EASA
European Union Aviation Safety Agency

ARISE+
Funded by the European Union and implemented by the European Union Aviation Safety Agency

P3.2. human activities &

obstacle control and monitoring

Your safety is our mission.

An Agency of the European Union

P3.2. human activities & obstacle control

1. Obstacle Control and Monitoring

2. Monitoring and mitigating hazards related to human activities

P3.2. human activities & obstacle control

1. Obstacle Control and Monitoring

P3.2. human activities & obstacle control

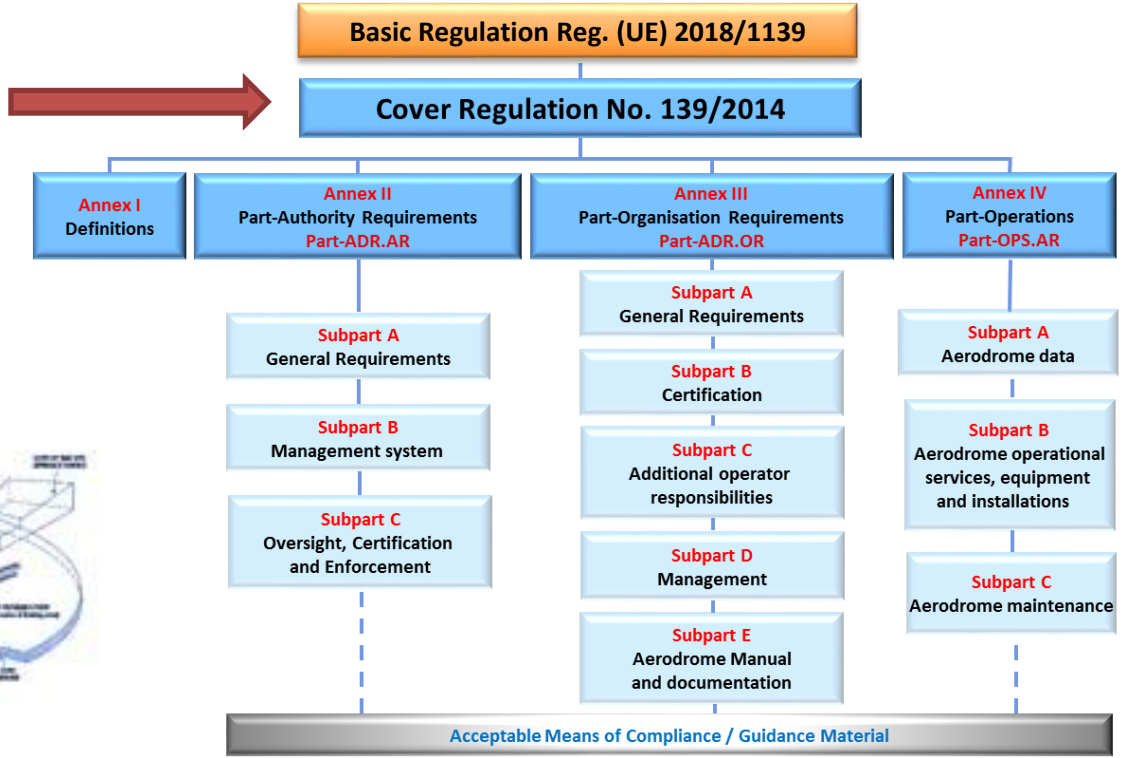
- Legal concept
- Spanish situation
- Technical assessments
- Airport operator compliance

P3.2. human activities & obstacle control

Legal concept

P3.2. human activities & obstacle control

This is the first stage of the **legal framework** related to the aerodrome safeguarding **(Articles 8 and 9)**



P3.2. human activities & obstacle control

Basic Regulation (REG 2018/1139)

Regulation (EU) 2018/1139:

Art. 38.1 (MS requirements)
*"**Member States** shall take the necessary measures to ensure that aerodromes located in their territory are safeguarded against **activities and developments** in their surroundings which may cause unacceptable risks to aircraft using the aerodrome."*

Art. 38.2 (Organisations responsible for the operation of aerodromes' requirements)
*The organisations referred to in Article 37(1) shall **monitor activities and developments** which may cause unacceptable safety risks to aviation in the surroundings of the aerodrome for the operation of which they are responsible. They shall take the **necessary measures to mitigate those risks** in as far as this lies within their control and, where that is not the case, **bring those risks to the attention of the competent authorities** of the Member State where the aerodrome is located"*

P3.2. human activities & obstacle control

ANNEX VII – Essential requirements for aerodromes

3. AERODROME SURROUNDINGS

3.1.1. The airspace around aerodrome movement areas shall be **safeguarded from obstacles** so as to permit the intended aircraft operations at the aerodromes without creating an unacceptable risk caused by the development of obstacles around the aerodrome. Obstacle monitoring surfaces shall therefore be developed, implemented and continuously monitored to identify any infringing penetration.

3.1.2. **Any infringement of those surfaces will require an assessment** to identify whether or not the object creates an unacceptable risk. Any object posing an unacceptable risk shall be removed or appropriate mitigating action shall be taken to protect aircraft using the aerodrome.

3.1.3. Any remaining obstacles shall be published and, depending on the need, shall be marked and, where necessary, made visible by means of lights.

3.2. Hazards related to human activities and land use, such as, but not limited to, items on the following list, shall be monitored. The risk caused by them shall be assessed and mitigated as appropriate:

a) any development or change in land use in the aerodrome area;
b) the possibility of obstacle-induced turbulence;
c) the use of hazardous, confusing and misleading lights;
d) the dazzling caused by large and highly reflective surfaces;
e) the creation of areas that might encourage wildlife activity in the surroundings of the aerodrome movement area; or
f) 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.

P3.2. human activities & obstacle control

Article 8 – Safeguarding of aerodrome surroundings

- Member States must ensure appropriate **consultations for constructions** within OLS, protection surfaces and other areas associated with ADR, safeguarding of ADRs located near the national border to be coordinated.

