



International Civil Aviation Organization

Runway and Ground Safety Working Group

Third Meeting (RGS WG/3)
(Cairo, Egypt, 19-22 September 2016)

Agenda Item 3: Implementation of Aerodrome Safety Priorities and Objectives in the MID Region

AERODROME SAFEGUARDING SAFETY ADVISORY

(Presented by Egypt)

SUMMARY

This paper presents a draft Safeguarding Advisory for Aerodromes' Safeguarding in support of Runway Safety (RS) Enhancement Initiative (SEI) Detailed Implementation Plan (DIP) deliverables of the MID-RAST.

Action by the meeting is at paragraph 3.

REFERENCES

- RASG-MID/5 Final Report
- RGS WG/2 Final Report 4/6 A

1. INTRODUCTION

1.1 The growing threat to air transportation safety involves the construction work and new buildings in area close to aerodromes.

1.2 The Aerodrome Safeguarding framework presented in the attached Safety Advisory was developed further to the expertise and experience of the Egypt's Civil Aviation Authority based on the implementation of Annex 14 and related documents requirement on its regulation, guidance materials and processes and embodies the DIP deliverable of the Safeguarding Toolkit for MID States including core items of safeguarding documentation, management, control and aerodrome's future development protection.

2. DISCUSSION

2.1 Safeguarding our aerodromes is one of the safety oversight components.

2.2 The Safeguarding Advisory provides a readily adoptable framework for aerodromes' safeguarding to support MID States in the development and benchmarking of regulations, guidance materials and processes to support aerodromes' safeguarding. The Advisory consists of the following elements:

- a) Model Regulation for Aerodromes Safeguarding in support of national civil aviation regulation. This is to be considered in conjunction with ICAO Doc.9137, Airport Service Manual.
- b) Model Guidance in support of national civil aviation regulation to provide aerodrome operators with details of the Aerodromes Safeguarding.
- c) Model Safeguarding main elements that needed to be included in the national law and national regulation.
- d) Model oversight Process as it is to be part of the State's Aerodrome Safeguarding and Safety Oversight processes.
- e) Model Forms & Templates which may be used in support of the Regulation, Guidance; and Safeguarding and Oversight presses. These materials are for use of States and aerodrome operators as appropriate.

2.3 The components of advisory shows main requirement for Aerodrome's Safeguarding System. The Safety Advisory as at **Appendix A** has been circulated by the ICAO MID Regional Office to MID States as well as ICAO HQ and applicable comments have been incorporated.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the content of this working paper and progress to MID-RASG RGS SEIs further to the coordinating activities of Egypt;
- b) request RSC to approve, on behalf of the RASG-MID, the Aerodrome Safeguarding Safety Advisory; and
- c) encourage States are advised to use the advisory as guidance in building their own safeguarding system.

MID-Region Aerodrome Safeguarding Toolkit

Appendix A

These guidelines are developed by the Runway and Ground Safety Working Group (RGS WG), as part of MID-RAST/RGS/3 DIP deliverables, based on the work of the Egyptian Civil Aviation Authority in collaboration with the ICAO MID Regional Office within the framework of RASG-MID the Regional Aviation Safety Group - Middle East (RASG-MID).

Disclaimer

This document is intended to provide guidance for civil aviation regulators, aerodrome operators and other stakeholders involved in aerodromes infrastructure and maintenance.

The document has been compiled by members of the aviation industry to enhance aviation safety. It is not intended to supersede or replace existing materials produced by the State or in ICAO SARPs. The distribution or publication of this document does not prejudice the State's ability to enforce existing National regulations. To the extent of any inconsistency between this document and the National/International regulations, standards, recommendations or advisory publications, the content of the National/International regulations, standards, recommendations and advisory publications shall prevail.

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ADVICE NOTE 1

INTRODUCTION

1. BACKGROUND

1.1 Safeguarding has been identified by the MID Region Annual Safety Report Team (RAST) as one of three main risk areas (Focus Areas) to be addressed under the MID Region Aviation Safety Group (RASG-MID) framework.

1.2 The MID-RAST RGS has undertaken a Safety Enhancement Initiative (SEI) to develop guidance material and training programs to support creation of action plans for Safeguarding.

1.3 The Detailed Implementation Plan (DIP) for the SEI included the action to develop and issue regulatory framework supporting establishment of Safeguarding teams.

2. PURPOSE

The purpose of this circular is to propose a regulatory framework to support the creation and success of a national Safeguarding System supported by the following elements:

(Chapter 1)

1- Primary Regulations to be included in the national regulations that are relevant to Safeguarding stakeholders who hold primary responsibility for Safeguarding of aerodromes. Ministerial decrees that may have been or are to be issued to promote aerodrome safeguarding (e.g. providing for coordination between Aviation and local planning authorities, establishment of a national aerodrome safeguarding committee, establishment of aerodrome safeguarding areas underlying the OLS, PANS-OPS, OAS surfaces and other critical areas that must be safeguarded so as to ensure safe operations of aircraft and national aerodromes) are to be also included. In the model framework this has been identified as the Civil Aviation Authority and Aerodrome Operator,

(Chapter 2)

2- Supporting Regulations to be included in the national regulations relevant to other Authorities who have not been identified as primarily responsible for safeguarding of aerodromes.

(Chapter 3)

3- Guidance Material to be developed in support of the regulations and to provide details regarding the conduct of the Safeguarding entity. This is to be considered in conjunction with ICAO annex 14 and related documents as well as PANS-OPS and related documents.

(Chapter 4)

4- Oversight Material to be developed and added to the existing safety oversight procedures of national regulators. This material can also be used by the Safeguarding stakeholders for their internal safety assurance processes.

USING THIS CIRCULAR

The Table of Contents provides key points of the regulatory framework supporting the creation of a nation aerodrome Safeguarding management system.

The reader will go through the steps of building its own safeguarding management system and could make any changes to any part the way it suite their needs and assure the implementation of acceptable level of aerodrome safeguarding.

1.4

This circular as it serves to further empower national authorities in their efforts to support establishment of Safeguarding system through model national regulation, guidance materials.

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Chapter 1

Primary Regulation

1.1 *Application*

It is recommended the below model regulation be included in the national regulation relevant to the stakeholder primarily responsible for aerodrome safeguarding in order to support the development of a national aerodrome safeguarding management system. In this example those stakeholder are the CAA and Aerodrome Operator.

The regulation is high level, noting it is aligned with aerodrome certification and safety management system principles. The regulation also provides a positive requirement for the CAA and aerodrome operator to ensure participation of all relevant stakeholders

1.2 *Model Regulation*

Aerodrome Safeguarding Management System

1.2.1 The ECAA Should:

1.2.1.1 Ensure that rights are established in the national law and relevant regulations, for Safeguarding of all aerodromes according to ICAO requirements including control of human activity within safeguarding areas, with definition of the word human activities (construction; lights; material used; change of land use; laser;) and clear statement on the Local Planning Authorities' mandatory duty to report any existing and proposed human activity within aerodrome safeguarding areas to the CAA for assessment;

1.2.1.2 Review and endorse:

- Safeguarding requirements for each aerodrome and,
- Safeguarding management system that has been put in place by the aerodrome operator;

1.2.1.3 Audit aerodromes operators to ensure efficient implementation of the aerodrome safeguarding management system;

1.2.1.4 Carry out safeguarding regular inspections;

1.2.1.5 Ensure that CAA safeguarding personnel are invested with judicial officer's right to access to such places as may be necessary to carry out the safeguarding inspections and audits and testing;

1.2.1.6 Define the entities invested with the power to impose the national law penalties in the event of detection of aerodrome safeguarding violations

1.2.2 The Aerodrome Operator should:

1.2.2.1 Establish safeguarding management system acceptable to CAA that, as a minimum complies with the requirements of the national safeguarding regulation and includes requirements such as:

- a. Establishment of safe guarding team with clear organizational structure;
- b. Establishment of obstacles' monitoring system and procedures.
- c. Ways of identifying obstacle and Dealing with them
- d. Procedures and documentations needed to contact CAA for assessment of new development around aerodromes; and
- e. Land use roles and restrictions.
- f. Terrain and obstacles data collection, according to QMS

- 1.2.2.2 Comply with the requirements stipulated in the CAA National Regulations and related laws regarding Safeguarding;
- 1.2.2.3 Establish, lead and implement Safeguarding requirement to promote safety and the exchange of safety-relevant information; and
 - Put in place Safeguarding monitoring system, and procedures for implementation
 - Require the organisations operating or providing services at the aerodrome to be involved in such system.

