Human activities & obstacle control and monitoring

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Aerodrome Certification

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EU-South East Asia Aviation Partnership Project (EU-SEA APP)
This project is funded by the European Union and implemented by the European Union Aviation Safety Agency - EASA

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

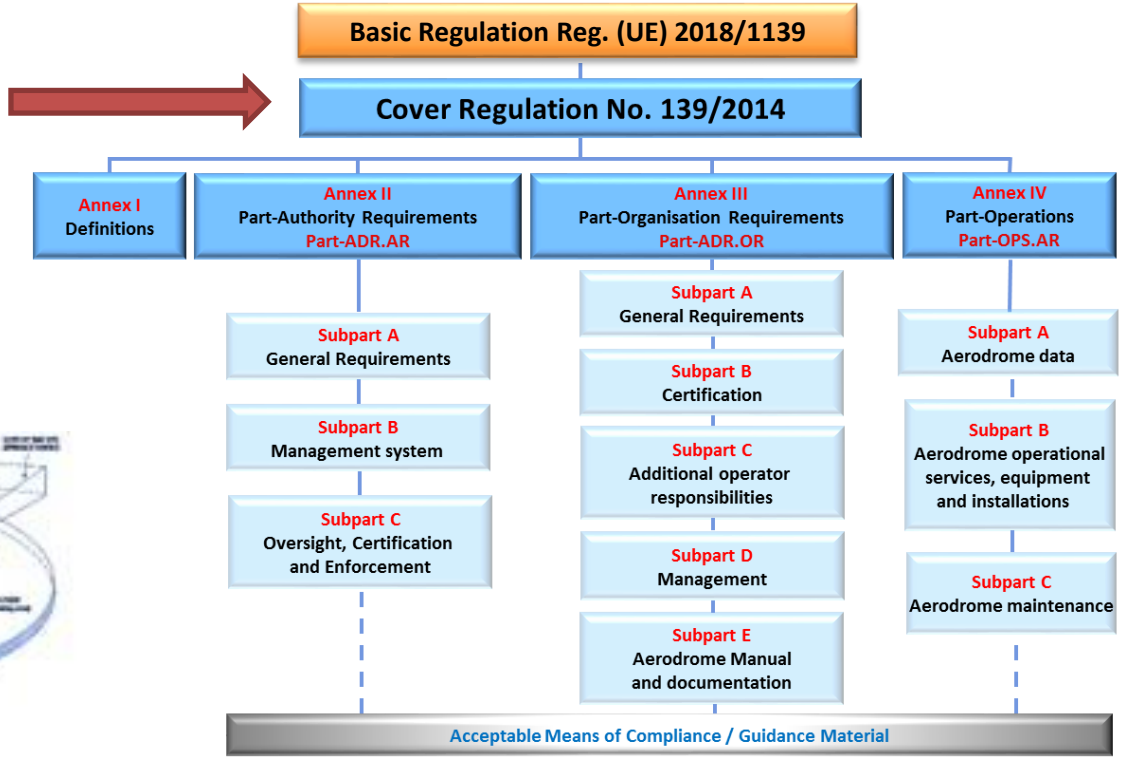
1. Obstacle Control and Monitoring

P3.2. human activities & obstacle control

Legal frame

P3.2. human activities & obstacle control

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



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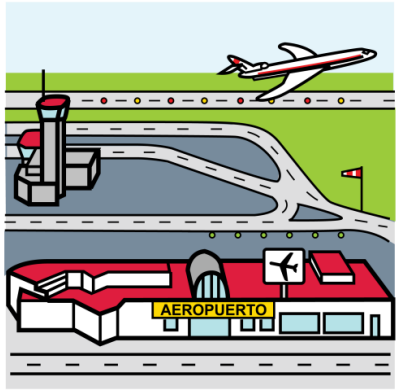
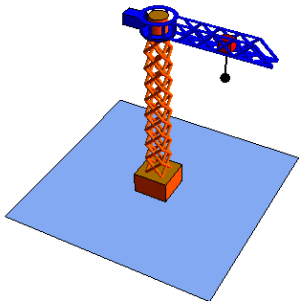
Article 8 – Safeguarding of aerodrome surroundings

a) 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.





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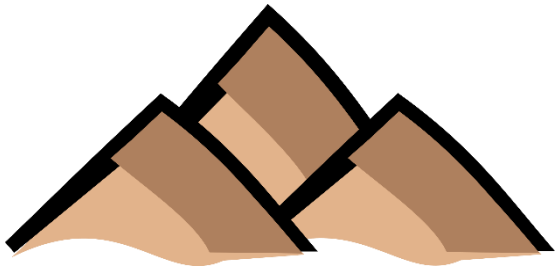
Article 8 – Safeguarding of aerodrome surroundings

b) 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**.



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Article 8 – Safeguarding of aerodrome surroundings

b) 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**.

HOW IS IT IN YOUR COUNTRY?

DO YOU HAVE LAWS TO PROTECT FROM NEW OBSTACLES **UNDER OLS** AND **BEYOND OLS**?

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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

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Cover Regulation (REG 139/2014)

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Cover Regulation (REG 139/2014)

HOW IS IT IN YOUR COUNTRY?

DO YOU HAVE LAWS TO PROTECT FROM HUMAN ACTIVITIES

UNDER OLS AND **BEYOND OLS**?

EASA

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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.

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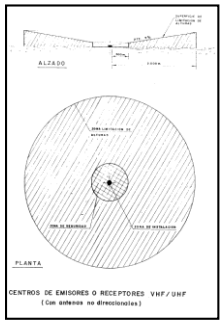
Aeronautical Easement

Legal concept

Limitation of the rights over a property for the public benefit

Materialised by



Three different type of surfaces:

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**)

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

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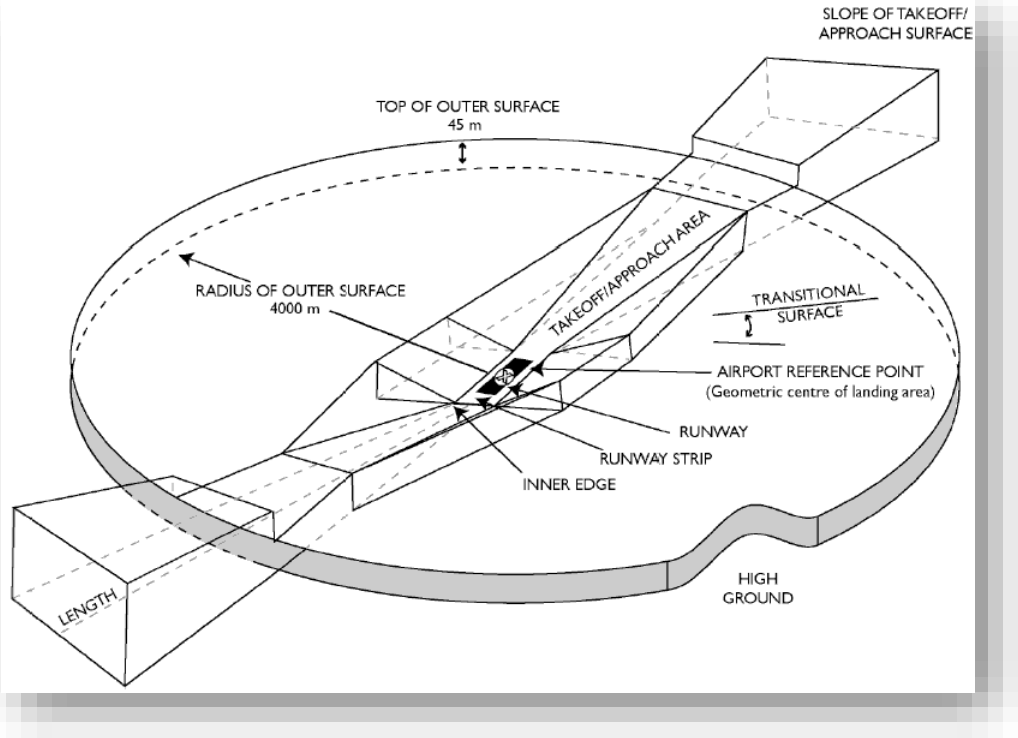
1. Surfaces similar to the **ICAO Annex 14 Obstacle Limitation Surfaces**



