HARMONIOUS

UAS Techniques for Environmental Monitoring

***Development of European and Spanish regulations for RPAS. Progress and future perspectives*.**

Israel Quintanilla (iquinta@cgf.upv.es), **Pedro Yuste (speaker) (pyuste@disca.upv.es)**

(Universitat Politecnica de Valencia, Spain)

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EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

Funded by the Horizon 2020 Framework Programme
of the European Union

Outline

1.- UPV.

2.- European Regulations. EASA.

3.- New Spanish Regulation. AESA.

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1.- UPV

COSIDANT:

- **Oficial commision to coordinate research groups working with UAS in UPV.**
- **Seven research groups coordinated by Israel Quintanilla:**
  - **Training and Safety, Heritage, Systems Engineering, Manufacturing, Geomatics, Shoreline**

TRAINING: Master in Unmanned Aircraft Systems (65 ECTS)

- **100+ teachers**
- **30+ institutions/companies**
- **Design-Construction**
- **Flight Operations-Applications**

MUASUPV
Master in Unmanned Aircraft Systems (MUAS)
Diseño, Construcción, Pilotaje y Aplicaciones de Sistemas de Aeronaves no Tripuladas (UPV)

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1.- UPV

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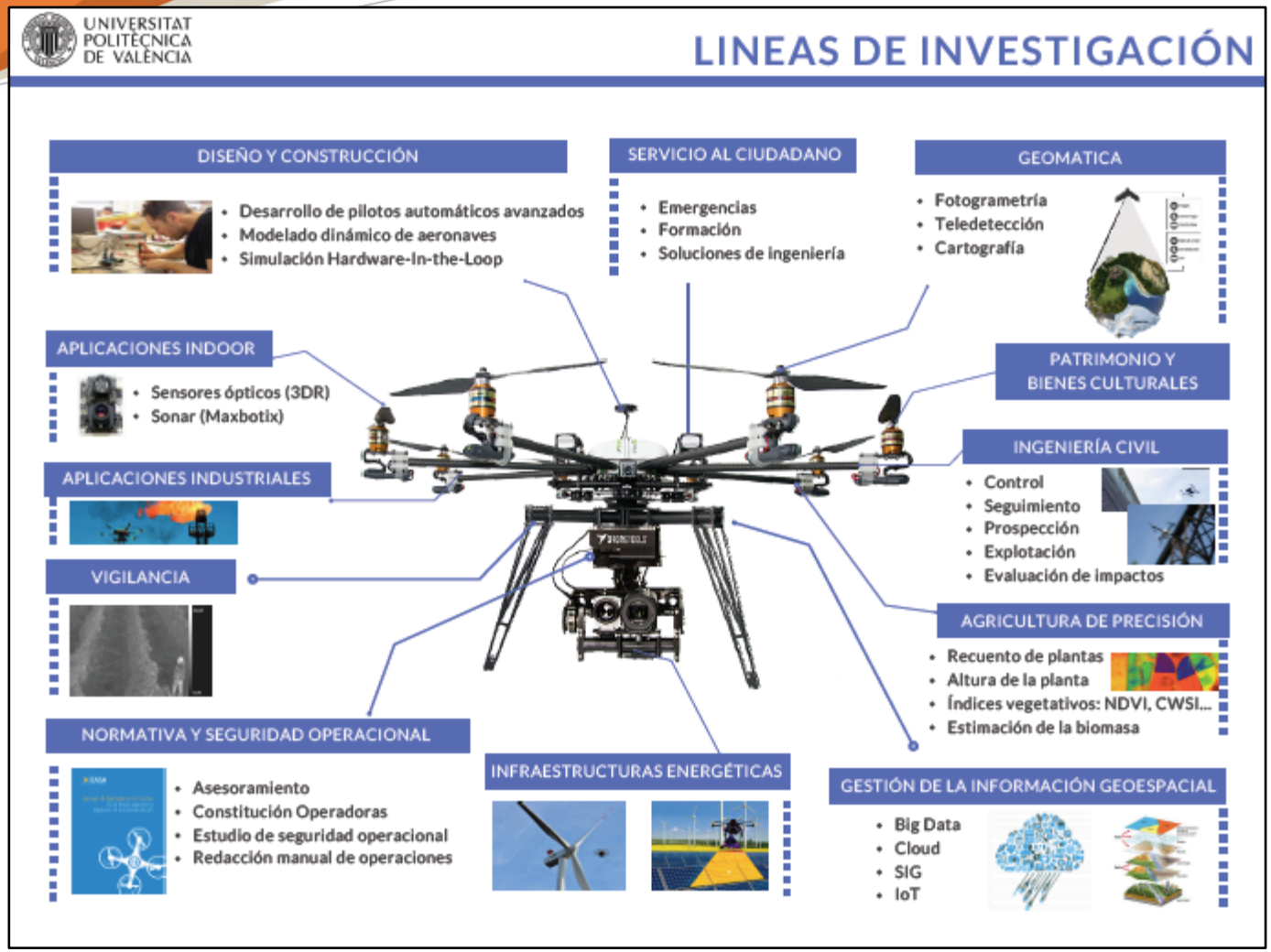
1.- UPV



