures could be as follows:</b>  |   |  |
| <b>Promulgation in the AIP appropriate information</b>   |   |  |

|   |                  |                        |
|---|------------------|------------------------|
| <b>Marking and /or lighting of the obstacle</b>   |                  |                        |
| <b>Variation of the runway distances declared as available</b>  |                  |                        |
| <b>Limitation of the use of the runway to visual approaches only</b>  |                  |                        |
| <b>Possibility of inducing turbulence, or defragment/reflection of navigation aid radiation</b>   |                  |                        |
| <b>Restriction on the type of traffic</b>   |                  |                        |
| <b>Database of land-use sites that may be in place or planned which may develop into a bird attractant/hazard to pilots (close coordination with planning authorities to prevent landscaping / water features / land-fill sites). This may also involve the listing of trees, bushes, berries as know bird attractants</b>  |                  |                        |
| <b>In addition to the requirements above it may be necessary to call for the other restrictions to development on and in the vicinity of the aerodrome in order to protect the performance of visual and electronic aids to navigation and to ensure that such development does not adversely affect instrument approach procedures and the associated obstacle clearance limits.</b> |                  |                        |
| <b>INSPECTOR'S REMARK:</b>  |                  |                        |
|   |                  |                        |
| <b>Inspectors Name:</b>   | <b>Position:</b> | <b>Signature/date:</b> |

C. **Safeguarding Monitoring System Checklist**  
1. **Pre-visit Checklist:**

This checklist is used by DGCA for pre-inspection visit, when the airport's operator has a system and procedures in place for obstacle's monitoring and control:

**Personal Personnel & equipment**

| Monitoring Implementation        |                     |                        |                            |          |
|----------------------------------|---------------------|------------------------|----------------------------|----------|
| Name of Aerodrome/Aerodrome:     |                     |                        |                            |          |
| Address:                         |                     |                        |                            |          |
| Name of Operator:                |                     |                        | Name of Aerodrome Manager: |          |
| Head of Safeguarding Department: |                     |                        |                            |          |
| Operational Hours:               |                     |                        | Telephone Numbers:         |          |
| E-mail Address:                  |                     |                        |                            |          |
| Reference:                       |                     |                        |                            |          |
| In Office :                      | Date of Inspection: |                        |                            |          |
|                                  | Name                | Response               | Cooperation                | Remark   |
| Aerodrome Operator               |                     |                        |                            |          |
| Obstacle Manager                 |                     |                        |                            |          |
| Obstacle Staff                   |                     |                        |                            |          |
| Obstacles Map                    |                     | Date of last Issuance: | Scale:                     | Comments |
| • Cadastral map                  |                     |                        |                            |          |
| • Subdivisions map               |                     |                        |                            |          |
| • Aerodrome Layout               |                     |                        |                            |          |
| Obstacle's Data Base Table       |                     | Comments:              |                            |          |
| Notifications                    |                     |                        |                            |          |
| Correspondence                   |                     |                        |                            |          |
| Aviation Permits Follow- Up      |                     |                        |                            |          |
| List of Airport's Buildings      |                     |                        |                            |          |
| Safeguarding Cadastral Map       | Has all surfaces    | Show all Obstacles     | Comment                    |          |
| Rules Listed                     | KCASR Standards     |                        |                            |          |
| Any for Archiving                |                     |                        |                            |          |
| INSPECTOR'S REMARK:              |                     |                        |                            |          |
| Inspectors Name:                 | Position:           |                        | Signature/date:            |          |
|                                  |                     |                        |                            |          |

| Equipment and guidance material  |  |                                     |                            |          |             |         |
|----------------------------------|--|-------------------------------------|----------------------------|----------|-------------|---------|
| Name of Aerodrome/Aerodrome:     |  |                                     |                            |          |             |         |
| Address:                         |  |                                     |                            |          |             |         |
| Name of Operator:                |  |                                     | Name of Aerodrome Manager: |          |             |         |
| Head of Safeguarding Department: |  |                                     |                            |          |             |         |
| Operational Hours:               |  |                                     | Telephone Numbers:         |          |             |         |
| E-mail Address:                  |  |                                     |                            |          |             |         |
| Reference:                       |  |                                     |                            |          |             |         |
|                                  |  |                                     |                            |          |             |         |
| In Office :                      |  | Date of Inspection:                 |                            |          |             |         |
|                                  |  | Name                                |                            | Response | Cooperation | Remark  |
| Aerodrome Operator               |  |                                     |                            |          |             |         |
| Obstacle Manager                 |  |                                     |                            |          |             |         |
| Obstacle Staff                   |  |                                     |                            |          |             |         |
| Maps                             |  | Yes                                 | No                         | N/A      |             |         |
| Aerodrome-Map                    |  | Aerodrome buildings Layout          |                            |          |             |         |
|                                  |  | Obstacles Layout                    |                            |          |             |         |
| Safeguarding Map                 |  | Safeguarding Limits surfaces        |                            |          |             |         |
|                                  |  | Out Aerodrome Obstacle (Survey map) |                            |          |             |         |
| Forms:                           |  |                                     |                            |          |             |         |
|                                  |  |                                     |                            | Yes      | No          | Remarks |
| Periodic Work Plan               |  | Buildings                           |                            |          |             |         |
|                                  |  | Permits                             |                            |          |             |         |
| Follow Up                        |  | Inside aerodrome                    |                            |          |             |         |
|                                  |  | Buildings                           |                            |          |             |         |
|                                  |  | Others                              |                            |          |             |         |
| Outside                          |  | Notifications                       |                            |          |             |         |