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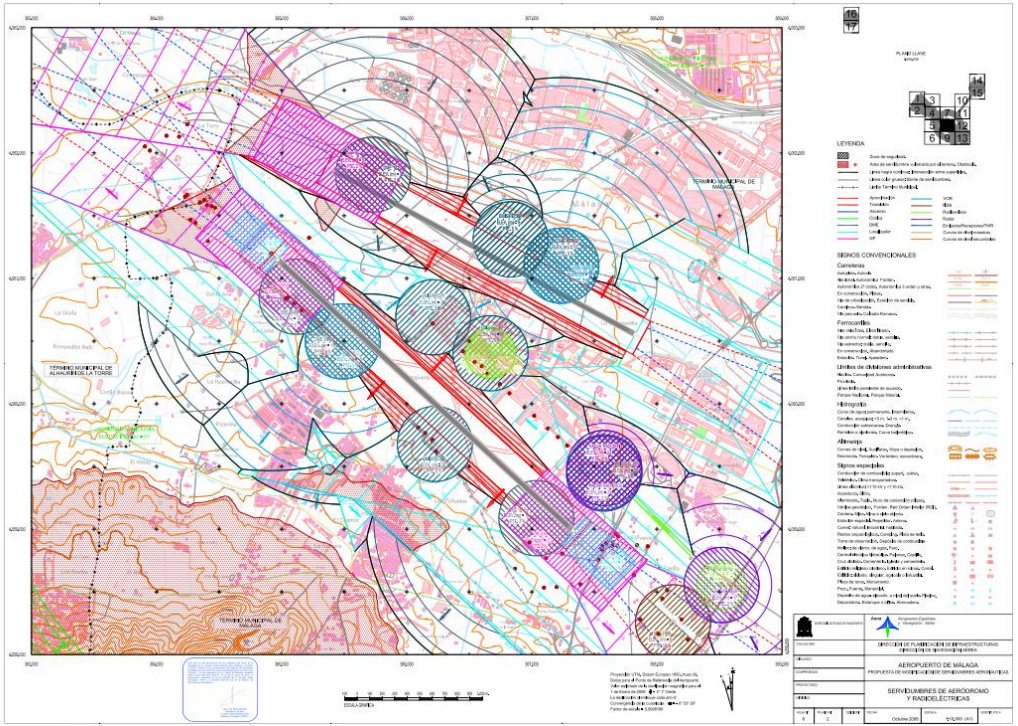
1. Surfaces similar to the **ICAO Annex 14 Obstacle Limitation Surfaces**



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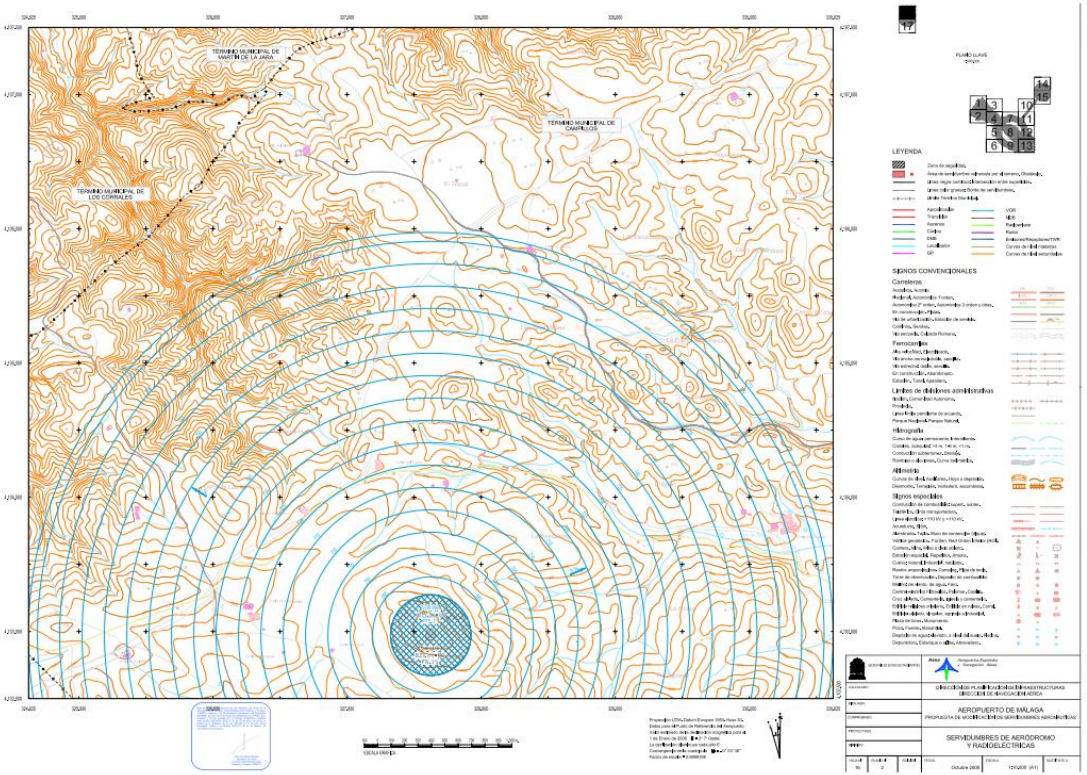
2. Surfaces designed **to protect the CNS facilities**



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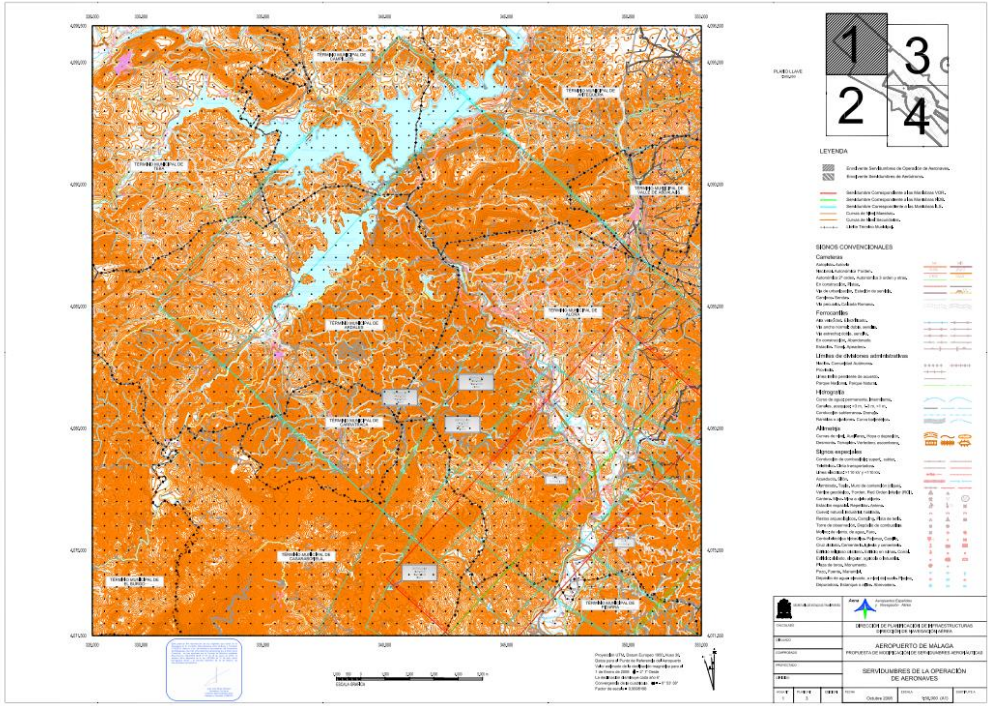
3. **Surfaces designed to protect the operations** in the airports beyond the OLS (additional surfaces, **NOT the ICAO Doc 8168 surfaces**)



