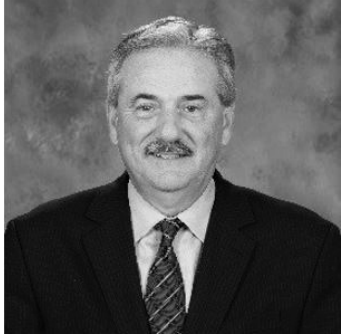


# The 12<sup>th</sup> Geneva Association Annual Liability Regimes Conference

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Session 3: Emerging Liability and Regulatory Issues  
for Unmanned Aerial Vehicles

Munich, 17-18 November 2016



**Kevin Frederick**  
**(Session Chair)**  
*Vice President -  
Counsel State  
Farm Mutual  
Automobile*



**André Clot**  
*Director  
EuroUSC*



**Laura A. Foggan**  
*Partner Wiley  
Rein LLP*



**Mark Sacco**  
*Exposure  
Manager & Vice  
President  
Aviation Lines XL  
Catlin*



**Patrick Slomski**  
*Partner Clyde &  
Co LLP*



# New Frontiers of Liability Risks

Geneva Association, Munich

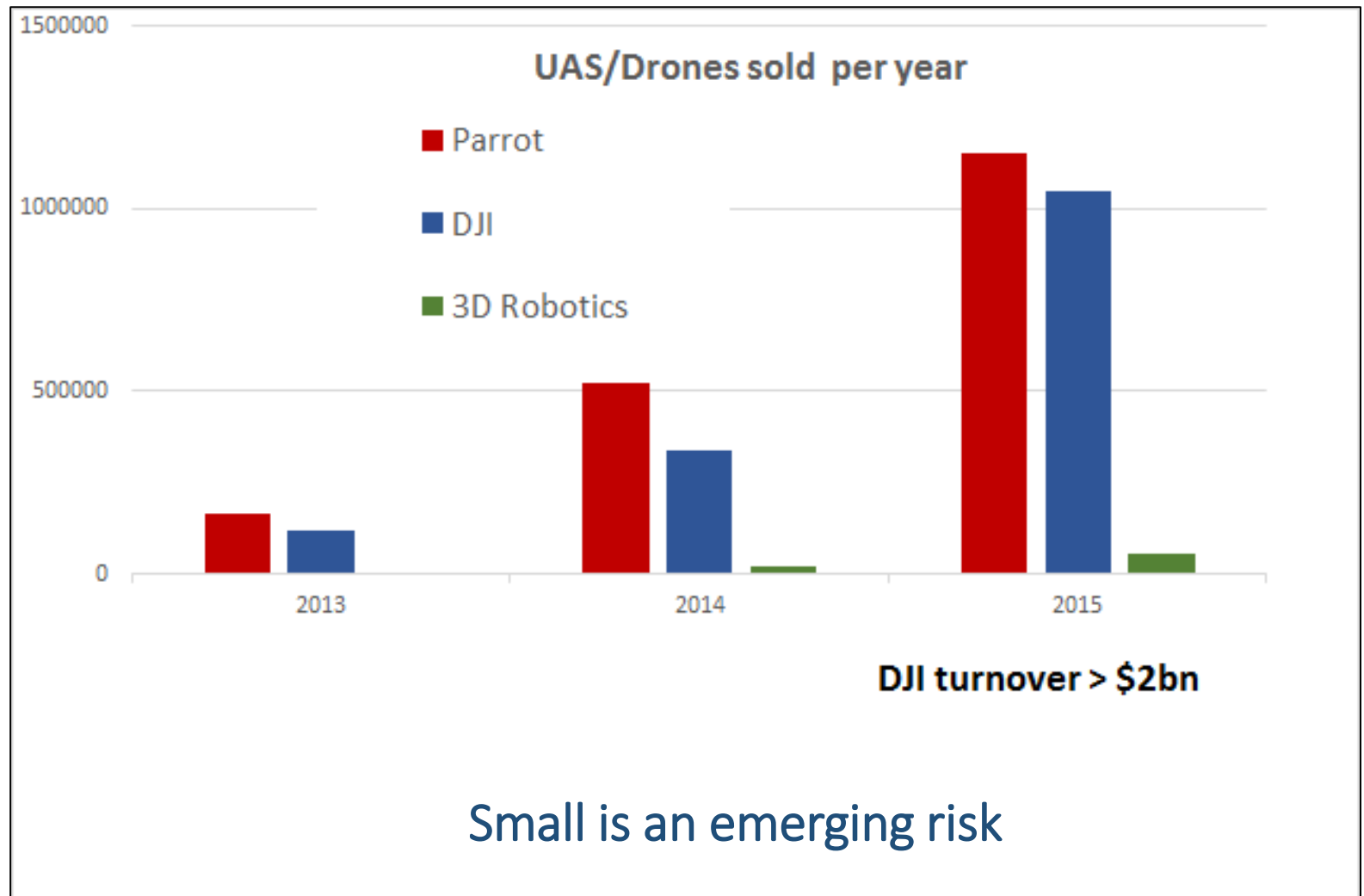
17<sup>th</sup> /18<sup>th</sup> November 2016

## Operational Risk

Emerging Liability Issues for Unmanned Aircraft Systems

# Introduction

- Operational Context
- Operational Risk
- Mitigation
- Emerging Risks



# Context : Who are the operators?

- Historically the Military
  
- Recreational Users : Flying for Private Use
  - Hobbyists : Individuals, Clubs and Societies
  - The wider Public – “Selfie Drones”
  
- Professional users : Flying for business
  - VLOS – Visual Line of Sight (Small UAS)
  - BVLOS – Beyond Line of Sight (Larger UAS)



