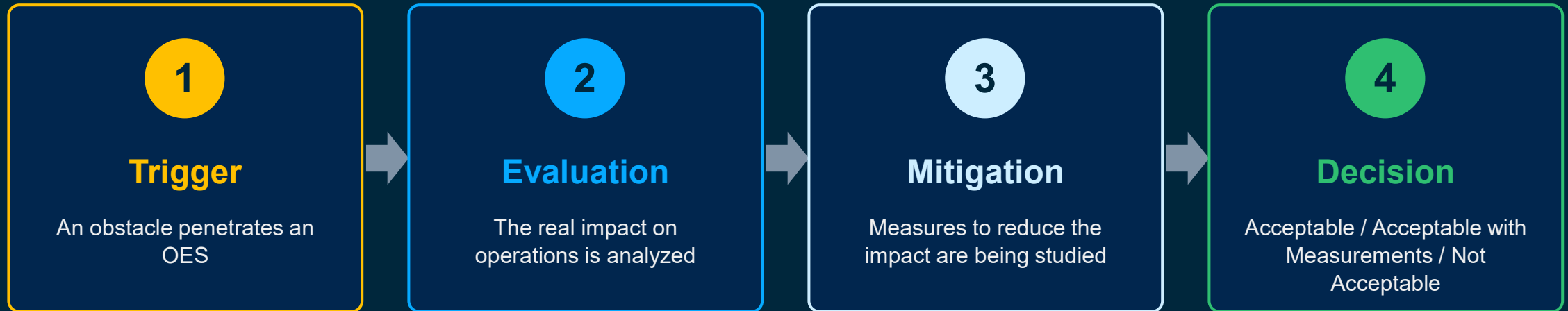


# S1.5

## Aeronautical Studies

**What is it?:** the process for assessing the impact of an obstacle that penetrates an OES and deciding whether it is acceptable — with or without mitigation measures.

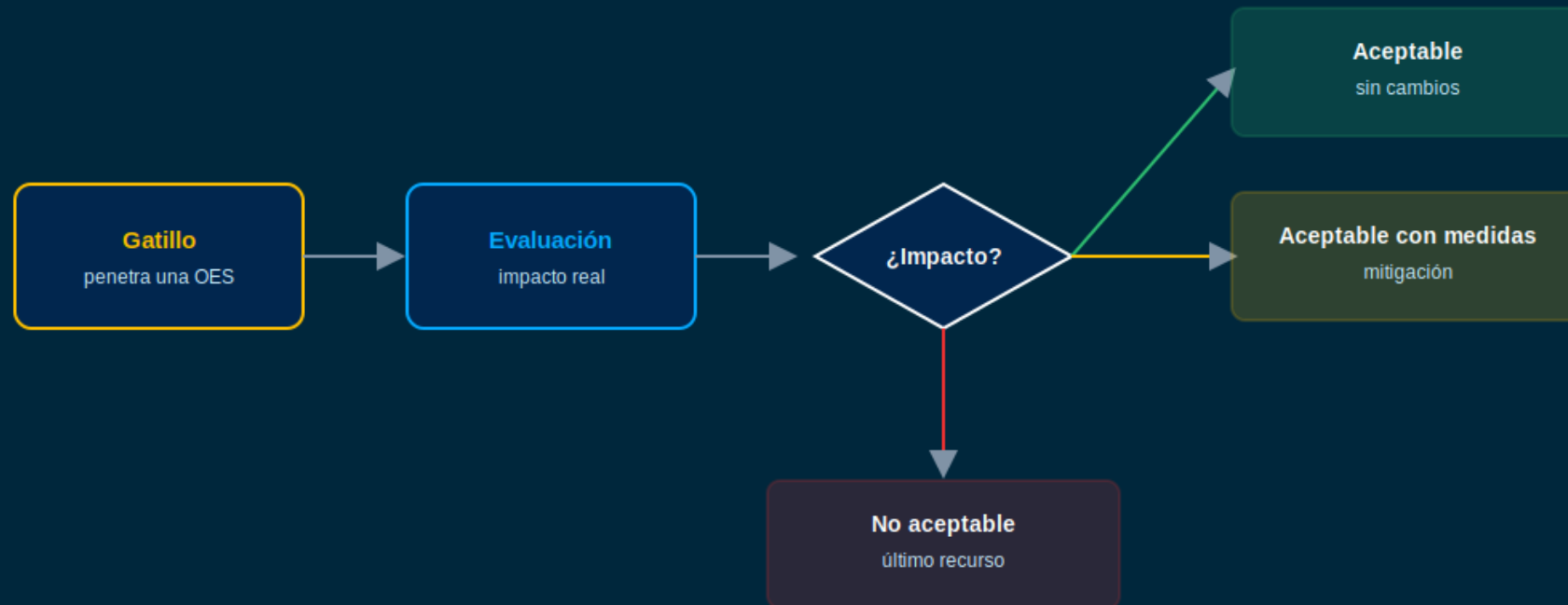
# The process, step by step



*The study is not a formality: it is a structured technical decision, based on documentation.*

# The complete flow, with its three outputs

El estudio aeronáutico, de principio a fin



Tres resultados posibles — la mayoría de los obstáculos resultan aceptables, con o sin medidas.

# How impact is evaluated

ASM Part 6 provides for two types of methodology. The choice depends on the data and which surface is penetrated:

## Qualitative assessment

Based on criteria and expert judgment.  
It may be sufficient for OES penetrations, where the impact is operational.

## Quantitative Evaluation

Data-based and calculation-based (e.g. collision risk).  
It may be necessary for more security-critical OFS penetrations.

*The two are often combined. The analysis includes IFR, VFR, contingency and aircraft performance procedures.*

*We are not going to solve calculations today: the detailed methodologies are in ASM Part 6 and are applied by the specialist.*

# Mitigation measures — by area

The measures depend on which surface is penetrated. Those that penalize the operation the least are preferred.

## Penetrate an OES

*Operational impact — adjusts how you fly:*

- Adjust flight procedures (MOCA, gradients, routes)
- Report the obstacle on ICAO charts
- Promulgate safety information to the user
- Specific operational constraints

## Penetrates an OFS

*More critical to safety — the initial consideration is to remove:*

- Remove the obstacle (initial consideration)
- Moving the threshold
- Raise the approach gradient (and associated GP/PAPI)

**From the airport's perspective:** Adjusting how you fly is less penalized than touching the infrastructure or removing. That is why removal is the last resort, not the first.

# Deepening: the range of mitigation

## Medidas de mitigación — según la superficie penetrada

ordenadas por cuánto penalizan la operación del aeropuerto (Doc 9137, ASM Parte 6, §4.7)

### Penetra una OES

impacto operacional — se ajusta cómo se vuela

#### Ajustar procedimientos

MOCA/gradientes,  
cambio de rutas

#### Informar en cartas

promulgar información  
de seguridad al usuario

#### Restricciones oper.

limitaciones puntuales  
a la operación

### Penetra una OFS

más crítico — la consideración inicial es remover

#### Desplazar el umbral

y/o elevar el gradiente  
de aproximación

#### Remover el obstáculo

consideración inicial en OFS

Menos penalización a la operación

Más penalización

Desde la óptica del aeropuerto: ajustar cómo se vuela penaliza menos que tocar la infraestructura o remover.

TO DISCUSS

**In your country, who would do an aeronautical study today?**

*Is there the framework, the capacity, the data — or is it a gap to be solved?*