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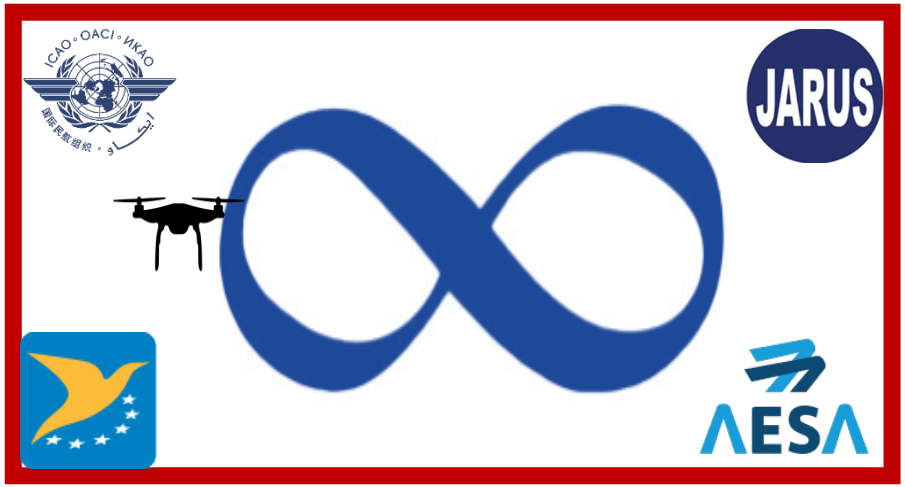
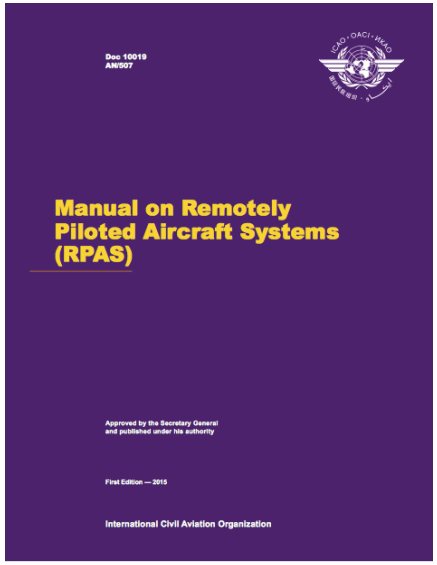
Regulations