[www.drone-rules.eu](http://www.drone-rules.eu)



Offshore Power Generation

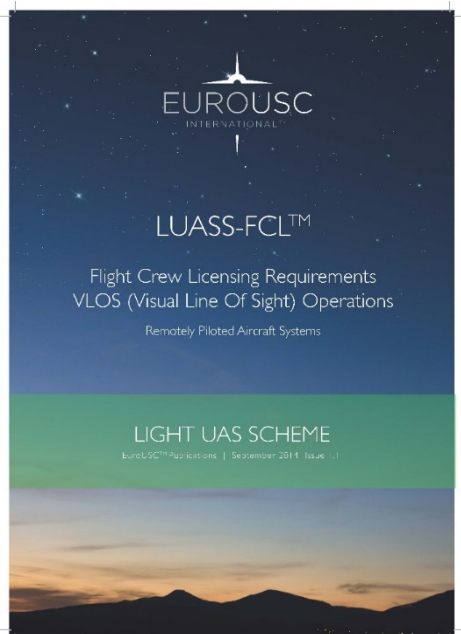


Turbine Inspection

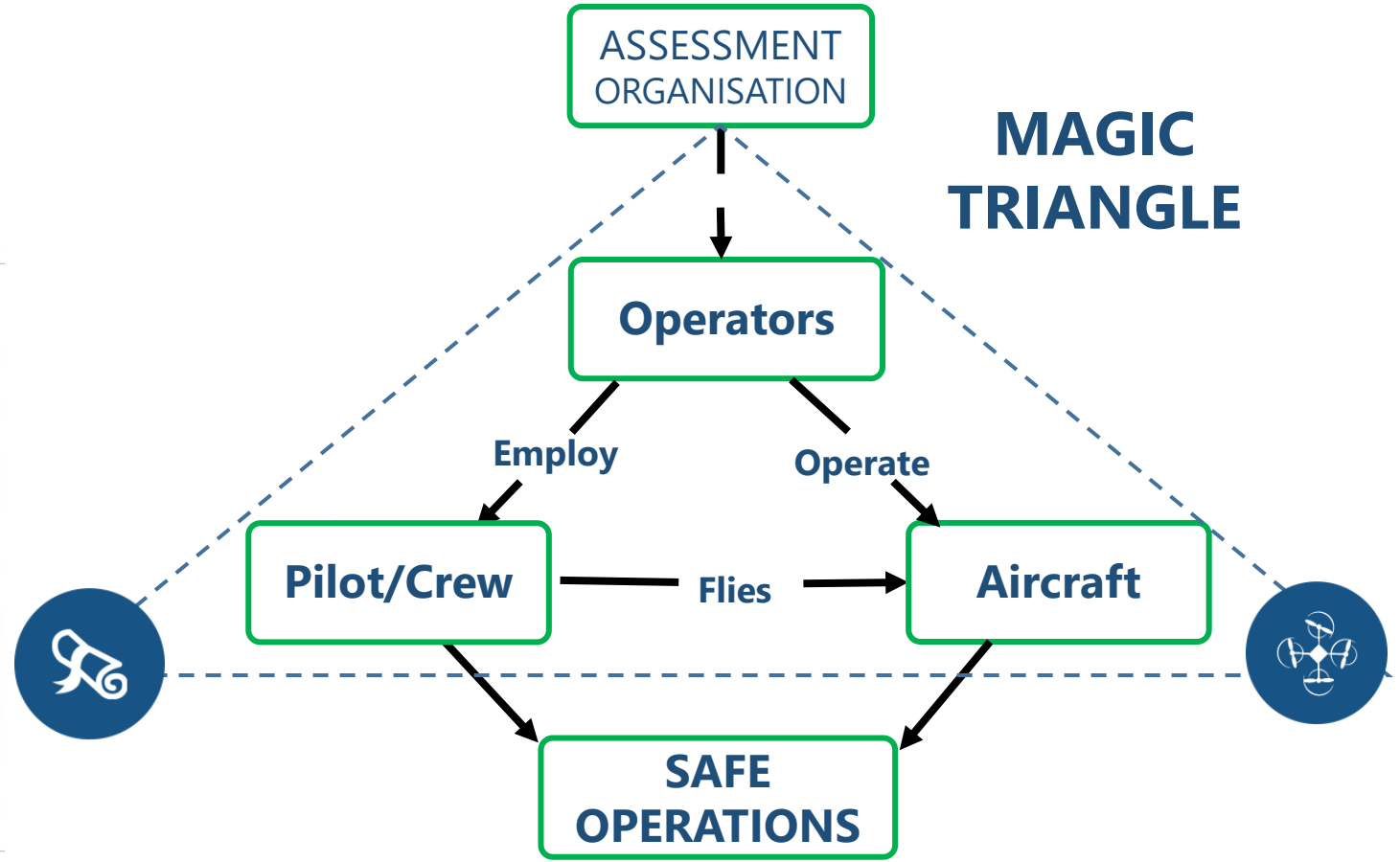


Oil & Gas Rig Inspection

# Context : Regulatory Maturity



**PILOT QUALIFICATION STANDARDS**



**AIRWORTHINESS STANDARDS**

# Context : Regulatory Maturity Levels



- CASE 1 - Tolerant Regulatory Regimes
- CASE 2 - Limited Regulation (Operator)
- CASE 3 - Medium Regulation (Pilot)
- CASE 4 - Improved Regulation (Aircraft)
- CASE 5 - Full Regulatory Regime (System)

?