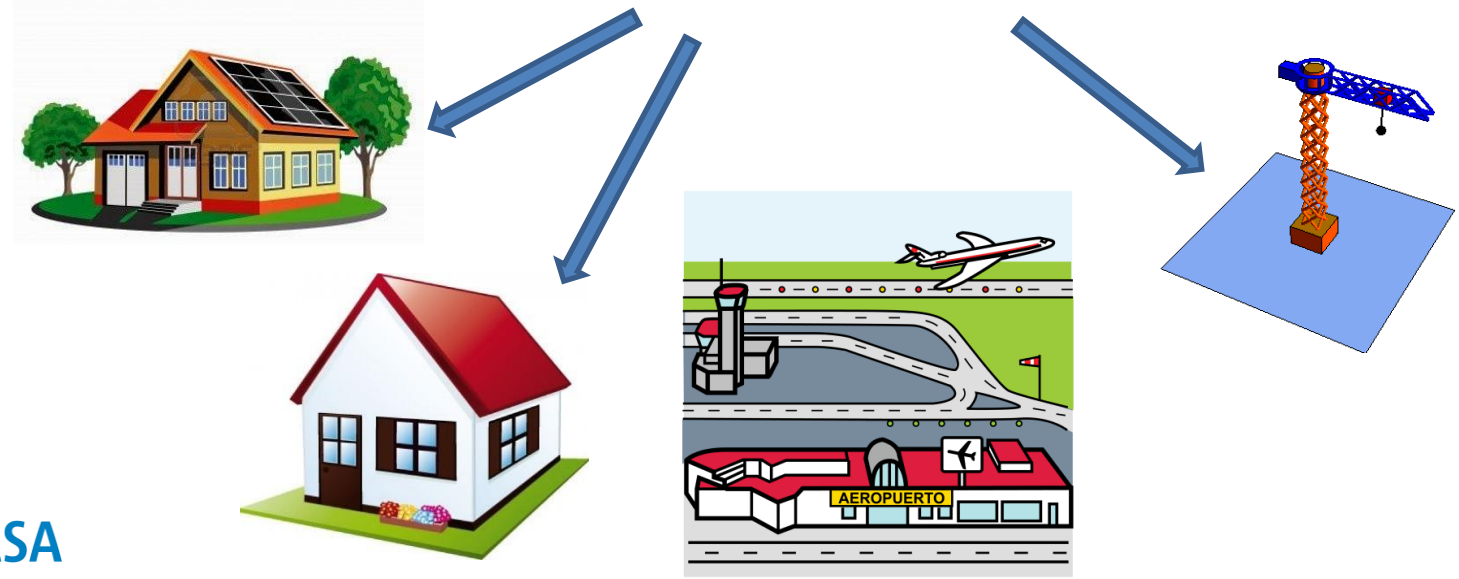
- Member States shall also ensure that consultations are conducted with regard to safety impacts of constructions proposed to be built beyond the limits of the obstacle limitation and protection surfaces.

P3.2. human activities & obstacle control

Cover Regulation (REG 139/2014)

Safeguarding of aerodrome surroundings

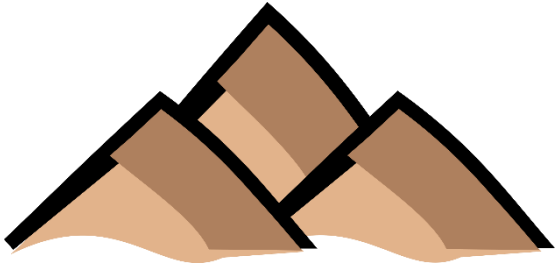
Consultations conducted



P3.2. human activities & obstacle control

Cover Regulation (REG 139/2014)

Even **beyond the limits** of the obstacle limitation surfaces:
Consultations conducted



P3.2. human activities & obstacle control

Article 9 – Monitoring of aerodrome surroundings

- Member States must ensure appropriate consultations with regard to human activities and land use such as:
  - Change of land use
  - Turbulence
  - Creating developments
  - Use of hazardous, confusing and misleading lights
  - Reflective surfaces
  - Areas that encourage wild life
  - Sources of visible and non-visible radiation

P3.2. human activities & obstacle control

Cover Regulation (REG 139/2014)

P3.2. human activities & obstacle control

Cover Regulation (REG 139/2014)

Safeguarding of aerodrome surroundings

The safeguarding of aerodrome surroundings in Spain has been covered since 1974 with a legal tool called “**Aeronautical Easements**”, to limit the “property right” in the vicinity of the airports

BOE

LEGISLACIÓN CONSOLIDADA

Decreto 584/1972, de 24 de febrero, de servidumbres aeronáuticas.

EASA

P3.2. human activities & obstacle control

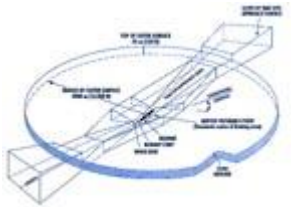
Three different type of surfaces:

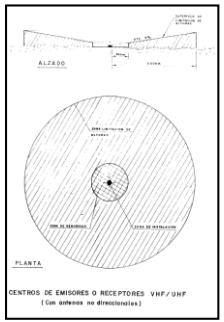
Aeronautical Easement

Legal concept

Limitation of the rights over a property for the public benefit

Materialised by





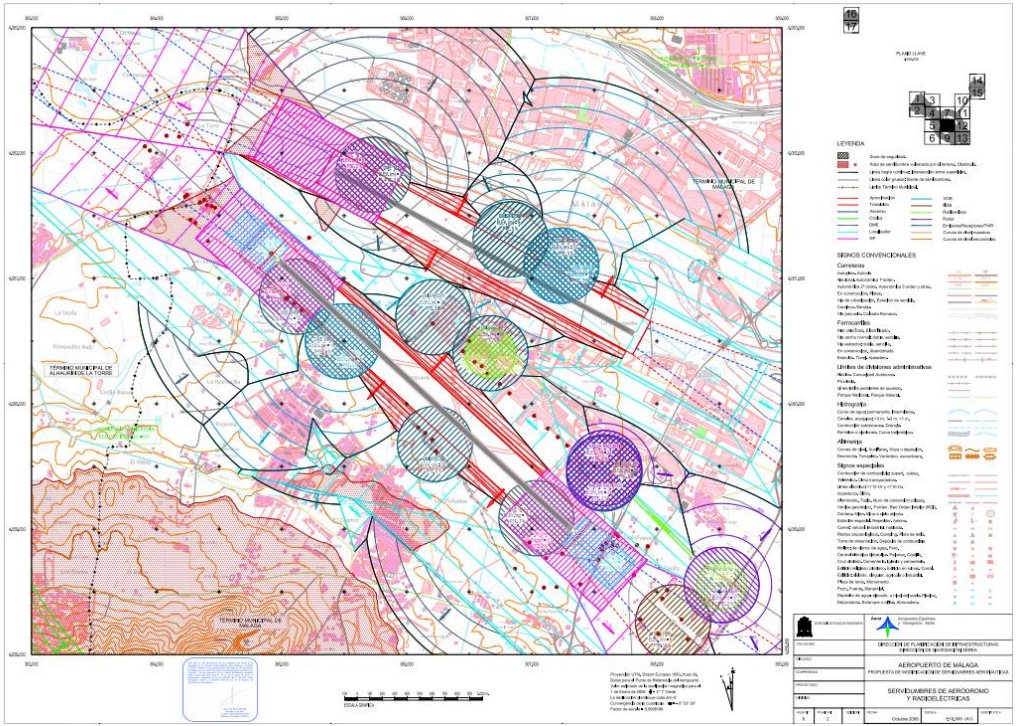
1. Surfaces similar to the **ICAO Annex 14 Obstacle Limitation Surfaces**
2. Surfaces designed to **protect the CNS facilities**
3. **Surfaces designed to protect the operations** in the airports beyond the OLS (additional surfaces, **NOT the ICAO Doc 8168 surfaces**)

P3.2. human activities & obstacle control

Based on the "**Aeronautical Easements**" Regulation, it is necessary to **approve and officially publish the aeronautical easements for each aerodrome**.

