



ADVISORY CIRCULAR

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GUIDANCE ON LAND USE AND ENVIRONMENT MANAGEMENT AROUND AERODROMES

1.0 PURPOSE

The purpose of this Advisory Circular (AC) is to provide guidance on land use practices and activities in the vicinity of aerodromes within Uganda.

2.0 REFERENCE

- 2.1 The Civil Aviation (Aerodromes) Regulations
- 2.2 ICAO Annex 14 Volume 1 – Aerodromes
- 2.3 ICAO Doc 9137 Part 3 – Bird Control and Reduction
- 2.4 ICAO Doc 9137 Part 6 – Control of Obstacles
- 2.5 ICAO Doc 9184 Part 2 – Land Use and Environmental Control

3.0 BACKGROUND

3.1 Legislative Requirements

The regulatory requirements for operations of aerodromes within Uganda are contained in the Civil Aviation (Aerodromes) Regulations. The Regulations require that all land use practices and activities in the vicinity of an aerodrome shall conform to guidelines prescribed by the Authority. It is imperative that aerodrome operators and communities around aerodromes are made aware of their obligations to ensure that all land use practices do not inhibit safety of aircraft operating into and around the aerodromes.

3.2 Introduction

- 3.2.1 The environment at and surrounding an aerodrome has unique characteristics that impact on land use. Specific requirements for aerodrome design and aerodrome operations are specified in the Civil Aviation (Aerodrome) Regulations

- 3.2.2 Aerodrome operators shall monitor and review land use activities around their aerodromes to ensure safe and secure operation of aircraft and protection of the airspace around the aerodrome. Those persons planning any developments or making changes to the land use around aerodromes must ensure that besides meeting other National and Local Authority requirements they comply with applicable Civil Aviation Regulations requirements and coordinate with the relevant aerodrome operators as appropriate.
- 3.2.3 In addition, off-aerodrome land management and use can contribute as much or more to the creation of wildlife hazards and creation of obstacles as those at an aerodrome itself. With urban-growth pressures showing no signs of easing, land in the vicinity of aerodromes rarely prime residential locations has become more attractive for such activities as industry, waste-disposal and agriculture. If not planned and managed properly, these developments can create a hazard to aircraft operations.
- 3.2.4 Successful aerodrome wildlife-management programs do not function in isolation; the aerodrome environment is only a small part of a local ecosystem, and any changes that take place at or near an aerodrome will likely be far reaching. Failure to conduct appropriate ecological studies can lead to elimination of one hazard and creation of a far more serious one.
- 3.2.5 This guidance material identifies specific regulatory aspects to be taken into account and is also designed to guide those persons proposing land use developments and changes around aerodromes.
- 3.2.6 These guidelines apply to all public use aerodromes certified and licensed by Uganda Civil Aviation Authority

Note - For the purpose of this AC:

Obstacle – means all fixed (whether temporary or permanent) and mobile objects, or part of an object, 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 defined obstacle limitation surfaces and that have been assessed by the appropriate authority as being a hazard to air navigation.

Obstacle Limitation Surfaces (OLS) – means a series of surfaces that define the volume of airspace at and around an aerodrome to be kept free of obstacles in order to permit the intended aircraft operations to be conducted safely and to prevent the aerodrome from becoming unusable by the growth of the obstacles around the aerodrome.

Appropriate Authority – means Uganda Civil Aviation Authority.

4.0 GUIDANCE

4.1 OBSTACLE LIMITATION SURFACES

- 4.1.1 Under the Civil Aviation (Aerodromes) Regulations, an aerodrome operator shall ensure that obstacle limitation surfaces are established for the aerodrome. These obstacle limitation surfaces are

necessary to enable aircrafts to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the aerodrome.

- 4.1.2 These surfaces should be free of obstacles and subject to control such as the establishment of zones, where the erection of buildings, masts and so on, are prohibited.
- 4.1.3 It is important that any proposed building or structure does not infringe required OLS areas. Consultation with the aerodrome operator and the appropriate Authority at an early stage is essential.
- 4.1.4 The obstacle limitation surfaces include outer horizontal surface, conical surface, inner horizontal surface, approach surface, inner approach surface, transitional surface, inner transitional surface, balked landing surface and take-off climb surface. These are defined in the Civil Aviation (Aerodromes) Regulations.

4.2 WILDLIFE HAZARD MANAGEMENT

- 4.2.1 An important consideration related to aerodrome operational safety is the prevalence and habits of wildlife in the area and the associated risk of aircraft wildlife strikes. Wildlife hazards at proposed new aerodromes can be minimized by careful selection of the aerodrome site; for example, avoiding established bird migration routes and areas naturally attractive to birds.
- 4.2.2 Wildlife hazards may also be minimized by using the land surrounding the aerodrome for purposes which will not attract concentration of the wildlife to the area. At existing aerodromes, the wildlife problem may be controlled by making the aerodrome and its environment unattractive to wildlife.
- 4.2.3 Under the Civil Aviation (Aerodromes) Regulations, an aerodrome operator must establish a management programme to minimize or eliminate any wildlife that presents a hazard to aircraft operations at their aerodrome. The management of wildlife, especially birds, is critical for aircraft operational safety. Bird strikes put the lives of aircraft crew members and their passengers at risk. In Uganda, many bird strikes have been reported and have caused serious damage to aircraft.
- 4.2.4 It is important that land use changes are monitored and reviewed by the aerodrome operator to ensure that these land use changes do not increase wildlife hazards for the aerodrome. Garbage disposal dumps and other sources that may attract wildlife activity on, or in the vicinity of, an aerodrome, need to be assessed as a potential hazard. If necessary an aeronautical study may need to be undertaken to assess the potential hazard arising from wildlife activity.