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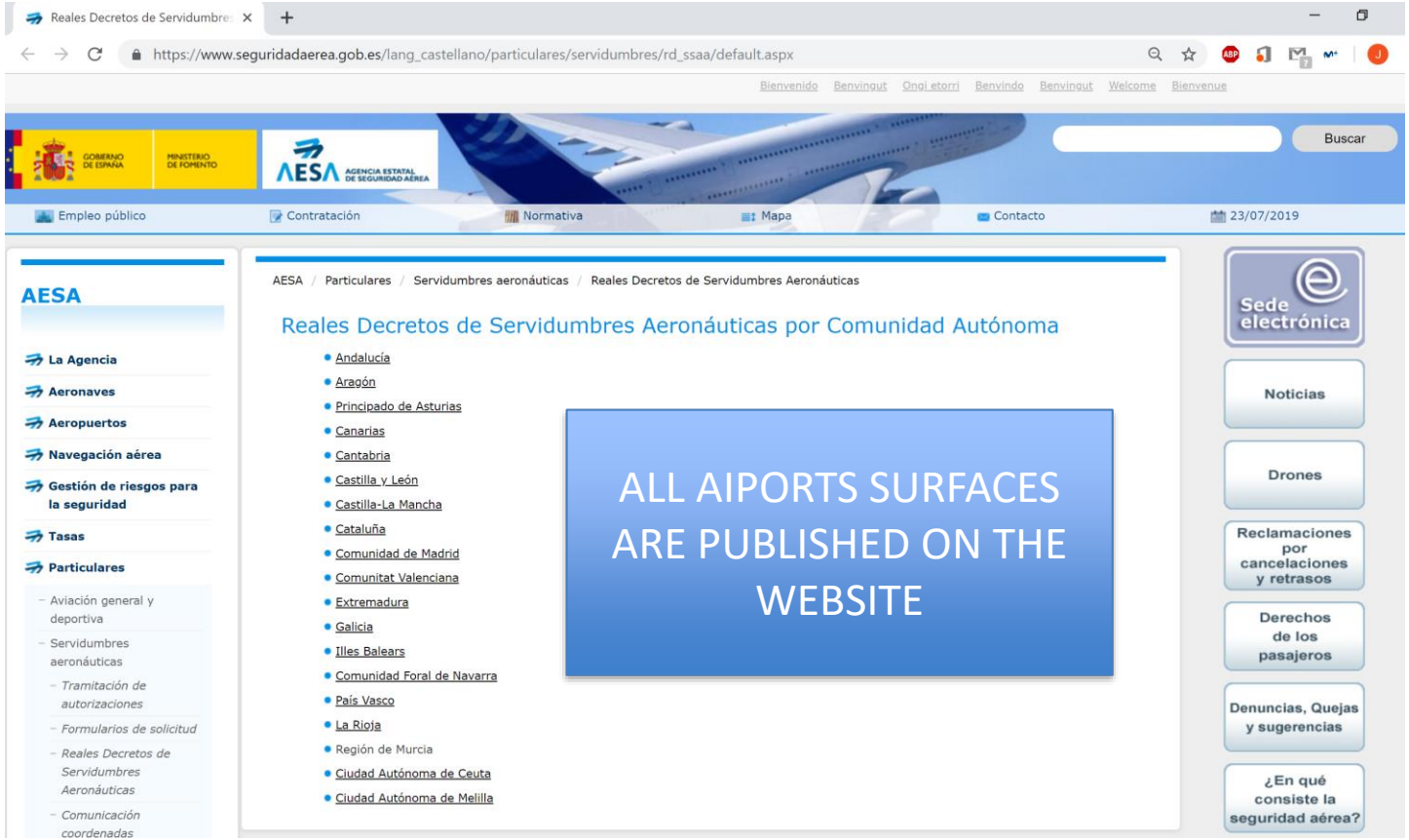