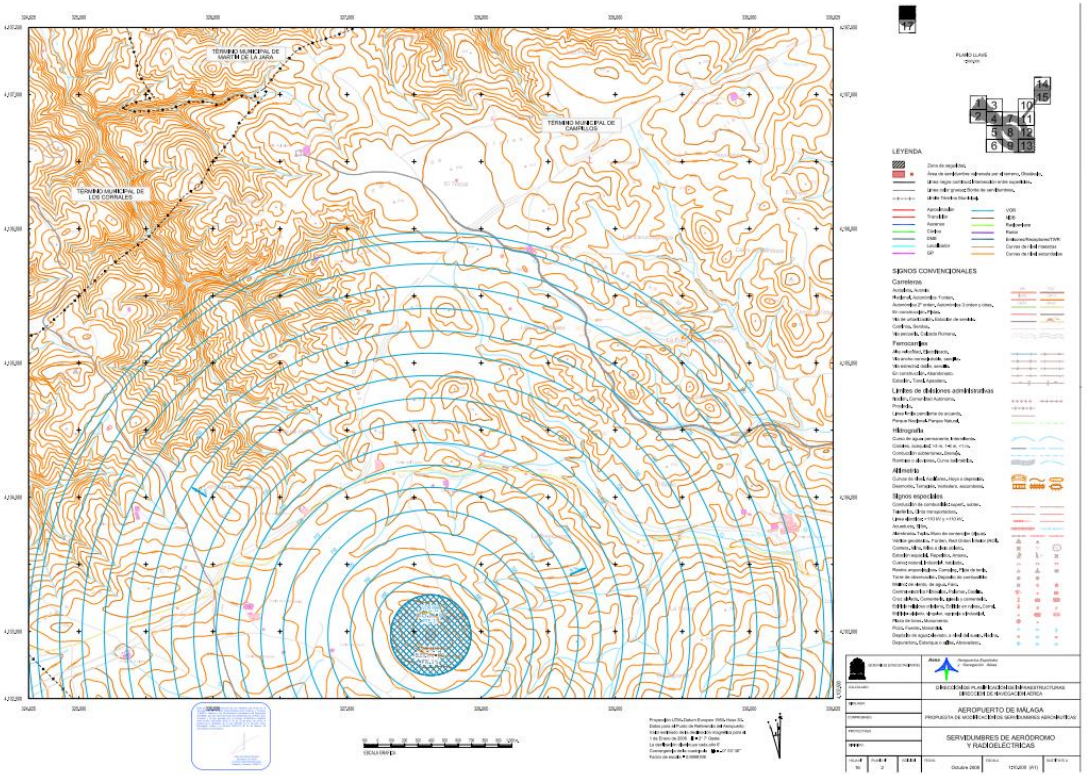
P3.2. human activities & obstacle control

1. Surfaces similar to the **ICAO Annex 14 Obstacle Limitation Surfaces**



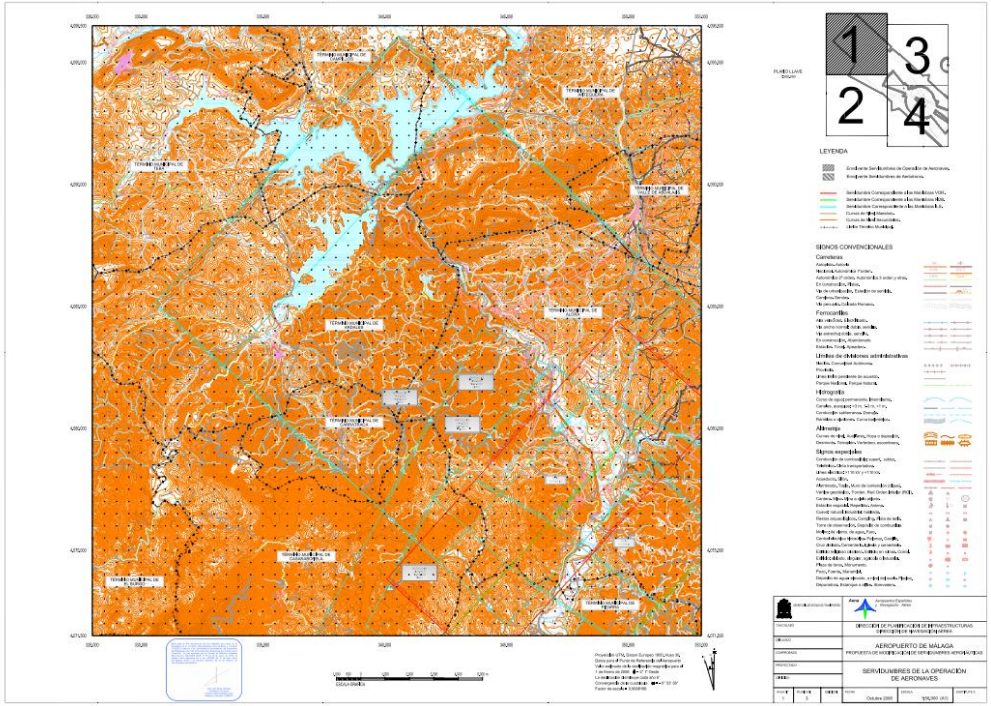
P3.2. human activities & obstacle control

2. Surfaces designed **to protect the CNS facilities**



P3.2. human activities & obstacle control

3. **Surfaces designed to protect the operations** in the airports beyond the OLS (additional surfaces, **NOT the ICAO Doc 8168 surfaces**)



P3.2. human activities & obstacle control

Spanish situation

P3.2. human activities & obstacle control

Within the terrain affected by aeronautical easements

Civil Aviation General Directorate

(Directorate which belongs to the **Ministry of Transports**)

*In charge of **informing the Urban Plans***

Civil Aviation Authority (AESA)

in charge of

Buildings, Facilities and Plantations Authorisations

P3.2. human activities & obstacle control

A **double check** is done:

When the **urban plan is approved**

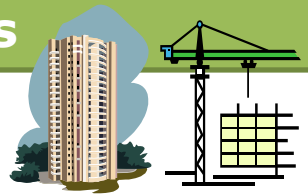
When the **building is approved**

Lesson learned:

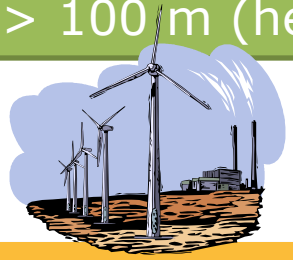
This is not an efficient procedure, in the majority of the situations, the assessment done within the first approval is enough.

P3.2. human activities & obstacle control

When somebody (**Citizen, Private Company or Public Organism**) wants to build something **within the areas affected by Aeronautical Easements**



Or, beyond those areas, if somebody wants to build something > 100 m (height)



It’s compulsory to request a **previous authorisation**

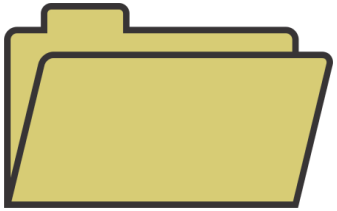
P3.2. human activities & obstacle control

Every **obstacle higher than 100 m** needs **prior approval** from the Civil Aviation Authority

Height > 100 m

P3.2. human activities & obstacle control

Around 30 people working for the Obstacle Limitation Unit



More than **6.000 applications** per year

P3.2. human activities & obstacle control

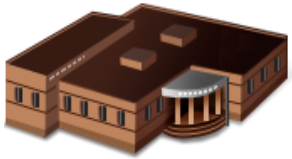
Applicant

Private companies and citizens

Application form

Local Authority

Application form



Applicant

Public organism (autonomous governments, railway infrastructures manager.)