**Operators**

Register or  
Permission

**Pilot/Crew**

PILOT QUALIFICATION

**Aircraft**

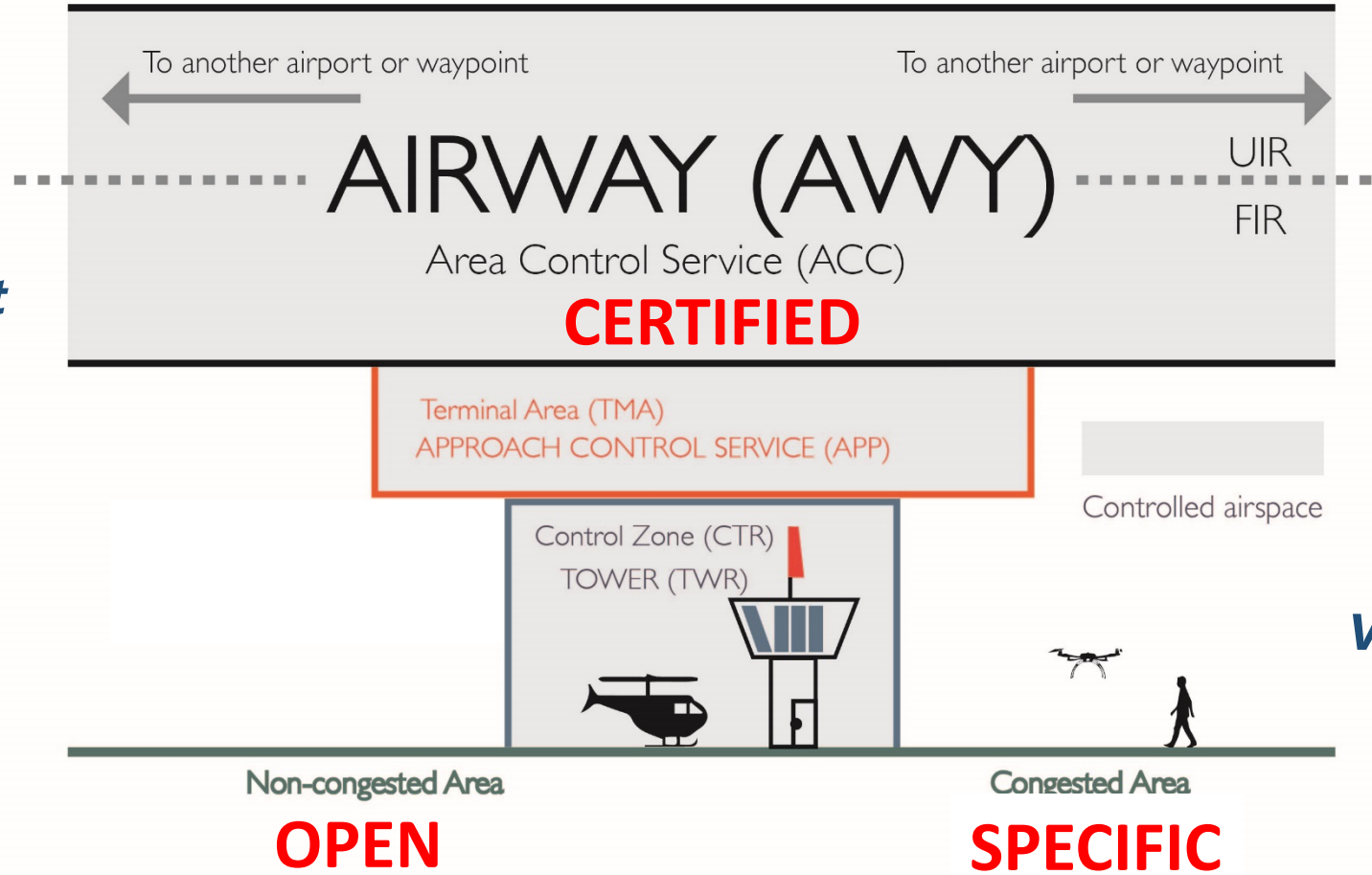
AIRWORTHINESS

**SYSTEM**



# Risk : Application Complexity & Manned Aviation

**BVLOS**  
*Beyond*  
*Visual line-of-sight*







## ICAO RPAS Manual – 6.4.2 Competency of personnel

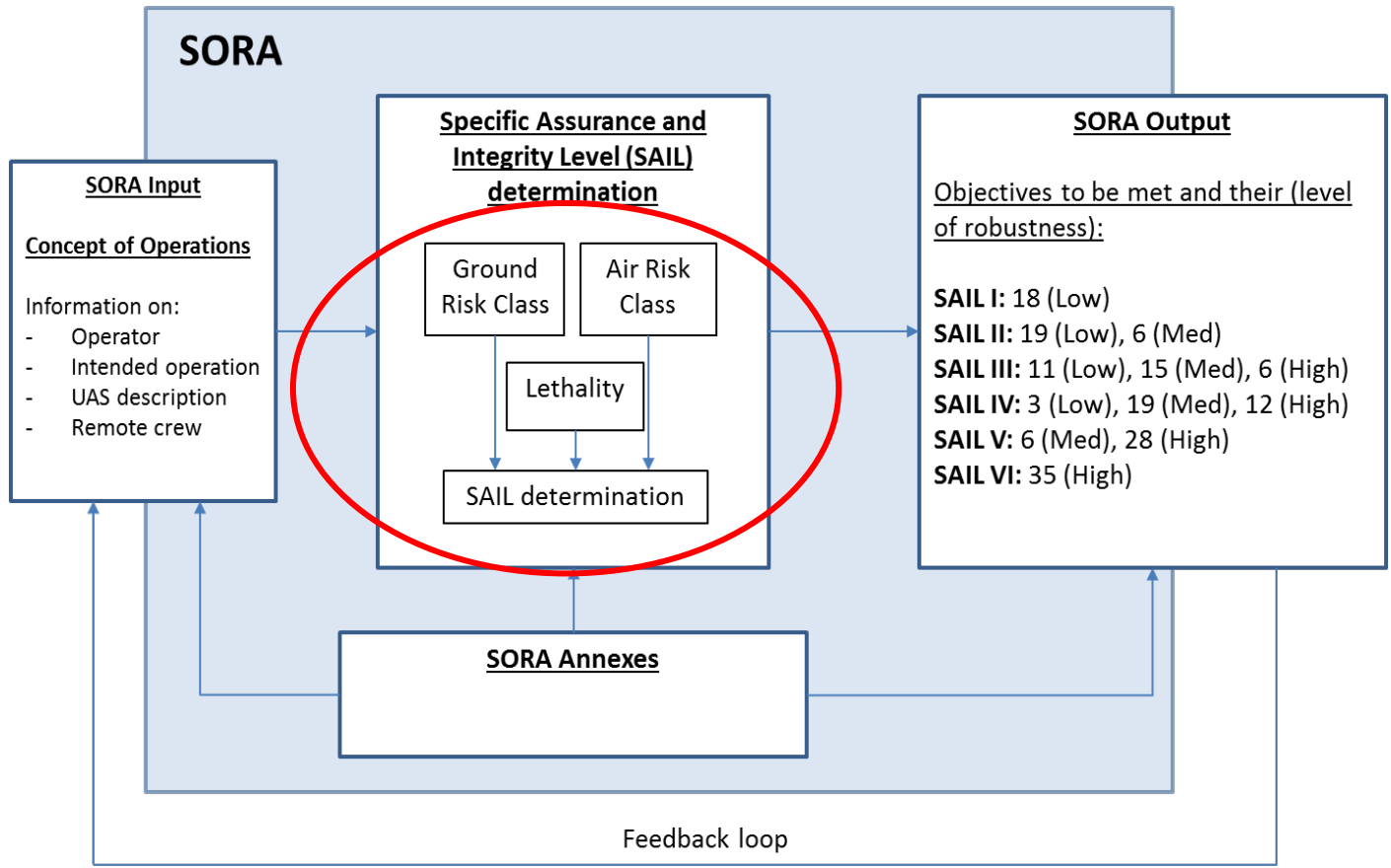
- An RPAS operator must ensure its personnel are properly **qualified** and **competent** to perform their allocated tasks and discharge their responsibilities. Such personnel should have the necessary:
  - a) theoretical **knowledge** ('to know');
  - b) practical **experience** and **skill** ('to know how'); and
