



Republika e Kosovës
Republika Kosovo - Republic of Kosovo



Autoriteti i Aviacionit Civil i Kosovës
Autoritet Civilnog Vazduhoplovstva Kosova
Civil Aviation Authority of Kosovo

Technical Publication – TP 19

Guide for the Operation of Lasers, Searchlights, Fireworks and Helium- filled Small Balloons in the Airspace of the Republic of Kosovo

Guidance Material

Foreword

1. Purpose

Individuals or organisations wishing to direct light sources, pyrotechnics or fireworks into the air are obliged to do so in a safe and sensible manner, as mandated by legislation contained in the Law No. 03/L-051 on Civil Aviation, so that their activities may safely co-exist with aircraft operations. The Civil Aviation Authority of the Republic of Kosovo (CAA) is responsible for policy regarding light displays, permanent laser sites, other light source installations, fireworks, helium-filled small balloon releases and their effects on aviation.

Consequently, the aim of this Technical Publication is to state existing policy and to provide individuals or organisations wishing to conduct directed light, firework, or helium-filled small balloon operations in the Republic of Kosovo, with a means of notifying their activities to the CAA. This will enable the aviation community to properly assess the impact of any such proposed activity and take appropriate measures to mitigate any dangers to flight safety.

2. Background

2.1 The Threat to Aircraft Safety

The use of lasers, searchlights, fireworks and helium-filled small balloons is now getting more and more popular throughout the Republic of Kosovo. Many of these activities make use of a generated light source to produce intense and directional beams of light and create special lighting effects. Whilst the production of many light sources is important for the purposes of the research and entertainment industries, this can create a potential risk to aircraft operations. The risk to aviation is increased when such activities take place in the vicinity of aerodromes - particularly during such critical phases of flight such as approach and landing - and when pilots are wearing night vision goggles and similar devices which amplify the available light. The risk is more likely to be from the unexpected dazzle rather than actual ocular or physical damage, although the risk of actual injury should not be discounted.

2.2 Structure

This document should be read in its entirety in order to appreciate the relevance of the issue to aviation. Following the introduction, Section 1 - General gives a general overview of the issues surrounding the impact of light and fireworks displays and balloon releases on the safety of flight operations and gives the legislative background to the subject. Section 2 - Lights, Firework and Helium-Filled Small Balloons display guidelines (Temporary Displays) describes the light display guidelines and indicates areas within which the Republic of Kosovo considers it especially necessary to protect flight operations from the dangers presented by temporary light displays. This section also refers to

firework displays and helium-filled small balloon releases. Section 3 - Permanently Sited Lasers and Searchlights, describes the issues surrounding the establishment of permanent laser or searchlight sites. The Annexes provide a notification format to be used by organisers to notify the CAA of their activities, together with graphical illustrations of the safety zones considered necessary to exist in the vicinity of aerodromes. Finally a list of reference documents is attached.

If an individual or organisation has the need for further information, please write to the following address:

Civil Aviation Authority of Kosovo
Arbëria district
Ahmet Krasniqi Street n.n.
10 000 Prishtina
Republic of Kosovo

E-mail: infocaa@caa-ks.org

Tel: +38 1 38 248 629

Fax: +38 1 38 211 009

Dritan Gjonbalaj
Director General
Civil Aviation Authority of the Republic of Kosovo