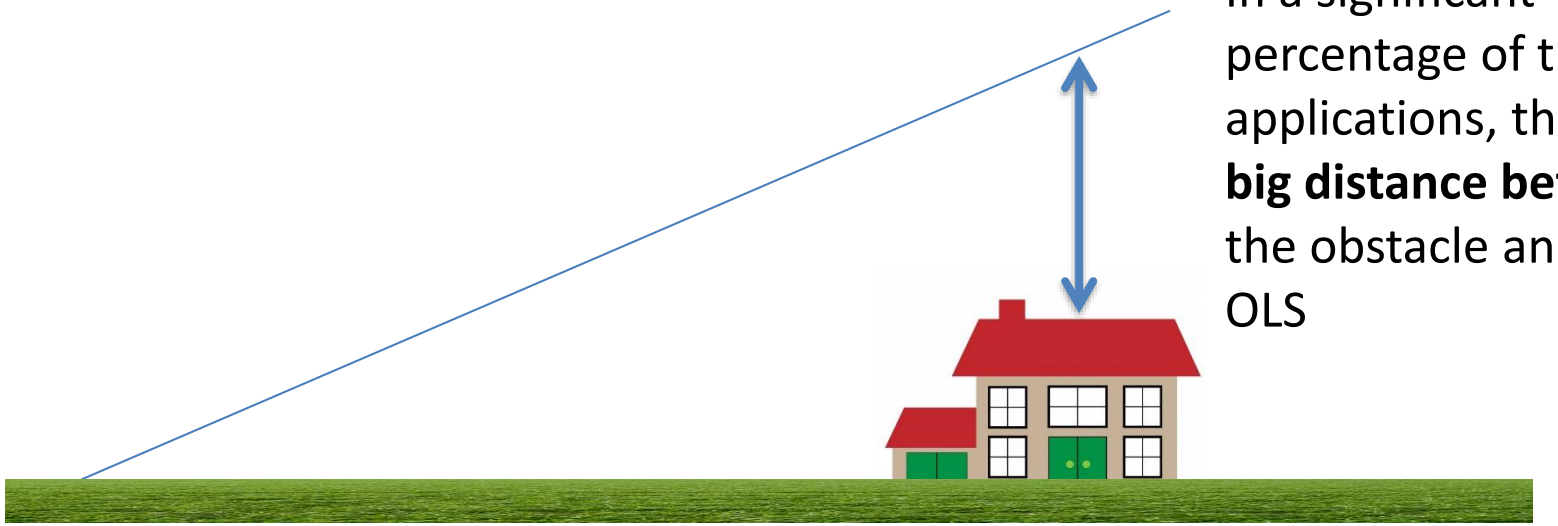
Application form

AESA

OLS Unit

Authorisation process

P3.2. human activities & obstacle control



In a significant percentage of the applications, there is a **big distance between** the obstacle and the OLS

Lesson learned:

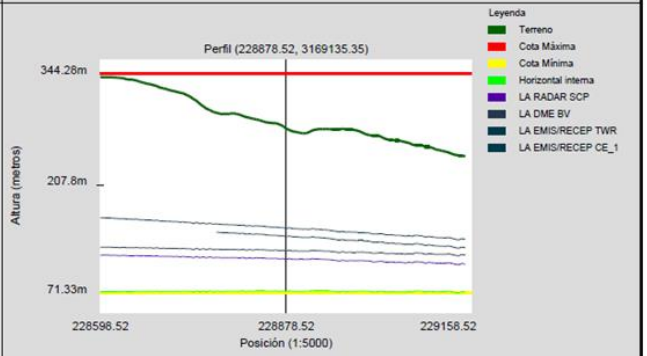
The Spanish Civil Aviation Authority spends a lot of time processing applications related to obstacles without any kind of safety impact

P3.2. human activities & obstacle control

Informe de Servidumbres Aeronáuticas - Aeropuerto de La Palma

Planta	Coordenadas UTM del punto investigado	Elevación del terreno en el punto	Altura Libre	Tipo de Superficie Limitadora
	X = 228878.52 Y = 3169135.35	282.54 m	-208.59 m	Horizontal interna

Siguientes superficies limitadoras en orden ascendente	Tipo	Altura Libre
	- LA RADAR SCP - LA DME BV - LA EMIS/RECEP TWR - LA EMIS/RECEP CE_1 - NDB-Aproximación frustrada NDB RWY 01	-167.78 m -157.32 m -138.88 m -128.52 m No Disponible

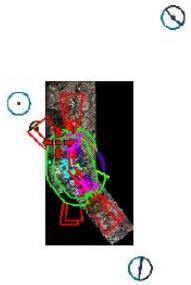
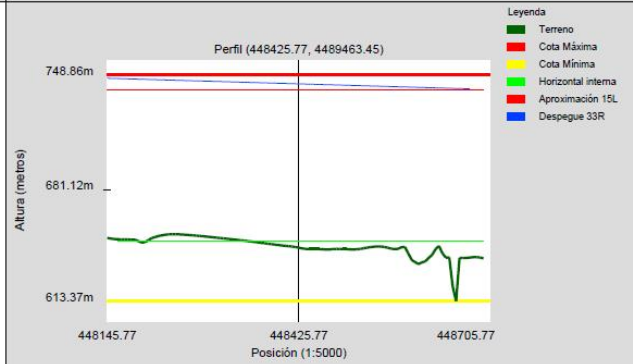
Plano de Intersección	Sección Transversal
	

P3.2. human activities & obstacle control

Informe de Servidumbres Aeronáuticas - Aeropuerto de Madrid-Barajas

Planta	Coordenadas UTM del punto investigado	Elevación del terreno en el punto	Altura Libre	Tipo de Superficie Limitadora
	X = 448425.77 Y = 4489463.45	646.24 m	3.76 m	Horizontal interna

	Tipo	Altura Libre
Siguientes superficies limitadoras en orden ascendente	- Aproximación 15L - Despegue 33R - VOR-Aproximación final VOR RWY 18L - VOR-Aproximación final VOR RWY 18R - VOR-Aproximación intermedia VOR RWY 18R - VOR-Aproximación intermedia VOR RWY 18L - VOR-Aproximación frustrada VOR RWY 33R - VOR-Aproximación frustrada VOR RWY 33L - ILS-Aproximación frustrada ILS RWY 33R	95.76 m 99.26 m No Disponible No Disponible No Disponible No Disponible No Disponible No Disponible No Disponible