Examples of wildlife attractants include:

- a) Refuse Dumps and landfills
- b) Sewage Treatment and Disposal
- c) Agricultural - cultivation of land, types of activity e.g. pig farming.
- d) Fish processing plants
- e) Cattle feed lots
- f) Wildlife refuges
- g) Artificial and natural lakes

- h) Animal farms
- i) Abattoirs and freezing works
- j) Construction sites

4.2.5 Proper planning of these activities and their impacts on wildlife should be undertaken. It should be noted that aircraft approach and take-off paths extend for a distance well beyond the runway threshold. This means that wildlife impact may not be immediately apparent. Any person planning activities around an aerodrome should consult the aerodrome operator as early as possible during the planning phase.

4.3 REFUSE DUMP OR LANDFILLS

4.3.1 Refuse dump sites and landfill shall be located no closer than 13 km from the aerodrome facility. An aeronautical study shall be conducted prior to the siting of the dump or landfill.

4.3.2 If a refuse dump is proposed in the vicinity of the aerodrome there should be a requirement to provide bird control at the site to reduce its attractiveness to birds. The potential threat to aircraft depends on location of the site relative to the aerodrome and flight paths, type of refuse, and the bird species expected in the vicinity.

4.4 WATER

Surface water is a potential wildlife attractant and developments that consist of drainage ditches, artificial waterways and large areas of water close to an aerodrome may attract birds and other wildlife. It is noted that in the vicinity of an aerodrome artificial and natural lakes may increase the wildlife hazard depending on the size and the shape of the lake, its ecological state and the surroundings. It is recommended that an ornithologist/biologist evaluates the ecological conditions of the whole vicinity as well as bird migration in the area.

4.5 CONSTRUCTION OF AERODROMES

4.5.1 The compatibility of an aerodrome with its environs is dependent on proper planning. The location, size and configuration of the aerodrome need to be coordinated with patterns of residential, industrial, commercial, agricultural and other land uses taking into account the effects of the aerodrome on people, flora, fauna, the atmosphere, water courses, air quality, soil pollution and other facets of the environment. In this regard, the Civil Aviation (Aerodromes) regulations provide that an aerodrome construction permit shall be obtained from the authority prior to commencement of construction.

4.5.2 The regulations further require that an applicant for aerodrome construction permit shall submit to the authority for approval, an application in the prescribed form. This application shall enable the authority to assess the suitability of the place proposed for construction of the aerodrome including determining whether the proposed aerodrome will constitute a hazard to other existing aerodromes.

4.5.3 The operator should cause an Environmental Impact Assessment (EIA) to be conducted prior to construction of aerodromes. An environmental impact assessment provides a systematic approach for identifying the environmental effects of proposed projects in order to allow for, where necessary, the modification of plans and incorporation of measures to minimize or eliminate any potential

adverse effects on the environment. The impact of construction activities on bird and wildlife and the relevant mitigation measures should be covered under the EIA study.

- 4.5.4 The authority shall, after receiving an expression of interest, provide technical advice to the applicant on the effects the proposal would have on the use of the navigable airspace by aircraft and on the safety of persons and property on the ground. Prior to approving construction of an aerodrome, an aeronautical study may be undertaken as determined by the authority.

4.6 OBJECTS AND ACTIVITIES AFFECTING NAVIGABLE AIRSPACE

- 4.6.1 The Civil Aviation (Aerodromes) regulations prescribes regulations for a person proposing to construct or erect an obstacle that could constitute a hazard to air navigation. Within Uganda, the most common obstacles are telecommunication towers and, it is common occurrence that these towers are erected near the aerodromes. Applicants or operators of such towers or any other structures are required to furnish the authority with the following information prior to erection for evaluation:

- a) Written application containing relevant data.
- b) The physical location of the proposed structure
- c) The proposed height of the structure
- d) Coordinates of the site in WGS-84 format and
- e) The technical designs if applicable

- 4.6.2 On account of the above supplied information, the authority shall evaluate the structure based on obstacle evaluation principles.

4.7 LOCAL AUTHORITY ZONING

- 4.7.1 Local authorities should protect aerodromes in their areas to ensure the long term sustainability of the aerodrome, the safety of the aircraft operations, and the safety of persons and property. In addition to the required obstacle limitation surfaces, other areas can be specifically zoned to ensure that future land use plans are compatible with existing and planned aerodrome operations and protect both the aerodrome and the residents around the aerodrome.