List of Effective Pages

Section	Pages	Revision No.	Effective Date
Cover page	1 of 19	Original	01 March 2014
Foreword	2 of 19	Original	01 March 2014
	3 of 19	Original	01 March 2014
List of Effective Pages	4 of 19	Original	01 March 2014
Table of Approval	5 of 19	Original	01 March 2014
Distribution List	6 of 19	Original	01 March 2014
Review Table	6 of 19	Original	01 March 2014
Table of Contents	7 of 19	Original	01 March 2014
Abbreviations	8 of 19	Original	01 March 2014
Section 1 - General	9 of 19	Original	01 March 2014
	10 of 19	Original	01 March 2014
	11 of 19	Original	01 March 2014
Section 2 - Lights, Firework and Helium-filled Small Balloon Display Guidelines (Temporary Displays)	12 of 19	Original	01 March 2014
	13 of 19	Original	01 March 2014
	14 of 19	Original	01 March 2014
Section 3 - Permanently Sited Lasers and Searchlights	15 of 19	Original	01 March 2014
Annex A - Notification of Outdoor Laser, Searchlight, Firework or Helium-Filled Small Balloon Operations	16 of 19	Original	01 March 2014
	17 of 19	Original	01 March 2014
Annex B - Notification Zones for Light and Firework Displays (Diagram)	18 of 19	Original	01 March 2014
Annex C - Reference Documents	19 of 19	Original	01 March 2014

Table of Approval





	Name and position	Date	Signature
Prepared by:	Naser Grajçevci Flight Operations Inspector, Flight Safety Department	07 November 2013	
Authorised by:	Kushtrim Musa Director Flight Safety Department	08 January 2014	
Quality Check by:	Lendita Kika-Berisha Manager, Internal Auditing and Quality Management	27 February 2014	
Approved by:	Dritan Gjonbalaj Director General	28 February 2014	

Table of Contents

<i>Foreword</i>	2
<i>List of Effective Pages</i>	4
<i>Table of Approval</i>	5
<i>Distribution List</i>	6
<i>Review Table</i>	6
<i>Table of Contents</i>	7
<i>Abbreviations</i>	8
Section 1 - General	9
1.1 Light Displays and Legislation	9
1.2 Lasers	9
1.3 Searchlights	10
1.4 Fireworks.....	11
1.5 Helium-Filled Small Balloons.....	11
Section 2 - Lights, Firework and Helium-Filled Small Balloon Display Guidelines (Temporary Displays)	12
2.1 Action by Light and Firework Display Organisers.....	12
2.2 Guidelines for Light and Firework Displays	12
2.3 Additional Guidelines for Firework Displays	13
2.4 Additional Guidelines for Helium-Filled Small Balloon Releases.....	13
Table 1.....	14
Section 3 - Permanently Sited Lasers and Searchlights	15
3.1 Permanent Laser and Searchlight Sites.....	15
3.2 Lasers, Searchlights and other Lights used for Air Traffic Control purposes ...	15
3.3 Use of Lasers by Military Units.....	15
Annex A - Notification of Outdoor Laser, Searchlight, Firework or Helium-Filled Small Balloon Operations	16
Annex B - Notification Zones for Light and Firework Displays (Diagram)	18
Annex C - Reference Documents	19

Abbreviations

Abbr.	Meaning
ARP	Aerodrome Reference Point
ATC	Air Traffic Control
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority of the Republic of Kosovo
GM	Guidance Material
ICAO	International Civil Aviation Organization
KFOR	Kosovo Force
KSF	Kosovo Security Force
LDO	Light Display Operator
LeP	List of Effective Pages
NOTAM	Notice to Airmen
SARPS	Standard and Recommended Practices
TP	Technical Publications

Section 1 - General

1.1 Light Displays and Legislation

1.1.1 Adequate lighting is necessary for all visual tasks. An excess of light, however, can detrimentally affect vision to the extent of rendering it ineffective. In aviation, a pilot may experience high levels of lighting when flying into the sun or looking at very bright artificial light sources such as searchlights. Sudden and intense bursts of lights can also cause distraction and confusion, especially if the occurrences are unexpected. Instances such as light displays, lasers or firework shows can be the cause of such events.

1.1.2 Ideally, pre-event analysis and discussion with aviation authorities should safely de-conflict flying and light display activities. Failure to take suitable or adequate measures to prevent a risk to aircraft may result in prosecution. CAA Advisory Circular on Reporting of Laser Illumination to Aircraft dated 17 August 2012, determines that shining any light (including that produced by a laser) at an aircraft in flight so as to dazzle or distract the pilot is considered to be a crime under Articles 99.2, 99.6 and 99.9 of the Law Nr. 03/L-051 on Civil Aviation in Republic of Kosovo and Article 165 of the Criminal Code of the Republic of Kosovo.