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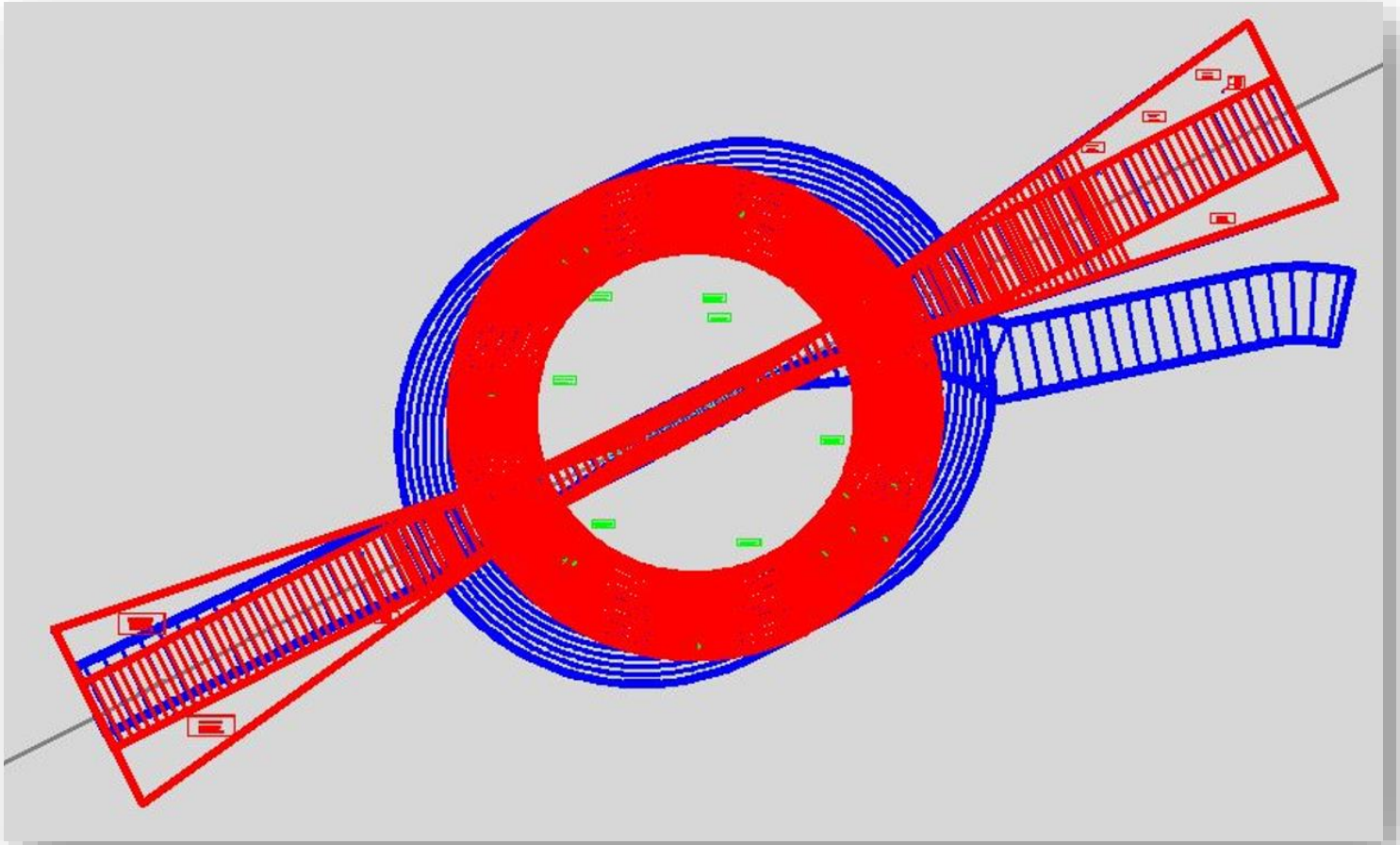
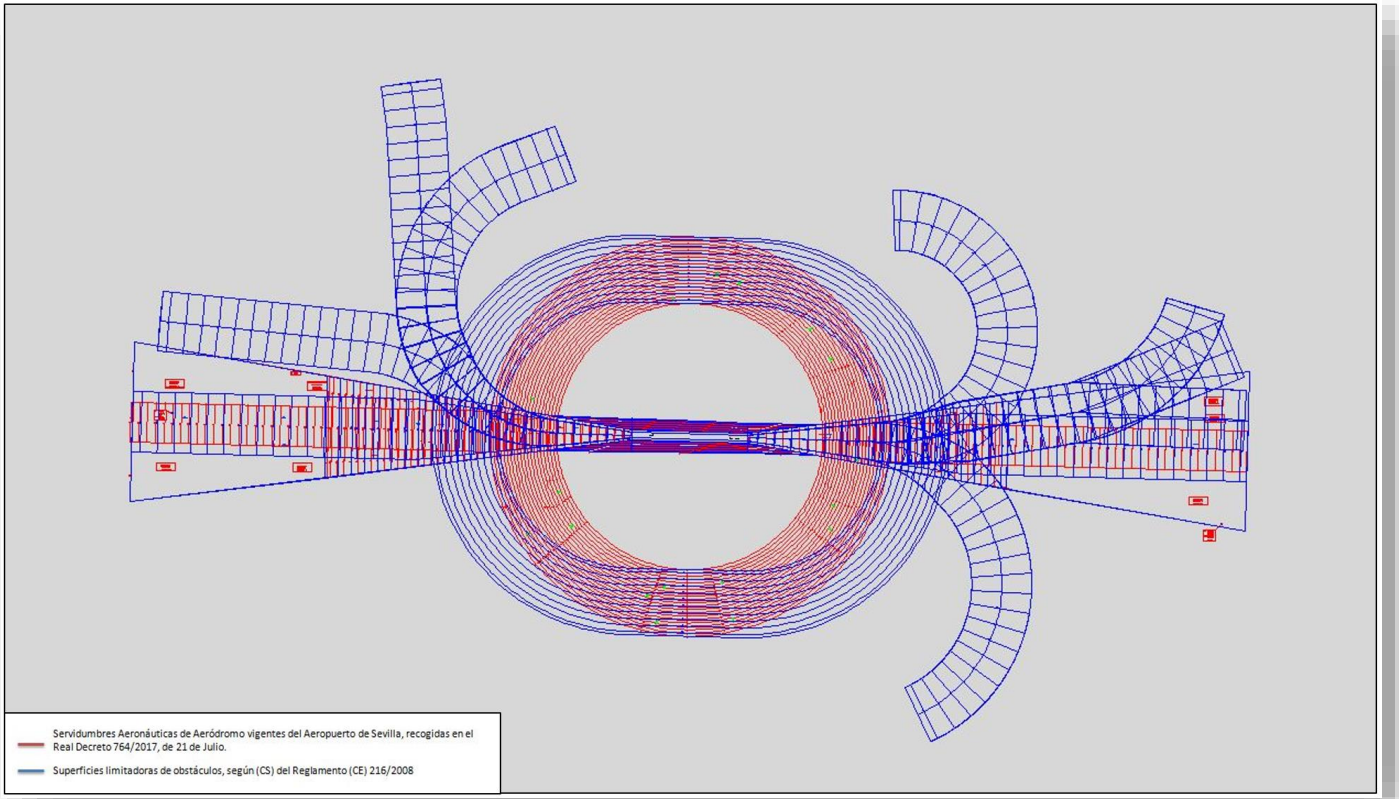


REGULAR UPDATE

P3.2. human activities & obstacle control



REGULAR UPDATE

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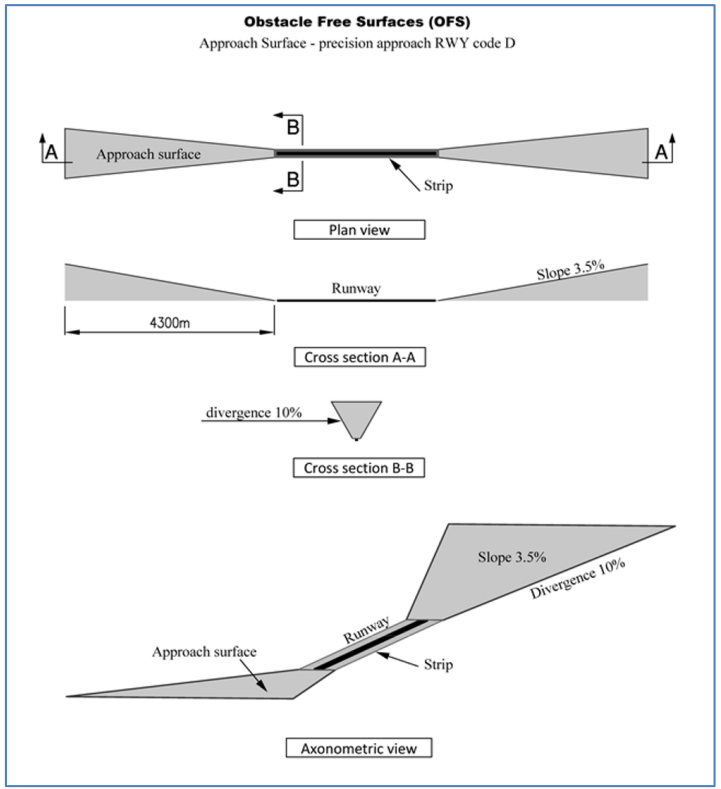

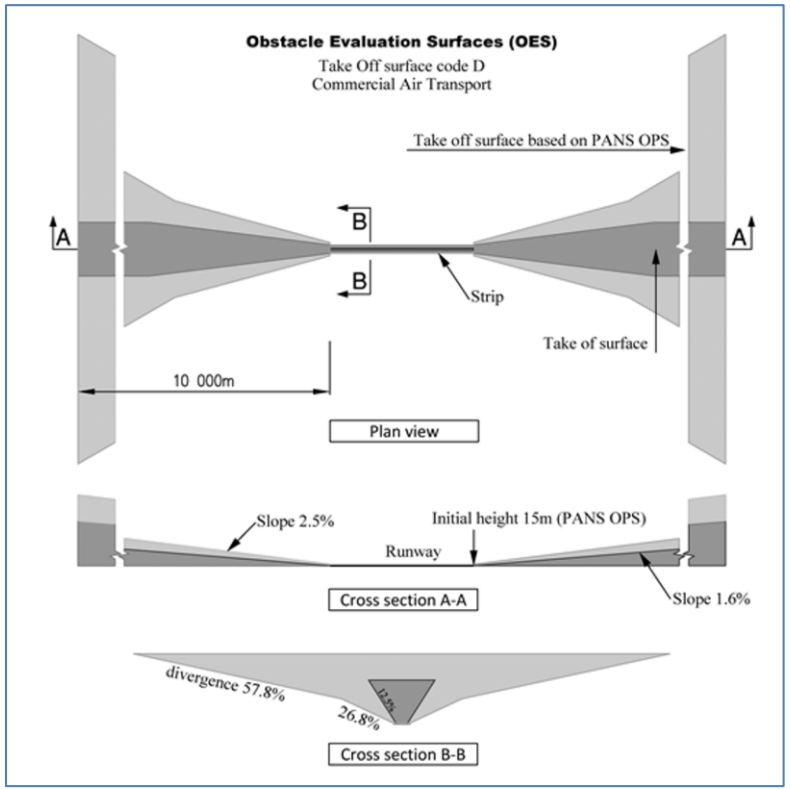

REGULAR UPDATE

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4.3.1 OFS

FREE

- The OFS intend to preserve the good accessibility of the aerodrome by containing **standard operations with a high level of probability**;
- The OFS shall include and replace the existing the OFZ; in general are **narrower, shorter and have steeper slopes than existing OFZs.**
- The **OFS shall not have penetrations**, except for special considerations for existing terrain and obstacles that do not impose an adverse impact on planned or existing operations or objects with low mass and frangible for air navigation purposes
- Situations will **likely** occur where proposed obstacles would penetrate the OFS.

