

UAS: French situation and perspectives

Muriel Preux– DGAC



MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE
ET SOLIDAIRE



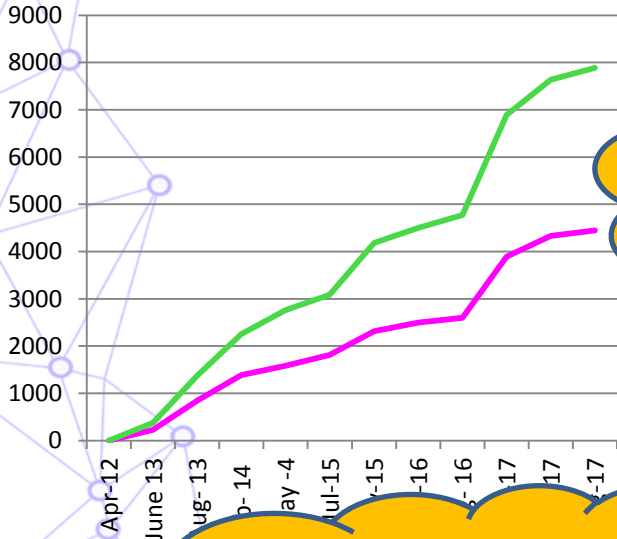
Direction générale de l'Aviation civile
Ministère de la Transition écologique et solidaire

RPAS versus sUAS

- RPAS:
 - Even if the pilot is not onboard, and if the impact on aviation is real, rather classical aviation issues: same industrial partners, same process (RPAS Panel writing SARPS...)
 - Not yet flying in our skies, and their number is expected to increase but not to « explode »
- sUAS:
 - Number of vehicles increasing very quickly
 - Multiple uses, and very different types of flight
 - Poor aviation culture
 - Raise many questions concerning airspace sharing
 - Safety and security issues closely related
 - Number of hobbyists buying their UAS in a store and being not trained or even not aware of the regulation is enormous

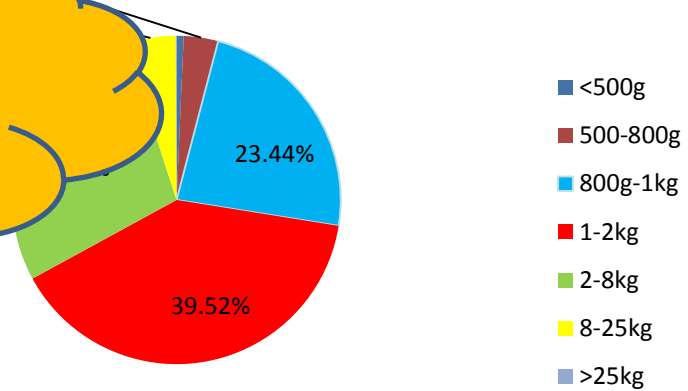


An innovative and growing sector in France



Newcomers coming from different non aeronautical jobs

Mass of UAS



A quick answer required every day

New manufacturers
 New UAS
 New operators
 Impact on CAAs
 human resources and organization

10 000 jobs (+71% operators in 1 year)
 >200 training centers



Hobbyists

MAIN LIMITATIONS FOR NON-PROFESSIONAL DRONES
www.ecologique-solidaire.gouv.fr/drones-loisir-et-com

- no flight over populated areas (urban areas and gathering of people)
- during day time only
- 150 m height max
- away from airports and restricted areas
- summarized in a do's and don'ts leaflet (French and English)
- Aeronautical information easy to use for recreational use:

<https://www.geoportail.gouv.fr/donnees/restrictions-pour-drones-de-loisir>

Data to be provided soon
professional in an adapted way

A large public unaware of the regulation has to be informed

Impact on CAAs communication

AISPs have to deliver adapted aeronautical information



MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE
ET SOLIDAIRE

Aerial work

VLOS

SCENARIO 1

Non-populated area
Mass < 25 kg
Height < 150 m
Dist < 200m



SCENARIO 3

Populated area
Mass < 8 kg
Dist < 100m
Height < 50m
Safety perimeter



BVLOS

SCENARIO 2

Non-populated area
D < 1 km
Mass < 25 kg and
Height < 50 m
Or Mass < 2kg and
height < 150m



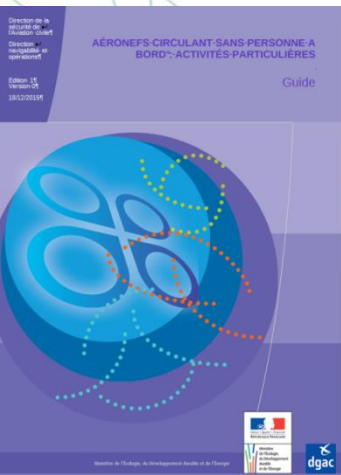
SCENARIO 4

Non-populated area
Mass < 2 kg
Height < 150m
Above third



- Technical requirements on UAV depending on scenario
- Prior notification required in **populated areas**
- Prior authorization required in **controlled areas**
- **Away from aerodromes**
- **Specific operations and experimentation subject to a risk analysis**
- **A handbook is available on line**

Adaptive regulation concerning UAS, competencies, operations and airspace organization



Introducing airworthiness and reliability objectives

For the first time, the Commission has introduced a pragmatic and performance-based approach rather than airworthiness to allow for