1.2 Lasers

1.2.1 Lasers used in the vicinity of aerodromes add to the known aviation related problems associated with high intensity lights. The technology can produce a beam of light of such intensity that permanent damage to human tissue, in particular the retina of the eye, can be caused instantaneously, even at distances over 10 km. At lower intensities, laser beams can seriously affect visual performance without causing physical damage to the eyes.

1.2.2 Protection of the pilot against deliberate or accidental laser beam strikes has been of interest to military aviation medicine specialists for many years. However, it was with the advent of the laser light display for entertainment or commercial purposes, and subsequent accidental illumination of civil aircraft from such displays, that civil aviation authorities have become increasingly concerned with the issue of projection of laser light into the air.

1.2.3 An event recorded in 1995 related the experience of a pilot on a commercial flight in the USA. Shortly after take-off the pilot was hit in the eye by a laser beam. He was completely flash-blinded in his right eye and suffered impaired vision in his left eye. He was unable to see for 30 seconds and for another two minutes was unable to interpret any of his flight instruments. Such an event has obvious safety implications in imperilling the lives of aircrew, passengers and those living in the vicinity of aerodromes.

1.2.4 Lasers used in outdoor Light Displays produce an intense, coherent, directional beam of light with wavelengths covering the visible spectrum of 400-700 nanometres. Such concentrated energy creates not only the potential for permanent eye injury to pilots, crew and passengers, but also loss of night vision. When such light displays are projected or reflected into airspace and intercept aircraft, unplanned exposure (incidents of illumination, startle and glare) may cause pilot distractions or create temporary vision impairments (flash blindness, afterimage). These effects may pose significant flight safety risks during critical phases of flight, in particular during approach and landing operations.

1.2.5 In view of the increasing risk to flight safety posed by the more widespread use of laser emitters around airports, the International Civil Aviation Organisation (ICAO) formed a study group in 1999 to evaluate the laser risk. During 1999 and 2000, the Aviation Medicine Section of the ICAO Secretariat developed the laser-related Standards or Recommended Practices (SARPs) which are now included in Annexes 11 and 14 to the Convention on International Civil Aviation. These standards, to which the Republic of Kosovo adheres, require states to take adequate steps to prevent laser beams from adversely affecting flight operations and recommends establishing zones around aerodromes within which the use of lasers should be restricted.

1.2.6 Safety regulations for laser displays must be taken into consideration by local municipalities, and risk assessments shall be carried out for associated planning applications or entertainment licences. Aviation risk assessments must be carried out along similar lines to establish Hazard Zones. ICAO Recommended Practices suggest the establishment of Laser Beam Free Flight Zones, Laser Beam Critical Flight Zones and Laser Beam Sensitive Flight Zones. The CAA approach, , does not prescribe precise dimensions for such zones around each airport in the Republic of Kosovo, but considers that a Notification Zone should exist around every aerodrome within which laser emissions must be controlled.

1.2.7 A Nominal Ocular Hazard Zone is considered to exist around any laser within which visible and invisible laser beams can pose a potential threat to safety by exceeding the Maximum Permissible Exposure. Assessment of lasers producing visible beams will also take into account the additional risks from dazzle and distraction in order to calculate a Sensitive Level and Visual Interference Level that determine whether the installation can safely co-exist with aircraft operations and, if appropriate, what restrictions or limitations should be applied. This assessment will depend on the range and bearing of the installation from any nearby aerodrome. If the proposed display or installation is particularly complex or contentious, a Local Laser Working Group may be convened to assess the implications of the proposal and produce a final assessment.

1.3 Searchlights

Searchlights are frequently used to provide spectacular backdrops to individual events. They are also used to provide lighting displays for structures or special events over periods of weeks or even months. Apart from the potential to distract aircrew, they may

also appear similar in appearance and position to airfield lighting, hence their position and operation must be considered with care.