1.2.3 Supporting Ministerial Decree(s) should include:

- 1.2.3.1 Definitions/ description and purpose of OLS and other protection surfaces which define distances and slopes needed for Runway, Radar and Navigation Aids in addition to any other restriction needed.
- 1.2.3.2 Establishment of Safeguarding committee. The Committee shall convene regularly, identify and review national aerodrome safeguarding issues, review and decide on permit applications referred thereto concerning existing or proposed constructions located within the areas underlying the aerodrome safeguarding areas, examine possible solutions and needs for action. Minutes of such meetings, should be kept for reference and information as required. .
- 1.2.3.3 Recommended Composition of the National Safeguarding Committee includes, but not limited to, representatives of:
 - a. Civil Aviation Authority
 - b. Aerodrome Operator;
 - c. Radar and Air Navigation Service Providers (ILS, VOR, , MICOWAVE....);
 - d. Operational representative; and
 - e. Other Stakeholders as needed.

It is also recommended to include the herein below listed provisions in the Primary regulation provisions related to the following:

- a. Definitions Obstacle Limitation Surfaces Obstacle Limitation Requirements
- b. Terrain and Obstacle Data Collection
- c. Obstacles Restriction and Removal
- d. Inspection
- e. Assessment
- f. Exemption
- g. Shielding Principle
- h. Objects outside OLS
- i. Other Objects
- j. Land Use Hazard
- k. Enforcement

CHAPTER 2

2.1 Supporting regulation

2.1.1 It is recommended the following model regulation be included in the national regulation relevant to the stakeholder who are critical to the success of the Safeguarding Management system, but are not primarily responsible for the establishment of the system.

2.1.2 The critical stakeholders are:

- a. Local Planning Authority
- b. Any land Owner (personnel or organization)
- c. Communication and Advertising Companies

2.2 Model Regulation

2.2.1 **Local Planning Authority (Housing Law) should :**

- a. Ensure that issued building permits for constructions within the aerodrome safeguarding areas do not have adverse impacts on safety of aircraft operation;
- b. Ensure that safeguarding violations are removed or reduced as monitored.
- c. Effect continuous coordination with Civil Aviation Authorities before any:
 - change of Land Use
 - planning of new Urban areas
- d. Ensure that the property owner shall be responsible compliance with the maximum d height and other conditions, if any, stipulated in the Aviation permit issued, using the right tools of measurements.

2.2.2 **Land owners (personnel or organizations) should:**

- a. Notify CAA, sufficiently in advance, prior to commencement of any procedures for type of development on their land if such is located in the vicinity of an aerodrome. The said notification should include, inter alia, detailed particulars of the land (boundaries, elevation of highest point) and details of the proposed development..
- b. Comply with CAA's conditions or restrictions on the proposed development, if any.

2.2.3 **Communication and Advertising Companies should :**

- a. Notify CAA, sufficiently in advance, prior to commencement of any procedures for carrying out any installations within areas underlying the aerodrome safeguarding protection surfaces. The said notification should include, inter alia, detailed particulars of the proposed installation, as appropriate (e.g. location, elevation of highest point, frequencies..etc.).
- b. Comply with CAA's conditions or restrictions on the proposed installation , if any.

Chapter 3

GUIDANCE MATERIAL

3.1 *Application*

The following guidance is recommended to be adopted to support the model regulation for the aerodrome safeguarding stakeholder. In this example that stakeholder is the Aerodrome Operator.

3-2 *Model Guidance for Aerodrome Safeguarding Management System*

Aerodrome Safeguarding Management System

3.2.1 The Aerodrome Operator should:

- a. Develop charts of the OLS, PANS OPS and other protection surfaces within and outside the aerodrom on charts as per ICAO requirements (national regulation requirements) and seek endorsement thereof by CAA;
- b. Coordinate with Local Planning Authority and other authorities to improve safety outside aerodrome
- c. Establish an adequately staffed and equipped aerodromesafeguarding entity.
- d. Organize, coordinate and implement aerodrome safeguarding programs to ensure protection of the airspace essential to the safe operation of aircraft at and around the aerodrome.
- e. Coordinate and promote the exchange of information and the joint inspections of areas underlying the aerodrome safeguarding surface , with the aerodrome safety management team as well as businesses and communities in the vicinity of the aerodrome, as appropriate;
- f. Ensure the aerodrome safeguarding entity is supported by a Policy and Procedures manual including clear details of the organizational structure, job descriptions, procedures for inspection, reporting of inspection results, dealing with existing and potential obstructions..etc.
- g. Identify existing removable and non-removable obstacles at the aerodrome and outside the aerodrome (location, height, nature and use), and undertake the mandatory reporting actions, as appropriate;
- h. Implement suitable strategies and procedures to remove hazardous obstacles or when this is not immediately possible, to undertake the necessary actions to manage and mitigate the risk, including publication Aeronautical Information Publication.

Note: The criteria used to establish and chart the several types of the aerodrome safeguarding surfaces are contained in ICAO Annex 14, ICAO PANS OPS document ICAO Annex 4 — Aeronautical Charts, and related documents thereof .

3.2.2. CAA should :

- a) Establish and implement national safeguarding system to promote safety inside or outside all aerodromes; which include but not limited to:
 1. Develop the Aviation law and regulations of safeguarding foundation and enforcement according to ICAO annex 14 and related documentations and State rules.

2. Assign Safeguarding team/division in charge of safeguarding and auditing of the aerodromes.
 3. Support technical and audit operator's safeguarding team/departments
 4. Review and approve aerodromes' OLS maps according to national regulations
 5. Have Obstacles assessment system policy and procedures.
- b) Arrange with Local Planning Authority, concerned ministries and all other parties on aerodrome safeguarding as follows:
1. Provide formal notifications of safeguarding protection area on maps for each aerodrome to the relevant Local Planning Authority
 2. Review all urban future development within State level .to ensure that none may adversely affect aerodrome future development.
 3. Review and approve different land use locations (industrial, commercial in addition to any wind-farms, electricity poles, communication antennas and advertising high masts)
 4. Review all new roads and bridges including light poles and traffic patterns in area adjacent to aerodromes.
 5. Other information as may be necessary, for example, landscaping details to enable the birdstrike potential to be assessed, or the types of cladding materials proposed so that the potential for radar reflection can be modeled.
 6. As part of the Aerodrome Certificate, CAA has to review/ accept all Obstacles data and the relevant aeronautical studies and make sure that publication in the AIP is made as per the relevant regulations.
 7. Audit and support operator's safeguarding Monitoring system to take necessary actions when needed;
 8. Taking all measures to ensure that obstacles are removed, lowered, marked or lit
 9. Apply law enforcement in case of violations;
 10. 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. However, when a new obstacle is detected, the aerodrome operator must ensure that the information is passed on to pilots, through NOTAM, in accordance with the standards for aerodrome reporting procedures set out in the relevant regulations

3.2.3Aerodrome Safeguarding Division should:

Have Specialized training to ensure:

- a) Understanding safeguarding management and obstacles assessment.
- b) Familiarization of safeguarding duties; responsibilities and data collection.
- c) Good use of safeguarding tools.
- d) Accurate obstacle data collection and reporting.
- e) Put in place and implement an effective plan for monitoring including contingency monitor.
- f) Development and implementation of safeguarding filing system.
- g) Detection of changes in the obstacle environment, marking and lighting and in human activities or land use on the aerodrome and the