4.3.2 OES

EVALUATION

- The OES complements the OFS; The OES supports aircraft operator development of **non-normal procedures;**
- The OES are intended to replace SLOs table 4-1 and 4-2, in general are **wider and longer than existing OLSs.**
- The **OES may be penetrated** when after an aeronautical study; There will be a series of tables a set of surfaces associated with the aircraft performance minima, approach type, and procedures
- It might be **frequent** that proposed obstacles would penetrated the OES

REGULAR UPDATE

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STATE KEY POINTS

Has the STATE Laws and procedures to protect OLS from new obstacles?

How does the STATE **update** the OLS?

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The procedure to Asess Obstacles

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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

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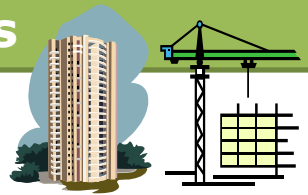
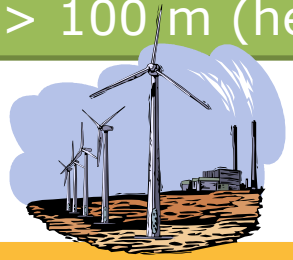
When somebody (**Citizen, Private Company or Public Organism**) wants to build something **within the areas affected by Aeronautical Easements**



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



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

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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.

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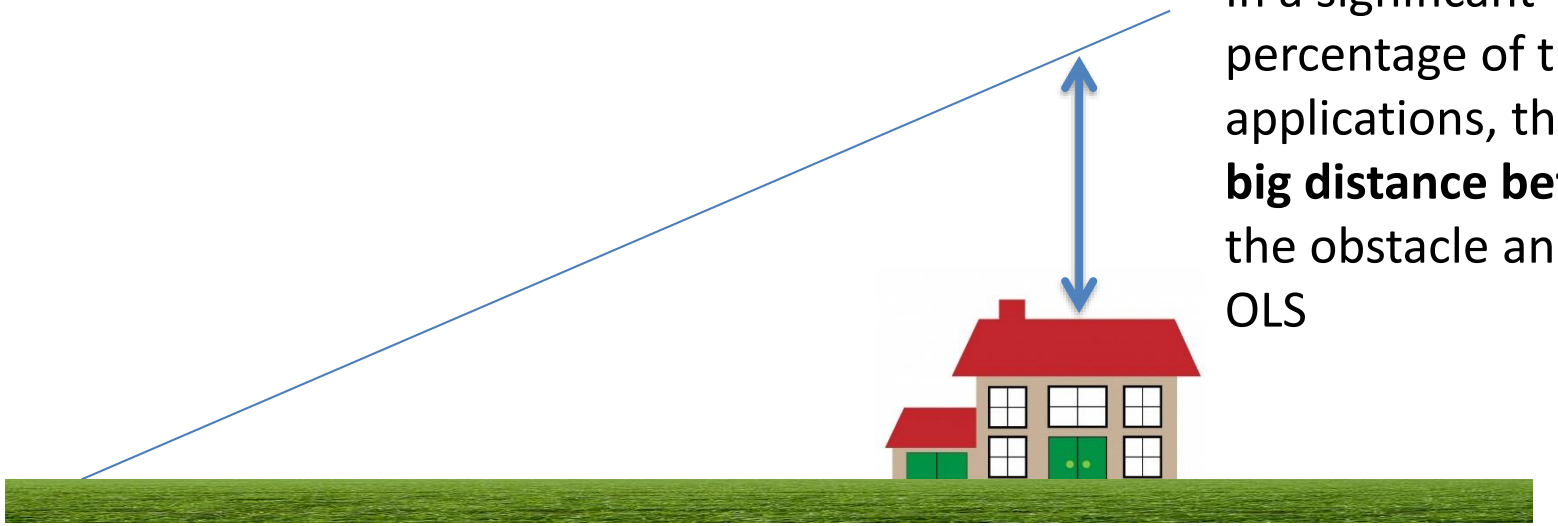

In a significant percentage of the applications, there is a **big distance between** the obstacle and the OLS

Lesson learned:

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

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

Height > 100 m

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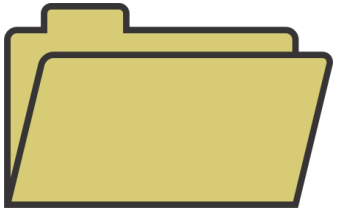
Around 30 people working for the Obstacle Limitation Unit



More than **6.000 applications** per year

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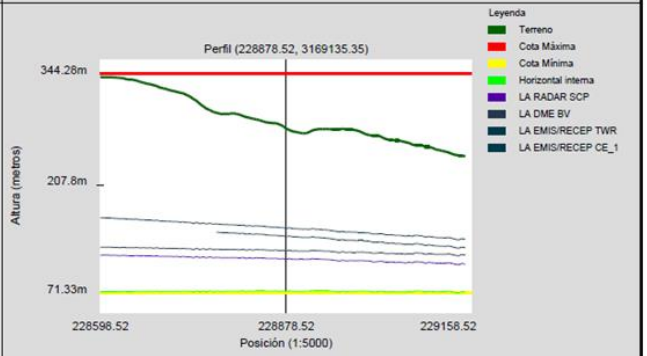
Informe de Servidumbres Aeronáuticas - Aeropuerto de La Palma

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
	

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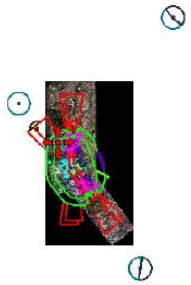
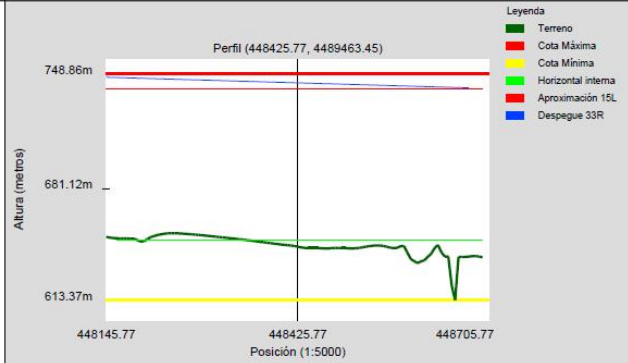
Informe de Servidumbres Aeronáuticas - Aeropuerto de Madrid-Barajas

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

Siguientes superficies limitadoras en orden ascendente	Tipo	Altura Libre
	- 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
	

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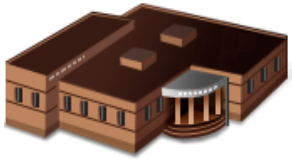
Applicant

