The EASA Technical Opinion on Unmanned Aircraft (UA)
related to A-NPA:2015-10

Sylvette Chollet . Tokyo 17 February 2016

Your safety is our mission.

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A) Background about European legislation in the Unmanned Aircrafts (UA) domain

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Established
2002

10 years+
in operation

750

aviation experts
& administrators

Headquarters in
Cologne
Office in
Brussels

32 EASA member states
= 28 + 4
EU + Switzerland, Norway
Iceland, Liechtenstein

The EU Aviation Safety System (2)

Proposes rules

Issues some certificates and approvals

Performs inspections

Manages European Aviation Safety Programme

European Aviation Safety Agency

European Commission

Adopts rules

Launches infringement procedure

Manages Safety List

National Aviation Authorities

Issue most certificates, approvals and licences

Oversee organisations

Implement EU law

Industry

The EU Aviation Safety System (3)

➤ Under current EU regulations , EASA is responsible for aircrafts with a mass higher than 150 kg which are not used for "state" operations.

➤ So today each EASA Member State has its own legislation for UA: no harmonisation.

➤ Last Dec 7, 2015 the European Commission published the "aviation strategy package" which includes a proposal for a new Basic Regulation, which intends to change this situation, proposing common EU rules for all UA

➤ The EASA Technical Opinion has been developed in parallel with the proposed Basic Regulation change and presents concrete proposals for a regulatory framework for UA operations and a roadmap to put them into practice

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▶ A) Background about European legislation in the Unmanned Aircrafts (UA) domain

▶ **B) New regulatory framework: EASA Technical Opinion and Principles**

▶ C) Categories of operation proposed by the Technical Opinion

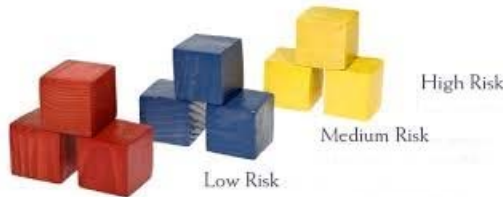▶ D) Implementation Roadmap for the new regulatory framework

Principles of proposed approach: 3 pillars

Operation centric

- Consequences of loss of control highly dependent on operating environment

Risk based

- 3 categories: open, specific, certified
- Commercial as well as non commercial

Smooth

- No undue burden on the aviation system

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   - Open

   - Specific : Operation Risk Assessment (SORA)

   - Certified

➤ D) Implementation Roadmap for the new regulatory framework

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

Today EASA accepts application in its present remit

Some systems (Datalink, Detect and Avoid, …) may receive an independent approval
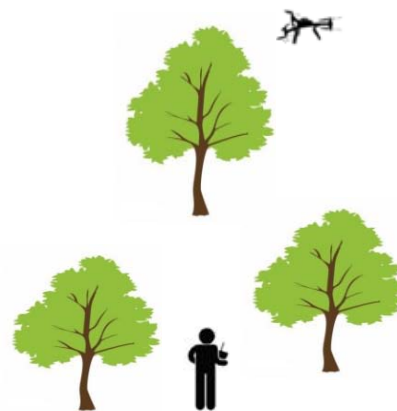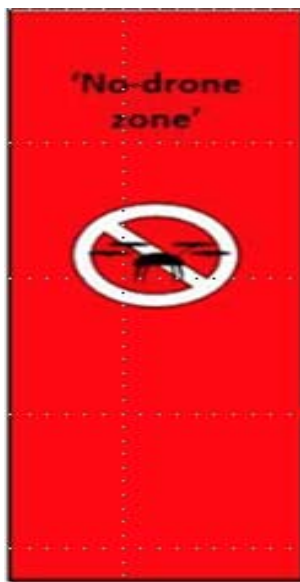
Open Category: "Harmless" sub-category

Specific harmless thresholds TBC with Impact Assessment Activity

OPEN	
Harmless	< 250 g
A0	
A1	
A2	< 25 kg

Light / Very light market regulation

Subject to local restrictions

Do not operate recklessly

Follow operating instructions and does and don'ts

Including FPV (First Person View)