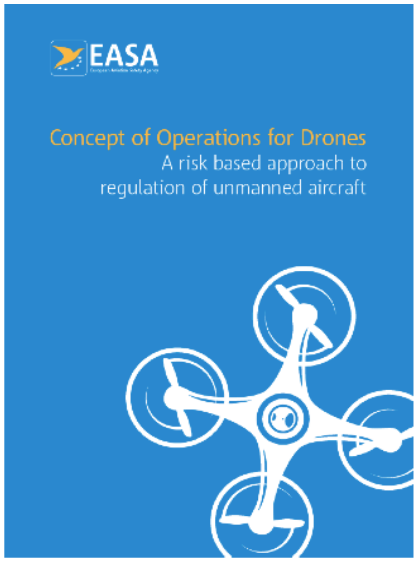


Cir 328 AN/190 (2011)

Amendment 43/OACI A2 (2012)



Manual RPAS (2015)



EASA (2016)

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2.- European Regulations. EASA

EASA activities Overview

- Draft Basic regulation (12/2015): EU competence to regulate all UA
- EASA technical opinion (12/2015): operation centric concept:
  - 3 categories (open, specific and certified)
  - Performance based, risk based and proportionate
- Prototype Regulation (08/2016):
  - Provides clarity on how the "open" and "specific" categories could be implemented
- 2 tasks forces set-up: reports published:
  - Geo limitation (e.g. Geo fencing)
  - Collision with manned aircraft followed up by the launch of a study to define a research programme (QinetiQ)
- Close cooperation with EC DG-MOVE and DG-GROW:
- Further cooperation with EDA (Air Traffic Integration) and SESAR joint undertaking
- International cooperation: ICAO, JARUS, FAA

Source: EASA-EUROCONTROL

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2.- European Regulations. EASA

Categories of Operation

OPEN:

- Low risk
- No involvement of Aviation Authority
- Limitations (Visual line of sight, Maximum Altitude, distance from airport and sensitive zones)
- Flights over crowds not permitted except for harmless subcategory

SPECIFIC

- Increased risk
- Approval based on Specific Operation Risk assessment (SORA)
- Approved by NAA possibly supported by accredited QE unless approved operator with privilege
- Manual of Operations mandatory to obtain approval

CERTIFIED

- Regulatory regime similar to manned aviation
- Certified operations to be defined by implementing rules
- Pending criteria definition, EASA accepts application in its present remit
- Some systems (Datalink, Detect and Avoid, ...) may receive an independent approval

06-03-2016 The way ahead on UA – Need for Standards 5

Source: EASA-EUROCAE (European Organisation for Civil Aviation Equipment)

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2.- European Regulations. EASA

Main Structure of the prototype Regulation

- 16 General Articles
  - Includes in the same regulation all aviation domains (i.e. airworthiness, operations, pilot competence etc..) and contribute to domains other than safety (i.e. privacy and security)
- Annex 1 Subpart A "Open Category"
  - Defines 4 UA subcategories from A0 to A3
- Annex 1 Subpart B "Specific Category"
- Annex 1 Subpart C: "Light UA Operator Certificate (LUC)"
- Appendices to Annex 1:
  - Product Requirements for the 4 UA subcategories, geo-fencing and identification
    - Product requirements are design requirements
    - They are met either complying to standards or by verification of a notified body
- Annex 2
  - EC Requirements for "making available on the market". Compliance to product requirements by CE marking

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2.- European Regulations. EASA

European Aviation Safety Agency

Notice of Proposed Amendment 2017-05 (A)

Introduction of a regulatory framework for the operation of drones

Unmanned aircraft system operations in the open and specific category

RMT.0230

European Aviation Safety Agency

Notice of Proposed Amendment 2017-05 (B)

Introduction of a regulatory framework for the operation of drones

Unmanned aircraft system operations in the open and specific category

RMT.0230

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2.- European Regulations. EASA