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

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Technical assessments

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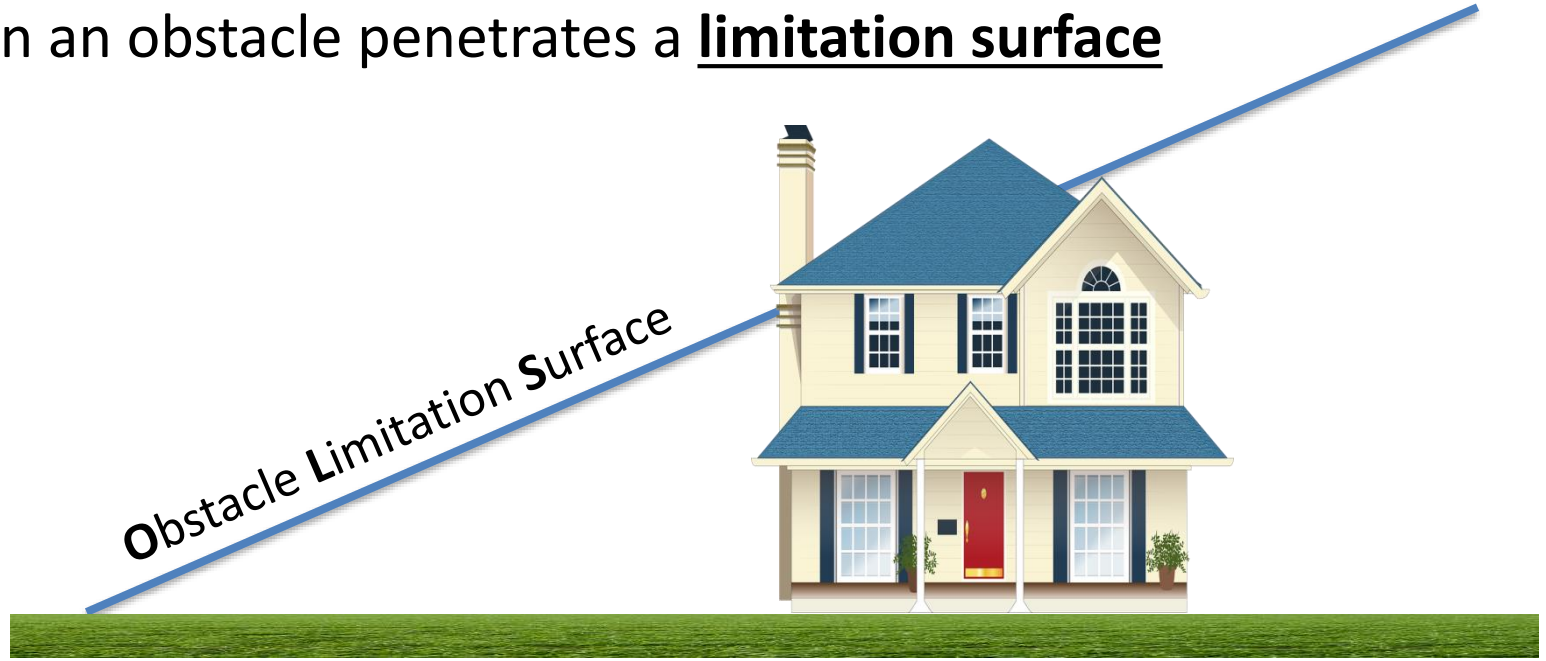
When an obstacle penetrates a **limitation surface**



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

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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

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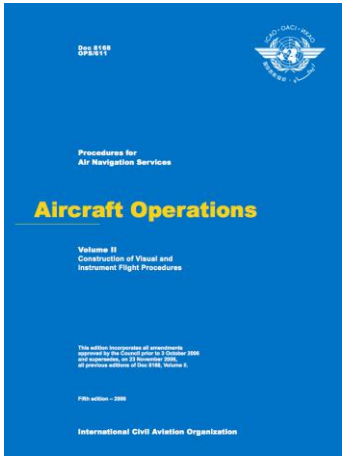
CASE 1

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)



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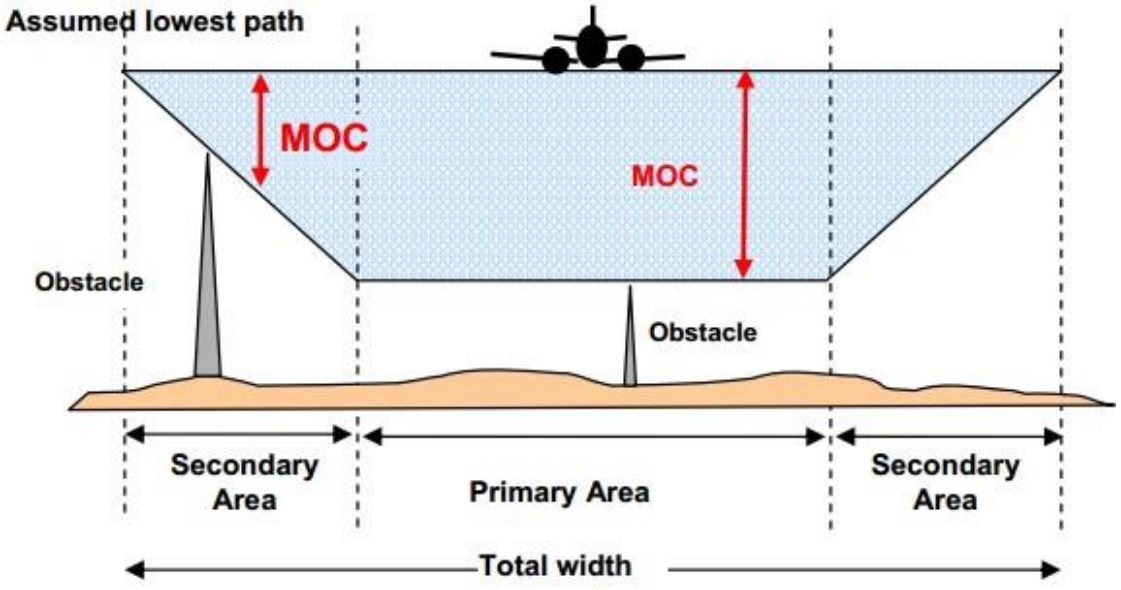
CASE 1



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

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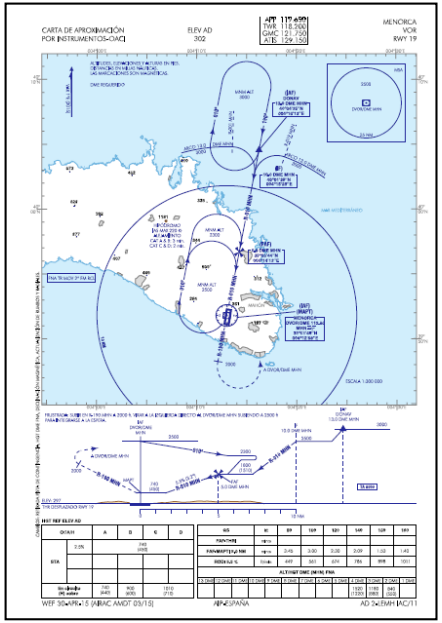
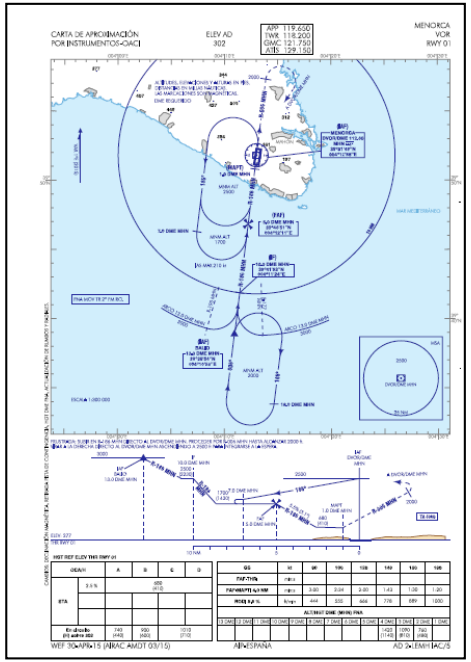
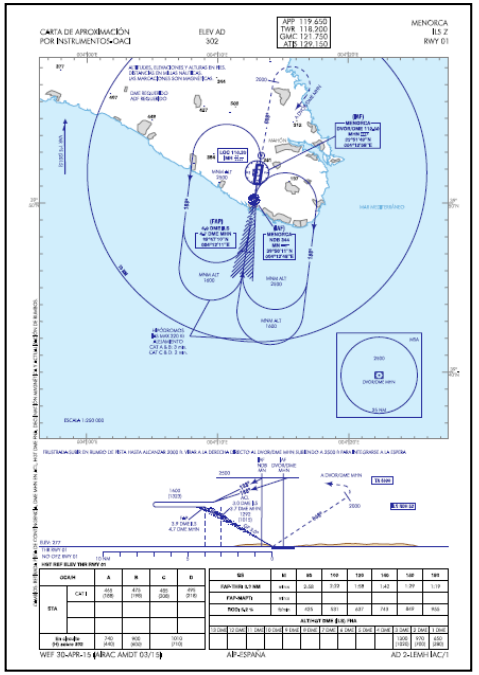
CASE 1