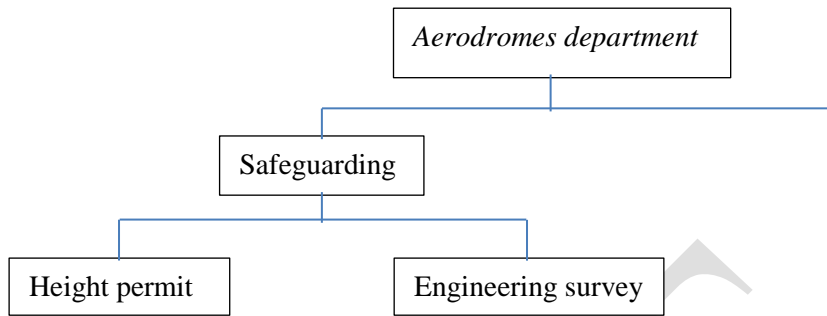
areas around the aerodrome, as defined in coordination with the competent authority

- h) Take the necessary actions to report to the procedure 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.
- i) Immediately report to CAA any violation or potential obstacle or new buildings, navigation aid equipment's or changes of use to any building within the aerodrome fence.
- j) Conduct an obstacle survey by competent surveyor to establish the initial coordinates and details of obstacles and conduct periodic surveys thereafter.
- k) 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.
- l) Mitigate the risks associated with changes on aerodrome and its surroundings identified with the monitoring procedures.
- m) Define the scope, limits, tasks and responsibilities for the monitoring in coordination with the relevant local authorities and air traffic services providers, and other relevant authorities
- n) Assess and mitigate the risks caused by human activities and land use which shall include but not limited to the following:
 - Obstacles and the possibility of induced turbulence;
 - Use of hazardous, confusing, and misleading lights;
 - Dazzling caused by large and highly reflective surfaces;
 - 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; and
 - Non-aeronautical ground light near an aerodrome which may endanger the safety of aircraft and which should be extinguished, screened, or otherwise modified so as to eliminate the source of danger.
- o) Protect area around the aerodrome visual aid outside aerodrome boundary all means of land acquisition (leasing, purchasing etc) or preventing new developments or extensions to existing structures from infringing the OLS.
- p) Report to CAA any infringement or potential infringement of the OLS .of nature and location of obstacles, and any subsequent addition, or removal of obstacles for action as necessary, including amendment of the AIS publications,
- q) 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

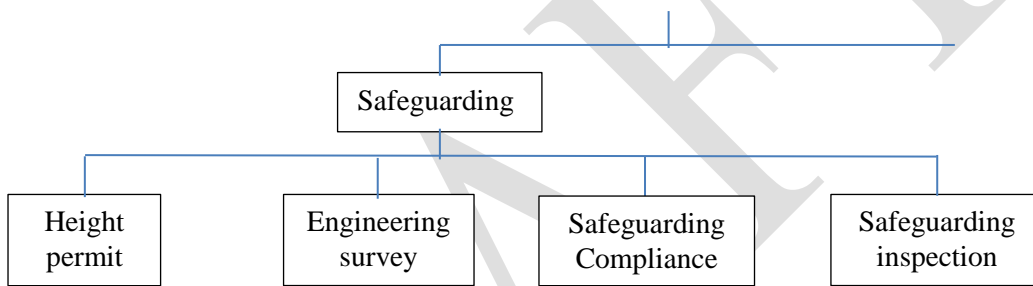
- r) Publish and mark, when needed and where necessary, and make visible by means of lights any remaining obstacles.
- s) Provide electronic obstacle data for all obstacles in Area 2 (the part within the aerodrome boundary) that are assessed as being hazardous to air navigation.

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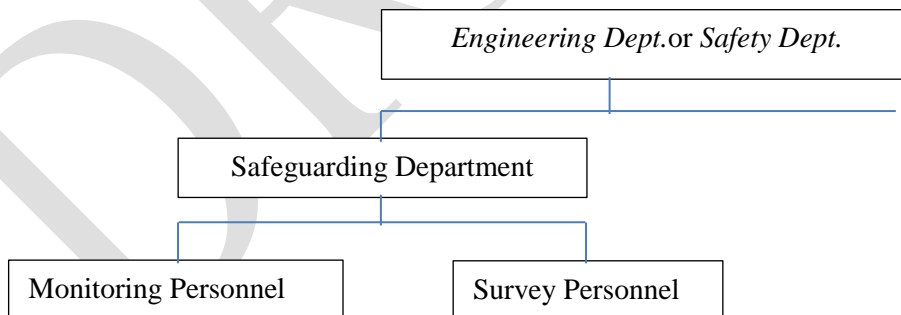
Examples of Typical Organizational Structure of Aerodrome Safety Management System



CAA Safeguarding Structure (Basic)



CAA Safeguarding Structure (Advanced)



Operator's Safeguarding Structure

Chapter 4

OVERSIGHT MATERIAL

4.1 Application

It is recommended the below questions are incorporated in existing safety oversight processes of national regulators in order to oversight the implementation and effectiveness of the model primary and supporting regulations.

The materials in section 4.2 may also be used by the aerodrome safeguarding prim stakeholder who holds primary responsibility for aerodrome safeguarding as part of their internal assurance audit processes.

The below checklists elements are recommended for aerodrome safeguarding activities.

4.2 Model Oversight Checklists

Model Checklist : Elements for Safeguarding Management System (within each of CAA and Aerodrome Operator)

Model Checklist : Elements for Aerodrome Safeguarding Division Terms of Reference

Model Checklist: Elements for Aerodrome Safeguarding Division Composition

Model Checklist: Elements for Composition of CAA Committee for Aerodrome Safeguarding

Model Checklist : Scope of Works of Aerodrome Safeguarding entity at the Aerodrome

Model Checklist : Scope of Works of Aerodrome Safeguarding entity at CAA

Appendix B

MID-Region

Safeguarding Of Aerodromes

Date of Issue:	April 2016
Revision No:	First Edition
Document Ref. No.:	RASG-MID/MIDRAST/RGS/SEI/04-1
Owner:	RASG-MID

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INTRODUCTION

Safeguarding - An Overview

1. The Purpose of this Advice Note

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

In the early days of aviation, the rights of property owners were considered to extend from the surface downward to the centre of the earth and upward to infinity. Accordingly, the owner was free to erect structures on his land to unlimited heights and any encroachment in the airspace by others constituted a trespass. This meant that aircraft could not fly over private property at any altitude without permission of each property owner. Obviously, that policy could have prevented the development of civil aviation and scheduled air transportation. So, legislatures modified the ownership doctrine to specify that a property owner has exclusive rights to the airspace over his land only to the greatest height which he might reasonably be expected to use, with a right of free public transit through the air above such height.

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 in the vicinity of airports is, therefore, a matter of interest and concern to national governments, local communities, property owners, and airport operators as well as civil aviation authorities (CAA). There are severe legal, economic, social and political limitations to what can be achieved by any of these interests with respect to an existing airport where obstacles already exist.

3. What is Safeguarding?

The word “Safeguard” means, according to the Concise Oxford Dictionary, “a proviso, stipulation, quality or circumstance, that tends to prevent something undesirable”, while “Aerodrome” is a defined area where aircraft can land, take-off, taxi or park, and includes airfields, airports, heliports, etc.

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):

- 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).
- 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 :

- Surfaces established by designers of Procedures for Air Navigation Services and Aircraft Operations (PANS-OPS) are intended to safeguard an aeroplane from collision with obstacles when flying on instruments.
- 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.
- 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.



- It is permissible to eliminate from consideration a particular sector where a prominent non-removable obstacle exists by- establishing appropriate operational procedures.
- In many cases, the size of the area will be considerably larger than that covered by the Annex 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 Annex 6)

5.3 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 Annex 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)

5.4 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.

5.5 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 / VOR / Microwave line.....), by:

- a. Contacting the Manufacturer company to provide all information about dimensions and slopes of protection area for each electronic aids and any restriction needed
- b. 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.

5.6 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;
- Preventing other lights which could dazzle pilots.