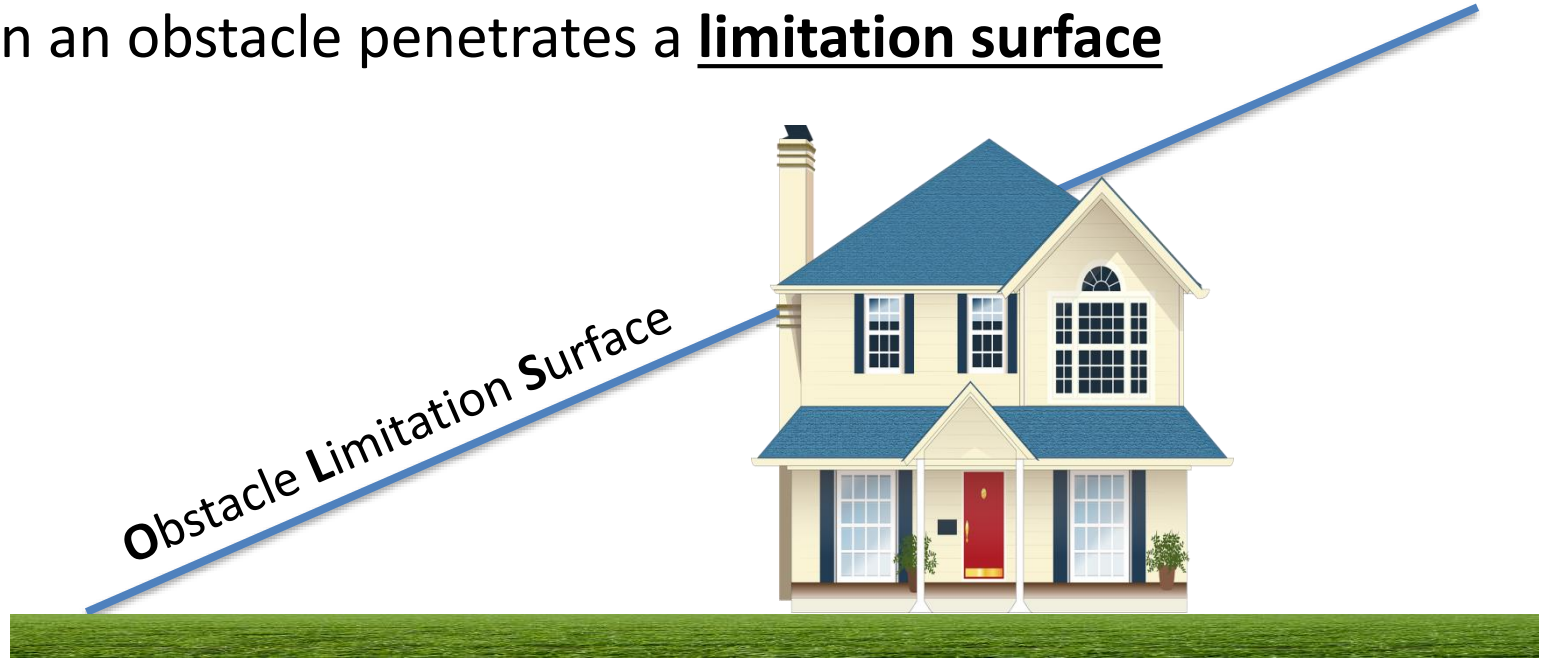
Plano de Intersección	Sección Transversal
	

P3.2. human activities & obstacle control

Technical assessments

P3.2. human activities & obstacle control

When an obstacle penetrates a **limitation surface**



A **technical assessment** is necessary in order to know if there is any **impact on the safety** of the airport operations

P3.2. human activities & obstacle control

The first thing we need to know is:

CASE 1

ICAO Annex 14 Obstacle limitation surface

Operational Safety Assessment is necessary (Both for instrumental operations and for VFR traffic)

CASE 2

Air Navigation facility protection surface

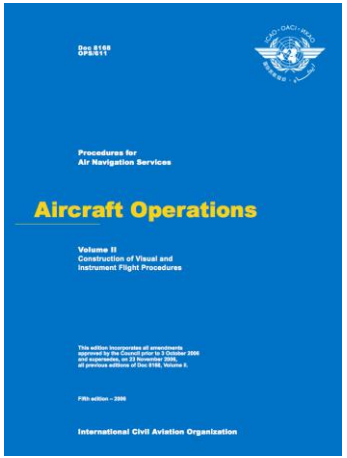
Radio-electrical Assessment is necessary

P3.2. human activities & obstacle control

CASE 1

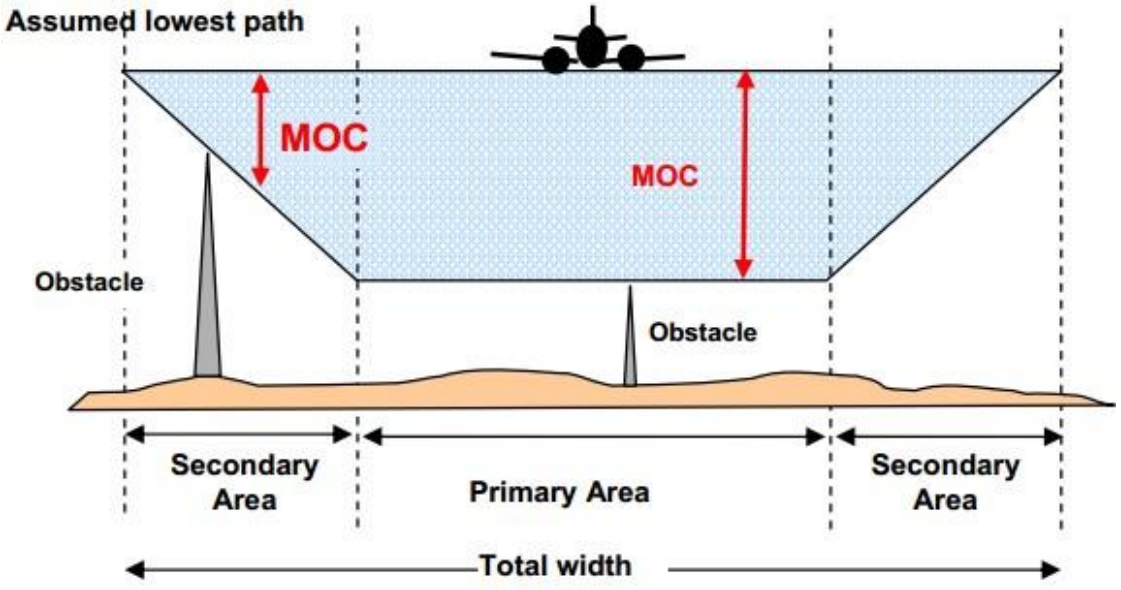
A. Instrumental approach and departure procedures

For the instrumental approach and departure procedures, the analysis is conducted based on the ICAO 8168 document (PANS OPS)