  - c) **psychological** and **ethical** characteristics and **attitudes** commensurate with the scope of their duties in relation to RPAS operations ('to be').

# Risk : Aircraft : How dependable are they?

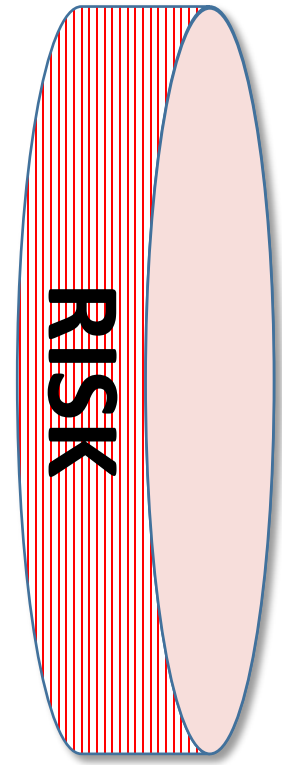
- Loss of Control Link (Control)
- Loss of GPS Signal (Navigation)
- Loss of Motor (Power)
- Loss of Energy Source (Power)
- Fuel/Battery Fire (Various)
- Flyaway (Control)
- Software failure ... after web update



# Mitigation : SORA (Specific Operation Risk Assessment)



SAFETY



INSURANCE

Two side of the same RISK coin

## JARUS/EASA Risk Based Approach

# Mitigation : UA Registers / GEO-fencing



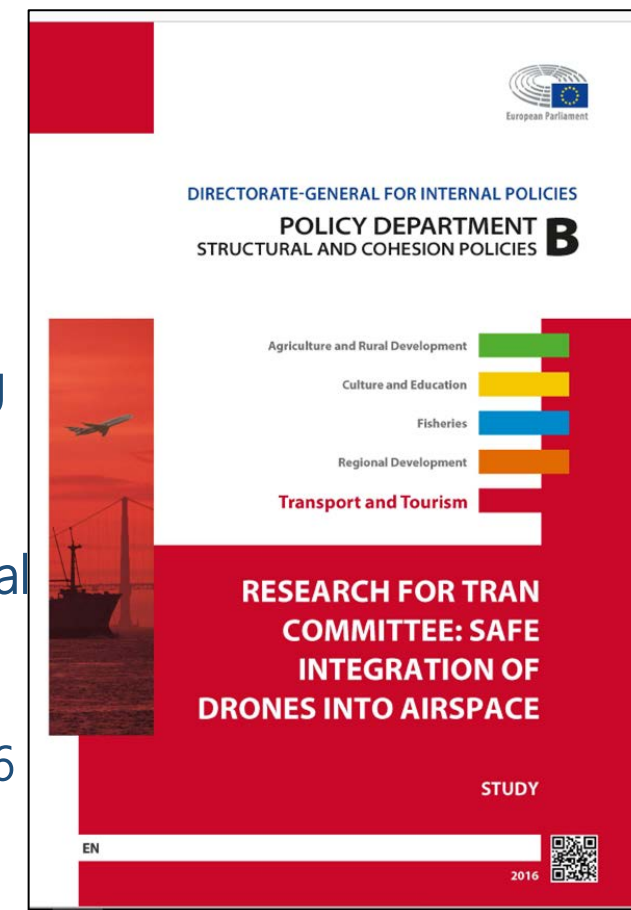
Register : PH-1JR - DJI Inspire 1  
Fire Resistant Plate