|                        |           |   |  |                 |  |
|------------------------|-----------|---|--|-----------------|--|
|                        | aerodrome | buildings   |  |                 |  |
| Office Inspection      |           | Subsidiarity  |  |                 |  |
|                        |           | location  |  |                 |  |
|                        |           | Supporting equipment  |  |                 |  |
| Technical Equipment    |           | G P S   |  |                 |  |
|                        |           | Printer   |  |                 |  |
|                        |           | Tel./ Fax.  |  |                 |  |
|                        |           | Scanner   |  |                 |  |
| Training               |           | Car   |  |                 |  |
|                        |           | Equipment<br>Technical:<br>•Basic Safeguarding<br>•Obstacle's<br>Assessment and<br>Management<br>•Obstacle's<br>monitoring<br>system<br>•Other required<br>training |  |                 |  |
| Personnel              |           | Habitat   |  |                 |  |
|                        |           | 2 Week  |  |                 |  |
|                        |           | Number  |  |                 |  |
|                        |           | Coalification   |  |                 |  |
| INSPECTOR'S<br>REMARK: |           |   |  |                 |  |
| Inspectors Name:       |           | Position:   |  | Signature/date: |  |
|                        |           |   |  |                 |  |

*This checklist is used before visit to review all available and tool needed:*

2.

**Site visit Checklists:**

This checklist is used in the site visit to inspect the implementation level of procedures listed in the aerodrome's manual

|  |   |
|--|---|
|  | <b>Name of Aerodrome/Aerodrome:</b>     |
|  | <b>Address:</b>                         |
|  | <b>Name of Operator:</b>                |
|  | <b>Name of Aerodrome Manager:</b>       |
|  | <b>Head of Safeguarding Department:</b> |
|  | <b>Operational Hours:</b>               |
|  | <b>E-mail Address:</b>                  |
|  | <b>Telephone Numbers:</b>               |
|  | <b>Reference:</b>                       |

|   | Yes | No | Comment |
|---|-----|----|---------|
| <b>Is there work plan (work cycle) to monitor construction work (buildings\objects) in area around the civil airport?</b>   |     |    |         |
| <b>Procedures for (work cycle) observing any aviation violated in areas around civil airport?</b>   |     |    |         |
| <b>Steps\Phase for monitoring level of compliance with max allowed height?</b>  |     |    |         |
| <ul style="list-style-type: none"> <li>• Steps for monitoring a buildings\objects that already has Aviation permit? (if applicable)</li> <li>• Steps for a monitoring buildings\objects that has no Aviation permit? (illegal Case)</li> </ul>  |     |    |         |
| <b>Process for Defining the exact amount of penetration.</b>  |     |    |         |
| <b>Field survey:</b>  |     |    |         |
| <ul style="list-style-type: none"> <li>• Through operators surveyors department</li> <li>• Through Coordination with other department</li> <li>• Have needed tools for this task                             <ul style="list-style-type: none"> <li>○ Leveling/total station or</li> <li>○ (GPS) for the required accuracy</li> </ul> </li> </ul> |     |    |         |
| <b>Procedures of periodic survey of OLS surfaces? And Repetition?</b>   |     |    |         |

|   |                         |                               |  |
|---|-------------------------|-------------------------------|--|
| <p><b>Type of data available for urban area around the civil aerodromes:</b></p> <ul style="list-style-type: none"> <li>● <b>DEM:</b></li> <li>○ Manual</li> <li>○ Digital</li> <li>● <b>Satellite imagery:</b></li> <li>○ Up to date</li> <li>○ Archival</li> <li>○ Accuracy</li> </ul> <p><b>Ways to extract data</b></p> |                         |                               |  |
| <p><b>Procedures to notify DGCA about monitored Obstacles for AIS or Notam issuance</b></p>   |                         |                               |  |
| <p><b>Procedures to remove obstacles,</b></p>   |                         |                               |  |
| <p><b>INSPECTOR'S REMARK:</b></p>   |                         |                               |  |
| <p><b>Inspectors Name:</b></p>  | <p><b>Position:</b></p> | <p><b>Signature/date:</b></p> |  |