1.4 Fireworks

Firework displays can vary from the small-scale garden event to a major commercial or ceremonial occasion. As with laser or searchlight displays, fireworks have the potential to distract and confuse aircrews or damage aircraft during flight operations.

A unique feature of fireworks displays is that solid objects are physically launched into the air to create the full visual effect. Many fireworks associated with large-scale events can dispense canisters several hundred feet into the air. Whilst the risk of collision with aircraft is small, the existence of such projectiles needs to be borne in mind when carrying out an assessment for firework displays in the vicinity of aerodromes.

1.5 Helium-Filled Small Balloons

The release of helium-filled small balloons is viewed as a valuable source of publicity and/or fundraising at many events. However, the conduct of such activities in the vicinity of aerodromes could present a risk to aviation. It has been determined that the ingestion of balloons would not have a detrimental effect on a gas turbine engine's performance, regardless of its passage through the engine.

However, regardless of any assurances apropos the nil effect of ingestion, pilots will tend to manoeuvre to avoid large concentrations of balloons. Therefore, to increase awareness and to minimise the potential risk, CAA guidelines are laid down in this TP for the benefit of balloon operators.

Note: *For the purposes of this TP, 'Fireworks' and 'Firework Displays' includes 'Sky Lanterns' and 'Sky Lantern Displays'; both involve the launching of one, or more solid combustible object into the air with the risk of either impacting against an aircraft, or causing a distraction to aircrew.*

2 Lights, Firework and Helium-Filled Small Balloon Display Guidelines (Temporary Displays)

2.1 Action by Light and Firework Display Organisers

2.1.1 This section refers to procedures concerned with temporary light, firework and helium-filled small balloon displays. (Refer to section 3 if the light display is designed as a permanent (longer than one month) installation)

2.1.2 For light and firework displays, or helium-filled small balloon releases, organisers should notify the CAA of their proposed activity by completing the notification form (*Annex A - Notification of Outdoor Laser, Searchlight, Firework or Helium-Filled Small Balloon Operations*). To allow time to de-conflict or coordinate the activity, as well as promulgate warnings to the aviation community and establish any control measures considered necessary, notification needs to be given at least 10 days in advance.

2.1.3 The CAA will examine the proposal based on the following guidelines. If no further information is required then appropriate warning action will be carried out. While the display organiser will not routinely receive written confirmation of this, if further information or action is required from the display organiser, the CAA may contact the originator of the proposal to discuss suitable future courses of action.

2.2 Guidelines for Light and Firework Displays

2.2.1 It is of prime importance that light displays and fireworks are never directed at or towards aircraft or aerodromes. The light display organiser should also nominate a single point of contact, known as a Light Display Operator (LDO), who will be directly responsible for the conduct of the actual event. Display organisers should be aware of the following geographical zones, illustrated in *Annex B - Notification Zones for Light and Firework Displays (Diagram)*, within which the CAA considers it necessary to impose restrictions in order to protect flight operations:

2.2.1.1 Within 3 miles of an aerodrome's notified Aerodrome Reference Point (ARP) or similar, or within 10 miles of the notified ARP along the track of the extended runway centreline and 500 metres either side of said centreline.

2.2.1.2 For Light Displays within 3 miles of an aerodrome's ARP, but not on the extended runway centreline, or within 10 miles of an aerodrome but only if within 500 metres either side of the extended runway centreline, the following procedures should be adhered to:

- a) Ideally, measures should be in place to prevent light escaping towards the aerodrome or along the extended runway centreline.

- b) If this proves impractical, other precautions are to be taken to ensure that light displays do not impinge on safe flight operations, such as arranging for a direct telephone or radio communications link between the LDO and relevant aerodrome, through which the light display can be terminated immediately on request from either an aircraft or the affected aerodrome.

Note: If this is not possible, then the light display may represent a threat to flight safety and should not proceed.