5.7 Control Tower:

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

6. Duties and Responsibilities:

A regulatory frame should be in place supported by law and includes clear duties and responsibilities for each of CAA, aerodrome operators and any other entity related to the implementation of aerodrome safeguarding management system. Full description of all types of protection surfaces including OLS should be included therein.

Provisions depicting the roles of enforcement against any violation; and relation between aviation authority and other authorities should be incorporated in the national law. Such provisions should include, but not limited to the following:

6.1 State/Regulator should:

- a. Develop the Aviation law and regulations of safeguarding foundation and enforcement according to ICAO annex 14 and related documentations without any conflict to state's other laws and regulations.
- b. Assign Safeguarding team/division in charge of safeguarding and auditing of the aerodromes.
- c. Support technical and audit operator's safeguarding team/departments
- d. Review and approve aerodromes' OLS maps according to national regulations
- e. Have Obstacles assessment system and procedures in place.
- f. 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 birdstrike potential to be assessed, or the types of cladding materials proposed so that the potential for radar reflection can be modeled.
- g. As part of the Aerodrome Certificate, CAA has to review/ accept all Obstacles' data and its aeronautical studies and make sure that all are published in AIP.
- h. Audit and support operator's safeguarding Monitoring system to take necessary actions when needed.
- i. Taking all measures to insure that obstacles are removed, lowered; marked or lit.
- j. Apply law enforcement in case of violation.

6.2 Aerodrome Operator

Each aerodrome operator shall:

- a. Observe the National Laws, Regulations and Advice Notes related to Aerodromes including all guidance materials issued by the competent authority on Safeguarding.
- b. Establish and implement aerodrome safeguarding protection applicable to the aerodrome on a map to be reviewed and certified by CAA.
- c. Designate members of the Aerodrome 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,
- d. Establish procedures to:

1. monitor all human activities and developments within areas underlying the OLS.
 2. identify the critical obstacles associated with the Non Precision Approach (NPA) procedures and have them recorded in the Aerodrome Manual.
 3. 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
 4. monitor changes in the obstacle environment, marking and lighting
 5. 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
 6. immediately report to CAA any violations, potential obstacles or new buildings, changes of navigation aid equipment or changes of use of any building within the aerodrome fence.
 7. conduct an obstacle survey by competent surveyor to establish the initial coordinates and details of obstacles and conduct periodic surveys thereafter.
 8. 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.
 9. mitigate the risks associated with changes on aerodrome and its surroundings identified by the monitoring procedures.
- e. 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
 - f. 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:
 1. Obstacles and the possibility of induced turbulence;
 2. Use of hazardous, confusing, and misleading lights;
 3. Dazzling caused by large and highly reflective surfaces;
 4. 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; and
 5. 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.
 - g. 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;
 - h. Notify CAA 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,
 - i. 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.
 - j. Publish and mark, when needed and where necessary, and make visible by means of lights any remaining obstacles.
 - k. 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, 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 CAA before issuance of any building certificate, or define any land use.
- c. The LPAs then refer to CAA/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:**

To enable accurate assessment of a proposed development, CAA should require certain information to be provided by LPA/Owner as followed:

- a. Position: an accurate map reference from a 1:50,000 scale ordnance survey map so that the exact position may be plotted OR
- b. Grid Reference (to at least 6 figures for each of easting and northing);
- c. The ground elevation of the proposed location referred to mean sea level(MSL) [to an accuracy of $\pm 0.25\text{m}$];
- d. 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 towersect.....any additional clarification could help the processing of the application)
 - Other information may be necessary, as for example: landscaping details to enable the birdstrike 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)/CAA 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. CAA should define validation date to Aviation permits issued thereby taking into account normal time line of construction according to related law and
- b. CAA should set rules for renewal of the permit, unless permit is surrendered by the permit is holder or revoked by the CAA in accordance with national regulation.

7.6 **Amendment of Permit:**

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

- c. Formal request of the owner providing reasons.
- d. Changes in the basic information due to inaccurate data/type of use formerly provided.
- e. Changes related to regulation;
- f. 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:**

CAA 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) and;
- b. Proposed type of use
- 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 CAA 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 , CAA/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 CAA petition to be exempted from compliance with a condition stipulated in the permit issued to him or from 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. CAA should conduct an aeronautical study of the case to identify the associated hazards and analyze the consequent risks. Based on the study and analysis results, CAA 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. .

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:

CAA 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:**

CAA 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:

- 8.1 Arrangements should be made to enable the CAA 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.
 - c. wind farms, chimneys or any object that has outcome that could affect airspace safety,
- 8.2 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.

9. Other Objects:

- 9.1 Objects which do not project through the approach surface but which would nevertheless adversely affect the optimum sitting or performance of visual or non-visual aids should, as far as practicable,
 - a. be removed.
 - b. Marked and/or lit
 - 9.2 Anything which may, in the opinion of the CAA 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.
- 9.3 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 CAA CASA to determine whether they will be a hazard to aircraft operations.
 - 9.4 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 Annex 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 CAA 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 Annex 4 - Aeronautical Charts) and through Notices to Airmen (NOTAM) or Aeronautical Information Publications; (AIP) pursuant to Annex 15

11. Other Requirement should be included in Regulation:

11.1 Protection form Light or Laser emission

Each person proposing to operate a light or laser should notify the CAA in accordance to Law;

- 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 CAA in accordance with related national regulation.

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 CAA in accordance with law.

11.4 Notice requirements.

- a. Each person required by national regulation to provide notice to the CAA should complete related CAA form and submit it to the Director CAA at least 90 days prior to the proposed date of commencement of construction, alteration, or use.

- b. 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;
 - the person responsible for the construction, alteration, or use should complete related CAA form and submit it to the Director within 5 days after the use, construction, or alteration
- c. 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—
 - I. is not required to provide notice under paragraph (a) and
 - II. should complete related CAA form and submit it to the CAA at least 14 working days prior to the commencement of the use.

12. Land Use Hazard

12.1 Wildlife:

- a. Birdstrikes collisions between birds and aircraft cost the aviation industry millions per year in damage and delays to aircraft and are a major hazard. Over 80% of birdstrikes occur on or close to aerodromes and their operators are required to take necessary steps to ensure that the birdstrike risk is reduced to the lowest practicable level.
- b. The risk to aircraft arises from birds that move into the path of aircraft, either because they are on the aerodrome itself, or because they are crossing the airfield or its approaches as they move between sites which may be many kilometers outside the aerodrome. Aircraft are particularly vulnerable to collisions with large birds such as swans and flocks of small, medium and large birds such as Starlings, gulls and geese.
- c. 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.
- d. The objective of the safeguarding process is to prevent any increase in, and where possible reduce, the birdstrike 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.
- e. When determining whether a planning application will increase the birdstrike 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.
 - 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 /):**

- Safeguarding aspects of a proposed development do not end with the grant of Aviation Permit.
- 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.
- 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:
 - 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 CAA it will be determined whether the operation can proceed and whether restrictions will apply and a relevant Permit should be issued by CAA setting out any restrictions as required to ensure aircraft operation safety.

12.4 **Roads and Railways near Safeguarded Aerodromes:**

12.4.1 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.

12.4.2 The CAA 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 CAA thereto.

12.4.3 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.