This checklist is used to assess the office and equipment and its compliance with what is listed in aerodrome's manual:

| <b>GENERAL INFORMATION:</b> |   |     |    |     |
|-----------------------------|---|-----|----|-----|
|                             | <b>Name of Aerodrome/Aerodrome:</b>   |     |    |     |
|                             | <b>Address:</b>   |     |    |     |
|                             | <b>Name of Operator:</b>  |     |    |     |
|                             | <b>Name of Aerodrome Manager:</b>   |     |    |     |
|                             | <b>Head of Safeguarding Department:</b>   |     |    |     |
|                             | <b>Operational Hours:</b>   |     |    |     |
|                             | <b>E-mail Address:</b>  |     |    |     |
|                             | <b>Telephone Numbers:</b>   |     |    |     |
|                             | <b>Reference:</b>   |     |    |     |
| S/N                         | ITEM  | YES | NO | N/A |
| 1                           | Does the inspector possess basic qualifications to carry out assigned responsibilities?   |     |    |     |
| 2                           | Does the inspector have the required knowledge and experience on the job (OJT) to perform the responsibility at the expected level of competence? |     |    |     |
| 3                           | Does the inspector have the required tools and equipment to carry out the operation in line with?   |     |    |     |
| 4                           | Does the inspector has clear job description that aware of?   |     |    |     |
| 5                           | Is there a personnel roster that indicates satisfactory workload for each inspector?  |     |    |     |

|                            |  |  |  |  |
|----------------------------|--|--|--|--|
| 6                          | Are the inspector's adequately and regularly trained to discharge the responsibility?  |  |  |  |
| 7                          | In demonstrating operations and maintenance competence, is the knowledge, skills and experience required to inspect aerodrome's obstacle limitation surface, obstacle's marking and lights, for conducting or supervising aerodrome works, and completing the NOTAM forms displayed? |  |  |  |
| 8                          | Are the inspector refresher trainings at such duration/interval to guarantee currency on the job?  |  |  |  |
| 9                          | Does the inspector have adequate knowledge of the working documents available for the performance?   |  |  |  |
| <b>INSPECTOR'S REMARK:</b> |  |  |  |  |
|                            |  |  |  |  |

## APPENDIX F

### STUDY CASE An Example

**Note** - This material is prepared as an example “case scenario” only not intended to serve as standard for how study should be conducted. Procedure used by safeguarding personnel is dependent on the needs, capabilities, and complexities of the participating organizations

#### a. Discovery of the case

1. Authority reviews all aviation permits issued with all details of location and allowed height showed in a map or in geographical coordinate's format.
2. Aerodrome operator shall monitor OLS area and report it to the authority any building/object that was done without approval or violating the allowed limits /restriction
3. When an obstacle is monitored then?

#### b. Dealing with identified case in-house:

1. The airport's Safeguarding team reports the case to the concerned authority with all details collected on site.
2. Concerned authority shall study the case according to the details and in relation to OLS and ensure the penetrates or the surfaces,
3. If the study shows the violation of the case, a higher-level group/committee (includes member of operation/Navigation Aids/Radar ...) to carry on the study

#### c. Committee:

1. Each member of the committee will review all details in relation to their specialist.
2. If the violation might, has an impact on the safety of any Nav. Aid, a recommendation of a site visit to do engineering survey and collect accurate data about surroundings (buildings' heights, type and material in certain area around the violated object).

#### d. Site visit:

1. A technical committee form airport Safeguarding personnel and survey engineers will make a site visit with needed equipment.
2. A technical report showing details of all buildings within the specified area supported with photos (distance form each runway/navigation aids ...) actual height related to mean see level (MSL), height of the highest objects around related to MSL.

e. **Decision:**

1. The technical committee will review the report and find if the object is shielded by any other object/s and actual height in this area
2. If the study shows:
  - a. The object is standing alone, then a review of the design procedures done to find if the object's height affect the height minima or not:
    - i. if not, no action will be taken against that object and data collected to be saved in the obstacle's data base,
    - ii. But if it affects the safety, then action has to be done to reduce height or removal of that object according to aviation law.
  - b. The object is shielded by other existing permanent object/s, then a revision of the design procedures to find the relation between the obstacle and the shielded building, then if:
    - i. the object is shielded by a higher object.
    - ii. no action will be done against that object and data collected to be saved in the obstacle's data base,
  - c. If the object's height is higher than the shielding object a study should be done to study the effect of the difference of height on the defined minima, then,
    - i. if it doesn't has effect on safety, no action will be taken against that object and data collected to be saved in the obstacle's data base,
    - ii. But if it affects the safety, then action has to be done to reduce height /removal of that object. Or increase the minima.
3. In the case of obstacle's removal an agreement should be done with the owner to reduce height or an legal action should be done if no response found, and a demolish note will be issued with name of the owner and any other parties listed in related Law.
4. Legal department should be involved to follow up with the note and take all action needed.

## List of References

1. KCASR 14 V.I
  2. KCASR 15 (e.TOD )
  3. KCASR 10
  4. KCASR 4 (Aeronautical Charts)
  5. ICAO Doc. 9137 Part 6
  6. ICAO Doc. 9774
- D.** WGS-84 Manual 9674
- E.** ICAO Doc. 9981 ICAO PANS Aerodrome

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