



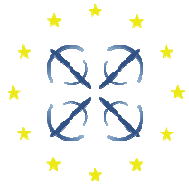
**Drone Manufacturers
Alliance Europe**

Unmanned Aircraft Stakeholders Workshop

**Short-term Outlook on Technically Feasible
Safety Measures**

Drone Manufacturers Alliance Europe

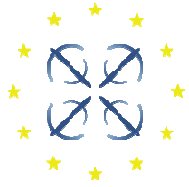
Köln, 20 June 2016



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Who we are

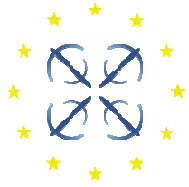
- DMAE: DJI, GoPro and Parrot
- Together almost 80% of civil drones in the world
- Established partner of JARUS, ASSURE, national aviation authorities, and EASA



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Regulatory architecture

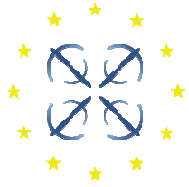
- **DMAE strongly supports 3-level approach:**
 1. General principles, objectives and essential requirements set out in EASA Basic Regulation
 2. EASA to define and implement appropriate, evidence-based measures, together with MS experts
 3. EU-wide industry standards to allow roll-out while fostering innovation



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Key principles

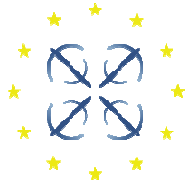
- **EU drone rules and requirements should be...**
 - risk-based, operation-centred, evidence-driven
 - tailored to successfully manage today's operations
 - ...but innovation-friendly and technology neutral
- **Harmonised where necessary:**
 - Technical requirements for drones
 - Operating rules
- **Localised where possible:**
 - Drone airspace designation
 - Temporary Restrictions (TRs)



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Safety features

- **Market asks for safe, user-friendly drones**
 - Flight stabilisation systems
 - Return-to-home functions
 - Automated landing
 - Advisory geo-fencing systems
- **A lot is possible with available technology, but...**
 - Not everything will be necessary
 - Not everything will need regulation



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Key requirements under discussion

- I. Operator registration and drone marking**
- II. Operator education**
- III. Performance limitation to comply with applicable operating rules**
- IV. Performance limitation to comply with no-fly and/or restrictive zones**
- V. Locating operator and/or drone in real time**

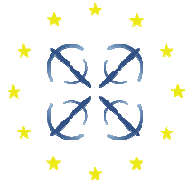


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I. Registration and marking

DMAE supports mandatory operator registration:

- online registration for operators in EU-wide database
 - post-sale registration (distinction buyer/operator)
 - immediate issuing of unique operator number
 - operator number used for physical drone marking
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- **Available immediately once EU & MS set up database and define access to information**
 - **Positive experience in the US / Ireland**

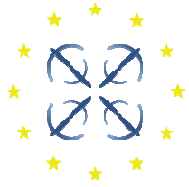


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II. Operator education

Mandatory tutorial as part of registration

- official online tutorial about applicable rules to be included into online registration process
 - operator to click “accept” button before unique operator number is released
 - Sufficient for Open Category operations
- **Build on ongoing EU educational work and launch together with online registration system**
- **Ongoing education efforts by manufacturers to continue (packaging, manuals, tutorials,...)**

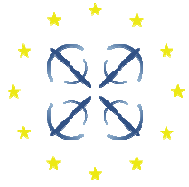


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III. Performance limitation to comply with operating rules

Soft-lock maximum height & distance from operator

- Soft-lock maximum height at 150m from take-off point with possibility to further reduce the limit
 - Soft-lock maximum distance from operator and allow to further reduce the distance
 - Soft-lock can be opened to enable 'specific' or 'certified' operations (e.g. by entering operator number)
- **The technology is available and “on the market”.**

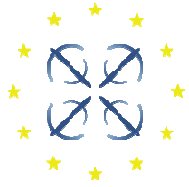


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IV. Compliance with drone airspace restrictions

1. External geo-information system for “harmless” category:

- Informs operator about restricted or no-fly zones
 - Provides geo-information via websites or smartphone apps of providers
 - Based on official, EU-wide drone airspace information, provided by authorities
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- **Commercial versions available and on the market, but...**
 - **Ideally system based on official EU-wide drone airspace data, provided by authorities**

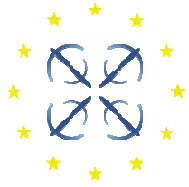


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IV. Compliance with drone airspace restrictions

2. Dynamic soft-locked geo-limitation > 2kg:

- Blocks entry or take-off into no-fly zones
 - Limits maximum height in restricted areas
 - Soft-lock can be opened to allow ‘specific’ or ‘certified’ operations (e.g. by entering operator number)
 - Any “default-on” system should include dynamic TR info
- **Advisory geo-fencing available on the market, but...**
- **Any mandatory system requires EU & MS to provide at least (1) official drone airspace data and (2) ideally real-time TRs**

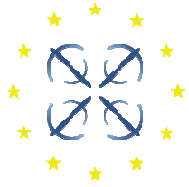


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V. Outlook: identifying and locating operators and their drones

In principle, it is possible with available technology:

- to set up real-time EU database for drone tracking
 - feed in unique operator number, together with
 - geo-localisation data of drone and/or of GCS
 - other info like soft-lock status?
 - law enforcement and relevant authorities access data in real-time
- **If authorities build EU-wide database, industry will find ways to feed in information**
- **On-board hardware requirements ONLY for heavy duty drones!! (if necessary at all)**

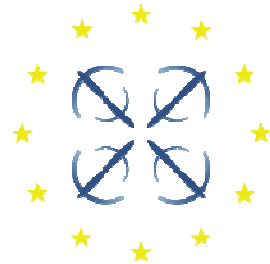


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Summary

- **Plethora of technologies available today**
- **Mandatory features require EU/MS action:**
 - Mandatory registration & education system
 - Official drone airspace data & TRs web-interface
 - Drone tracking database
- **Harmonisation and interoperability are key:**
 - Define information needs of various State authorities
 - Define data standards and set up infrastructure
 - Industry to find technical solutions / define standards

Thank you for your attention



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