P3.2. human activities & obstacle control

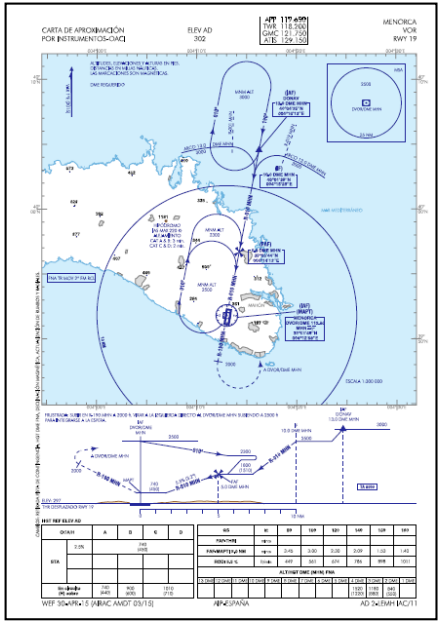
CASE 1

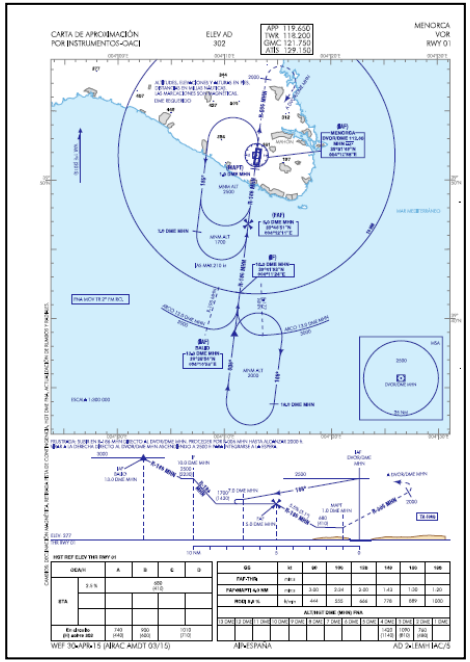


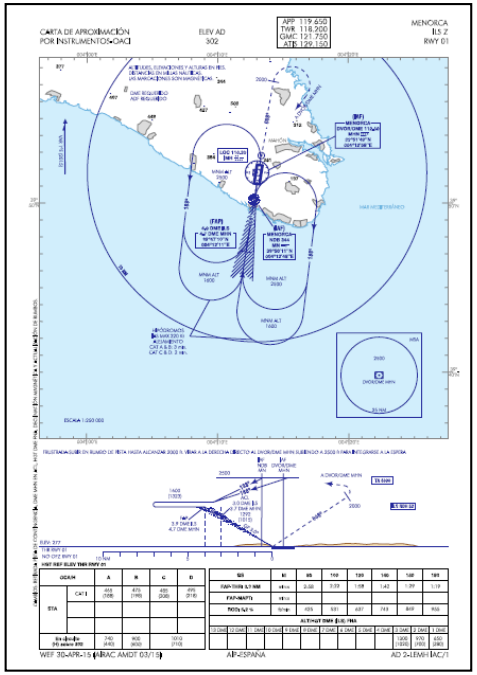
The primary and the secondary areas **must not be penetrated** by the obstacle

P3.2. human activities & obstacle control

CASE 1







All the instrumental procedures must be analysed

P3.2. human activities & obstacle control

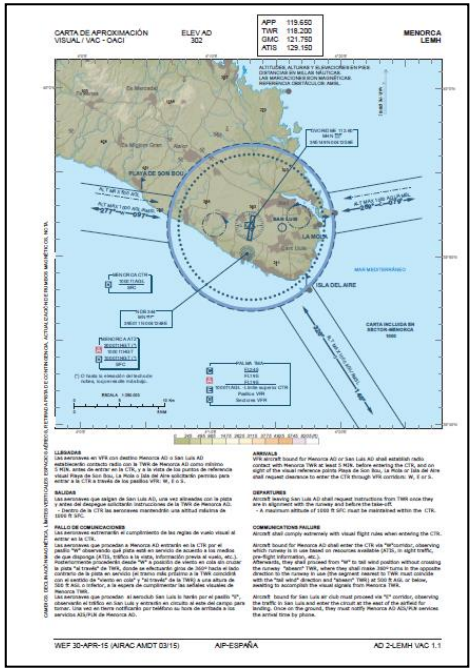
B. VFR operations

CASE 1

A qualitative safety assessment for the VFR traffic is necessary.

This assessment have to take into account the following issues:

- VAC assessment (Notification Points, other characteristics, etc.).
- Visual Circuit Position
- Common paths used by the VFR pilots
- Pilots opinions within an experts meeting (when it is possible).
- Radar information (when it is available).
- Similar height obstacles in the surroundings.



P3.2. human activities & obstacle control

CASE 2

Radio-electrical safety assessment

This kind of studies, evaluates the impact of the new obstacle to the functioning of the CNS facilities, using software simulation tools based on physical and mathematical models

Ohio University Performance Prediction Model (FAA approved)

LOC / GP / VOR

IMPULSE

RADAR / DME / Multilateration

P3.2. human activities & obstacle control

CASE 2

For these kind of assessments it is necessary:

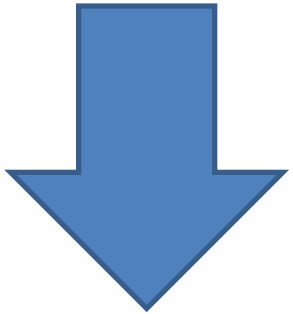
- To know the **technical characteristics of the CNS facility** (Brand and model, frequency of operation, position and dimensions, antenna characteristics, etc.).
- To know the **dimensions and characteristics of the obstacle**.
- To **make a model of the obstacle** (shape, material, dimensions).
- Etc.

P3.2. human activities & obstacle control

CASE 2

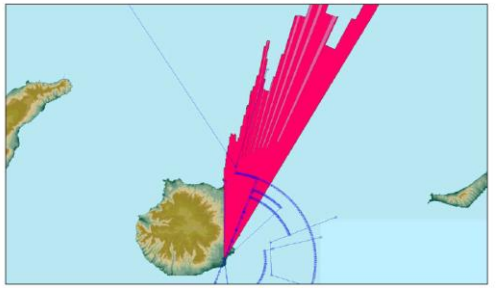
With:

- All the information shown in the previous slide
- The appropriate software tool
- The necessary hypothesis



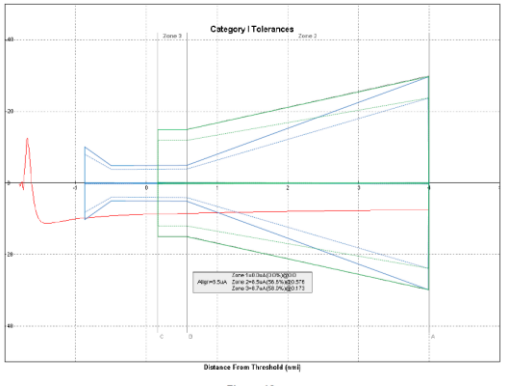
P3.2. human activities & obstacle control

CASE 2



The people dedicated to carry out these kind of studies, analyse:

- If the coverage of the CNS facility could be affected by presence of the obstacle
- If the on-board signal could be altered by the presence of the obstacle
- If the ground signal could be altered by the presence of the obstacle