EASA "Prototype" Regulation for "open" and "specific" category

EASA

European Aviation Safety Agency

'Prototype' Commission Regulation on Unmanned Aircraft Operations

22 August 2016

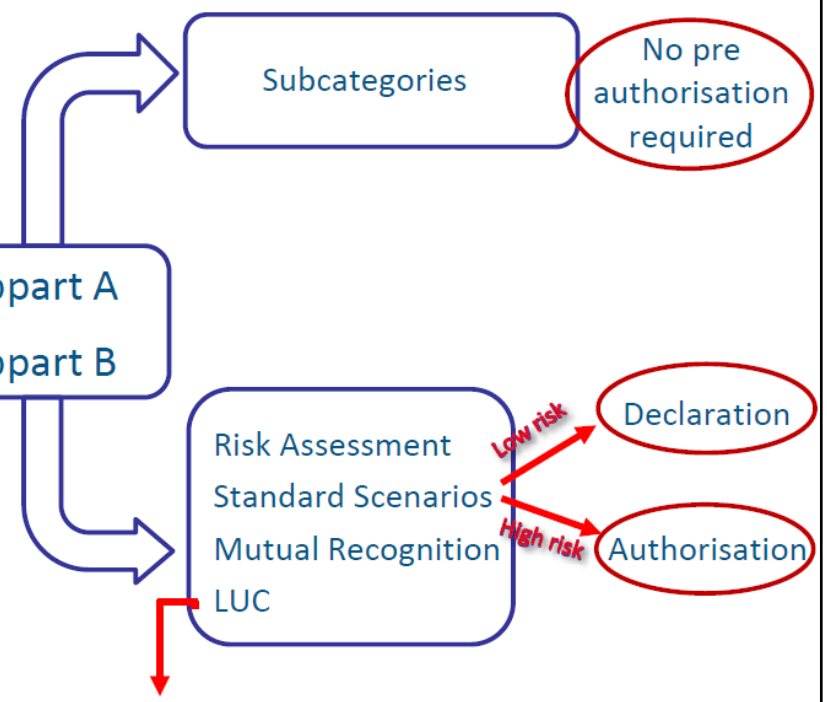
Legal notice: This document presents a 'prototype' regulation for to the operation of unmanned aircraft in the 'open' and 'specific' categories. Its sole purpose is to inform and consult stakeholders in view of the ongoing negotiations with the Parliament and the Council on the review of Regulation (EC) No 216/2008 and in view of giving indications on the possible direction that EASA will take on its implementation, after appropriate consultation, in a notice of proposed amendment (NPA) planned for the end of 2016. It represents the current views of EASA; however, it does not constitute any formal commitment on behalf of EASA nor of the European Commission.

Article 1 and 2: Scope and definition
Article 3: Categories of Operations
Article 4: Principles

Article 5: Open Category → Subpart A
Article 6: Specific Category → Subpart B

Article 7: Safety Critical Services
Article 8, 9: Competent Authority
Article 10: Exchange of Safety Information
Article 11: Means of Compliance
Article 12: Airspace Areas and Special Zones for UA Operations
Article 13: Immediate Reaction to a Safety problem
Article 14: Applicability
Article 15: Transitional Provisions
Article 16: Entry into Force

PROTOTYPE



Light Operator Certificate: Privileges to self authorise operations in specific category (Subpart C)

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2.- European Regulations. EASA

EASA "Prototype" Regulation for "open" and "specific" category: flexibility for MS