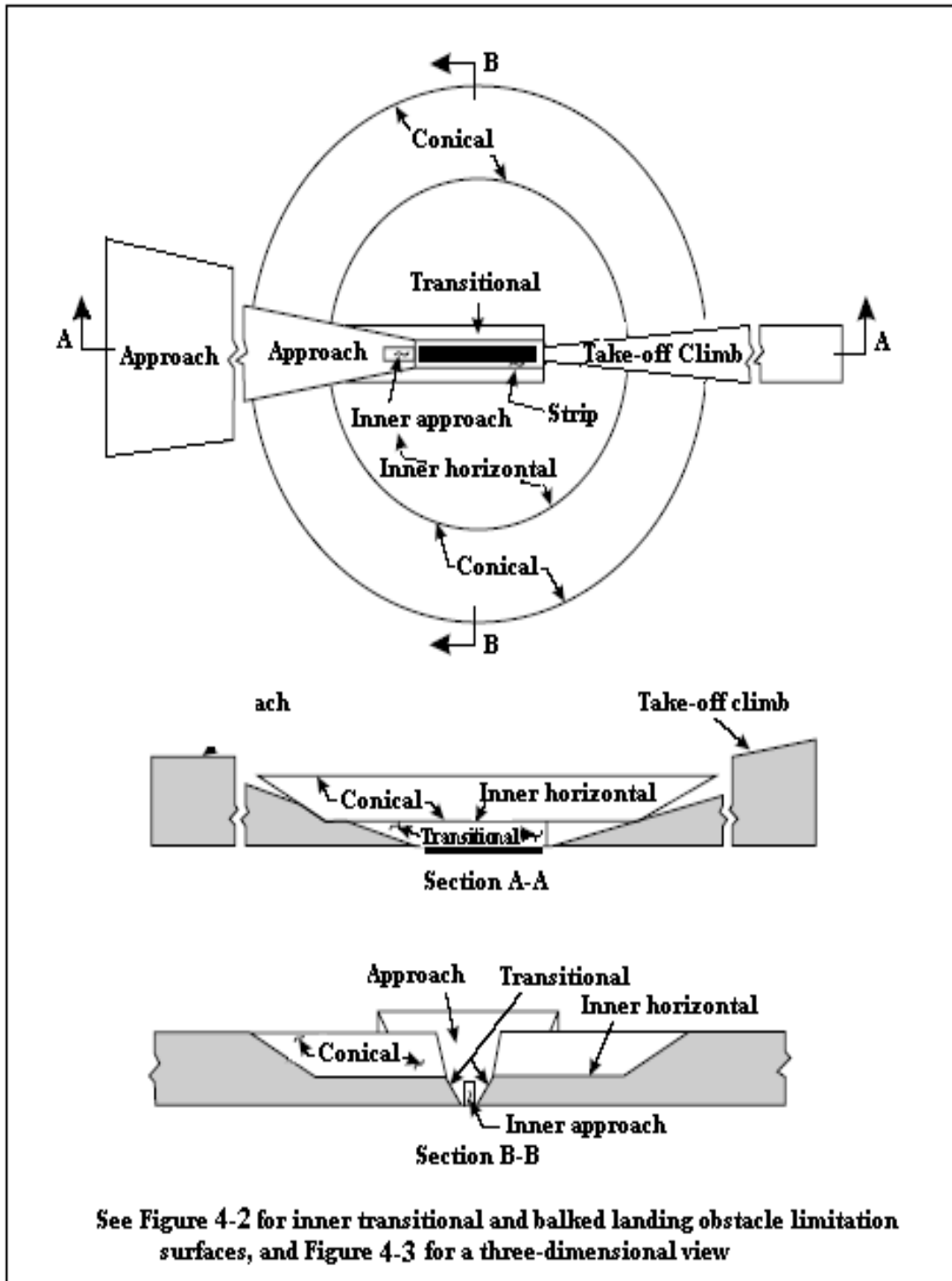
13. Recommendations

- 13.1 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.
- 13.2 Any advice would be informal and without prejudice to detailed consideration of any future Planning Application(s).
- 13.3 The absence of any safeguarding concerns should not be construed as support for any proposed development(s).
- 13.4 It must be stressed that a runway protected only by the obstacle limitation surfaces of Annex 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 Annex 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.

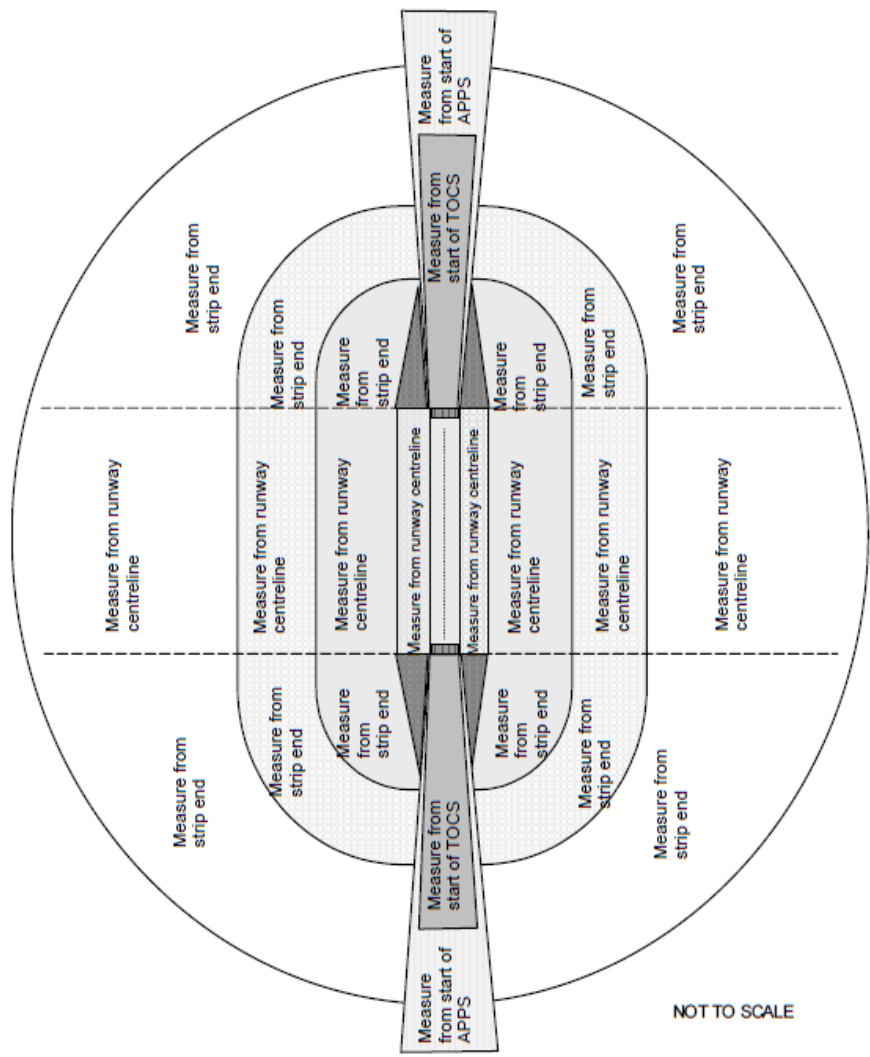
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APPENDIX A



Obstacle's Limitation Surfaces (Type 1)