2.2.1.3 Elsewhere, although the light display is unlikely to affect aerodrome flight operations, the light display organiser should notify the CAA to ascertain if there are any other aviation activities that may be affected by the display.

2.3 Additional Guidelines for Firework Displays

2.3.1 Aerial fireworks displays should be limited to a height of 1500 feet above ground level.

2.3.2 Displays within 10 miles radius of an active aerodrome or within an Aerodrome Traffic Zone (ATZ) may require notification and coordination action and must be notified by the event supervisor to the CAA for consideration.

2.4 Additional Guidelines for Helium-Filled Small Balloon Releases

2.4.1 While the geographical zones described in paragraph 2.2.1 do not apply for helium-filled small balloon releases, the CAA will usually consider placing restrictions upon any request for such balloon releases within 5 miles of an aerodrome ARP; however, all applications are considered on their individual merit.

2.4.2 Balloons should be made of latex, **not metallic foil, nor have a metallic finish**. It is strongly recommended that plastic inserts are not used to close the balloons, nor lengths of string, streamers or ribbons; the balloons are not to be tied together. Where the balloons are restrained prior to release, the restraining medium must be attached to the ground or a fixed structure to prevent any inadvertent release of the restraining medium with the balloons.

2.4.3 The application procedure for helium-filled small balloon mass releases varies as the number of balloons to be released changes. Details are as follows:

Table 1

Number of Balloons	Procedure
Between 1,000 and 5,000	<p>The organiser should contact CAA (<i>see contact details at Annex A</i>) to ascertain ATC Unit that may be affected by the release. CAA will instruct the organiser to contact the appropriate ATC Unit before the date of release and again on the day of the release. The organiser should also inform the Kosovo Police of the release.</p>
5,001 to 20,000	<p>The organiser must apply <i>in writing</i> to CAA, giving at least 10 day notice. Co-ordination will be affected by CAA with ATC Unit affected by the release. De-confliction process will be taken by CAA from other notified unusual aerial activities.</p> <p>For sites outside controlled or notified airspace, CAA will issue an approval letter to the organiser and copy this to the ATC Unit, and Kosovo Police.</p> <p>For sites within controlled or notified airspace, CAA will issue a Permission to the organiser and copy this to the ATC Unit, and Kosovo Police.</p> <p>CAA will promulgate the release by NOTAM.</p>
20,001 or more	<p>The organiser must apply in writing to CAA, giving at least 10 day notice. Co-ordination will be affected by CAA with ATC Unit affected by the release. De-confliction process will be taken by CAA from other notified unusual aerial activities. CAA will issue Permission to the organiser and copy this to the ATC Unit, and Kosovo Police.</p> <p>CAA will promulgate the release by NOTAM.</p>

Note: An ATZ is airspace established in the vicinity of an aerodrome with the purpose of providing protection to aircraft landing, taking off and flying in the visual circuit.

Note: Balloon releases that do not meet the definition of mass release are less likely to cause a hazard to aircraft. However, organisers are encouraged to seek advice from the CAA (*contact details at Annex A*) on the safe conduct of such releases.

3 Permanently Sited Lasers and Searchlights

3.1 Permanent Laser and Searchlight Sites

3.1.1 Any laser or searchlight site that is likely to remain in position for more than a month is considered a permanent site. Not every site will be significant to aviation, but the CAA should be consulted during the initial planning process for any such installation.

3.1.2 An initial approach should be made to the Flight Safety Department at the CAA. The Flight Safety Department jointly with the Air Navigation Services Department will examine the proposal and advise the originator of whether it is likely to affect aircraft operations and, if so, what measures to take to mitigate its effect. The guidelines given in Section 2 and Annex B will be utilised to make an initial assessment of the likely risk to aircraft operations. Further advice may be sought from the Aeromedical Section of the Flight Safety Department of the CAA.