## Airspace Integration Issues

e.g. "GEO-fencing

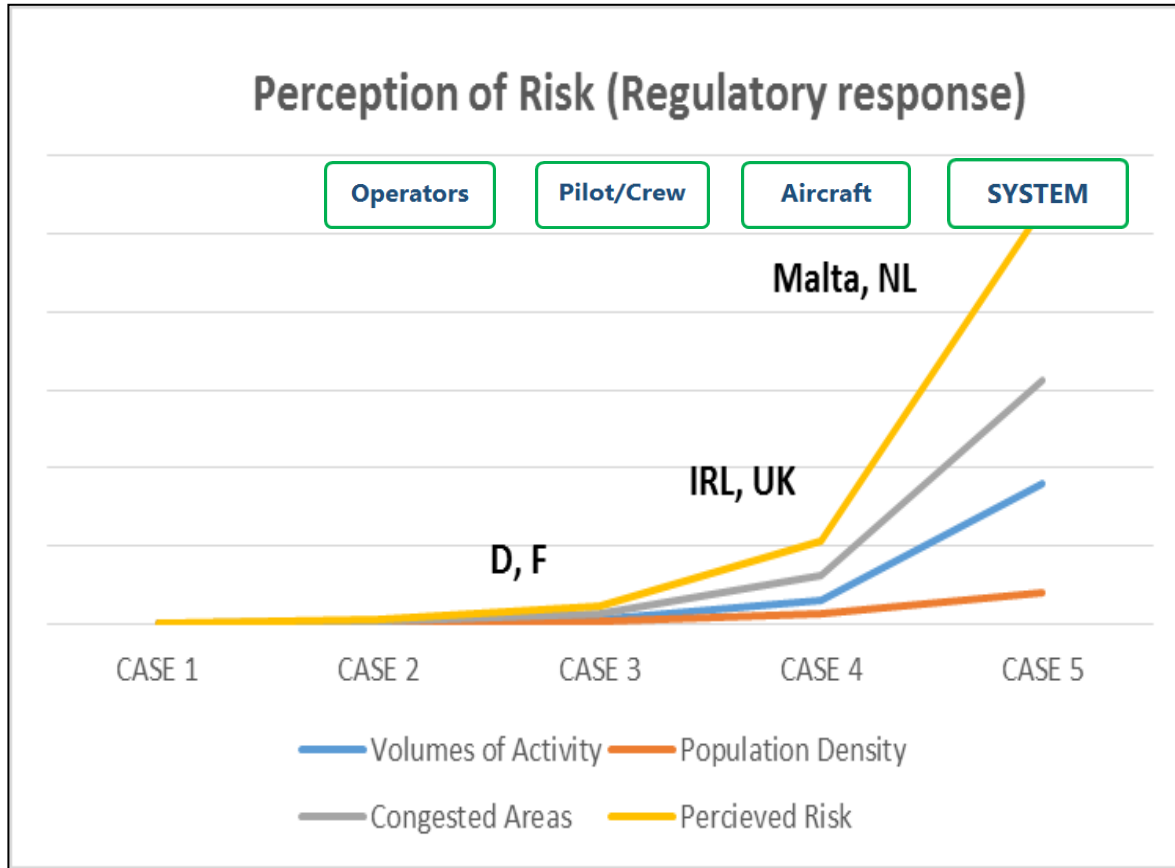
"... the capability of automatically maintaining the UAS in a position compliant with some geometric or geographical limitations.

EC Commission Report :2016  
ISBN 978-92-846-0174-5





# Emerging Risks



## Regulatory Uncertainty

### Emergent Tech

## Height of stupidity: Heathrow airliner buzzed by drone at 7,000ft

Second incident saw drone miss cockpit by barely 10m



A mangled quadcopter drone. File picture, US government

30 Aug 2016 at 14:14, Gareth Corfield



40

An airliner circling Heathrow narrowly missed colliding with a drone flying at 7,000 feet – while another aircraft approaching the London airport saw a drone hurtle past just 30 feet from its cockpit.

## Technology Overtake & Misuse

# Thank you

**André J. Clot, Centre Director  
EuroUSC  
Cardinal Point  
Rickmansworth WD3 1RE  
United Kingdom  
Tel: +44 020 3005 5750  
Email: [andre.clot@eurousc.com](mailto:andre.clot@eurousc.com)**

**[www.eurousc.com](http://www.eurousc.com)**

# Regulation of UAS in the US and Europe

Geneva Association

Munich - 18 November 2016



# Regulation of UAS in the United States

**Laura A. Foggan**

lfoggan@wileyrein.com

Wiley Rein LLP

Washington DC

# Regulation of UAS in the United States

## Federal Government

The Federal Aviation Administration is the primary regulator and has focused principally on operational safety.

## State and Local Government

States, Counties and Municipalities increasingly are asserting authority over UAS, primarily geared to the health and safety – and privacy – of residents.

# The Federal Aviation Administration

The Federal Aviation Administration (FAA) is the federal regulator of air travel and aircraft in the United States.

The FAA asserts authority over anyone who wants to fly an aircraft – manned or unmanned – in U.S. airspace. It does, however, make a key distinction between model aircraft flown solely for hobby or recreational reasons and commercial use of UAS.