CE

Product Legislation

Instructions manual

'No-drone zone'

Limited Drone Zone

Geo-limitation System required

Registration required

Identification System rerquired

Open Category: A0 – A2 subcategories
Product and Pilot Requirements

Product Legislation

OPEN	
HL	< 250 g
A0	
A1	
A2	< 25 Kg

Product must comply with legislation

Adequate pilot competence required

Mandatory Registration

Instructions manual

PILOT COURSES

PILOT COURSES

PILOT COURSES

REGISTRATION

Open Category: A0 – A2 subcategories Operational and Functional Requirements

OPEN	
HL	< 250 g
A0	
A1	
A2	< 25 Kg

Compliance with Identification requirements

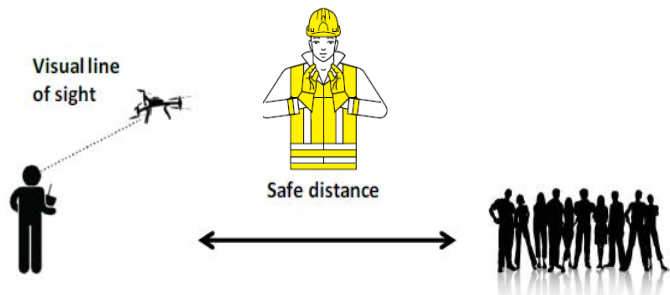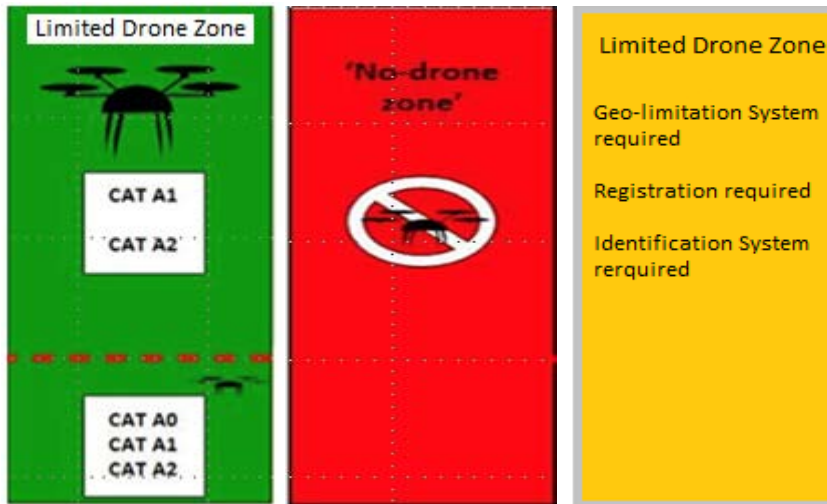**Compliance with no drone zones and special drone zones supported with automatic geo-limitation technology**

Observe minimum distance from uninvolved persons, fly only in VLOS and do not fly over crowds

HVL D 135

Identification

150 m

STOP

Geo-limitation

Limited Drone Zone

CAT A1

'CAT A2'

CAT A0
CAT A1
CAT A2

'No-drone zone'

Limited Drone Zone

Geo-limitation System required

Registration required

Identification System rerquired

Visual line of sight

Safe distance

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- Certified

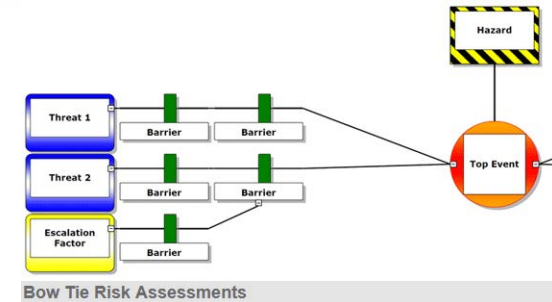➤ D) Implementation Roadmap for the new regulatory framework