All the instrumental procedures must be analysed

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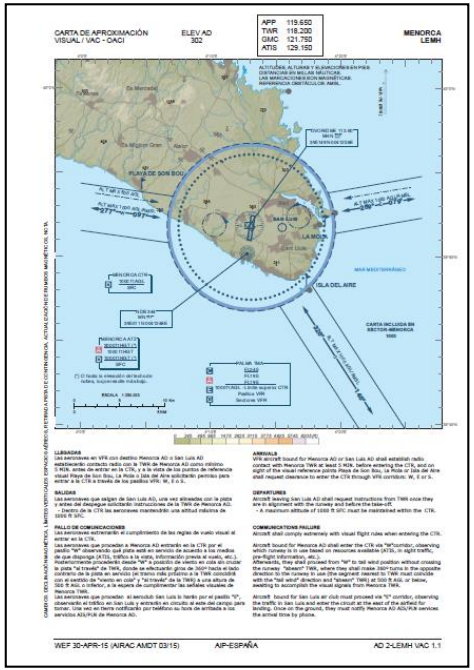
B. VFR operations

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.



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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

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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.

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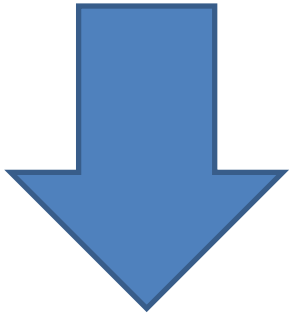
CASE 2

With:

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



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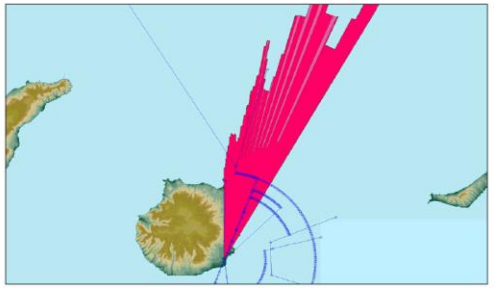
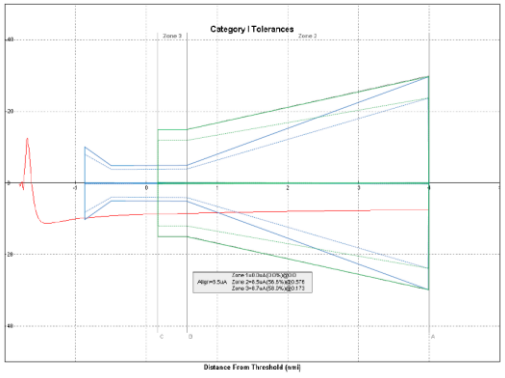
CASE 2



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



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STATE KEY POINTS

How are Aeronautical Obstacle Studies make?

Are there enough resources to make all the Sutudies?

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Airport operator compliance

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How can the aerodrome operator detect an obstacle which penetrates a **limitation surface without authorisation**

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AUDITING KEY POINTS

What inspections for monitoring of new obstacles is the aerodrome operator carrying?
(types, frequency, who, how, registers)

- Cheking the inside the airport
- Cheking the outside of the airport from inside
- Cheking the outside of the airport goin out


Kodak
CampuFull
7.0


Aeropuerto Internacional de Rangún
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EASA

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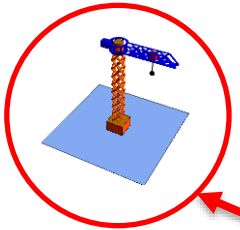
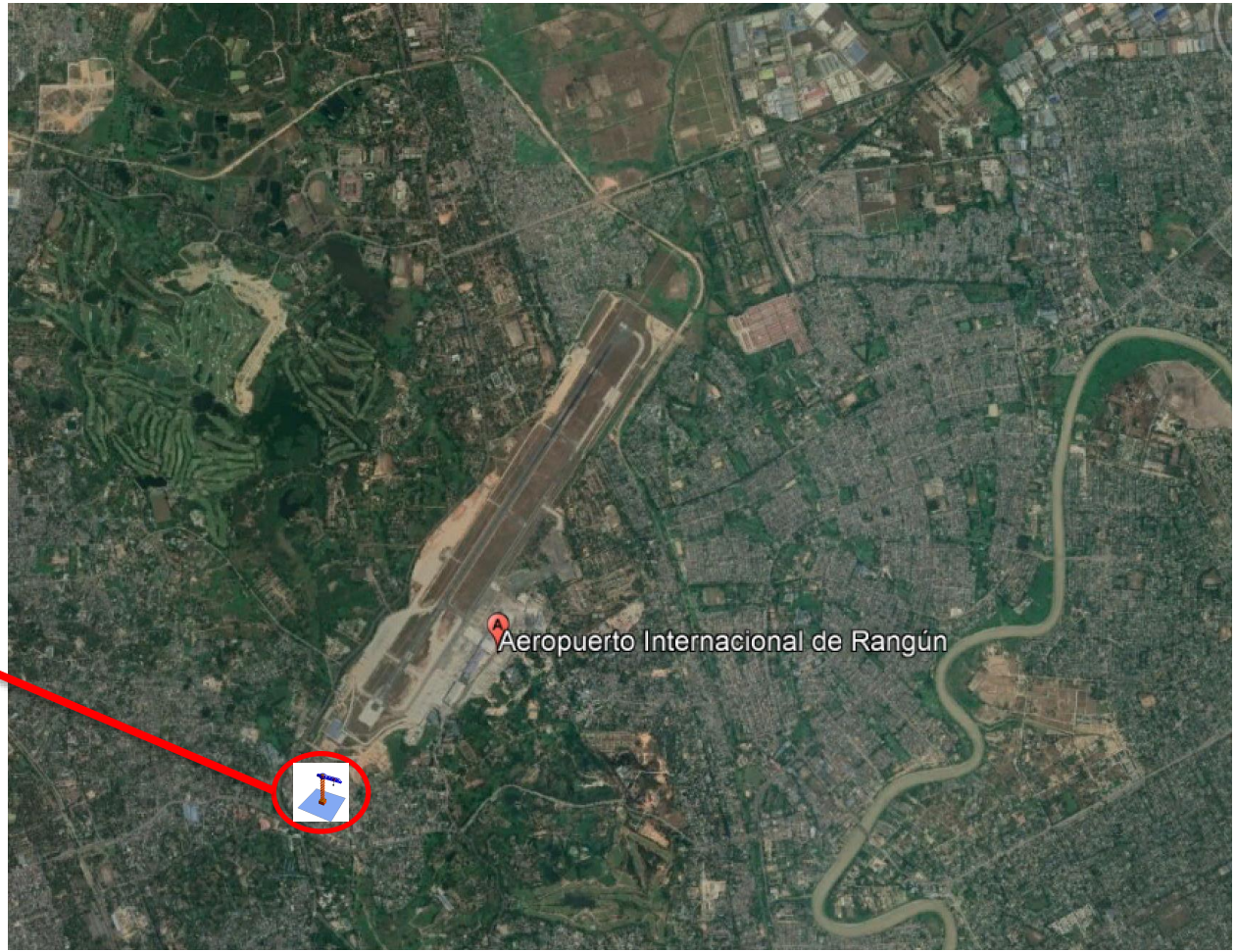
AUDITING KEY POINTS

Has the aerodrome operator identified all obstacles around the airport?