# The FAA Modernization and Reform Act of 2012

The FAA Modernization and Reform Act of 2012 (FMRA) provided specific guidance to the FAA concerning the regulation of UAS. Congress instructed FAA to develop a comprehensive plan to safely integrate civil UAS into the national airspace system, with a September 30, 2015 deadline.

# Section 333 Exemptions

Under Section 333 of the FMRA, the FAA gained authority to give exemptions permitting commercial use of sUAS based on a determination that it would be safe to operate in the National Airspace System. Section 333 Exemptions become the primary route for commercial operation of U.A.S.

In February 2015, State Farm was the first insurer to gain permission under Section 333 for commercial operation of sUAS. Many other insurers quickly followed in obtaining exemptions for commercial sUAS programs.

# FAA Part 107

The FAA finally issued new, comprehensive regulations for routine, non-recreational use of sUAS in August 2016.

Part 107, for the first time, broadly authorizes small commercial UAS operations in the United States.

# FAA Part 107 – Small UAS

- FAA Part 107 opens up opportunities for commercial use of SMALL UAS, but . . .
- Extensive commercial operations of LARGE UAS may not become reality for a number of years (at least not in the U.S.). Civil operators may seek special approvals to operate large UAS. However, these approvals come with significant conditions and are far from the regulatory framework necessary for widespread commercial operations.
- The FAA will have to address other major issues before it can achieve large commercial UAS integration, including pilot certification and training, security, airport issues, and air-traffic management.



# FAA Part 107 – Key Points for Commercial Use of sUAS

- Small UAS - must weigh less than 55 lbs. (25 kg).
- Operators must obtain Remote Pilot Certificate via aeronautical knowledge exam (removes requirement for pilot's license).
- Maximum altitude of 400 feet above ground level (AGL) or, if higher, remain within 400 feet of a structure.
- Visual Line of Sight (VLOS) still required; the remote pilot needs to be able to see-and-avoid other aircraft and obstacles.
- Flights prohibited over people (unless in a covered structure or stationary vehicle) that are not “directly participating in the operation of the UAS.”
- No requirement in Part 107 to obtain permission to fly over private property (but state and local laws may impact where UAS can fly).
- Daylight only or twilight operations with anti-collision lighting allowed.

# Federal Regulation Beyond Safety: Privacy?

National Telecommunications and Information Administration (NTIA) multi-stakeholder process: voluntary privacy “best practices” including promises to create and publish UAS privacy notices; forgo collecting information where a person has a reasonable expectation of privacy; delete or de-identify UAS images when no longer needed; and avoid making information public except as necessary or with permission.

Congress has considered legislation to impose privacy regulation on UAS. For instance, one proposal would require that drone licenses be publically available and disclose the operator, area of operation, what data will be collected, how the data will be used, and if data will be transferred to third-parties.

# State and Local Regulation of UAS

Based on the health and welfare – and often privacy - of residents, many states, counties and municipalities have enacted a patchwork of regulation governing use of UAS.

In some areas, state and local regulations could be preempted by federal law -- to the extent the FAA evidences an intent to occupy the field through sufficiently pervasive regulation.

# Scope of Preemption

In December 2015, the FAA released a “State and Local Regulation of Unmanned Aircraft Systems (UAS) Fact Sheet.” It provided two examples of state and local laws for which “consultation with the FAA” is recommended:

- Operational UAS restrictions on flight altitude, flight paths; operational bans; any regulation of the navigable airspace. For example – a city ordinance banning anyone from operating UAS within the city limits, within the airspace of the city, or within certain distances of landmarks. Federal courts strictly scrutinize state and local regulation of overflight.
- Mandating equipment or training for UAS related to aviation safety such as geo-fencing would likely be preempted. Courts have found that state regulation pertaining to mandatory training and equipment requirements related to aviation safety is not consistent with the federal regulatory framework.

# Scope of Preemption

The “State and Local Regulation of Unmanned Aircraft Systems (UAS) Fact Sheet” also provided examples of laws within state and local government power, which were: Laws traditionally related to state and local police power – including land use, zoning, privacy, trespass, and law enforcement operations – generally are not subject to federal regulation.

Examples include:

- Requirement for police to obtain a warrant prior to using a UAS for surveillance.
- Specifying that UAS may not be used for voyeurism.
- Prohibitions on using UAS for hunting or fishing, or to interfere with or harass an individual who is hunting or fishing.
- Prohibitions on attaching firearms or similar weapons to UAS.

# Examples of State and Local Regulation

At least 32 states have enacted laws addressing UAS issues and an additional five states have adopted resolutions.

Common issues addressed in the legislation include: defining a UAS, addressing use by law enforcement or other state agencies, addressing use by the general public, and prohibiting or regulating use of UAS in hunting game.

# Liability Risks Under US Laws

The patchwork of U.S. federal, state and local laws and regulations can generate lawsuits and/or fines and penalties against UAS operations.

In addition what has been discussed earlier, these include laws that are not specific to UAS such as wiretap laws, stalking and harassment laws, and privacy laws.

Also, there are risks of common law claims based on trespass and nuisance, as well as tort suits for bodily injury or property damage.



# Challenges for Insurers

The U.S. regulatory framework – at the federal, and state and local level – as well as the common law tort system, are a key backdrop for determining liability risks related to UAS. Given the evolving regulation of UAS in the United States, and the emerging technology and uses of unmanned aircraft systems themselves, there are significant challenges in identifying and understanding the scope of liability risks.

These liabilities may extend far beyond traditional aviation liability to include, for instance, general liability (including for third-party bodily injury and property damage and personal injury, e.g., invasion of privacy), property insurance (including damage to property and business interruption), and professional liability coverages.

