VTOL Symposium 2020:
Update on EASA AI Roadmap Implementation

Prepared by the EASA AI project team
November 2020
Guillaume Soudain – EASA Software Senior Expert / AI Project Manager
EASA organisation for innovation

The EASA innovation network
Alain Leroy – Principal Advisor to the EASA Certification Director
AI as first key topic for our innovation network

Artificial Intelligence Task Force

EASA Directorates
ED – Executive Directorate
SM – Strategy & Safety Management
CT – Certification
FS – Flight Standards
RS – Resources & Support

AI Roadmap V1.0

Focus on
- Machine Learning
- Deep Learning

www.easa.europa.eu/ai
EASA AI Roadmap overview

A human-centric approach to AI in aviation
Alain Leroy – Principal Advisor to the EASA Certification Director
EASA AI Roadmap timeframe and milestones

**AI Roadmap Deliverables**

- **2021**: First usable guidance for Level 1 AI/ML (human assistance/augmentation)
- **2022**: First usable guidance for Level 2 AI/ML (human/machine collaboration)
- **2024**: First usable guidance for Level 3 AI/ML (more autonomous machine)
- **2026**: Finalized guidance for Level 1 and 2 AI/ML
- **2028**: Finalized guidance for Level 3 AI/ML
- **2029**: Adapt to further innovation in AI

**Phase I: Exploration and first guidance development**

- 2019: First EASA AI/ML IPCs & applications

**Phase II: AI/ML framework consolidation**

- 2025: First approvals of AI/ML

**Phase III: Pushing barriers**

- 2030: Single-pilot CAT operations*
- 2035: Autonomous CAT operations*

*For Large Aircrafts, based on roadmaps from major players
AI Trustworthiness

A driving concept
AI Roadmap building blocks

EC Ethical Guidelines
- Accountability
- Technical robustness and safety
- Oversight
- Privacy and data governance
- Non discrimination and fairness
- Transparency
- Societal and environmental well being

EASA Trustworthy AI building-blocks
- Learning Assurance
- AI Explainability
- AI Safety Risk Mitigation
Learning Assurance: W-shaped Process

How do we ensure that a Machine Learning application will behave as intended?
Learning Assurance: W-shaped Process

- Requirements management
- Data management
- Learning process management
- Model Training
- Learning process verification
- Model Implementation
- Inference model verification
- Data verification
- Requirements verification

Safety Assessment Process
Learning Assurance: CoDANN IPC Use Case
Generalisation guarantee is a crucial characteristic of the Learning Assurance concept.

Traditional Safety Assessment methods are compatible with the use of NNs, with some adaptations.

[www.easa.europa.eu/ai]
So where are we now...

... and where are we going?
Guillaume Soudain – EASA Software Senior Expert / AI Project Manager
Thank you for your attention!

Any question?
Please contact us: guillaume.soudain@easa.europa.eu