3.2 Lasers, Searchlights and other Lights used for Air Traffic Control purposes

Several types of laser, searchlights and other lights are used or may be used on or near airfields for Air Traffic Control (ATC) meteorological purposes or as a bird hazard control. These include cloud and visibility measurement, communications, and navigation aid calibration tasks. It is the responsibility of the aerodrome operator to ensure that equipment used for such purposes is operated in accordance with the manufacturer's instructions, national and international ATC procedures, and in a manner that will neither endanger any aircraft nor prejudice flight safety.

3.3 Use of Lasers by Military Units

Lasers are commonly used for military purposes (ex.: range finding, target designation and weapon guidance). This TP does not cover the use of lasers, searchlights or other light sources by the military authorities in the Republic of Kosovo (KFOR and KSF), and their subordinate organisations, should produce separate regulations concerning the safe use of lasers by the military. However, such regulations do not absolve any person from using best judgement to ensure the safety of aircraft and aircrew while operating equipment employing lasers, searchlights or other light sources.

Annex A - Notification of Outdoor Laser, Searchlight, Firework or Helium-Filled Small Balloon Operations

To: Civil Aviation Authority of Kosovo Ahmet Krasniqi Street n.n. Arbëria District 10000 Prishtinë, Kosovë Tel: (0)38 248 629 Fax: (0)38 211 009 Email: infocaa@caa-ks.org	From: (Applicant)	Date: <i>(this form requires submission at least 10 days in advance of the date of the event given in paragraph 1)</i>
--	--------------------------	--

1 - GENERAL INFORMATION

Event or facility		
Customer		Site address (must include postcode)
GEOGRAPHIC LOCATION		
Latitude ___ deg (°) ___ min (') ___ sec (")		Longitude ___ deg (°) ___ min (') ___ sec (")
OS Grid Ref :		Post Code (if available) :
Ground elevation at site (Above Mean Sea Level)	Elevation above ground (if on buildings, etc.)	For Firework Displays – maximum height of display (Above Ground Level)
DATE(S), TIME(S) AND DURATION OF EVENT		
Testing and/or alignment		Operation

2 - BRIEF DESCRIPTION OF OPERATION

--

3 - SMALL BALLOON RELEASE INFORMATION

Number of balloons
Method of Release: Mass/Batches/Individual If batches, state size and number of batches
Total time taken to release the balloons (in minutes)
BALLOONS MUST BE MADE OF LATEX/RUBBER, NOT METALLIC NOR HAVE A METALLIC FINISH

4 - ON-THE-SITE OPERATION INFORMATION

Operator(s)	
On-site phone 1 (Emergency Contact)	On-site phone 2
BRIEF DESCRIPTION OF CONTROL MEASURES	