No low cost regulation

Pragmatic: Adapted to safety risks. Civil aviation regulation should not be transposed
Incremental approach : take into account technology improvement and return of experience

As drones number increase and as they are expected for critical operations (over people, in cities, for BVLOS flights...) their design must be improved to guarantee safety => UAS airworthiness has to be improved

European airspace is really complicated
Solutions validated elsewhere may not

Regional validation

Manufacturers



delair-tech

Administrations



DGE

Operators, training organizations



Professional associations



The Civil Drones Council: 200 members

Structure that
between
French a

New industrial
cooperation

Drone users



Clusters and financing institutions



Research organisms, universities, consulting firms, test centers



Malicious Acts : solutions without endangering the sector

The number of leisure drones increases rapidly

Extensive media coverage of UAVs overflights in 2014: illegal UAV flights over cities or sensitive sites in France

Reports of drones flying near major airports

Safety and security
closely related

A cross governmental approach, with 4 work

R and D about technical solutions

A regulation based on the principle that behavior is, at least in some countries, an

Enforcement of leisure UAS: a herculean technological solutions

Close cooperation
between civil aviation
authorities, DOD and
Home Ministry required

Security issues

The difficulty resides in **seizing/identifying** non-compliant UAS

Need of technological solutions to **detect, identify** and possibly **neutralize** UAS

Solutions must be assessed in terms of **costs and benefits** with the involvement of the industry

NEW OBLIGATIONS AND SANCTIONS

Information
(do's & don'ts)

Training
(profess.
and
hobbyists)

Registration
(online)

Electronic ID
Safety horn
Light

First step of
geofencing

Dedicated

International standards should be defined, but security requires a quick response

PREVENT

Applicable to professional and leisure UAS

Implementation in July 2018 in France – detailed decrees currently in progress

Electronic ID and geofencing

- **Drones can be threats for manned aviation and weapons in terrorists' hands**
- **eID and geofencing can be technological solutions to mitigate both safety and security risks**
- **Their specifications cannot rely solely on the industry: state agencies have to be involved**



Hologarde: long range detection

Airports issues

How to protect a large volume ?

Neutralization near airports :
GPS Spoofing and jamming
is not a solution

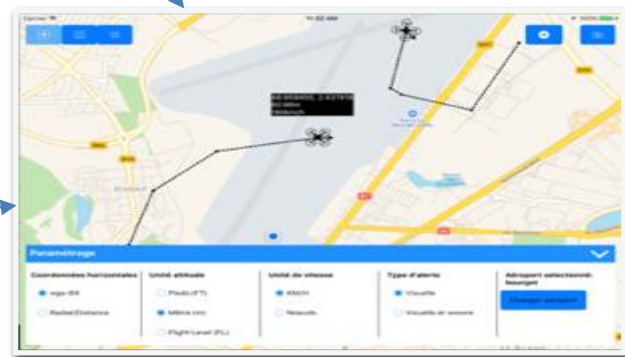
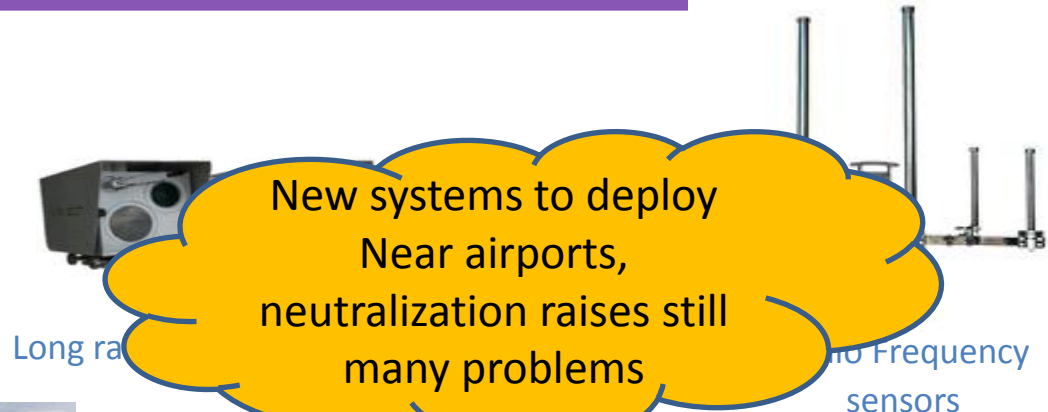
Whether imprudent or
malicious, a UAV remains
dangerous

=> **Decision to test a
solution at Charles
de Gaulle airport**

First step in
Le Bourget during Paris Air
show



Holographic radar
Détection : 5km, alt: 900m



Command
control center on
PC or tablet

Adaptable for
state services

Improving UAV integration

Space/AI

Improving airspace organization/regulation

Delivering information

Traffic information

Ground systems

Easier flight notification/authorization for

law enforcement forces

Demand capacity balancing

UAVs

Improving airworthiness
Mandatory to fly over

Rules of the Air

Remote pilots / owners

Better trained

Registration and declaration

Even hobbyists

We need standards and concepts for UTM
We need a collaboration with industry
UTM will have to meet security requirements
ANSPs, CAAs, and Home Ministry and DOD have to be closely involved



LIBERTÉ • ÉGALITÉ • FRATERNITÉ
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE



MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE
ET SOLIDAIRE