Specific category – SORA Elements

- Area of Operation
- Airspace
- UA Design
- Operational Procedure
- Pilot Competence
- Organizational Factors
- Effect on Environment

Hazard

Threat 1 — Barrier — Barrier
Threat 2 — Barrier — Barrier — Top Event
Escalation Factor — Barrier

Bow Tie Risk Assessments

Risk Assessment

Operation Authorisation (OA)

Improvements Needed

Limitations
- Speed
- …

Limitations
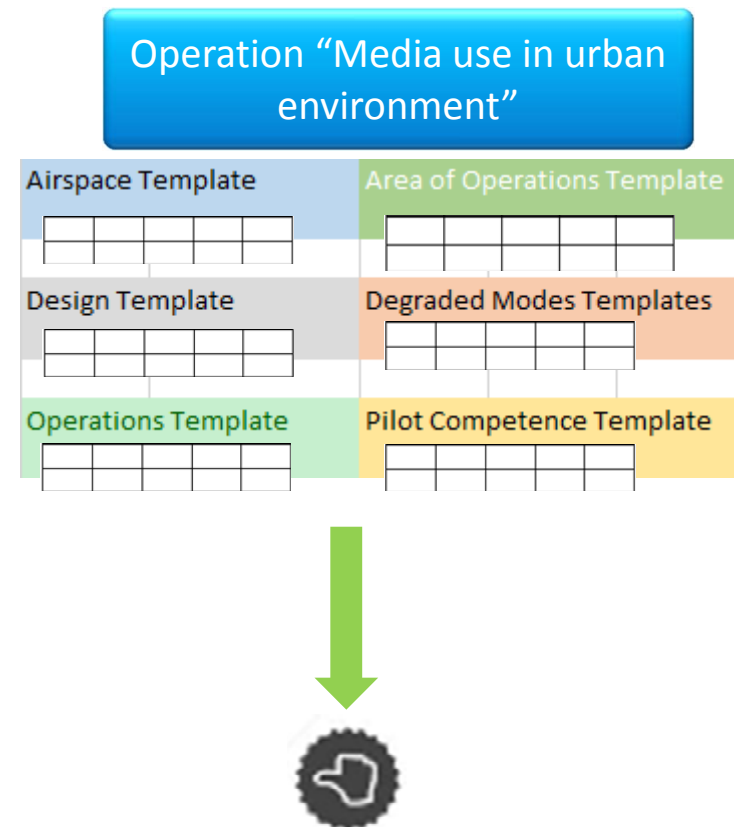- MTOM

Specific category – Standard Solutions

- Industry and Standardisation bodies are expected to provide standard solutions to address the risks associated with the use of UA in standard scenarios

- These solutions can be envisaged as pre-defined templates / forms of simplified risk assessments

- If the operation "fits" the form (all the fields can satisfactorily be compiled and/or criteria positively matched) the approval should be granted

- In this case the operation approval process would be very simple and would not require the know-how of traditional aviation organizations

Operation "Media use in urban environment"

Airspace Template	Area of Operations Template

Design Template	Degraded Modes Templates

Operations Template	Pilot Competence Template

Some standards Activities

- **Industrial Inspections**
  - Power centrals
    - Nuclear
    - …
  - Mining
  - Naval
  - Aviation
  - …
- **Precision farming**
  - Monitoring
  - Fertilizer spreading
  - …
- **Infrastructures inspections**
  - Railways
  - Power lines
  - ..
- ….