EASA

European Aviation Safety Agency

'Prototype' Commission Regulation on Unmanned Aircraft Operations

22 August 2016

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PROTOTYPE

- Article 1 and 2: Scope and definition
- Article 3: Categories of Operations
- Article 4: Principles
- Article 5: Open Category
- Article 6: Specific Category
- Article 7: Safety Critical Services
- Article 8, 9: Competent Authority
- Article 10: Exchange of Safety Information
- Article 11: Means of Compliance
- **Article 12: Airspace Areas and Special Zones for UA Operations**
- Article 13: Immediate Reaction to a Safety problem
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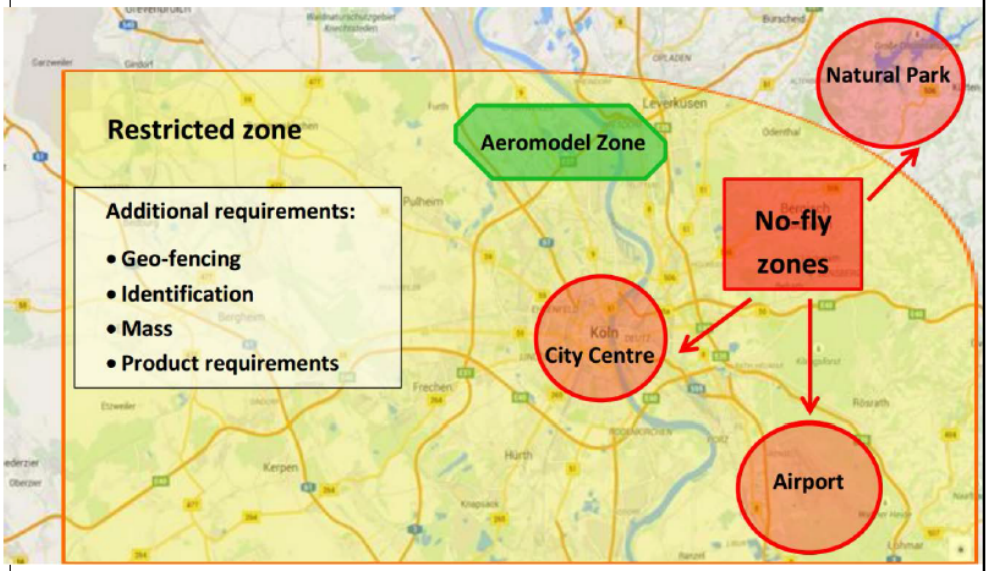
- Article 15: Transitional Provisions
- Article 16: Entry into Force



Defined by Member States

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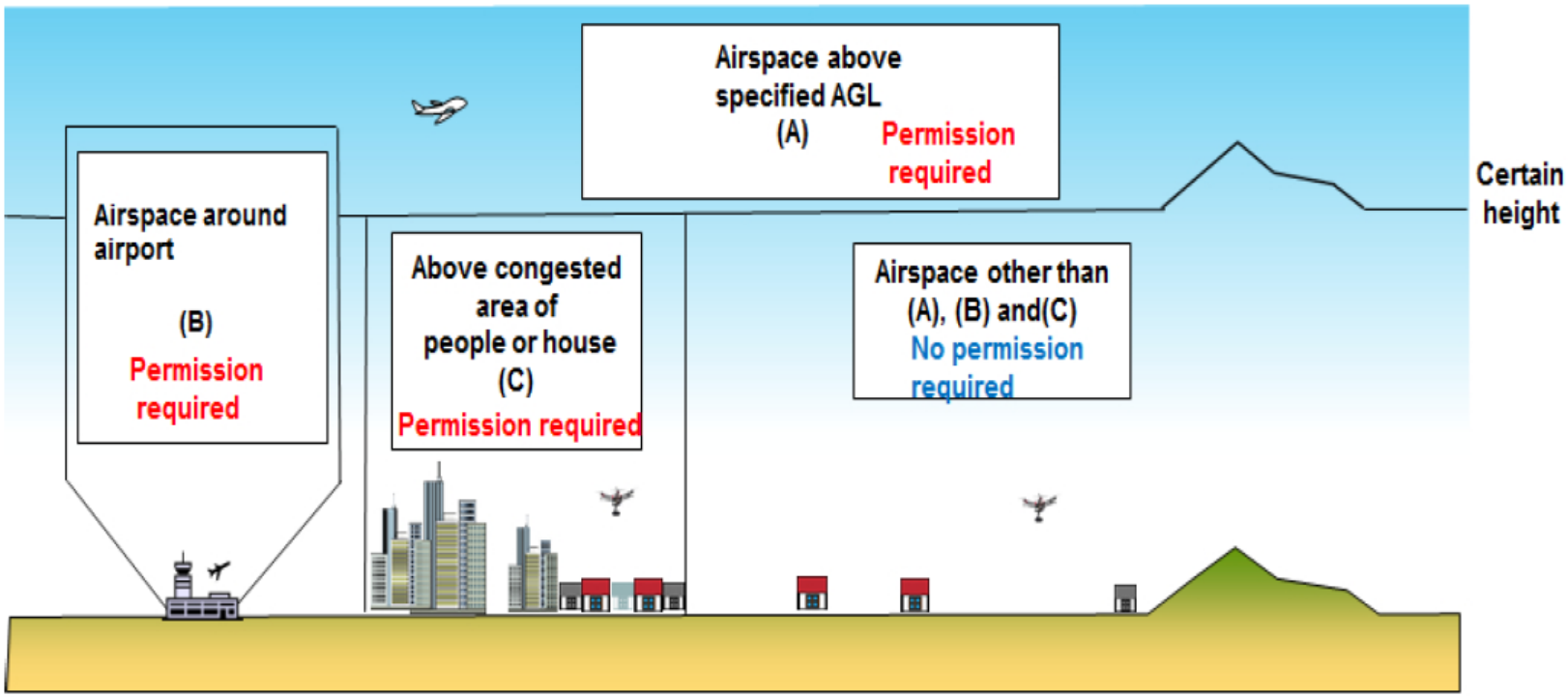
2.- European Regulations. EASA