# Questions?

Laura Foggan  
Lfoggan@wileyrein.com  
202.719.3382  
Wiley Rein LLP  
Washington, D.C.

# **Drones (UAS) in Europe – some aspects of the legal landscape**

Clyde & Co LLP

Patrick Slomski

Munich - 18 November 2016

# Present European landscape

“Basic Regulation” (Regulation (EC) 216/2008):

- Direct application
- Framework regulation – safety oversight of design, manufacture, maintenance, operation (incl. personnel)
- No express / no effective exceptions or exemptions
- Not applicable to drones mass  $\leq 150\text{Kg}$
- Not applicable to state-type operations (military or non military)

National Aviation regimes:

- Patch work – increasingly aligned but details vary and no harmonised recognition of licensing / approvals

Local By-laws:

- Relevant but usually of very limited (geographical and legal) scope

# National regimes – UAS ≤ 150Kg

Vary from State to State; increasing alignment of principles

Key aspects:

- Small UA – mass <20 – 25 Kg
  - Excepted from majority of requirements (licensing, airworthiness, operational approval)
  - Operational restrictions – VLOS, ceiling (400 – 500 ft), separation from structures/vehicles (typically 50-150m), no overflight of congested areas/people
  - Additional “surveillance” and “commercial operation” restrictions and requirements
- Larger mass UA:
  - Exemption powers (e.g. UK)
  - Discretion / policy – operation-centric approach (risk based), e.g.:
    - increased mass
    - E-VLOS

# Draft new “Basic Regulation” / proto-type UAO Regulation

## Draft “Basic Regulation”:

- Framework regulation
- Subject to (European) parliamentary review – expected 2016/early-2017
- 150Kg mass limit disappears – all UA(S) fall within oversight
- Annex IX – “Essential Requirements” – applicable to UA and UAS
- Structure for subsequent implementing regulations

## Proto-type UA Operations Regulation

- Envisaged to come into force in 2017
- Tiered approach:
  - “open” and “specific” categories – operation centric / risk based
  - “certified” category – not covered by proto-type
- Product safety requirements – Annex II

# Operation-centric approach – “Open”

No prior authorisation before the operation

Technical requirements for UA and operational limits

Subcategories A0-A3:

- Increasing risk of third party injury / damage
- A0 (toy-type): <150ft ceiling; max ground speed 15m/s; small (mass <250g)
- VLOS (A3 – limited E-VLOS); for lower risk categories – “1<sup>st</sup> person view” / “follow-me” mode
- Ceiling = 150ft; except A3 = 500ft

Equipment: geo-fencing and ceiling-limiter for certain sub-categories

Operator registration (except A0); and electronic identification



# Operation-centric approach - “Specific”

Prior authorisation taking into account the mitigation measures identified in an operational risk assessment, except

- ... for operation within limitations of “standard scenarios”

Standard scenarios to be published by EASA

Registration of operator

Declaration of compliance with standard scenarios or approved risk assessment

# Insurance

## Regulation (EC) 785/2004:

- Excludes “model aircraft” MTOM < 20Kg (see “proto-type UAO Regulation”)
- Minimum third party liability insurance cover: <500Kg SDRs 750,000 (~€951,300 (14.11.16))
- To include war, terrorism, sabotage, hijacking, unlawful seizure, civil commotion. Except non-commercial operations

2014 study – no change to Regulation

# Liability – traditional third party damage

## Ground damage:

- Domestic operation – patch work; common pattern but details vary
- Tendency towards strict liability:
  - e.g. fault based liability is relevant under NDL regime; in excess of limits under German and Italian regimes
  - e.g. limited liability under German and Italian regimes (strict liability); unlimited liability under UK and French regimes.
  - Details or “defences” vary.
  - Operator or “owner” (e.g. lessors...)

## Interference with other aircraft:

- Tendency towards fault based liability (but patch work - see e.g. French law)
- Tendency towards unlimited liability

Harmonised European liability regime appears unlikely

# Liability – some novel aspects (1)

Interference with other aircraft:

- Fault based – standard of operator's (/owner's) care – not so uncertain: UAS accommodate other a/space users, not vice versa.
- Airspace separation/confliction detail – work in progress

Ground “damage”:

- Defences of reasonable precautions – uncertain standards of operation (... loss of C2 link mitigations?)
- Interference / trespass / nuisance – uncertain scope and (?) fact sensitive – many regimes do not have altitude floors

Pilot's / operator's dependence on third party service providers:

- C2 / telemetry – robustness and latency
- Confliction advice (urban operations)
- Information (e.g. geo-fenced zones)

# Liability – some novel aspects (2)

Manufacturer's (/operator's?) liability:

- “Basic Regulation” / “proto-type UAO Regulation” – equipment requirements e.g. mitigations where loss of C2 link
- Radio interference e.g. RED 2014/53/EU
  - 2015 survey: ~50% small UAS non-compliant

# Security

New draft “Basic Regulation” provides for civil oversight (equipment and operation requirements) and EASA consultation to include security considerations (e.g. cyber-security considerations in equipment; operator requirements). Those are reflected in general terms in Annex IX and proto-type UAO Regulation.