Activity …

Airspace Template	Area of Operations Template

Design Template	Degraded Modes Templates

Operations Template	Pilot Competence Template

Standard Activity "Media Use in Urban Environment"

- ► **Area of Operation**
  - ► Population density during operation < …
  - ► Presence of crowds: no
  - ► Traffic overflown: no
  - ► …

- ► **Airspace template**
  - ► Nearest airport area > … Km
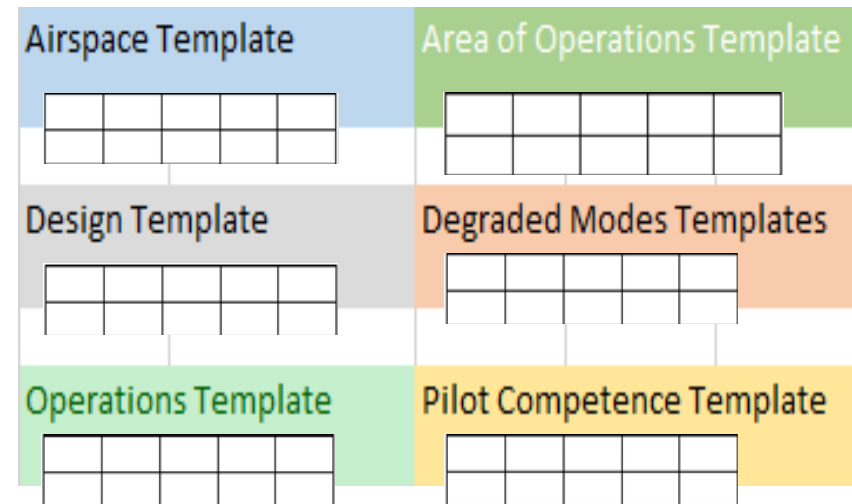 - ► Low level helicopter traffic: no
  - ► …

- ► **UA Design**