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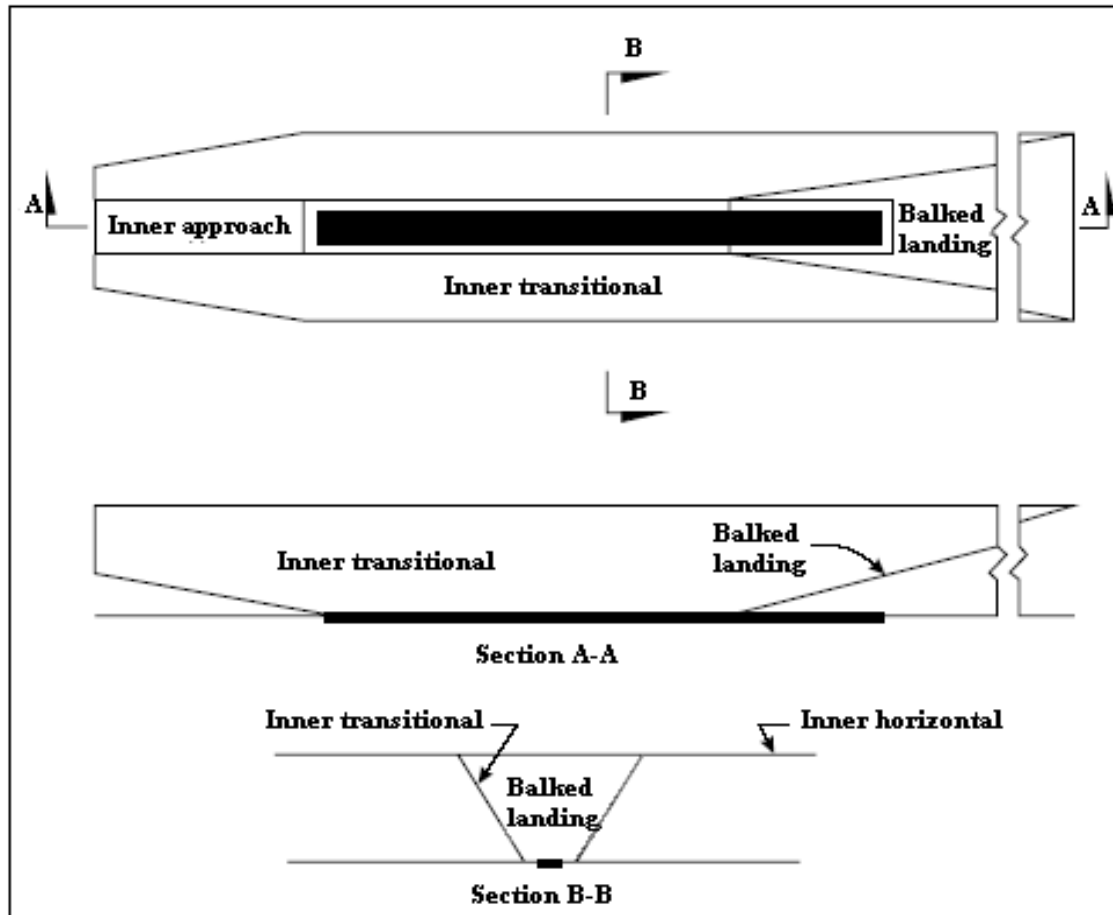
NOTE: May not apply in all cases.

KEY

- | | | | | | |
|--|---------------------------------------|--|--------------------------------------|--|---|
| | Inner Horizontal Surface (IHS) | | Take-off Climb Surface (TOCS) | | See CAP 168 (Chapter 4, paragraph 4.4) |
| | Conical Surface | | Approach Surface (APPS) | | |
| | Outer Horizontal Surface (OHS) | | Transitional Surface | | |

Figure 3 Guidance on the Measurement of the Location of a Proposed Development in Relation to the Aerodrome and its Obstacle Limitation Surfaces, Where the Longest Runway is Greater Than 1800 m in Length

Obstacle's Limitation Surfaces (Type 2)



Obstacle's Free Zones

APPENDIX B

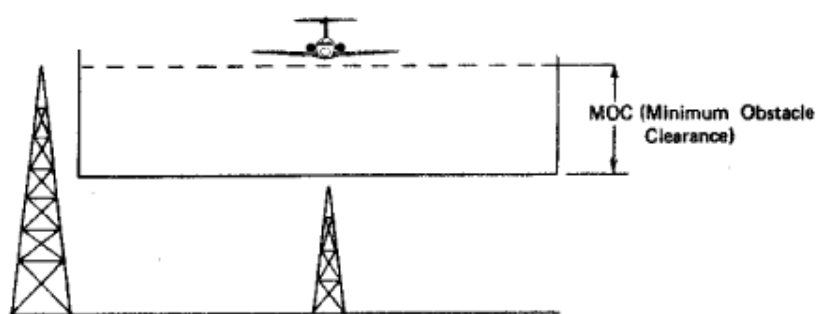


Figure 1-4.

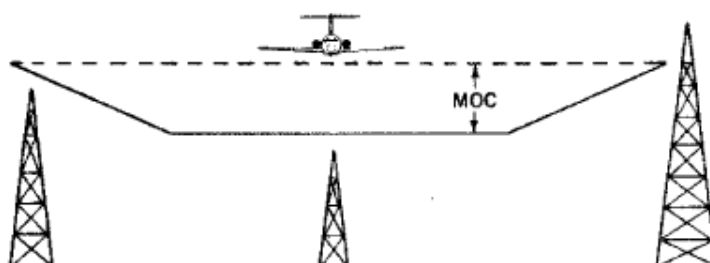
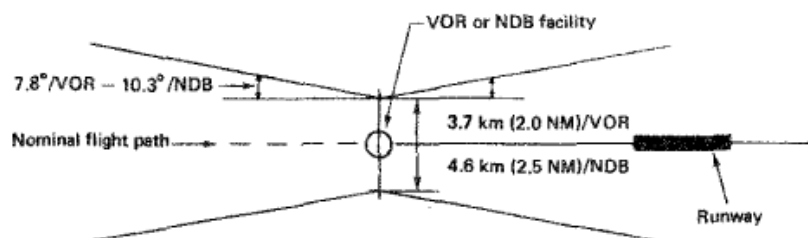
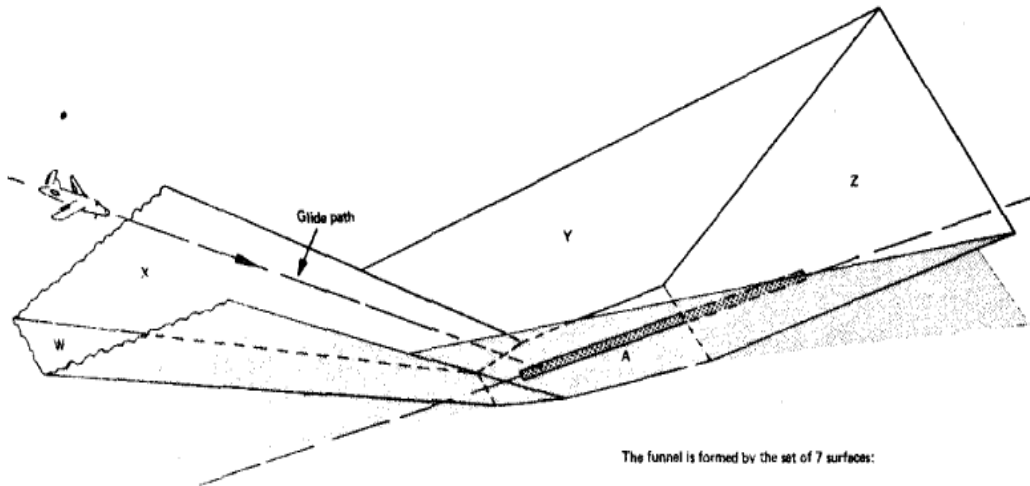


Figure 1-5.



PANS-OPS

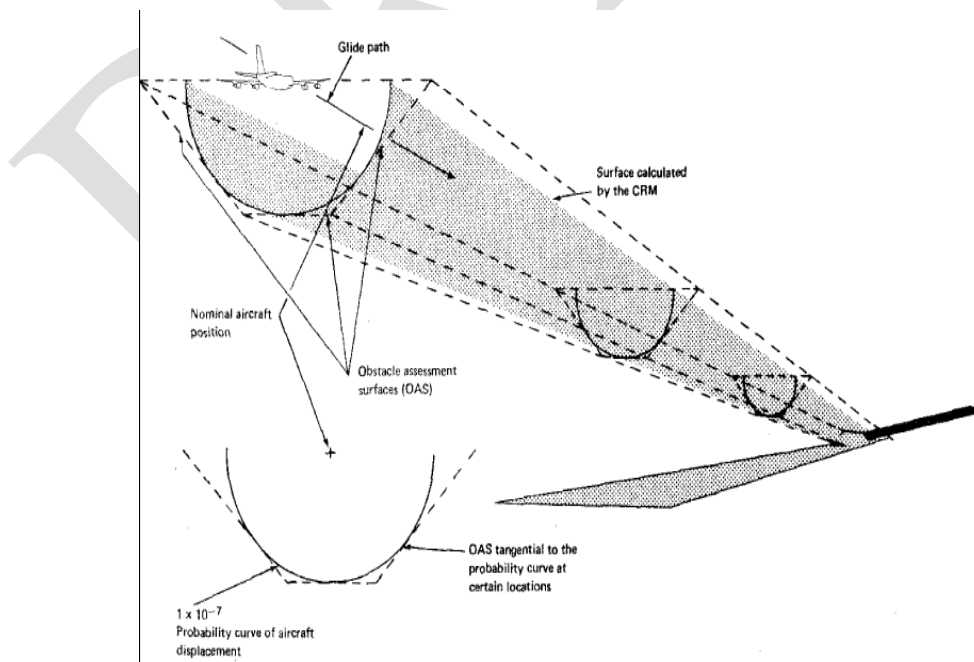
APPENDIX C



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

Safeguarding Checklists

INTRODUCTION

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

- **These checklists are result of Egypt's best Practice in Safeguarding with support of UAE, and England experience.**