National authorities retain overall responsibility

Standards (e.g. C2 link) in development

Operator liability – e.g.:

- “cargo” screening requirements?
- Security of C2 link and positioning information? (e.g. urban operation)

**THANK YOU FOR LISTENING**

**QUESTIONS?**



XL CATLIN

# RISKS RELATED TO DRONES UNDERWRITING CONSIDERATIONS

Mark A. Sacco

Vice President

Western Region Manager – Aviation

San Francisco



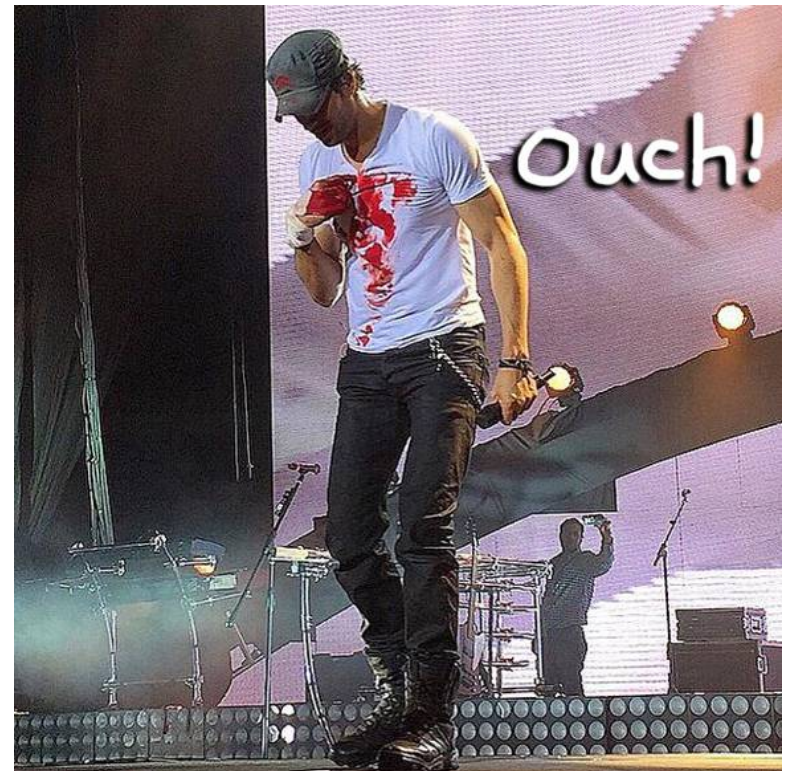
# Underwriting Considerations



- What could happen?

<https://www.youtube.com/watch?v=IAOzOIV3wm0>

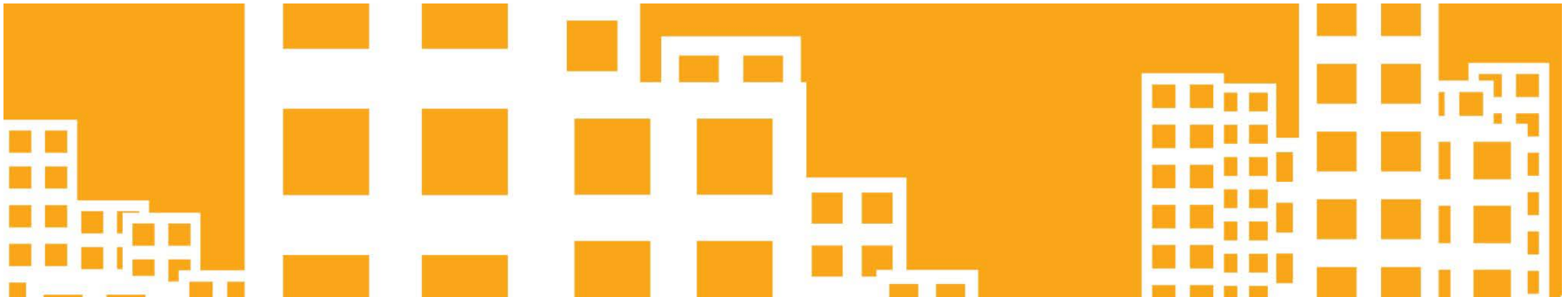
<https://www.youtube.com/watch?v=PyczZ1ZVLmo>



# Underwriting Considerations



- The benefit of UAS's are they are devoid of the major liability risk of manned aircraft – passengers
- We will need to develop an understanding of potential BI and PD on the ground or in other aircraft
- Hull coverage, *if needed*, will be greatest challenge to underwrite



# Underwriting Considerations



Like the manned Hull & Liability world, it will be imperative for the underwriter to *build* a detailed understanding of the risk.

- Organization operating it – research, law enforcement, commercial etc...
- Use
- Physical attributes
- Control System
- Operating environment
- Regulatory environment

# Underwriting Considerations - UAS Attributes



- What type of UA is it? – airplane, rotorcraft, other
- Who is the manufacturer?
- What type of system is it – Autonomous, Auto Land and Return To Home
- How long has the model been in service?
- How many have been delivered?



# UAS – State of the Market



- The aviation insurance market place has responded enthusiastically to the introduction of drones to the National Aerospace System (NAS).
- Initially, coverages have been provided on drones via existing hull & liability policies with minor changes in form wording.
- Liability limits are readily available from non-aviation markets, most notably construction and professional liability (via CGL).
- Small drone coverage (less than 55 lbs, hull values up to \$2K, and liability limits up to \$5MM CSL) is easily obtainable with annual premiums less than \$5,000.

# UAS Coverage



- Underwriters are providing “insured value” coverage for 1<sup>st</sup> party physical damage.
- No known limitations in current re-insurance treaties.
- XLC – currently no separate policy form, coverage added via existing hull and liability policy forms or via endorsement.
- XLC is developing a separate drone product and investigating distribution methods (i.e. – MGA’s or online quoting).

# Conclusions



- This will be the one area of growth in aviation in many parts of the world with highly developed aviation businesses – ***there are opportunities***
- There is significant lack of clarity in current regulations
- We will employ a cautious approach to our participation in this developing market
- ***Immanuel Kant – Sapere aude – Dare to be wise***





**XL CATLIN**

**THANK YOU  
QUESTIONS?**