

UNIVERSITY OF TWENTE.



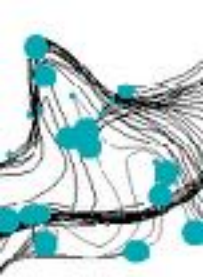
**THE MISSING LINK...**

**REGULATION & EXPERIMENTING WITH DRONES**

**MICHIEL A. HELDEWEG**

**11 OCTOBER 2017**





# OUTLINE

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1. Why regulate drones?
2. How regulate drones?
3. Current regulation & trends – NL & EU
4. Regulating drone experimentation
5. Final remarks

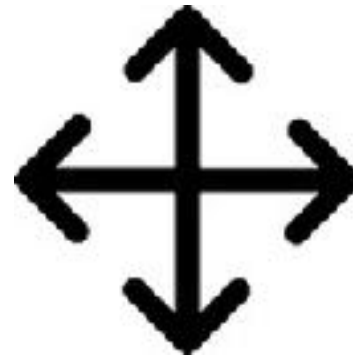


# WHY REGULATE DRONES?

**No rules: no constraints & no support!**

**Regulatee (developer/user)**

**Legal protection**



**Legal facilitation**

**3<sup>rd</sup> Party**



# HOW TO REGULATE DRONES?

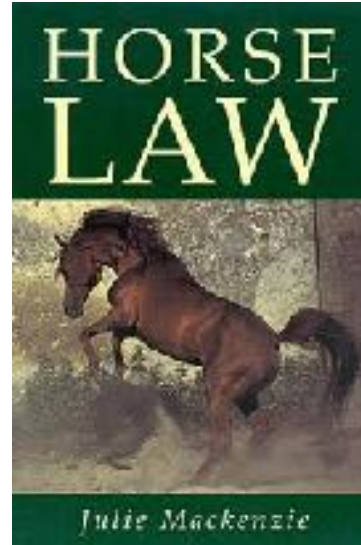
## Quadrants of Regulation



**Operator**  
**National**

**Subject (Techno)**  
**Supra/International**

# HOW TO REGULATE DRONES?



**Specific Privat** ↔

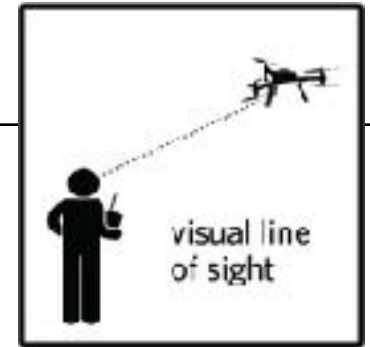
**Specific Public**

**Aviation** ↔

**Robotics**

# CURRENT REGULATION & TRENDS

ESP. THE NETHERLANDS & THE EU



## ■ Aviation – key elements

### General: all aircraft:

- Competent pilot
- Airworthy aircraft
- Capable air service
- Proper air traffic management
- Suitable airport

### Specific RPA: (?)

- Pilot on board? (B/E)VLOS)
- Certificate/registration?
- AoC?
- Captain? NOTAM?
- Anywhere?

**Aircraft**



**Drone**

# CURRENT REGULATION & TRENDS

ESP. THE NETHERLANDS & THE EU

## Two interesting developments

### EU: Prop. Amendment 2017-05A



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  
2017-05-01

### Art.12. Special zones

- risk mitigation
- exemptions to requirements

### NL: Experimental Test locations

> Home internetconsultatie

### Besluit testlocatie drones

### Test and Experimental zones

- no pilot license
- non-certified RPA

# REGULATING DRONE EXPERIMENTATION

- **Experimentation – Legally**

- By derogation – exceptional permission
- By devolution – decentralised regulation (OMC)
- By open texture – interpretive practice

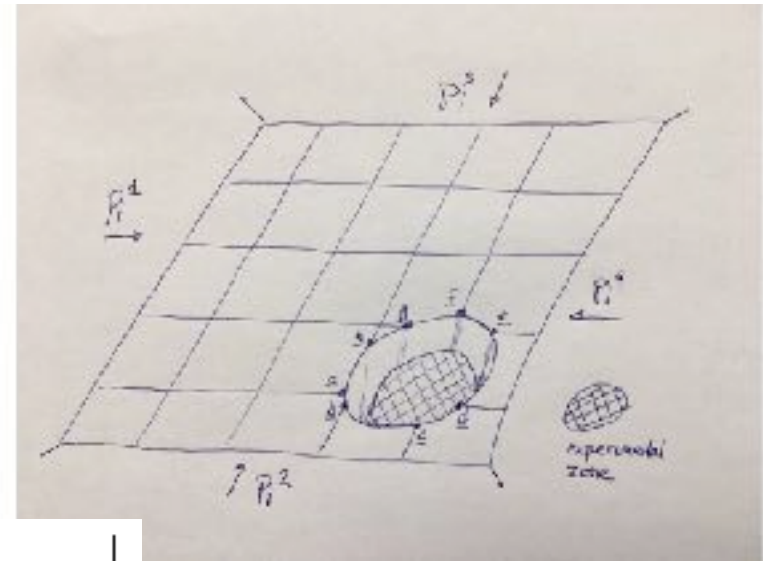


of technology  
of governance  
of regulation....



# REGULATING DRONE EXPERIMENTATION

- Experimenting by derogation
  - Zoning
  - Sequential experimental upscaling



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# FINAL REMARKS

- Proposed NL zones ⇔ EU/EASA exceptional zone
- Opportunities for .....
  - derogation!
  - co-regulation?
  - participation?
  - sequencing?
  - experimenting by devolution ('OMC')?

<b>EFFECT →</b>	<b>KNOWN</b>	<b>UNKNOWN</b>
<b>CHANCE ↓</b>		
<b>KNOWN</b>	<b>CERTAINTY/RISK</b>	<b>AMBIGUITY</b>
<b>UNKNOWN</b>	<b>UNCERTAINTY</b>	<b>IGNORANCE</b>

Diagram illustrating the relationship between Effect/Chance and Knowledge/Unknown states. The table shows four quadrants: Certainty/Risk (Known Effect, Known Chance), Ambiguity (Unknown Effect, Known Chance), Uncertainty (Known Effect, Unknown Chance), and Ignorance (Unknown Effect, Unknown Chance). Blue arrows indicate transitions: from Ambiguity to Certainty/Risk, from Ignorance to Ambiguity, from Ignorance to Uncertainty, and from Uncertainty to Certainty/Risk.