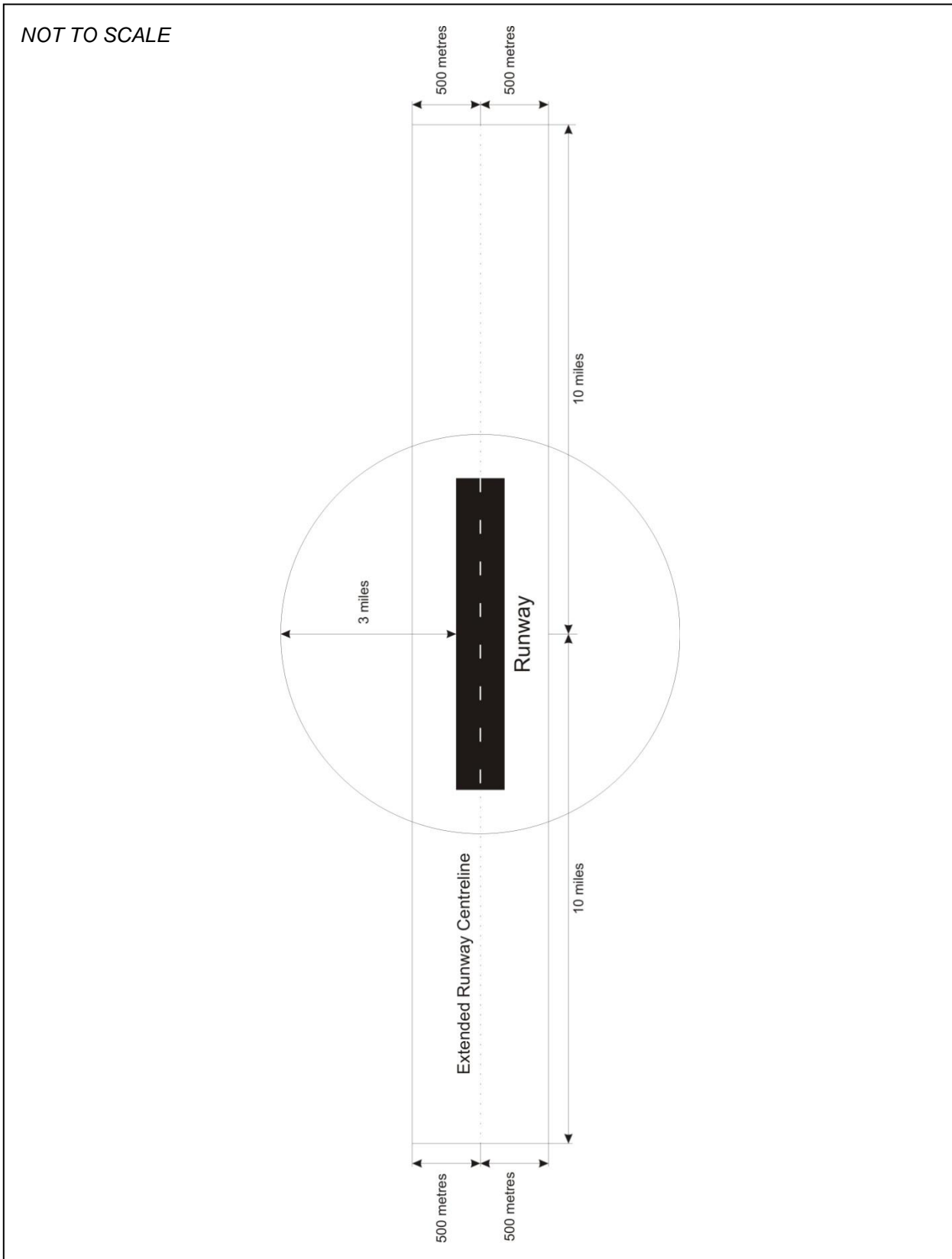
5 - ATTACHMENTS

List any additional attachments needed to evaluate this operation (<i>could include maps, diagrams, and details of control measures</i>)

6 - DESIGNATED CONTACT PERSON (*if further information is needed*)

Name	Position	
Phone	Fax	E-mail
STATEMENT OF ACCURACY To the best of my knowledge, the information provided in this Notice of Proposal is accurate and correct.		
Name (<i>if different from contact person</i>)	Position	
Signature	Date	

Annex B - Notification Zones for Light and Firework Displays (Diagram)



Annex C - Reference Documents

The following documents contain further specific guidance on the risks, notification and conduct of Light Displays:

- **Law No. 03/L-051 on Civil Aviation;**
- **CAA Advisory Circular on Reporting of Laser Illumination to Aircraft (AAC/DSF/AC-LAS);**
- **ICAO Annex 11 - Air Traffic Services**
(Chapter 2.18 Coordination of activities potentially hazardous to civil aircraft);
- **ICAO Annex 14 - Aerodromes (Chapter 5.3 Lights);**
- **ICAO document AN5/19.3-01/56 - Laser Protection at Aerodromes;**
- **ICAO document (Doc 9815) - Manual on Laser Emitters and Flight Safety;**
- **DIRECTIVE 2006/25/EC** on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation);
- **Eurocontrol Safety Regulation Commission Document - SRCDOC 7 (Outdoor Lasers in the Navigable Airspace) 2001** (*available from www.eurocontrol.int*).