- **It's up to each State to adjust the checklists to suit their national regulation and their view of implementation as long as keeping main line.**

- **List of references:**
 1. **Annex 14 V.I**
 2. **Annex 15 (e.TOD)**
 3. **Annex 4 (Aeronautical Charts)**
 4. **Doc. 9137 Part 6**
 5. **Doc. 9774**
 6. **WGS-84 Manual9674**
 7. **Doc. 9981 ICAO PANS Aerodromes**

Appendix (E)

A. Establish new Safeguarding System

Model 1.1

Questions for Building up Safeguarding System:

insert CAA Name and Logo)
CHECKLIST ON
(Insert Checklist Number)

	Yes	No	Comment
Are you aware by Annex14? docs 9137 "part 6"? and Related documentation			
Do you have an updated data about your civil airports: <ul style="list-style-type: none"> • Number. • Type of each Aerodrome • Operation (Hours, Season...). • No. and code of Runways. • Type and number of Navigation Aids 			
Does state/airport operator has a development plan for the next 20 to 30 years with respect to : <ul style="list-style-type: none"> • New aerodromes. • New Runways. • Changing Aerodrome Reference Code. • Installing / uninstalling or upgrading Nav. Aid equipment. 			
Clear definition of "Obstacles Limitation Surfaces" and guidance material for each aerodrome : <ul style="list-style-type: none"> • Type of definition and guidance material (law, decree, national regulation, maps, electronic data.....) • Type of map used (contour, tourism, Cadastral...) • Scale of used map (if applicable) • Surfaces according to Annex 14 or different? list of differences? 			
Is there in place "Obstacle Assessment System" reflecting Annex 14 requirements and related documentation? <ul style="list-style-type: none"> • In which type? (Digital, CAD, Paper...)? • Last update? • Degree of Accuracy? Metadata?			
Do you have division/department in-charge of Safeguarding?			
Do you have restrictions to control / monitor type of construction materials in the area around the aerodromes?			
Do you have defined land use control? Do you have procedures for bird-strike control within a circle of (13km)diameter?			

<p>Do you have a field survey (Footprint\Elevation) for the near-by buildings & high objects around the civil aerodromes?</p> <ul style="list-style-type: none"> • Area • Description. • Type of object/buildings? • Accuracy of Footprint? • Accuracy of Elevation? 			
<p>Do you have procedures for implementing eTOD requirement?</p> <ul style="list-style-type: none"> • Areas of implementation • Degree of implementation • Degree of accuracy 			

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Can you determine the amount of penetration for buildings/objects within the OLS & OAS? <ul style="list-style-type: none"> • Do you have technical tool for checking amount of penetration? (required for high density urban area) • Way of performing analysis? (required for low density urban) 				
REMARK:				
Aerodrome personnel		Position	Signature / date	

DRAFT

Model 1.2 (System's input-output)

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

insert CAA Name and Logo)			
CHECKLIST ON			
(Insert Checklist Number)			
	Yes	No	Comment
Expected "Urban Extension" 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? <ul style="list-style-type: none"> • The Aerodrome Operator? or • The Civil Aviation Authority? or • 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? <ul style="list-style-type: none"> • What is the mechanism of data exchange? • Does the other entities' Law/regulation reflect the civil aviation authority regulations? • Are you informed regularly with each new building/object allowable height? Can you review its license? 			
Remarks			
Assigned personnel name:	Position		Signature / date

A. Existing Safeguarding System
Model 2.1

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

insert CAA Name and Logo)			
CHECKLIST ON			
(Insert Checklist Number)			
	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?			
<ul style="list-style-type: none"> • Steps for a building / object that already has a permitted height? (legal Case) • Steps for buildings / objects that has no max height permit? (illegal Case) 			
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"> • Procedures for field visits to inspect / monitor objects / buildings around the aerodrome? • Do you have arrangements in place with other department regarding Field Survey procedures for objects / buildings? Or • Do you have your field surveyor's team? • Do you have the tools for previous task? – <ul style="list-style-type: none"> ○ Ordinary tools (levelling-total station) Or ○ High technology tools (GPS) for fast and accurate results? • Do you have manual DEM? Area? 		
Digital inspection	<ul style="list-style-type: none"> • Do you have an access to recent Satellite images for OLS area? • What is the horizontal / vertical accuracy of the satellite images? • Can the objects / features in these images be extracted & converted to digital form by any way? • Do you have another tool to verify the Satellite images digital output (extracted features)? 		
What is the operator's role in the monitoring process? Is it approved by the concerned department in the CAA?			
Description of data flow?			
Does the result of that process been forwarded to CAA ?			
REMARK:			
Assigned personnel name:		Position	Signature / date

Model 2.2

This checklist is used for checking the aerodrome manual compliance with safeguarding requirement.

insert CAA Name and Logo)			
CHECKLIST ON			
(Insert Checklist Number)			
	Name of Aerodrome/Aerodrome:		
	Address:		
	Name of Operator:		
	Name of Aerodrome Manager:		
	Head of Safeguarding Department:		
	Operational Hours:		
	E-mail Address:		
	Telephone Numbers:		
	Reference: Regulation..... MOS..... Advisory Circular.....		
Activity and objective	Regulatory /standards reference	Status C/NC/O/N/A	Comments
Aerodrome Manual			
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			
• Procedures for quick detection of new obstacles? Including objects, buildings, and structures			
• Procedure for CAA notification about new obstacles or additional removed obstacles?			
• Procedures for dealing with Wind farms / solar panels and electricity poles assessment?			

• 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 CAA 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 CAA 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?			
Protection of Radar and Navigation Sites :			
Procedures for protection, operations and maintenance of radar and radio navigation aids			
• 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.			
• Name and Details of persons responsible			
Record Keeping			
List of documents checked.			

List of Obstacles inside and outside aerodrome with all details			
Forms used to assess or report obstacles			
Is the operator maintaining records in accordance with the aerodrome manual? (Check OLS survey data, Inspection logbooks, Obstacle control reporting (NOTAM)etc.)			
Facilities			
Are adequate and suitable staff and resources available?			
Are adequate and suitable equipment, training and resources available?			
Are OLS surveys conducted by an appropriately trained or qualified person?			
Activity and objective	Regulatory	Status	Comments
	/standards reference	C/NC/O/ N/A	
Procedures			
Is the OLS monitored in accordance with the manual?			
Is type A surfaces monitored in accordance with the manual?			
Are NPA areas monitored in accordance with the manual?			
Does monitoring conducted includes temporary and permanent structures?			
And for gaseous fluxes?			
Are the procedures for liaising with other authorities being followed?			
Is the staff aware of safety requirements related to obstacles?			
Are any conditions or exemptions complied with?			
Product Check			
Is OLS plan prepared in accordance with national regulation according to ICAO requirement?			
Do survey records agree with published information?			
Does field condition appear to reflect survey data and published information?			
Does obstacle related NOTAMs reflect field condition?			
Feedback			
Are obstacle control incidents noted, reported and followed up?			
INSPECTOR'S REMARK:			
Inspectors Name	Position	Signature / date	