- 4.7.2 Zoning solely to protect the obstacle limitation surfaces is insufficient to prevent the construction of incompatible uses such as housing or uses that attract accumulation of people in the approach and climb out paths of aircraft. Zoning shall take into account anticipated future aerodrome developments so that when aerodrome developments take place, interference to the vicinity will be minimal.

- 4.7.3 It is important that aerodrome operators share their development master plans with relevant authorities highlighting the future aerodrome developments. This is meant to guide the authorities during zoning and approval of developments in the vicinity of aerodromes.

4.8 LAND USE PLANNING, ENVIRONMENTAL AND PUBLIC CONTROL

- 4.8.1 Within the comprehensive planning framework, aerodromes developments and operations should be coordinated with the planning, policies and programmes for the area where the aerodrome is located. In this way, the social and economic impact, along with the environmental effects of the aerodrome can be evaluated to ensure to the greatest extent possible that the aerodrome environs are compatible with the aerodrome and conversely, that the physical development and use of the aerodrome is compatible with the existing and proposed patterns of land use.
- 4.8.2 The problem of noise in the vicinity of aerodromes can only be solved by pursuing all possible means to alleviate it. Proper land use planning can contribute significantly to the solution. Flight paths including take-off and landing profiles, number of operations, mix of aircraft, operating procedures, runway utilization, time of the day and meteorological conditions are some of the factors that will determine intrusiveness of aircraft noise into communities at or around aerodromes. On the other hand, land use, building use, type of building construction and distance from the aerodrome are some of the factors that must be considered to avoid exposure of aerodrome communities to aircraft noise.
- 4.8.3 The local authorities should not permit developments in zones around aerodromes with high exposure noise levels and also ensure that noise-sensitive land uses are restricted in such areas. High density housing around aerodromes is prohibited. Offices, banks, schools and hospitals may be allowed subject to approval by the appropriate authority, when there is a national need and where suitable building techniques and sound insulation have been employed to reduce the aircraft noise exposure to an acceptable level.
- 4.8.4 Pollution occurring in and around the aerodrome has the potential to affect not only the immediate area, but also the surrounding areas including the navigable airspace. Aerodromes can operate with limited environmental impact by incorporating environmental management plans and procedures with land use planning. The use of materials, processes or practices that cause the creation of environmental pollutants, hazardous emissions and waste at or around the aerodromes should not be permitted. These include practices that encourage the emissions of smoke, soot, ash, grit and dust or other substances into the navigable airspace which may obscure visibility.
- 4.8.5 Public control of land in the vicinity of the aerodrome recognizes the need to have in place measures that ensure activities which potentially conflict with safety of aircraft operations are discouraged or eliminated. These activities include;
- a) Activities that could cause electrical interference with radio communication and navigation aids;
 - b) Lights that might confuse pilots in the clear interpretation of aeronautical lights; and
 - c) The production of smoke that reduces visibility.

4.9 COORDINATION OF ACTIVITIES

Aerodrome operators have an important role in aviation safety and in particular the safety of aircraft and passengers. It is important that persons wanting to initiate or change land use near an aerodrome do so in consultation with the appropriate authority, the aerodrome operator and the relevant local authorities. Oversight of aviation safety should be based on International and National Civil Aviation requirements.

4.10 THE NEED FOR ENVIRONMENTAL CONTROL

4.10.1 In recent years there has been increased public concern regarding the protection of the environment from the impact of transportation, and consequently, a growing emphasis on the need to employ effective measures to minimize such impacts. Since pollution may be generated within an airport as well as within the area surrounding it, environmental controls should be applied at the airport and its environs.

4.10.2 The environment has been defined as including:

- a) air, land and water;
- b) all layers of the atmosphere;
- c) all organic and inorganic matter and living organisms; and
- d) the interacting natural systems referred to above

Since all of these components interact, disruption to one may have a profound effect on the entire system. Therefore, to lessen local and global impacts, it is important that the entire civil aviation industry endeavours to control harmful emissions. This includes the management of solid and hazardous wastes emanating from paints, lubrication oils, sludge, solvents, toxic chemicals, etc., handled at aerodromes.

4.10.3 Pollution occurring in and around the airport has the potential to affect not only the immediate area, but also the surrounding areas. Because it can have an effect on human health and the ecology of the surrounding area, efforts should therefore be made towards pollution prevention. Environmental controls thus provide a means of either decreasing pollution at the source or reducing the potential for negative environmental impacts. Controls such as air and water quality guidelines, aircraft engine noise limits, waste management plans, environmental emergency plans, and environmental management plans are necessary.

4.10.4 Aerodromes can operate with limited environmental impact by incorporating environmental management plans and procedures with land-use planning. In the past, environmental management has concentrated on pollution abatement or control by finding ways to dispose of waste after it has been produced. More recently, organizations have been shifting toward pollution prevention; which focuses on reducing or eliminating the need for pollution control. Pollution prevention can be defined as "the use of materials, processes or practices that reduce or eliminate the creation of pollutants and wastes at the source." It includes practices that reduce the use of hazardous and non-hazardous materials, energy, water or other resources. Anticipatory action is used to pre-empt the need for control or remedy.



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