P3.2. human activities & obstacle control

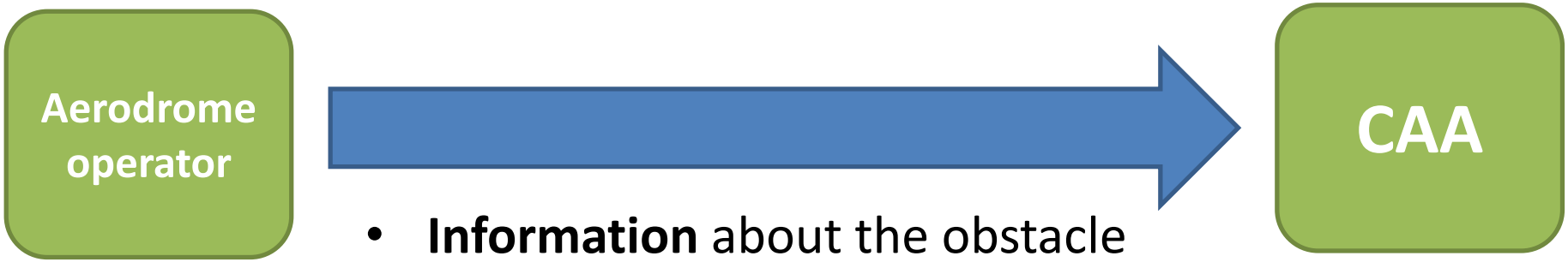
Airport operator complaint

P3.2. human activities & obstacle control

When the aerodrome operator report to the CAA, about an obstacle which penetrates a **limitation surface without authorisation**

P3.2. human activities & obstacle control

It is necessary to submit:

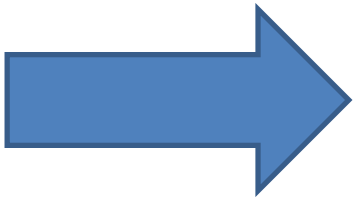


- **Information** about the obstacle

- **Operational** and/or **radio-electrical** safety assessment (done by the aerodrome operator)

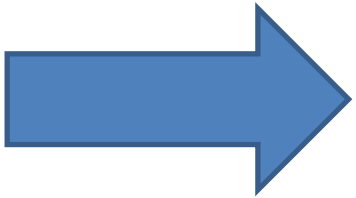
P3.2. human activities & obstacle control

If there is **not safety impact**, according to the Aerodrome Operator assessment



- The obstacle has to be legalised
- No fine is imposed to the owner

If there is **safety impact**, according to the Aerodrome Operator assessment



- Mitigation measures or operational restrictions have to be implemented
- A monetary fine is imposed to the owner
- The owner is instructed to remove the obstacle
- The authority could remove the obstacle if it is necessary

P3.2. human activities & obstacle control

P3.2. human activities & obstacle control

1. Monitoring and mitigating hazards related to human activities

P3.2. human activities & obstacle control

- Scope and objective
- From Europe to Spain. Regulation
- Aerodrome operators
- The Spanish procedure today. 2017’s review
- Practical implementation. Example 1
- Practical implementation. Example 2

P3.2. human activities & obstacle control

Scope and objective

P3.2. human activities & obstacle control

Objective

How does the Spanish Civil Aviation Authority (**AESA**) deal with hazardous **activities** near the aerodromes?

- Regulation
- CAA Oversight (Aerodrome procedures, safety assessments, etc.)

Scope

What are considered potentially dangerous activities in Spain?

- Wildlife
- Aerial activities: balloons, lanterns…
- RPAs
- Sport activities: kites, kitesurf…
- Other: fireworks, laser beams…

P3.2. human activities & obstacle control

Regulation from Europe to Spain

P3.2. human activities & obstacle control

EU Regulation 

FORMER BASIC REGULATION **(REPEALED)**

REG 216/2008:

Art. 8a-3 (MS requirements)

*"**Member States** shall ensure that provisions are in place to safeguard aerodromes against **activities and developments** in their surroundings which may cause unacceptable risks to aircraft using the aerodrome."*

Art. 8a-4 (aerodrome operators requirements)

*"**Aerodrome operators** shall **monitor activities and developments** which may cause unacceptable safety risks to aviation in the aerodrome surroundings and take, within their competence, **mitigating measures as appropriate**."*

P3.2. human activities & obstacle control

EU Regulation

NEW BASIC REGULATION

Regulation (EU) 2018/1139:

Art. 38.1 (MS requirements)

*"**Member States** shall take the necessary measures to ensure that aerodromes located in their territory are safeguarded against **activities and developments** in their surroundings which may cause unacceptable risks to aircraft using the aerodrome."*

Art. 38.2 (Organisations responsible for the operation of aerodromes' requirements)

*The organisations referred to in Article 37(1) shall **monitor activities and developments** which may cause unacceptable safety risks to aviation in the surroundings of the aerodrome for the operation of which they are responsible. They shall take the **necessary measures to mitigate those risks** in as far as this lies within their control and, where that is not the case, **bring those risks to the attention of the competent authorities** of the Member State where the aerodrome is located"1*

Art. 37.1

Organisations responsible for the operation of aerodromes shall be subject to certification and shall be issued with a certificate. (…)

P3.2. human activities & obstacle control

EU Regulation

NEW BASIC REGULATION

ANNEX VII – Essential requirements for aerodromes

3. AERODROME SURROUNDINGS

(…)

3.2. Hazards related to **human activities** and land use, such as, but not limited to, items on the following list, shall be monitored. The **risk caused by them shall be assessed and mitigated** as appropriate:

a) any development or change in land use in the aerodrome area;

b) the possibility of obstacle-induced turbulence;

c) the use of hazardous, confusing and misleading lights;

d) the dazzling caused by large and highly reflective surfaces;

e) the creation of areas that might encourage wildlife activity in the surroundings of the aerodrome movement area; or

f) 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.

P3.2. human activities & obstacle control

EU Regulation

REG. 139/2014

REG 139/2014:

Art. 9 (MS requirements)

*"**Member States** shall ensure that **consultations are conducted** with regard to **human activities and land use** such as:*

*a) any **development or change in land use** in the aerodrome area;*
*b) any **development** which may create **obstacle-induced turbulence** that could be hazardous to aircraft operations;*
*c) the use of hazardous, confusing and misleading **lights**;*
*d) the use of **highly reflective surfaces** which may cause dazzling;*
*e) the creation of **areas that might encourage wildlife activity** harmful to aircraft operations;*
*f) 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."*

P3.2. human activities & obstacle control

Spanish Regulation

Royal Decree 584/1972: (last update in 2013)

Establish the aeronautical easements which put in place:

1. The obligation for the local authority to obtain a previous approval from the CAA, before issuing any local authorisation for:
    - **Buildings**
    - **Facilities**
    - **Plantations**

    in certain areas in the surroundings of the airports (very similar to the OLS) and the Air Navigation facilities (CNS).
2. Spanish CAA is entitled to prohibit, restrict or limit **activities** within airports' surroundings which could be hazardous for both air operations or air navigation equipment.