How will the aerodrome operator react if they find a new obstacle not approved?
(Who, How, What)

NEW OBSTACLE





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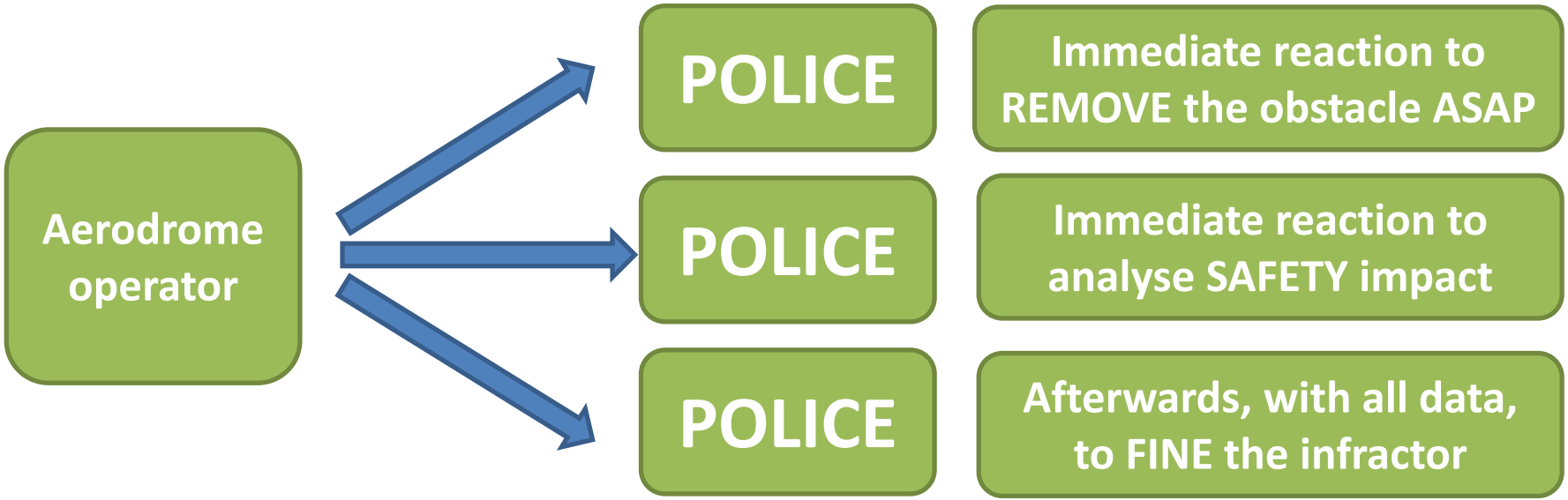
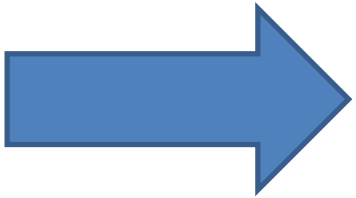
REACTION AFTER DETECTING A NEW OBSTACLE THAT HAS NOT BEEN APPROVED BY THE CAA



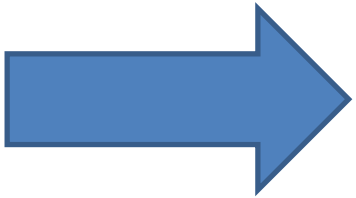
P3.2. human activities & obstacle control

If there is **no safety impact**, according to the Aerodrome Operator assessment



- The obstacle has to be legalised
- A monetary 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
- The owner is instructed to remove the obstacle
- The authority could remove the obstacle if necessary
- A monetary fine is imposed to the owner

P3.2. human activities & obstacle control

OLS

VS

AIRCRAFTS OR VEHICLES

– Los aterrizajes por la RWY 07L son compatibles con el rodaje de S14 a M16 o viceversa de aeronaves con empenaje vertical igual o inferior a 16.46 m.
– Los aterrizajes por la RWY 07L son compatibles con el rodaje de T14 a N16 o viceversa de aeronaves con empenaje vertical igual o inferior a 14.86 m.

P3.2. human activities & obstacle control

P3.2. human activities & obstacle control

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, smog…

P3.2. human activities & obstacle control

Regulation from Europe to Spain

P3.2. human activities & obstacle control

Aerodrome operators

P3.2. human activities & obstacle control

Spanish Regulation

CAA Guidance material:

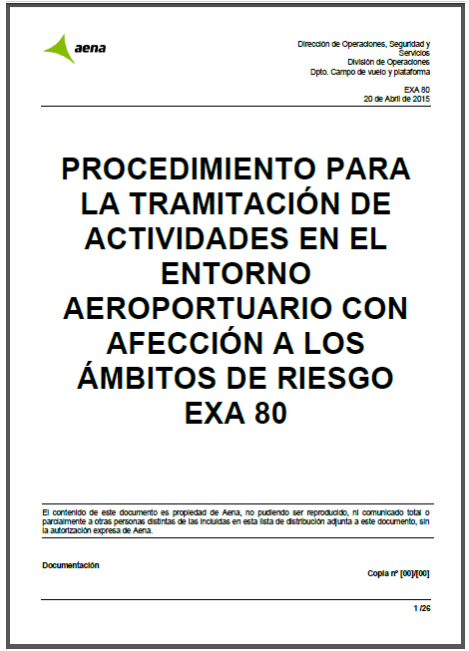
AESA's technical guide for aerodrome operators:

- ✓ 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

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*"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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

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Documentación

Copia nº [00][000]

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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

The Spanish procedure today. 2019’s review

P3.2. human activities & obstacle control

2019 first semester…

- ≈ 600 applications (from 30 different airports)
- Authorised by aerodrome operator (Aena): ≈90%
- Main activities:
  - Fireworks and lanterns: ≈ 70%
  - Balloon: ≈ 15%
  - Drones: ≈ 10% (included the necessary prior approval from AESA)
  - Other: ≈ 5%
- AESA's coordination required for activities. Among them…
  - Pigeons fancying
  - Kitesurf

P3.2. human activities & obstacle control

Practical implementation. Example 1

P3.2. human activities & obstacle control

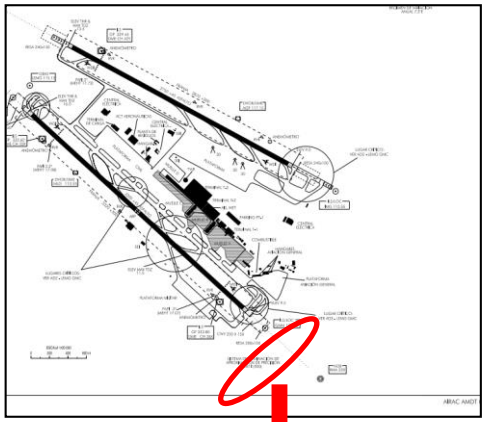
- **Case: Kitesurf. Málaga Airport (LEMG)**

  1 Kitesurf activities near RWY 13-31

- **The process**

  1. **LEMG SMS identified the problem**
  2. **LEMG Risk assessment and safety study**

Conclusion of the assessment → Potential risk activity
Mitigation measures: external coordination needed



  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)

…and AESA's role during the process?

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

EASA

P3.2. human activities & obstacle control

EASA
European Union Aviation Safety Agency

Human activities & obstacle control and monitoring

www.eu-sea-app.org
easa.europa.eu/connect

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