Concepto UTM/U-Space



Conceptual Airspace

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2.- European Regulations. EASA

Air risk

- Air risk mitigation in open category
  - Pilot responsibility (no autonomous flight)
  - VLOS operations only
  - Maximum altitude 150ft if no competence proved by remote pilot
  - Maximum altitude up to 400 ft after demonstrating with an online test basic remote pilot competence
  - First assessment of the impact on **European Rules of the Air (SERA)** confirmed that no changes needed for operation in the open category (remote pilot responsible to maintain VLOS and separation)
- Operations exceeding open category limitations (including above 400 ft) will be in specific category
  - Requirements based on risk assessment

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3.- New Spanish Regulation. AESA

Nuevos escenarios operacionales

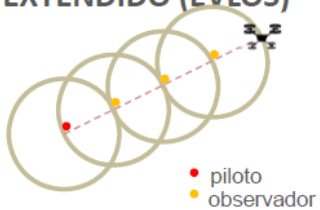
ZONAS CON AGLOMERACIONES

Aeronaves con MTOW ≤ 10 kg

ESPACIO AÉREO CONTROLADO

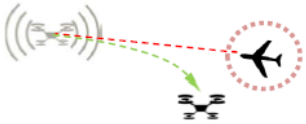
NOCTURNO

ALCANCE VISUAL EXTENDIDO (EVLOS)



FUERA ALCANCE VISUAL

Aeronaves con MTOW > 2 kg.
Con sistemas "Detect & Avoid"



GOBIERNO DE ESPAÑA | MINISTERIO DE FOMENTO

AESA AGENCIA ESTATAL DE SEGURIDAD AÉREA

MINISTERIO DE FOMENTO

REGISTRO DE DECLARACION RESPONSABLE DE OPERADOR DE AERONAVES RPA's

Número de Operadores Totales: 2810

AESA AGENCIA ESTATAL DE SEGURIDAD AÉREA

Desde:	Hasta:	Tipo Declaración: Actividades aéreas de trabajos técnicos o científicos			
BVLOS	VLOS	Operador	Fecha Acuse	Localidad	Provincia

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HARMONIOUS UAS for environmental monitoring

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

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