  - ► Weight < … Kg including payload
  - ► Dangerous materials: no
  - ► MTBCF (minimum time between critical failures) > …
  - ► …

- ► **Operations Template**
  - ► Max flight altitude < …
  - ► Max speed: …
  - ► Operation duration, number of operations forecasted, …

Activity "Media use in urban environment"

Airspace Template	Area of Operations Template

Design Template	Degraded Modes Templates

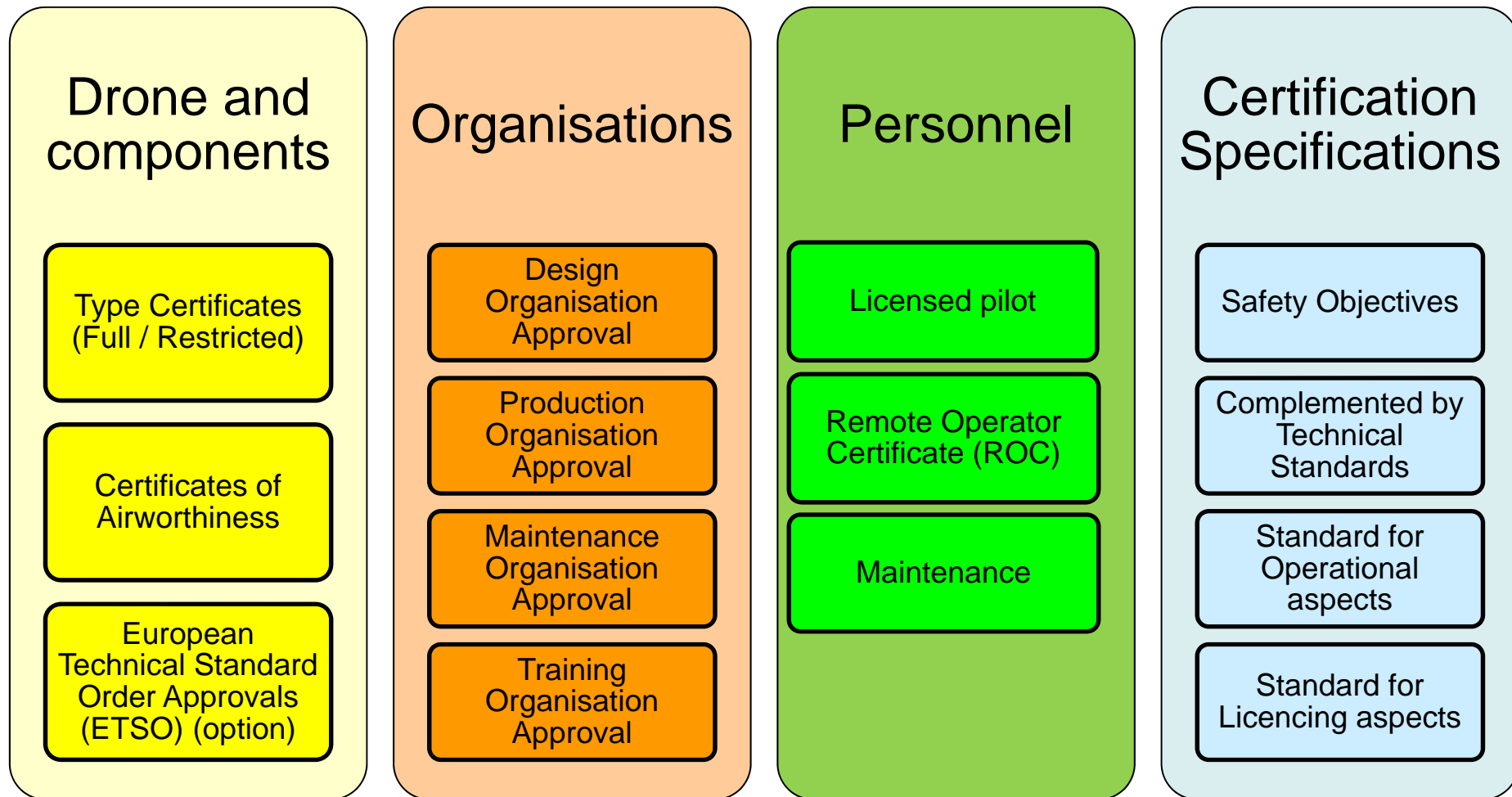| Operations Template	Pilot Competence Template