P3.2. human activities & obstacle control

Spanish Regulation

CAA Guidance material:

AESA's technical guide for aerodrome operators:

- ✓ Scope: It is clearly defined the activities **IN** & **OUT** of the guide's scope
- ✓ Process: complete guidance for aerodrome operators about:
  - The activity identification (through the SMS or external source) and the preliminary analysis
  - Risk assessment and mitigation measures conducted by the SMS (operational restrictions included)
  - Coordination with internal/external organizations (the "promoter of the activity", ANSP, Airport Operations Unit, etc.)
  - Mitigation measures monitoring
  - Coordination with the Spanish CAA (AESA) (along the whole process)
- ✓ Communication: both with AESA and the activity's responsible (as a result of the SMS risk assessment)

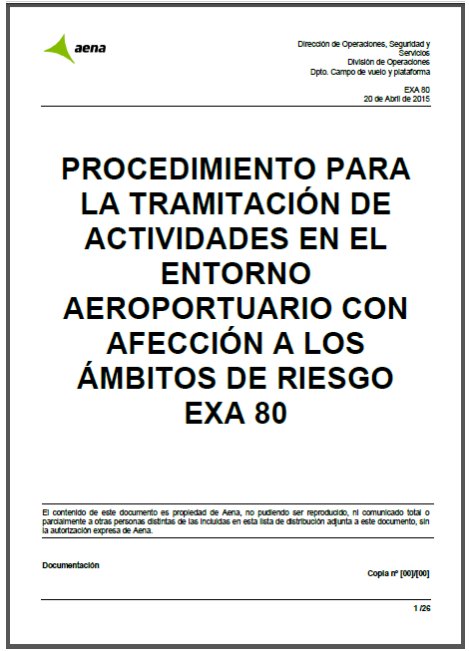
P3.2. human activities & obstacle control

Aerodrome operators

P3.2. human activities & obstacle control

What have our airports already done?

The aerodrome operator has developed a Specific procedure (SP)
"*Procedure for managing activities in the airport environment affecting risk areas*"


aena

Dirección de Operaciones, Seguridad y Servicios
División de Operaciones
Dpto. Campo de vuelo y plataforma

EXA 80
20 de Abril de 2015

PROCEDIMIENTO PARA LA TRAMITACIÓN DE ACTIVIDADES EN EL ENTORNO AEROPORTUARIO CON AFECCIÓN A LOS ÁMBITOS DE RIESGO EXA 80

El contenido de este documento es propiedad de Aena, no pudiendo ser reproducido, ni comunicado total o parcialmente a otras personas distintas de las incluidas en esta lista de distribución adjunta a este documento, sin la autorización expresa de Aena.

Documentación

Copia nº [00][00]

1 /26

What does this specific procedure contain?

- Responsible: safety manager + chief operating officer + others.
- Application: 20 days in advance the activity takes place
- Airport coordination activities: activity promoters, ANSP, others
- Risk assessment: trough the SMS (following AESA's specific GM)
- Monitoring: mitigation measures monitoring
- Coordination with AESA: if it's considered necessary as a result of the SMS risk assessment
- Other: questionnaire models (for the promoter), check list, communications, …

P3.2. human activities & obstacle control

How does the Specific Procedure work?

Overall process

P3.2. human activities & obstacle control

Initial application

Previous Documental Review
+
Risk assessment (AD operator)

If it's an activity banned,
Out of scope
No safety impact

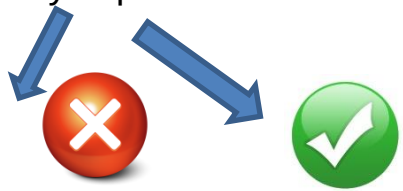
If the risk assessment shows that:
- No mitigation possible
- Unacceptable risk

Mitigation measures
(as a result of the SMS risk assessment)

AD notifies AESA
AESA acts if necessary

AD notifies AESA
AESA acts if necessary

Could the mitigation measures be appropriately implemented?



Activity **takes place**
AESA is informed

EASA

P3.2. human activities & obstacle control

Previous Documental Review
+
Risk assessment (AD operator)

Airport Operator

Coordination with

Spanish ANSP (Air space coordination unit)

ENAIRE

AD departments: ops., maintenance, RFFS..

Local AD ATC/AFIS

ferroNATS

saerco ATS Air Traffic Services

ineco

Airport SMS

- **Risk assessment appropriately documented**
  +
- **Mitigation measures clearly defined**

- **Activity approved or denied**

EASA

P3.2. human activities & obstacle control

The Spanish procedure today. 2017’s review

P3.2. human activities & obstacle control

2017 first semester…

- 439 applications (from 30 different airports)
- Authorised by aerodrome operator (Aena): 93%
- Main activities:
  - Fireworks and lanterns: 79%
  - Balloon: 12%
  - Drones: 5% (included the necessary prior approval from AESA)
  - Other: 4%

- AESA's coordination required for 8 activities. Among them…
  - Pigeons fancying
  - Kitesurf

P3.2. human activities & obstacle control

Practical implementation. Example 1

P3.2. human activities & obstacle control

Case 1: Fireworks in "A Coruña Airport (LECO)"

D-20

A Coruña city council (promoter) notify the airport (LECO)

D-20 to D-3

Previous documental review:
- In or out of the scope of the procedure?

Risk assessment (done by LECO)
- Carefully study about the distance to LECO, LECO operation hours, etc.
- Risk assessment: Done by the Safety manager
- Coordination LECO TWR (ATC)
- Mitigation measures

Promoter: phone LECO TWR **ten minutes before** fireworks start
LECO TWR: real time coordination and confirmation

D-3

Airport authorisation and complete info is submitted to AESA (LECO by e-mail)

D-day

Mitigation measures ok? → Fireworks!

P3.2. human activities & obstacle control

Practical implementation. Example 2

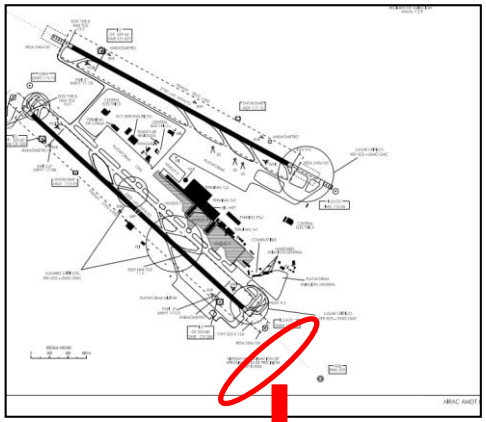
P3.2. human activities & obstacle control

- **Case 2: Kitesurf. Málaga Airport (LEMG)**

  1 Kitesurf activities near RWY 13-31

- **The process**

  1. **LEMG SMS identified the problem**
  2. **LEMG Risk assessment and safety study**
  3. **Measures implementation**
     - Meetings: Regional Government (Andalucia), National Coast Authority, Málaga city council and kitesurf users
     - Final result: **Regional Government banned kitesurf activities in the affected area** near RWY 13-31 (in the beach close to the threshold)



Conclusion of the assessment

Potential risk activity
Mitigation measures: external coordination needed

…and AESA's role during the process?

- Safety assessment review
- Coordination between Airport, coast authority, regional authority, etc.
- Overall oversight

P3.2. human activities & obstacle control

EASA
European Union Aviation Safety Agency

ARISE+
Funded by the European Union and implemented by the European Union Aviation Safety Agency

END

Thanks for your attention!!

easa.europa.eu/connect

Your safety is our mission.

An Agency of the European Union