B. Obstacle's Assessment Checklist
Model 3.1

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

insert CAA Name and Logo)		
CHECKLIST ON		
(Insert Checklist Number)		
	Name of Aerodrome/Aerodrome	
	Name of Operator:	
	Name of Aerodrome Manager:	
	Head of Safeguarding Department:	
	Reference: Regulation..... MOS..... Advisory Circular.....	
Obstacle Assessment		
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		
The location of the obstacle relative to Air Navigation surfaces		
The amount by which the surface is infringed		
The gradient presented by the obstacle to the surface origin		
The type of air traffic at the aerodrome; and		
Type of building materials		
Shape of Obstacle		
Nature and height of surroundings		
Is it shielded by another reported fixed obstacle		
The instrument approach procedures published for the aerodrome		
Safety Measures could be as follows:		
Promulgation in the AIP appropriate information		
Marking and /or lighting of the obstacle		
Variation of the runway distances declared as available		
Limitation of the use of the runway to visual approaches only		
Possibility of inducing turbulence, or defragment/reflection of navigation aid radiation		
Restriction on the type of traffic		
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		

<p>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.</p>		
<p>INSPECTOR'S REMARK:</p>		
<p>Inspectors Name</p>	<p>Position</p>	<p>Signature / date</p>

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C. Safeguarding Monitoring System Checklist

I. Pre-visit Checklists:

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

Model 4.1

Personal Personnel & equipment

insert CAA Name and Logo)				
CHECKLIST ON				
(Insert Checklist Number)				
Monitoring Implementation				
Name of Aerodrome/Aerodrome:				
Address:				
Name of Operator:				
Name of Aerodrome Manager:				
Head of Safeguarding Department:				
Operational Hours:				
E-mail Address:				
Telephone Numbers:				
Reference: Regulation.....				
MOS.....				
Advisory Circular.....				
In Office :		Date of Inspection:		
		Name		
Aerodrome Operator			Response	Cooperation
Obstacle Manager				Remark
Obstacle Staff				
Obstacles Map''		Date of last Issuance:	Scale:	Comments
• Cadastral map	<input type="checkbox"/>			
• Subdivisions map	<input type="checkbox"/>			
• Aerodrome Layout	<input type="checkbox"/>			
Obstacle's Data Base Table	<input type="checkbox"/>	Comments:		
Notifications	<input type="checkbox"/>			
Correspondence	<input type="checkbox"/>			
Aviation Permits Follow-Up	<input type="checkbox"/>			
List of Airport's Buildings	<input type="checkbox"/>			
Safeguarding Cadastral Map	Has all surfaces	Show all Obstacles		Comment
Rules Listed	ICAO Standards			
Any for Archiving				
INSPECTOR'S REMARK:				
Inspectors Name		Position	Signature / date	

Model 4.2

insert CAA Name and Logo)					
CHECKLIST ON					
(Insert Checklist Number)					
<u>Equipment and guidance material</u>					
Name of Aerodrome/Aerodrome:					
Address:					
Name of Operator:					
Name of Aerodrome Manager:					
Head of Safeguarding Department:					
Operational Hours:					
E-mail Address:					
Telephone Numbers:					
Reference: Regulation.....					
MOS.....					
Advisory Circular.....					
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 aerodrome	Notifications			
		buildings			
Office Inspection		Subsidiary			
		location			
		Supporting equipment			
Technical Equipment		G P S			
		Printer			
		Tel./ Fax.			
		Scanner			
		Car			
Training		Equipment			

	Technical: <ul style="list-style-type: none"> • Basic Safeguarding • Obstacle's Assessment and Management • Obstacle's monitoring system • Other required training 			
Personnel	Habitat			
	2 Week			
	Number			
	Qualification			
INSPECTOR'S REMARK:				
Inspectors Name	Position	Signature / date		

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

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II. Sit visit Checklists:

Office visit
Model 4.3.1

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

<u>insert CAA Name and Logo)</u> CHECKLIST ON (Insert Checklist Number)			
Name of Aerodrome/Aerodrome:			
Address:			
Name of Operator:			
Name of Aerodrome Manager:			
Head of Safeguarding Department:			
Operational Hours:			
E-mail Address:			
Telephone Numbers:			
Reference: Regulation..... MOS..... Advisory Circular.....			
	Yes	No	Comment
Is there work plan (work cycle) to monitor construction work (buildings\objects) in area around the civil airport?			
Procedures for (work cycle) observing any aviation violated in areas around civil airport?			
Steps\Phase for monitoring level of compliance with max allowed height? <ul style="list-style-type: none"> • Steps for monitoring a buildings\objects that already has Aviation permit? (if applicable) • Steps for a monitoring buildings\objects that has no Aviation permit? (illegal Case) 			
Process for Defining the exact amount of penetration.			
Field survey: <ul style="list-style-type: none"> • Through operators surveyors department • Through Coordination with other department • Have needed tools for this task <ul style="list-style-type: none"> ○ Leveling/total station or ○ (GPS) for the required accuracy 			

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

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Model 4.3.2

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

insert CAA Name and Logo) CHECKLIST ON (Insert Checklist Number)				
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: Regulation..... MOS..... Advisory Circular.....			
S/N	I T	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 as 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			
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 of			
INSPECTOR'S REMARK:				

Model 4.4.1

This checklist is used on site to monitor the aerodrome implementation of Safeguarding roles:

insert CAA Name and Logo					
CHECKLIST ON					
(Insert Checklist Number)					
<u>Site Inspection</u>					
	Name of Aerodrome/Aerodrome:				
	Address:				
	Name of Operator:				
	Name of Aerodrome Manager:				
	Head of Safeguarding Department:				
	Operational Hours:				
	E-mail Address:				
	Telephone Numbers:				
	Reference: Regulation.....				
	MOS.....				
	Advisory Circular.....				
Inspection Date:				Inspector's Name:	Remarks
Day Inspection	Inside Aerodrome	Area 1	Surface Affected	Building	
		(strip/inner transitional/transitional)		Antennas/masts/poles	
		Area 2	Surface Affected	Obstacles (marking.)	
		(Inner Approach/Approach/Take-Off)		Others (land use...)	
		Area 3	Surface Affected	Building	
		(Inner Horizontal / Conical/ Outer Horizontal)		Antennas/masts/poles	
		Area 4	Affected Nav. Aid	Obstacles (description / lighting / marking)	
		Nav. Aids protection area		Others (land use...)	
	Outside Aerodrome	Area 1	Surface Affected	Building	
		(strip/inner transitional/transitional)		Antennas/masts/poles	
		Area 2	Surface Affected	Obstacles (description / lighting / marking)	
		(Inner Approach/Approach/Take-Off)		Others (land use...)	
		Area 3	Surface Affected	Building	
		(Inner Horizontal / Conical/ Outer Horizontal)		Antennas/masts/poles	
			Obstacles (description / lighting / marking)		
			Others (land use...)		

		Area 4 (f Applicable)	Affected Nav. Aid	Markers		
		Nav. Aids protection area		Singe		
	General	Surface Affected		Material of surrounded buildings		
Night Inspection	Inside Aerodrome	Area 1	Surface Affected	Is there any Cranes detected		
		(strip/inner transitional/transitional)		Building		
		Area 2	Surface Affected	Antennas/masts/poles		
		(Inner Approach/Approach/Take-Off)		Obstacles (description / lighting / marking)		
		Area 3	Surface Affected	Others (land use...)		
		(Inner Horizontal / Conical/ Outer Horizontal)		Building		
		Area 4	Affected Nav. Aid	Antennas/masts/poles		
		Nav. Aids protection area		Obstacles (description / lighting / marking)		
	Outside Aerodrome	Area 1	Surface Affected	Others (land use...)		
		(strip/inner transitional/transitional)		Building		
		Area 2	Surface Affected	Antennas/masts/poles		
		(Inner Approach/Approach/Take-Off)		Obstacles (description / lighting / marking)		
		Area 3	Surface Affected	Others (land use...)		
		(Inner Horizontal / Conical/ Outer Horizontal)		Building		
		Area 4(f Applicable)	Affected Nav. Aid	Antennas/masts/poles		
		Nav. Aids protection area		Obstacles (description / lighting / marking)		
INSPECTOR'S REMARK:						
Inspectors Name			Position		Signature / date	

APPENDIX F

STUDY CASE

An Example of

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 listed in aviation law 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 sitevisit 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.

- END -