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- **Certified**

D) Implementation Roadmap for the new regulatory framework

"Certified" category

Implementing rules included in existing rules for manned aviation

Drone and components

- Type Certificates (Full / Restricted)
- Certificates of Airworthiness
- European Technical Standard Order Approvals (ETSO) (option)

Organisations

- Design Organisation Approval
- Production Organisation Approval
- Maintenance Organisation Approval
- Training Organisation Approval

Personnel

- Licensed pilot
- Remote Operator Certificate (ROC)
- Maintenance

Certification Specifications

- Safety Objectives
- Complemented by Technical Standards
- Standard for Operational aspects
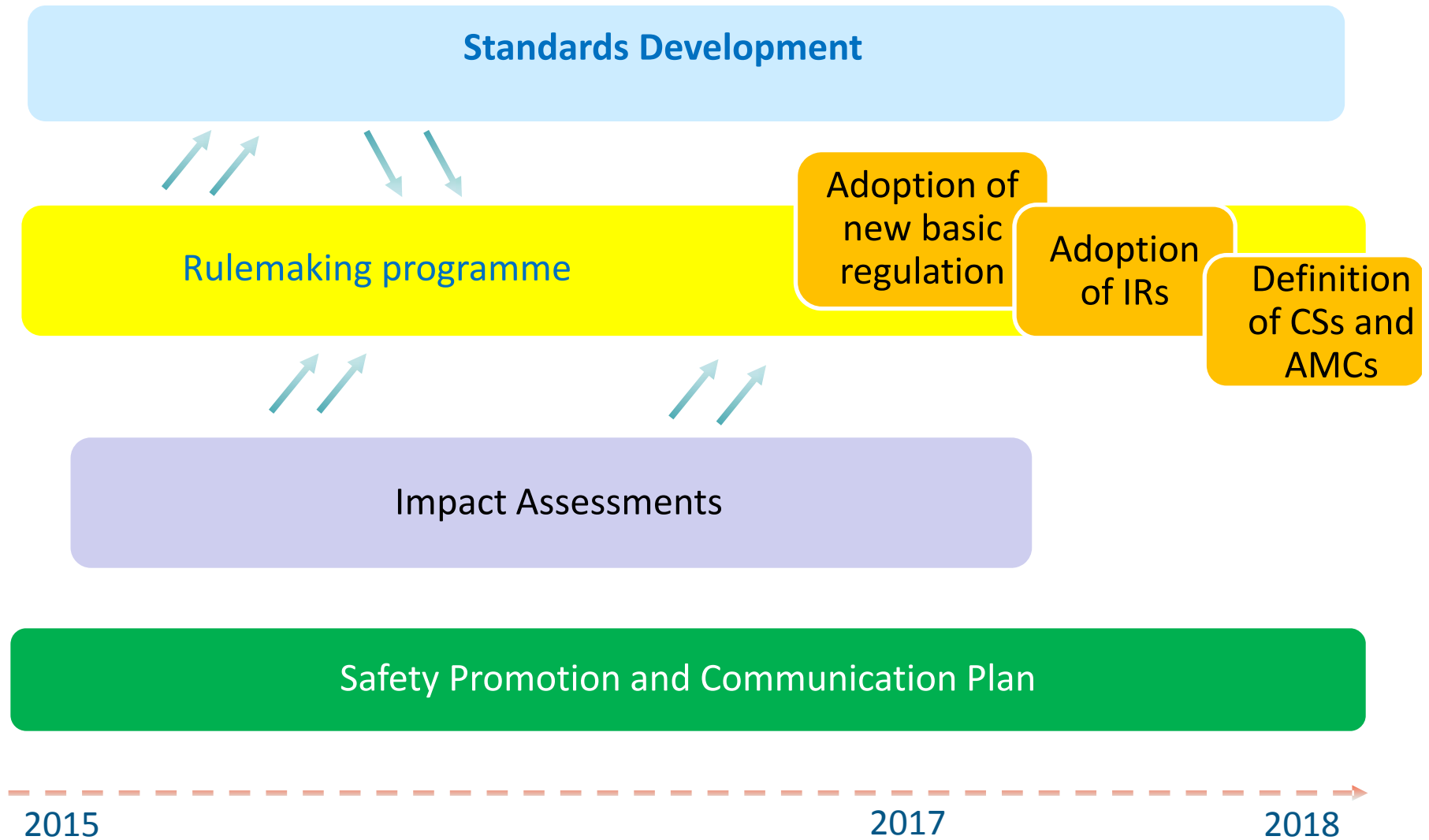- Standard for Licencing aspects

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EU Roadmap :

Rulemaking programme
- CS for unmanned aeroplanes / rotorcrafts
- IR for Open Category
- IR for Specific Category
- Adaptation of IR from manned aviation

Impact Assessments
- Establishment of additional subcategories
- Specific technical requirements, minimum distances, limited access to some operational areas

Standards Development in Coordination with Standardization Bodies
- Identification
- Geo-limitation
- Pilot Competence
- Standard cases for specific category
- …

International Harmonization and Research
- Harmonization: ICAO, JARUS
- Research: EDA, ESA, SESAR

Safety Promotion and Communication Plan
- Addressing stakeholders at large (IOs, MSs, EU institutions, general public, ..)
- Leaflets with dos and dont's , posters, videos,..
- Includes cooperation with law enforcement agencies

Summary: EASA Technical Opinion on UA

- EASA Technical opinion:
    - Foundation for future work
    - Illustrate articles and essential requirements of the proposed Basic Regulation
    - Guidance for Authorities for further development of their rules
    - Provides roadmap
    - You will find it at:

http://www.easa.europa.eu/document-library/opinions/opinion-technical-nature

Conclusion

▶ This technical opinion is an Important step for safe, secure, environmentally friendly Unmanned Aircraft Operations, respecting privacy of the citizens

▶ However significant work is still ahead of us

▶ EASA is committed to work in cooperation with all stakeholders